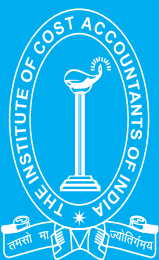


COSTING PRINCIPLES & PRACTICES and FINANCIAL ACCOUNTING

EXECUTIVE DIPLOMA IN
COST & MANAGEMENT ACCOUNTING FOR ENGINEERS

MODULE
I



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THE INSTITUTE OF COST ACCOUNTANTS OF INDIA**

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VISION STATEMENT

The Institute of Cost Accountants of India would be the preferred source of resources and professionals for the financial leadership of enterprises globally.

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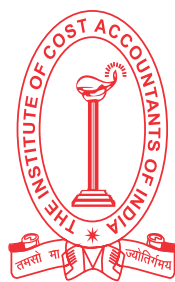
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ABOUT THE COURSES

01: EXECUTIVE DIPLOMA IN BUSINESS VALUATION

Valuation, particularly financial valuation, is emerging as an important profession, with the growth in the profession of financial analysts due to various factors like increased interest in mergers, acquisitions, demerger and divestiture, increased interest of PE firms in Indian business and implementation of IndAS. The valuation profession is expected to get a boost with the introduction of the concept of Registered Valuers in the Companies Act 2013. Registered Valuers will provide valuation in respect of property, stocks, shares, debentures, securities, goodwill or any other assets or net worth of a company or its assets or liabilities.

This diploma course aims to develop proficiency in Valuing assets and liabilities through a learning process that blends concepts with applications. The course is an advanced knowledge module that presupposes understanding of management accounting and corporate finance. The participants will get extensive exposure through project work on Valuation and by analyzing case studies.

Course Duration: 6 months

02: EXECUTIVE DIPLOMA IN COST & MANAGEMENT ACCOUNTING FOR ENGINEERS

In modern competitive business environment, suitable business decision making is very crucial. All professionals irrespective of their domain expertise need to understand the commercial aspects of the business, contribute effectively and efficiently to the strategic business decisions making.

Engineers being the frontline technocrats, are part of the team for taking various commercial decisions in the interest of the organization, which requires adequate expertise to understand the various facets of the Cost, Finance, Taxation, Laws and other such aspects. This course has been specifically designed for Engineers to synergies their domain expertise with the commercial link in a most practical oriented manner.

Course Duration: 6 months

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03: CERTIFICATE COURSE IN ARBITRATION

Arbitration is a form of alternative dispute resolution (ADR), is a technique for the resolution of disputes outside the courts, the parties to a dispute refer it to Arbitration by one or more persons (the arbitrators awards or arbitral Tribunal), and agree to BE bound by the arbitration decision (the award). A third party reviews the evidences in the case and imposes a decision that is legally binding on both sides and enforceable in the courts. In fact Arbitration is a process in which disputants can resolve dispute amicably. This method can bring solutions to disputes as well as among disputants.

The objective of this course is to familiarize the participants with legal framework of arbitration, arbitration procedures, and arbitration practice. It is also designed to cover practical aspects covering case analysis and mock arbitral proceedings.

Course Duration: 3 months

04: CERTIFICATE COURSE IN GOODS AND SERVICES TAX (GST)

Goods & Services Tax (GST) is a major tax reform in the Country and is a game changer. There has been a paradigm shift in the Indirect Tax structure with the GST rollout w.e.f 01st July 2017. As a professional, it is imperative to understand and assimilate the new taxation structure, associated compliances and the changes in business processes emanating there from.

In the above backdrop, a course module on GST has been planned so as to upgrade the knowledge level of our members & professionals in a structured and practical oriented manner. Institute has twin expectations from this course, first the GST concepts and implementation has to be understood in a simple way by our professional colleagues, and second the same can be percolated to the business houses, traders and other such concerns having GST impact in their respective locations. This course is being launched in association with Tax Research Department of the Institute.

Course Duration: 3 months

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INTRODUCTION

"The stock market clearly does not value a company for excellently prepared financial statements if operational excellence is lacking"

- Philip Lawton

Business excellence presupposes information-based management as one of its core principles. In today's context, integrated information system with global and local networks, cuts across all activities of an enterprise and it attunes the enterprise to its internal and external realities. It is the principal tool to the management for analysing facts, taking decisions, communicating instructions and reviewing performance. Information system indispensably includes 'accounting' for the money measure of transactions for an entity (enterprise). However, traditional or financial accounting records transactions between an entity and its contractual persons (suppliers, customers, employees, etc). It is also used for discharging statutory liabilities. There is no reason as to why should financial accounting record internal transactions like processing, handling & testing of materials, idleness of machineries, abnormal wastages and so on. Therefore, traditional or financial accounting is historical in its approach enshrined in its own principles. It does not throw much light on risks that confront future and opportunities that are lost.

The need for a complementary system combining all other systems for strengthening financial information was felt for long. Initially, 'cost accounting' was developed with the advent of factories after industrial revolution (1760-1820). Cost accounting was then practiced as a confidential discipline for matching revenue-cost, controlling expenditure and pricing products. It was institutionalized much later in comparison to accounting and management professions. Decades after institutionalization, industries started viewing cost accounting as a useful tool for management which should outgrow the limitations of traditional or financial accounting and become a comprehensive discipline by itself. This led to evolution of 'cost & management accounting' specially during the great depression following the great wars ending in 1945. Thus, cost & management accounting has its initial roots in cost accounting. Many authors prefer to name it as 'cost & management accounting'. [Note : Britain is known to be the first to institutionalize Cost & Works Accountancy in 1919. Later, the institute was renamed for Cost & Management Accountancy in 1972 and for Management Accountancy in 1986].

Today, cost & management accounting is the most important information-link between accounting and management. Ongoing researches on the subject across the globe consider significant issues like measurement of business result as effect of enterprise's processes (including employee development), e-transactions and integrated information.

The differences between cost & management accounting and financial accounting: are considered in the next few lines;

Sl	Aspects	Cost & management accounting	Financial Accounting
1	Purpose	Voluntarily adopted for internal use of management. Information processed are usually confidential.	Mandatory in corporate and many other businesses. Disclosures to external stakeholders (investors, lenders, tax authorities, etc).
2	Processes	Use of tools like the following : Marginal & differential cost analysis, throughput accounting. Opportunity cost analysis. Risk accounting, inflation accounting, replacement cost & other valuations. Human resource accounting Cash-flow and funds-flow Financial ratios Budgeting, variance analysis with standard costing, responsibility accounting. Quantitative techniques and quality management tools.	Book-keeping and ledger posting Extraction of trial balance Preparation of financial statements (Balance Sheet, Profit & Loss A/c, Cash-Flow, Consolidation of group accounts)

3	Interdependency	Governed by management's information needs. Requires co-ordination with other systems for balanced information. Not subject to audit unless management's self-audit (internal audit) is reinforced.	Governed by Generally Accepted Accounting Practices (GAAP) and Accounting Standards. Independent system. Accounts are subject to statutory (external) audit depending on the nature and size of enterprises.

Note : 'Cost & management accounting' and 'financial accounting' are not watertight compartments. Former draws basic information from the latter (e.g. receipts and payments, income and expenditure, etc) and generates several information utilizing other systems for use by finance and non-finance executive.

DISCIPLINES INFLUENCING COST & MANAGEMENT ACCOUNTING & THEIR INTER-RELATIONSHIPS

We have seen in the foregoing sections that cost & management accounting draws upon various disciplines for meaningful analysis of financial information for use by the management. Such disciplines are as follows :

Economics as the foundation of cost & management accounting

Economics provides rationales for allocating limited resources to unlimited and competing human ends with 'money', the medium of exchange, providing the common measure. Though money has no intrinsic value, yet it is a distinct property for storing and lending savings without wear and obsolescence. Therefore, demand-supply of money (currency and credit in circulation) affect prices and income besides their determinate influence on interest rate.

Important points are summarized below:

An enterprise earns profit as residual revenue over cost by managing demand-supply of its products through appropriate organization deploying necessary capital.

In short-run, an enterprise may earn super profits or incur losses. There are fewer options for avoiding losses like price-cuts or break-even. Labour may also be laid-off for minimizing fund-erosion (subject to compliance of labour regulations). But in the short-run, an enterprise can neither divest of its existing business nor invest in new business. In long-run, labour-capital can be re-organized innovatively if reasonable profits are expected over life of capital. In long-run, profits must justify capital invested in the business. Else, an enterprise may have to divest, rehabilitate itself or even exit.

Though profit over capital is used for measuring 'return on capital' (ROC), it is a reward for risk bearing. Risk attaches to capital for uncertainties in demand-supply.

National income as aggregate expenditure is also related to demand-supply of money and consequent interest rate. Lower interest rate (below ROC) induces investment in an enterprise.

'Utility' creation and its cost are the principles underlying demand-supply [Note : 'utility' refers to need satisfying power of a product (article or service)].

The above facts of economics are the foundations of cost & management accounting in as much as cost & management accounting explains business economics of an enterprise in accounting language.

Operations Research (O.R.) and Statistical techniques

Quantitative techniques developed during the war, are now applied to solve numerical business problems involving constrained objectives. Many of the O.R. models are simulated according to situations using definite steps (algorithms). A number of problems can be solved like the following.

Games of competitive strategies

Product-mix yielding optimum profits

Resource allocation with minimum costs (e.g. allocation of transport vehicles amongst various warehouses)

Queue and idle time rationalization for cost minimization

Inventory replenishment for least cost of replenishment, storage & stock-out

Equipment replacement for minimising average discounted operating & maintenance cost over equipment (This often requires Discounted Cash Flow technique, a well known technique in cost & management accounting)

tool).

Project time-cost trade off (Projects may include product development or modification including simplification & upgradation, plant modernization, market expansion, etc).

A generalized format for defining a problem in O.R. is as follows :

Parts of problem	Functions	Conditions
Objective	$Y = F(x_1, x_2, \dots, x_n)$	Maximize Y (as for sales and profit) or Minimize Y (as for cost and time)
Constraints	$G(x_1, x_2, \dots, x_n) \leq c_1$ $H(x_1, x_2, \dots, x_n) \leq c_2$ $M(x_1, x_2, \dots, x_n) \leq c_m$	$x_1, x_2, \dots, x_n \geq 0$

Where $x_1, x_2, \dots, x_n$ represent decision variable (e.g. quantities of two or more products), 'c' represents restrictions or limits on resources e.g. restrictions on capacity, time, funds, etc. There are 'm' number of restrictive functions (G, H, ..., M).

The problems can be solved through Linear Programming, Non-Linear Programming, Integer Programming or Dynamic Programming as appropriate.

Also, statistical forecasting, estimation and testing have profound applications in business research and quality control much as these are used in probabilistic models of O.R. Regression analysis, which is one of the key techniques of forecasting, is also used for understanding cost behaviour, sales projection and the like.

Cost & management accounting makes use of above quantitative techniques often through computer programs for helping management in planning and control.

Information & Communication Technology (ICT)

Modern computers are used in solving complicated business problems involving large number of variables. Many enterprises use O.R. & Statistical techniques tailored into **computer programs** after careful systems analysis. This apart, increasing use of **e-Commerce** (like net banking, e-tendering, e-invoicing, etc) with global networking since 90's and of LAN-connected digital applications (like **bar coding/ decoding, Auto-CAD, CAM, PLC, GPS, Digital-Survey, Biometric Scanner, Face & Voice Recognizers** etc) took information system to a new height. Today, integrated software (like 'Enterprise Resource Planning' or **ERP**) captures data not only from online vouchers but also from digital applications aforesaid and external sources. Further, ICT today offers a number of communication channels from e-mails to web conferencing (audio & video) such that dependence on public assembly and board-room meetings are much reduced. Therefore, this era is rightly called 'information-age'.

It goes without saying that cost & management accounting has now at its disposal, a wide range of tools for extracting and analysing information and for making right information available to the management at right time.

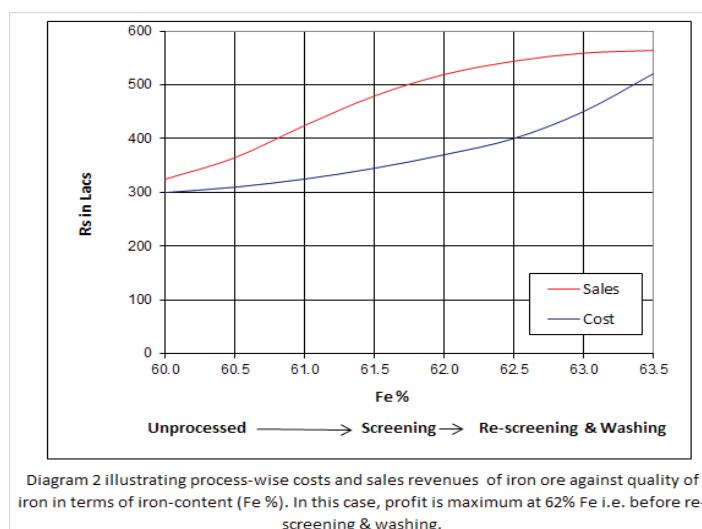


Diagram illustrating process-wise costs and sales revenues of iron ore against quality of iron in terms of iron-content (Fe%). In this case, profit is maximum at 62% Fe i.e. before rescreening & Washing

EMERGING TRENDS IN COST & MANAGEMENT ACCOUNTING: INTEGRATION OF ENGINEERING, FINANCE & OTHER SYSTEMS FOR MANAGERIAL ANALYSIS

Growing practice of integrated management & its impact on cost & management accounting:

Three most important enablers for integrated management are as follows :

ICT-enabled production processes, e-Commerce & informatics – Already explained in one of the previous sections. It is suffice here to note that today, almost all information need for an enterprise can be tracked through appropriate software with global and local networks. We will consider further examples later.

Supply Chain Management (SCM)– Already explained in one of the previous sections. The point emphasised here is that SCM presupposes appropriate ICT. Enterprise as a 'supplier' is required to explore supply network catering to the target markets & customers through networked integrated information system. It has to complement its resources with that of the suppliers in improving supplies, drawing relevant information from such system.

Organizational learning - Progressive companies are increasingly recognizing virtuous learning throughout the organization with every employee involved in continuous improvements sometimes in groups and circles. ICT is well utilized as a medium for it. Organizational learning brings togetherness which also helps integration.

Thus, ICT plays a very important role in integrating fragmented functions of an enterprise. A simple illustration of bar coding/ decoding is depicted in Diagram 1 below. It can facilitate online sales ordering, invoicing with all details of customer, product & mode of despatch, sales accounting & inventory management with data drawn from marketing, production & quality control.

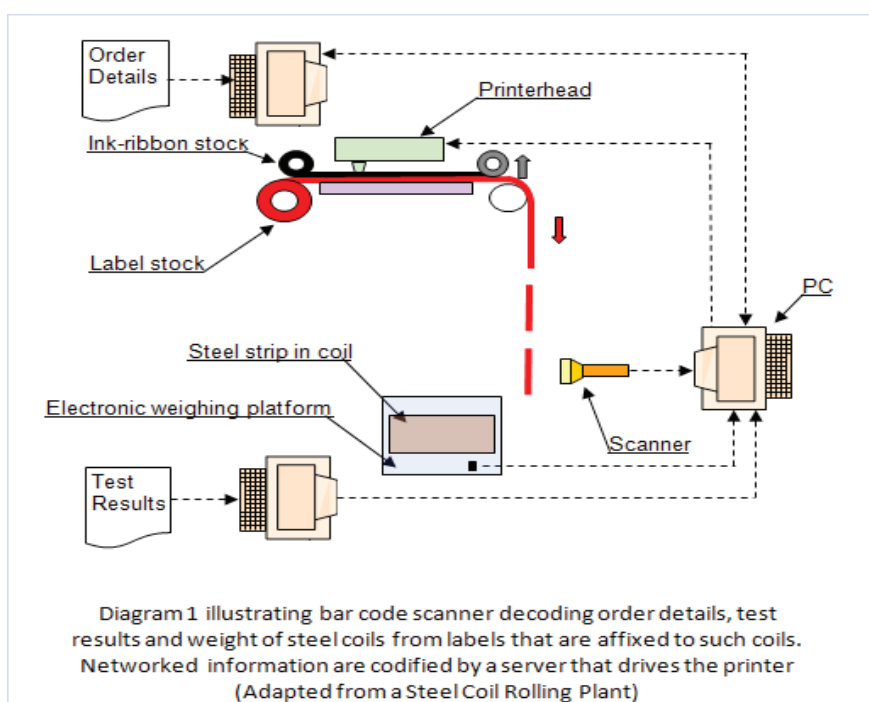


Diagram 2 below shows how benefits of integrated information can be reaped in analysing process costs for a ferro-chrome arc-furnace. This is explained below :

Sample results of laboratory analysis for a batch of 400 Kgs of dry chrome ore (lumpy and friable) indicate 32.84% chromium (Cr) in ore out of which 172.42 Kgs ferro-chrome containing 64% Cr is obtained. Similar analysis is available for spillage, slag and flue gas. If 85% Cr recovery is considered normal, ferro-chrome short produced is 2.04 Kgs [=172.42-32.84×0.85×400/64]. Such loss has cost implications depending on input costs with labour & overheads, and should be examined by verifying furnace and operational efficiencies. Similar analysis can be made for coke (Flux used for separating Silicon present in ore, is not shown in the diagram).

INPUT-OUTPUT BALANCE FOR A BATCH OF 400 KGS. BLENDED CHROME ORE											
INPUT (DRY KGS.)						OUTPUT (DRY KGS.)					
	Total	Cr	Fe	Si	C		Total	Cr	Fe	Si	C
Lumpy Ore	200.00	69.79	25.20	7.00		Ferro-chrome	172.42	110.35	42.84	5.17	
Friable Ore	200.00	61.58	22.40	10.50		Spillage	9.78	2.63	0.95	0.35	1.55
Coke	88.87				77.32	Slag	206.90	18.39	3.81	11.98	
						Flue gas	99.77			0.00	75.77
TOTAL	488.87	131.37	47.60	17.50	77.32	TOTAL	488.87	131.37	47.60	17.50	77.32

Diagram 2 illustrating lab results of a ferro-chrome plant that can be used for process costing

Engineering standards & analysis adoptable in cost & management accounting

Types & sources of engineering standards - Matching cost-revenue, analyzing their relationship and controlling wasteful expenditure, require accounting of expenditure-income not only in financial terms but also in terms of enterprise's performance standards. These include following physical or engineering standards :

Specifications for products, materials, processes & machineries.

Norms for input-output, ma-machine, time-work, capacity utilization, etc.

Various sources of physical standards are as follows :

Enterprise's product literature (drawings, formulae, etc).

Patent document.

Technical collaboration agreements.

Equipment manufacturer's norms for input-output, operation & maintenance.

Norms published by Bureau of Indian Standards & manufacturers' associations.

Standard input-output norms (SION) considered in Govt's EXIM policy.

Uses of engineering standards in cost & management accounting - Some of the important areas for use of engineering standards, are as follows :

Enterprise's budgets (OPEX, CAPEX and Working Capital).

Project reports for bank loans and share issue.

Declarations to Pollution Control Boards & tax authorities.

Cost-benefit analysis of all forms – from contribution analysis to projected internal rate of return (IRR). Diagram 4 in the concluding sub-section of this section illustrates use of integrated information for cost-benefit analysis.

We have seen in Diagram 1 above how relevant information including sales orders, test results, invoices, etc are integrated through bar codes in a steel plant. We have also seen in Diagram 2 how laboratory analysis captured in information system can be used for analysing costs in a ferro-chrome plant. We will also consider another example later illustrating various standards in an engineering works with Diagrams 3.1, 3.2 & 3.3 in a separate sub-section on ABC below.

Scientific approaches in Activity Based Costing (ABC) – ABC is gaining popularity in industries for its scientific measures of activities that give rise to costs. Such scientific measures (referred to as "Cost Vectors") not only remove arbitrariness of cost allocations but also establish activity-cost relationship. Owing its origin to Kaplan & Bruns (1987), ABC takes into account constraints described in Goldratt's TOC, transfer pricing needs and target cost validation. Because of work volume in ABC, integrated software (ERP) is of immense help specially in big plants and multi-product situations. ABC is an opportunity as well as a challenge in service sector for difficulties in defining and recording cost vectors.

We will now review an example of cost vectors adopted in an engineering works. Diagram 3.1 shows top and front views of a flanged conical hopper made from mild steel sheet in an engineering works. D, d, l, f are the prime parameters from which value for b and finally, values for 8a and 8c are determined (Refer sheet layout drawing in Diagram 3.2). Accordingly, appropriate sheet size

is selected for minimum scrap. Various cost vectors like length of cut, hopper area & weight, etc derived from drawing as well as operation-wise time-standards fixed after Works Studies for $D=500$ mm, $d=100$ mm, $l=1200$ mm and $f=150$ mm using sheet thicknesses of 2 mm & 4 mm are shown in Diagram 3.3.

To elaborate the use of cost vectors, let us take welding for 4 mm quality. It takes 7.53 man-hours approx (= 8.5 man-minutes $\times$ 53.15 inches : Ref Diagram 3.3). [Note : Man-machine is standardized through Works Studies]. Similarly, painting quantity (primer & enamel) and time can be calculated from hopper area, handling time from hopper weight & distance moved, and so on. Thus, costs (including labour & overheads) can be easily linked to cost vectors. In welding for example, electrode consumption is directly related to sheet thickness and length of weld while labour & overheads may be absorbed on man-hourly basis (Ref calculation above). Different thicknesses (viz. 2 mm & 4 mm) account for differences in costs of steel, welding electrodes, cutting operation (gas cutting for 4 mm and nibbling for 2 mm) and other costs. Interestingly, cost per Kg is lower for 4 mm quality compared to that of 2 mm quality due to doubling of weight in former while total cost does not increase proportionately. Some reasons for these can be found out from Diagram 3.3 e.g. fixed work-times for marking & painting.

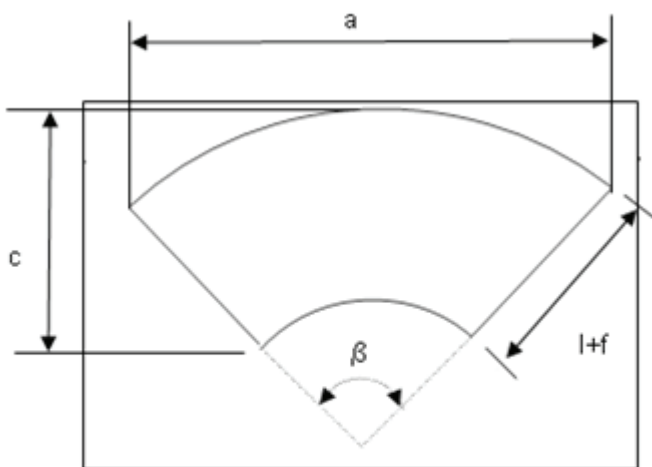


Diagram 3.2 showing sheet layout for cutting hopper surface

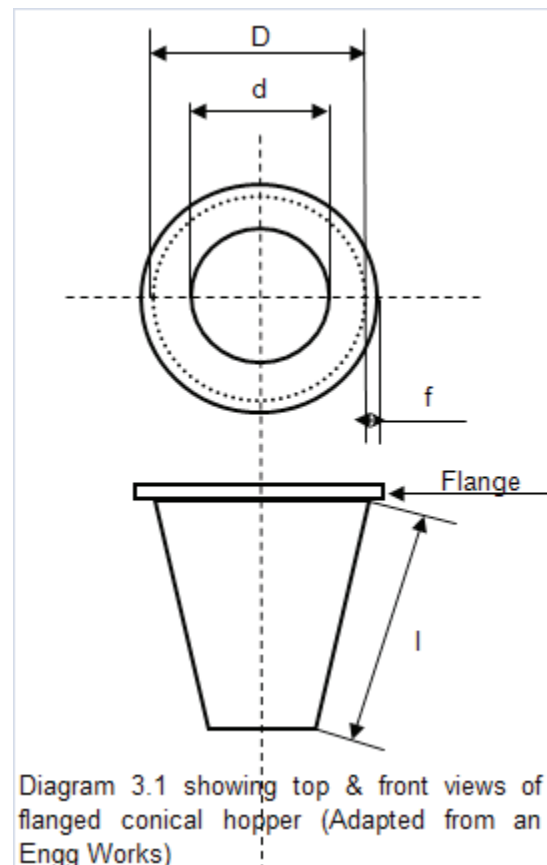


Diagram 3.1 showing top & front views of flanged conical hopper (Adapted from an Engg Works)

Cost Vectors	Unit	2 mm	4 mm
Length of cut with allowance for grinding	In	189.57	189.57
Length of weld	In	53.15	53.15
Sheet Area	Sq In	4,805	4,805
Hopper Area	Sq In	1,233	1,233
Hopper Weight	Kg	12.49	24.98
Marking	Minute/ In	0.17	0.17
Nibbling	Minute/ In	0.90	
Gas cutting	Minute/ In		0.35
Grinding	Minute/ In	0.20	0.40
Rolling	Minute/ In	0.04	0.05
Welding	Minute/ In	6.94	8.50
Flanging	Minute/ In	0.61	0.77
Painting	Minute/ Sq In	0.06	0.06
Handling	Minute/ Kg-Ft	0.01	0.01
Diagram 3.3 showing cost vectors for steel flanged conical hopper of given dimensions			

Techno-Commercial analysis of Quality-Cost-Value projects - Competitive edging focuses on three prime and inter-related areas viz. Quality-Cost-Value. Often it involves capital projects like modernization, diversification, simplification, etc supported by R&D, benchmarking or collaboration as appropriate. Normally, such projects call for detailed Techno-Commercial analysis in a group for the enormity of factors like market, product, technology, plant location & layout, process control, supply-chain, organization, etc. Cost & Management accountants have important roles to play for evaluation of such capital projects.

Latest trends (Some important topics elaborated)

Cost analysis requires relevant data besides monetary expenditure. We will review below a few major points concerning accounting and analysis of costs in light of today's information needs :

Multi-entry accounting

Besides give-take aspects of a transaction (as reflected in 'Debit'-'Credit' duality), modern integrated information systems record other aspects as follows :

Quality standards & test results

Quantities of input, output, wastages, etc.

Purchase & sales orders

Warranty complaints

Some of the above, are not 'transactions' in traditional accounting, but useful for analysis including Activity Based Costing (ABC). A few illustrations are cited from different fields :

Illustration1 :Procuring materials from alternative sources (example from steel industry)

If imported coke with 87% carbon costs Rs 4,680 per ton as against domestic coke with 84% carbon Rs 4,585, then imported coal is cheaper. It will be wrong to go by monetary figure alone since carbon directly impacts steel output.

Illustration2 :Standard Input-output for product costing

Integrated information can conveniently capture data on input mix for given output, broadening production accounting. Refer example above for a ferro-chrome plant.

Illustration3 :Cost drivers in decision-making

Various overheads enter into quantitative analysis for cost minimization. For example, taking fixed order quantity model for inventory with average purchasing cost (P) in Rs. per order and annual storing cost (S) in Rs. per rupee of inventory, any stores item with price 'r' and annual requirement (A) in units will have economic ordering

quantity $(EOQ) = \sqrt{\frac{2P}{\delta}}$. Therefore, it is imperative to know overheads like purchasing and storing costs and respective cost drivers viz. number of orders p.a. and average inventory (in money value).

Above model can also be applied with little variation for optimizing batch-size of production where it is necessary to know the costs of setting a machine up and down. Compiling such costs would involve Work Study for data on setting times.

In project scheduling, it is necessary to crash activities for minimum cost where time-cost are important parameters for trade-off.

Scientific and engineering standards are well used in ABC (Refer example above taken from a sheet-metal works with Diagrams 3.1, 3.2 & 3.2).

Non-linear cost behaviour in some cases

In some cases as illustrated below, cost does not behave linearly with production :

Maintenance cost :

Expenditure on equipment maintenance depends on various factors like practices adopted for maintenance & safety, equipment technology & age, operator's skill, spares availability, etc. A trade-off is necessary between preventive & contingency measures (including stand-by facilities and insurance spares) on one hand and downtime costs (including liquidated damages and loss of profits & goodwill) on the other hand.

Maintenance policy varies with equipment, depending on its failure probability. Normally, such probability multiplies with failure probabilities of its critical parts. Some parts (like fasteners, shafts, pulleys, bearings, gears, machine tools, etc) wear and corrode in varying degrees with time, while some others (like electrical bulbs) fail completely after a time-period. Equipment manufacturers usually suggest maintenance and renewal schedules of parts. Modern plants also have software (PLC) for monitoring relevant parameters (like lubricant & coolant levels, etc).

One important model for predicting equipment failures using Poisson probability function is $P(n, t) = e^{-\lambda t} (\lambda t)^n / n!$ where $P(n, t)$ is probability of 'n' number of failures of a machine in time 't' and ' λ ' is the average failure rate.

It follows, planned maintenance cost of equipment is likely to correspond to a pattern like $Y = a + bX + cX^2$ where Y = Maintenance Cost (in money value), X = Production (in units) during a given time period and a, b, c represent regression constants for the period (expanding the above probability function, introducing X substituting 't' suitably. Note : terms with higher powers of X are ignorable for negligible values).

For a new man-machine or technology, operators should be sufficiently trained for reduction of initial mis-handlings and consequent downtime and maintenance costs.

Power & Fuel Costs

In machine controlled (automated) operation, power cost is fairly proportional to volume of output, if constant machine efficiency is ensured through maintenance. In labour-controlled machine operation, power cost also depends on labour efficiency besides machine condition. Fuel-driven machineries have similar characteristics though for mobile equipment, several external factors like plant layout, route, terrain, traffic density, weather, etc can come into play.

Industrial tariff for power usually stipulates a minimum charge irrespective of power consumption.

Let us take the fundamental machine law ($P = aW + b$) where 'P' and 'W' represent input energy spent and output work achieved respectively. 'a' and 'b' are regression constants, depending on the machine, work, operating conditions, etc. We may apply this simple rationale for analysing energy costs in different situations. For example, if a crusher in a mine is run by a generator set, norms can be set for diesel consumption in generator and electricity consumption in crusher (estimating with generator's Kilo-Watt and crusher's Horse-Power capacities, efficiency factors of these machineries as may be studied from supplier's published literatures). Thus, diesel cost can be co-related to mineral quantity (tonnage) crushed.

Direct labour cost is normally assumed to be variable. However, many industries employ labour on fixed monthly payment basis (though there may be performance linked payments as well).

There are many other examples of non-linearity of costs.

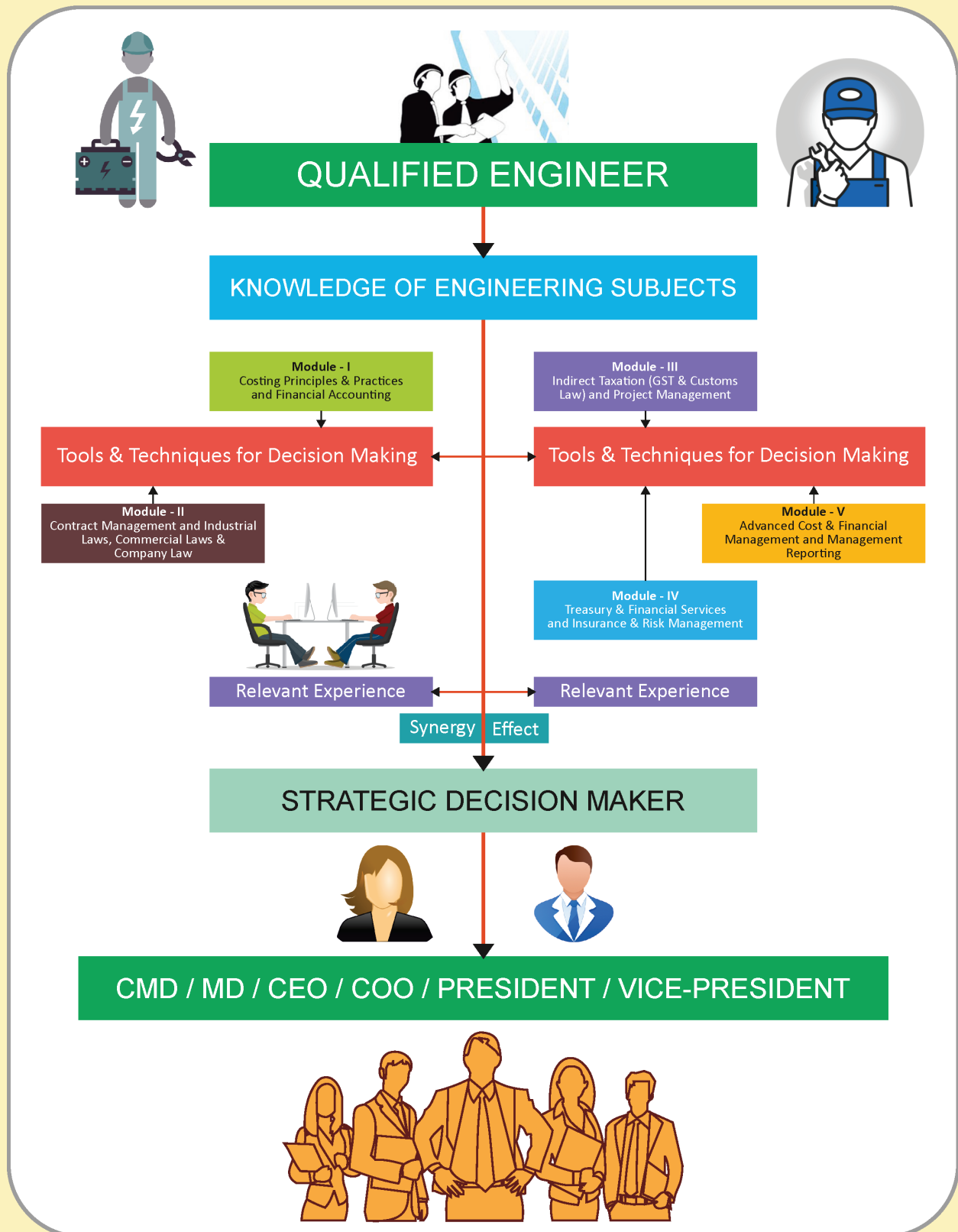
Part-A

COSTING PRINCIPLES AND PRACTICES





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CAREER PATH FOR ENGINEERS TO BECOME STRATEGIC DECISION MAKERS

1

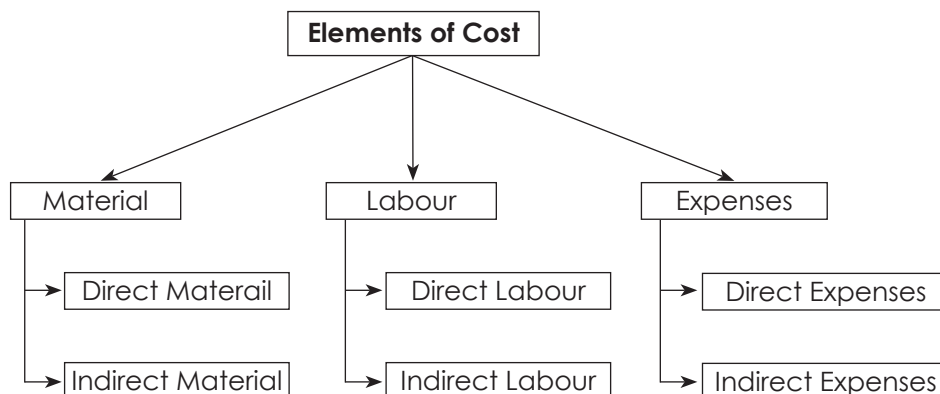
COST OBJECTS, COST CENTRE AND COST UNIT

COST OBJECT, COST CENTERS AND COST UNIT – ELEMENTS OF COST

Cost: Cost is a measurement, in monetary terms, of the amount of resources used for the purpose of production of goods or rendering services.

Cost in simple, words, means the total of all expenses. Cost is also defined **as the amount of expenditure (actual or notional) incurred on or attributable to a given thing or to ascertain the cost of a given thing**. Thus it is that which is given or in sacrificed to obtain something. The cost of an article consists of actual outgoings or ascertained charges incurred in its production and sale. Cost is a generic term and it is always advisable to qualify the word cost to show exactly what it meant, e.g., prime cost, factory cost, etc. Cost is also different from value as cost is measured in terms of money whereas value in terms of usefulness or utility of an article.

Elements of Cost



Direct Material + Direct Labour + Direct Expenses = Prime Cost

Indirect Material+ Indirect Labour + Indirect Expenses = Overheads

Direct Material Cost

Direct material cost can be defined as **'The Cost of material which can be attributed to a cost object in an economically feasible way'**. Direct materials are those materials which can be identified in the product and can be conveniently measured and directly charged to the product. Thus, these materials directly enter the product and form a part of the finished product. For example, timber in furniture making, cloth in dress making, bricks in building a house. The following are normally classified as direct materials :-

- (i) All raw materials, like jute in the manufacture of gunny bags, pig iron in foundry and fruits in canning industry.
- (ii) Materials specifically purchased for a specific job, process or order, like glue for book binding, starch powder for dressing yarn.
- (iii) Parts or components purchased or produced, like batteries for transistor-radios.

- (iv) Primary packing materials like cartons, wrappings, card-board boxes, etc.

Indirect Material Cost

Materials, the costs of which cannot be directly attributed to a particular cost object. Indirect materials are those materials which do not normally form a part of the finished product. It has been defined as "materials which cannot be allocated but which can be apportioned to or absorbed by cost centres or cost units". These are:

- (i) Stores used in maintenance of machinery, buildings, etc., like lubricants, cotton waste, bricks and cements.
- (ii) Stores used by the service departments, i.e., non-productive departments like Power House, Boiler House and Canteen, etc., and
- (iii) Materials which due to their cost being small, are not considered worthwhile to be treated as direct materials.

Direct Labour / Employee Cost

The cost of employees which can be attributed to a cost object in an economically feasible way. In simple words, it is that labour which can be conveniently identified or attributed wholly to a particular job, product or process or expended in converting raw materials into finished goods. Wages of such labour are known as direct wages. Thus it includes payment made to the following groups of labour:

- (i) Labour engaged on the actual production of the product or in carrying out of an operation or process.
- (ii) Labour engaged in adding the manufacture by way of supervision, maintenance, tool setting, transportation of material etc.
- (iii) Inspectors, analysts etc., specially required for such production.

Indirect Labour/ Employee Cost

The labour / employee cost which cannot be directly attributed to a particular cost object. The wages of that labour which cannot be allocated but which can be apportioned to or absorbed by cost centres or cost units is known as Indirect Labour. In other words paid to labour which are employed other than on production constitute indirect labour costs. Example of such labour are: charge-hands and supervisors; maintenance workers; men employed in service departments, material handling and internal transport; apprentices, trainees and instructors; clerical staff and labour employed in time office and security office.

Direct or Chargeable Expenses

Direct expenses are expenses relating to manufacture of a product or rendering a service which can be identified or linked with the cost object other than direct material cost and direct employee cost. Direct expenses include all expenditure other than direct material or direct labour that is specifically incurred for a particular product or process. Such expenses are charged directly to the particular cost account concerned as part of the prime cost. Examples of direct expenses are: (i) Excise duty; (ii) Royalty; (iii) Architect or Supervisor's fees; (iv) Cost of rectifying defective work; (v) Travelling expenses to the city; (vi) Experimental expenses of pilot projects; (vii) Expenses of designing or drawings of patterns or models; (viii) Repairs and maintenance of plant obtained on hire; and (ix) Hire of special equipment obtained for a contract.

Overhead

Overheads comprise of indirect materials, indirect employee cost and indirect expenses which are not directly identifiable or allocable to a cost object. Overheads may be defined as the aggregate of the cost of indirect material, indirect labour and such other expenses including services as cannot conveniently be charged directly to specific cost units. Thus overheads are all expenses other than direct expenses. In general terms, overheads comprise all expenses incurred for or in connection with, the general organization of the whole or part of the undertaking, i.e., the cost of operating supplies and services used by the undertaking and includes the maintenance of capital assets.

Prime Cost

The aggregate of Direct Material, Direct Labour and Direct Expenses. Generally it constitutes 50% to 80% of the total cost of the product, as such, as it is primary to the cost of the product and called Prime Cost.

Cost Object

Cost object is the technical name for a product or a service, a project, a department or any activity to which a cost relates. Therefore the term cost should always be linked with a cost object to be more meaningful.

Establishing a relevant cost object is very crucial for a sound costing system. The Cost object could be defined broadly or narrowly. At a broader level a cost object may be named as a **Cost Centre**, where as at a lowermost level it may be called as a **Cost Unit**.

Cost Centre

CIMA defines a cost centre as "a location, a person, or an item of equipment (or a group of them) in or connected with an undertaking, in relation to which costs ascertained and used for the purpose of cost control". The determination of suitable cost centres as well as analysis of cost under cost centres is very helpful for periodical comparison and control of cost. In order to obtain the cost of product or service, expenses should be suitably segregated to cost centre. The manager of a cost centre is held responsible for control of cost of his cost centre. The selection of suitable cost centres or cost units for which costs are to be ascertained in an undertaking depends upon a number of factors such as organization of a factory, condition of incidence of cost, availability of information, requirements of costing and management policy regarding selecting a method from various choices. Cost centre may be production cost centres operating cost centres or process cost centres depending upon the situation and classification.

Cost centres are of two types-Personal and Impersonal Cost Centre. A personal cost centre consists of person or group of persons. An impersonal cost centre consists of a location or item of equipment or group of equipments.

In a manufacturing concern, the cost centres generally follow the pattern or layout of the departments or sections of the factory and accordingly, there are two main types of cost centres as below :-

- (i) **Production Cost Centre:** These centres are engaged in production work i.e engaged in converting the raw material into finished product, for example Machine shop, welding shops...etc
- (ii) **Service Cost Centre:** These centres are ancillary to and render service to production cost centres, for example Plant Maintenance, Administration...etc

The number of cost centres and the size of each vary from one undertaking to another and are dependent upon the expenditure involved and the requirements of the management for the purpose of control.

Responsibility Centre

A responsibility centre in Cost Accounting denotes a segment of a business organization for the activities of which responsibility is assigned to a specific person. Thus a factory may be split into a number of centres and a supervisor is assigned with the responsibility of each centre. All costs relating to the centre are collected and the Manager responsible for such a cost centres judged by reference to the activity levels achieved in relation to costs. Even an individual machine may be treated as responsibility centre for cost control and cost reduction.

Profit Centre

Profit centre is a segment of a business that is responsible for all the activities involved in the production and sales of products, systems and services. Thus a profit centre encompasses both costs that it incurs and revenue that it generates. Profit centres are created to delegate responsibility to individuals and measure their performance. In the concept of responsibility accounting, profit centres are sometimes also responsible for the investment made for the centre. The profit is related to the invested capital. Such a profit centre may also be termed as investment centre.

Cost Unit

Cost Unit is a device for the purpose of breaking up or separating costs into smaller sub divisions attributable to products or services. *Cost unit can be defined as a 'Unit of product or service in relation to which costs are ascertained'.* The cost unit is the narrowest possible level of cost object.

It is the unit of quantity of product, service of time (or combination of these) in relation to which costs may be ascertained or expressed. We may, for instance, determine service cost per tonne of steel, per tonne-kilometre of a transport service or per machine hour. Sometimes, a single order or contract constitutes a cost unit which is known as a job. A batch which consists of a group of identical items and maintains its identity through one or more stages or production may also be taken as a cost unit.

A few examples of cost units are given below:

Industry / Product	Cost Unit
Automobile	Number of vehicles
Cable	Metres / kilometres
Cement	Tonne

Chemicals / Fertilizers	Litre / Kilogram / tonne
Gas	Cubic Metre
Power - Electricity	Kilowatt Hour
Transport	Tonne-Kilometre, Passenger-Kilometre
Hospital	Patient Day
Hotel	Bed Night
Education	Student year
Telecom	Number of Calls
BPO Service	Accounts handled
Professional Service	Chargeable Hours

Cost Allocation

When items of cost are identifiable directly with some products or departments such costs are charged to such cost centres. This process is known as cost allocation. Wages paid to workers of service department can be allocated to the particular department. Indirect materials used by a particular department can also be allocated to the department. Cost allocation calls for two basic factors - (i) Concerned department/product should have caused the cost to be incurred, and (ii) exact amount of cost should be computable.

Cost Apportionment

When items of cost cannot directly charge to or accurately identifiable with any cost centres, they are prorated or distributed amongst the cost centres on some predetermined basis. This method is known as cost apportionment. Thus we see that items of indirect costs residual to the process of cost allocation are covered by cost apportionment. The predetermination of suitable basis of apportionment is very important and usually following principles are adopted - (i) Service or use (ii) Survey method (iii) Ability to bear. The basis ultimately adopted should ensure an equitable share of common expenses for the cost centres and the basis once adopted should be reviewed at periodic intervals to improve upon the accuracy of apportionment.

Cost Absorption

Ultimately the indirect costs or overhead as they are commonly known, will have to be distributed over the final products so that the charge is complete. This process is known as cost absorption, meaning thereby that the costs absorbed by the production during the period. Usually any of the following methods are adopted for cost absorption - (i) Direct Material Cost Percentage (ii) Direct Labour Cost Percentage (iii) Prime Cost Percentage (iv) Direct Labour Hour Rate Method (v) Machine Hour Rate, etc. The basis should be selected after careful maximum accuracy of Cost Distribution to various production units. The basis should be reviewed periodically and corrective action whatever needed should be taken for improving upon the accuracy of the absorption.

Conversion Cost

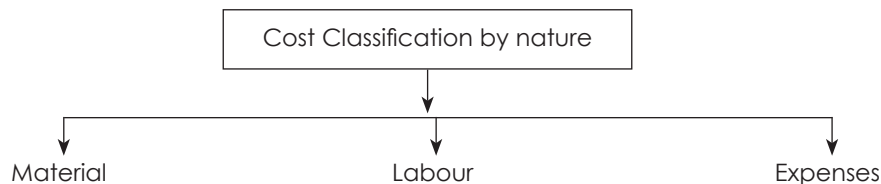
This term is defined as the sum of direct wages, direct expenses and overhead costs of converting raw material to the finished products or converting a material from one stage of production to another stage. In other words, it means the total cost of producing an article less the cost of direct materials used. The cost of indirect materials and consumable stores are included in such cost. The compilation of conversion cost is useful in a number of cases. Where cost of direct materials is of fluctuating nature, conversion cost is used to cost control purpose or for any other decision making. In contracts/jobs where raw materials are on account of the buyers conversion cost takes the place of total cost in the books of the producer. Periodic comparison/review of the conversion cost may give sufficient insight as to the level of efficiency with which the production unit is operating.

2

CLASSIFICATION OF COST

(a) Classification by Nature of Expense

Costs should be gathered together in their natural grouping such as Material, Labour and Other Direct expenses. Items of costs differ on the basis of their nature. The elements of cost can be classified in the following three categories. 1. Material 2. Labour 3. Expenses



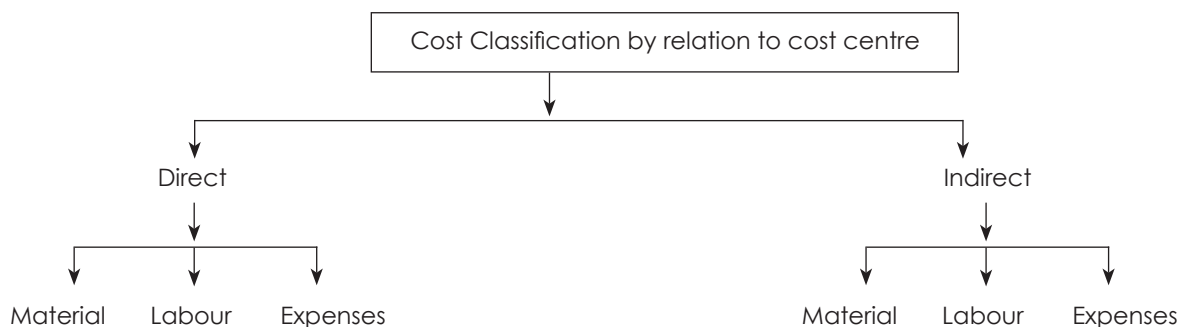
Material Cost: Material cost is the cost of material of any nature used for the purpose of production of a product or a service. It includes cost of materials, freight inwards, taxes & duties, insurance ...etc directly attributable to acquisition, but excluding the trade discounts, duty drawbacks and refunds on account of excise duty and vat.

Labour Cost: Labour cost means the payment made to the employees, permanent or temporary for their services. Labour cost includes salaries and wages paid to permanent employees, temporary employees and also to the employees of the contractor. Here salaries and wages include all the benefits like provident fund, gratuity, ESI, overtime, incentives...etc

Expenses: Expenses are other than material cost or labour cost which are involved in an activity.

(b) Classification by Relation to Cost Centre or Cost Unit:

If expenditure can be allocated to a cost centre or cost object in an economically feasible way then it is called direct otherwise the cost component will be termed as indirect. According to this criteria for classification, material cost is divided into direct material cost and indirect material cost, Labour cost is divided into direct labour and indirect labour cost and expenses into direct expenses and indirect expenses. Indirect cost is also known as overhead.



Direct Material Cost: Cost of material which can be directly allocated to a cost centre or a cost object in an economically feasible way.

Direct labour Cost: Cost of wages of those workers who are readily identified or linked with a cost centre or cost object.

Direct Expenses: Expenses other than direct material and direct labour which can be identified or linked with cost centre or cost object.

$$\text{Direct Material} + \text{Direct labour} + \text{Direct Expenses} = \text{Prime Cost}$$

Indirect Material : Cost of material which cannot be directly allocable to a particular cost centre or cost object.

Indirect Labour : Cost of wages of employees which are not directly allocable to a particular cost centre.

Indirect expenses: Expenses other than of the nature of material or labour and cannot be directly allocable to a particular cost centre.

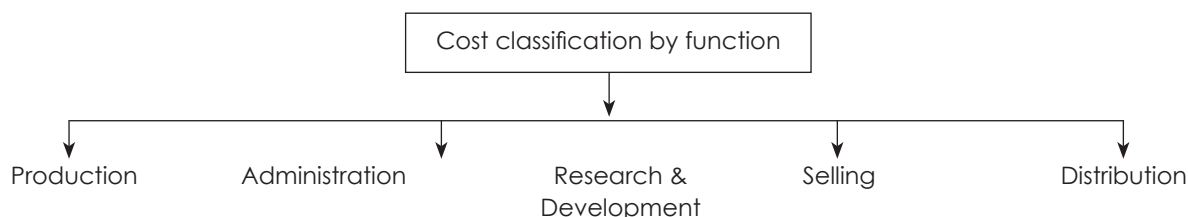
$$\text{Indirect Material} + \text{Indirect Labour} + \text{Indirect Expenses} = \text{Overheads}$$

(c) Classification by Functions:

A business enterprise performs a number of functions like manufacturing, selling, research...etc.

Costs may be required to be determined for each of these functions and on this basis functional costs may be classified into the following types:-

- (i) Production or Manufacturing Costs
- (ii) Administration Costs
- (iii) Selling & Distribution cost
- (iv) Research & Development costs



(i) Production or Manufacturing Costs: *Production cost is the cost of all items involved in the production of a product or service. These refer to the costs of operating the manufacturing division of an undertaking and include all costs incurred by the factory from the receipt of raw materials and supply of labour and services until production is completed and the finished product is packed with the primary packing.*

The followings are considered as Production or Manufacturing Costs:-

- (1) Direct Material
- (2) Direct Labour
- (3) Direct Expenses and
- (4) Factory overhead, i.e., aggregate of factory indirect material, indirect labour and indirect expenses.

Manufacturing cost can also be referred to as the aggregate of prime cost and factory overhead.

(ii) Administration Costs: *Administration costs are expenses incurred for general management of an organization. These are in the nature of indirect costs and are also termed as administrative overheads. For understanding administration cost, it is necessary to know the scope of administrative function. Administrative function in any organization primarily concerned with following activities :-*

- (1) Formulation of policy
- (2) Directing the organization and
- (3) Controlling the operations of an organization. But administrative function will not include control activities concerned with production, selling and distribution and research and development.

Therefore, administration cost is the cost of administrative function, i.e., the cost of formulating policy, directing,

organizing and controlling the operations of an undertaking (Administrative cost will include the cost of only those control operations which are not related to production, selling and distribution and research and development). In most of the cases, administration cost includes indirect expenses of following types:

- (1) Salaries of office staff, accountants, directors
- (2) Rent, rates and depreciation of office building
- (3) Postage, stationery and telephone
- (4) Office supplies and expenses
- (5) General administration expenses.

(iii) Selling & Distribution Costs: *Selling costs are indirect costs related to selling of products or services and include all indirect costs in sales management for the organization. Distribution costs are the costs incurred in handling a product from the time it is completed in the works until it reaches the ultimate consumer.*

Selling function includes activities directed to create and stimulate demand of company's product and secure orders. Distribution costs are incurred to make the saleable goods available in the hands of the customer.

Following are the examples of selling and distribution costs:

- (1) Salaries and commission of salesmen and sales managers.
- (2) Expenses of advertisement, insurance.
- (3) Rent, rates, depreciation and insurance of sales office and warehouses.
- (4) Cost of insurance, freight, export, duty, packing, shipping, etc.,
- (5) Maintenance of Delivery vans.

(iv) Research & Development Costs: Research & development costs are the cost for undertaking research to improve quality of a present product or improve process of manufacture, develop a new product, market research...etc. and commercialization thereof.

R&D Costs comprises of the following:-

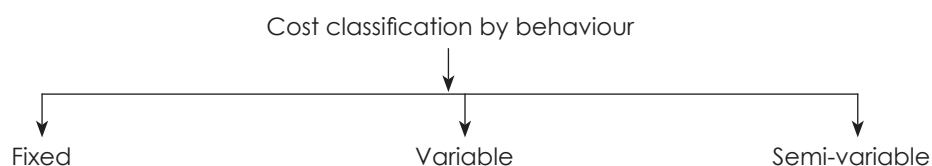
- (1) Development of new product.
- (2) Improvement of existing products.
- (3) Finding new uses for known products.
- (4) Solving technical problem arising in manufacture and application of products.
- (5) Development cost includes the costs incurred for commercialization / implementation of research findings.

Pre-Production Costs:

These are costs incurred when a new factory is in the process of establishment, a new project is undertaken, or a new product line or product is taken up but there is no established or formal production to which such costs may be charged. Preproduction costs are normally treated as deferred revenue expenditure and charged to the costs of future production.

(d) Classification based on Behaviour – Fixed, Semi-variable or Variable

Costs are classified based on behaviour as fixed cost, variable cost and semi-variable cost depending upon response to the changes in the activity levels.



Fixed Cost: Fixed cost is the cost which does not vary with the change in the volume of activity in the short run. These costs are not affected by temporary fluctuation in activity of an enterprise. These are also known as period costs. Example: Rent, Depreciation...etc.

Variable Cost: Variable cost is the cost of elements which tends to directly vary with the volume of activity. Variable cost has two parts (i) Variable direct cost (ii) Variable indirect costs. Variable indirect costs are termed as variable overheads. Example: Direct labour, Outward Freight...etc.

Semi-Variable Costs: Semi variable costs contain both fixed and variable elements. They are partly affected by fluctuation in the level of activity. These are partly fixed and partly variable costs and vice versa. Example:

Factory supervision, Maintenance...etc.

(e) Classification based on Costs for Management Decision Making

Ascertainment of cost is essential for making managerial decisions. On this basis costing may be classified into the following types.

Marginal Costing: Marginal Cost is the aggregate of variable costs, i.e. prime cost plus variable overhead. Marginal cost per unit is the change in the amount at any given volume of output by which the aggregate cost changes if the volume of output is increased or decreased by one unit. Marginal Costing system is based on the system of classification of costs into fixed and variable. The fixed costs are excluded and only the marginal costs, i.e. the variable costs are taken into consideration for determining the cost of products and the inventory of work-in-progress and completed products.

Differential Cost: Differential cost is the change in the cost due to change in activity from one level to another.

Opportunity Cost: Opportunity cost is the value of alternatives foregone by adopting a particular strategy or employing resources in specific manner. It is the return expected from an investment other than the present one. These refer to costs which result from the use or application of material, labour or other facilities in a particular manner which has been foregone due to not using the facilities in the manner originally planned. Resources (or input) like men, materials, plant and machinery, finance etc., when utilized in one particular way, yield a particular return (or output). If the same input is utilized in another way, yielding the same or a different return, the original return on the forsaken alternative that is no longer obtainable is the opportunity cost. For example, if fixed deposits in the bank are proposed to be withdrawn for financing project, the opportunity cost would be the loss of interest on the deposits. Similarly when a building leased out on rent to a party is got vacated for own purpose or a vacant space is not leased out but used internally, say, for expansion of the production programme, the rent so foregone is the opportunity cost.

Replacement Cost: Replacement cost is the cost of an asset in the current market for the purpose of replacement. Replacement cost is used for determining the optimum time of replacement of an equipment or machine in consideration of maintenance cost of the existing one and its productive capacity. This is the cost in the current market of replacing an asset. For example, when replacement cost of material or an asset is being considered, it means that the cost that would be incurred if the material or the asset was to be purchased at the current market price and not the cost, at which it was actually purchased earlier, should be taken into account.

Relevant Costs: Relevant costs are costs which are relevant for a specific purpose or situation. In the context of decision making, only those costs are relevant which are pertinent to the decision at hand. Since we are concerned with future costs only while making a decision, historical costs, unless they remain unchanged in the future period are irrelevant to the decision making process.

Imputed Costs: Imputed costs are hypothetical or notional costs, not involving cash outlay computed only for the purpose of decision making. In this respect, imputed costs are similar to opportunity costs. Interest on funds generated internally, payment for which is not actually made is an example of imputed cost. When alternative capital investment projects are being considered out of which one or more are to be financed from internal funds, it is necessary to take into account the imputed interest on own funds before a decision is arrived at.

Sunk Costs: Sunk costs are historical costs which are incurred i.e. sunk in the past and are not relevant to the particular decision making problem being considered. Sunk costs are those that have been incurred for a project and which will not be recovered if the project is terminated. While considering the replacement of a plant, the depreciated book value of the old asset is irrelevant as the amount is sunk cost which is to be written-off at the time of replacement.

Normal Cost & Abnormal Cost: Normal Cost is a cost that is normally incurred at a given level of output in the conditions in which that level of output is achieved. Abnormal Cost is an unusual and typical cost whose occurrence is usually irregular and unexpected and due to some abnormal situation of the production.

Avoidable Costs & Unavoidable Costs: Avoidable Costs are those which under given conditions of performance efficiency should not have been incurred. Unavoidable Costs which are inescapable costs, which are essentially to be incurred, within the limits or norms provided for. It is the cost that must be incurred under a programme of business restriction. It is fixed in nature and inescapable.

Uniform Costing: This is not a distinct system of costing. The term applies to the costing principles and procedures which are adopted in common by a number of undertakings which desire to have the benefits of a uniform system. The methods of Uniform Costing may be extended so as to be useful in inter-firm comparison.

Engineered Cost: Engineered Cost relates to an item where the input has an explicit physical relationship with the output. For instance in the manufacture of a product, there is a definite relationship between the units of raw material and labour time consumed and the amount of variable manufacturing overhead on the one hand and units of the products produced on the other. The input-output relationship can be established the form of standards by engineering analysis or by an analysis of the historical data. It should be noted that the variable

costs are not engineered cost but some administration and selling expenses may be categorized as engineered cost.

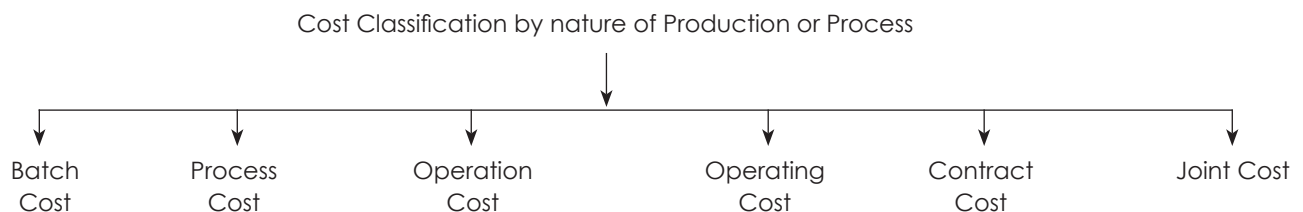
Out-of-Pocket Cost: This is the portion of the cost associated with an activity that involve cash payment to other parties, as opposed to costs which do not require any cash outlay, such as depreciation and certain allocated costs. Out-of-Pocket Costs are very much relevant in the consideration of price fixation during trade recession or when a make-or-buy decision is to be made.

Managed Cost: Managed (Programmed or Discretionary) Costs all opposed to engineering costs, relate to such items where no accurate relationship between the amount spent on input and the output can be established and sometimes it is difficult to measure the output. Examples are advertisement cost, research and development costs, etc.,

Common Costs: These are costs which are incurred collectively for a number of cost centres and are required to be suitably apportioned for determining the cost of individual cost centres. Examples are: Combined purchase cost of several materials in one consignment, and overhead expenses incurred for the factory as a whole.

Controllable and Non-Controllable Costs: Controllable Cost is that cost which is subject to direct control at some level of managerial supervision. Non-controllable Cost is the cost which is not subject to control at any level of managerial supervision.

(f) Classification by nature of Production or Process:



Batch Costing: Batch Costing is the aggregate cost related to a cost unit which consists of a group of similar articles which maintains its identity throughout one or more stages of production. In this method, the cost of a group of products is ascertained. The unit cost is a batch or group of identical products instead of a single job, order, or contract. This method is applicable to general engineering factories which produces components in convenient economical batches.

Process Costing: When the production process is such that goods are produced from a sequence of continuous or repetitive operations or processes, the cost incurred during a period is considered as Process Cost. The process cost per unit is derived by dividing the process cost by number of units produced in the process during the period. Process Costing is employed in industries where a continuous process of manufacturing is carried out. Costs are ascertained for a specified period of time by departments or process. Chemical industries, refineries, gas and electricity generating concerns may be quoted as examples of undertakings that employ process costing.

Operation Cost: Operation Cost is the cost of a specific operation involved in a production process or business activity. The cost unit in this method is the operation, instead of process. When the manufacturing method consists of a number of distinct operations, operation costing is suitable.

Operating Cost: Operating cost is the cost incurred in conducting a business activity. Operating cost refer to the cost of undertakings which do not manufacture any product but which provide services. Industries and establishments like power house, transport and travel agencies, hospitals, and schools, which undertake services rather than the manufacture of products, ascertain operating costs. The cost units used are Kilo Watt Hour (KWH), Passenger Kilometer and Bed in the hospital....etc. Operation costing method constitutes a distinct type of costing but it may also be classed as a variant of Process Cost since costs in this method are usually compiled for a specified period.

Contract Costing: Contract cost is the cost of contract with some terms and conditions between contractee and contractor. This method is used in undertakings, carrying out, building or constructional contracts like constructional engineering concerns, civil engineering contractors. The cost unit here is a contract, which may continue over more than one financial year.

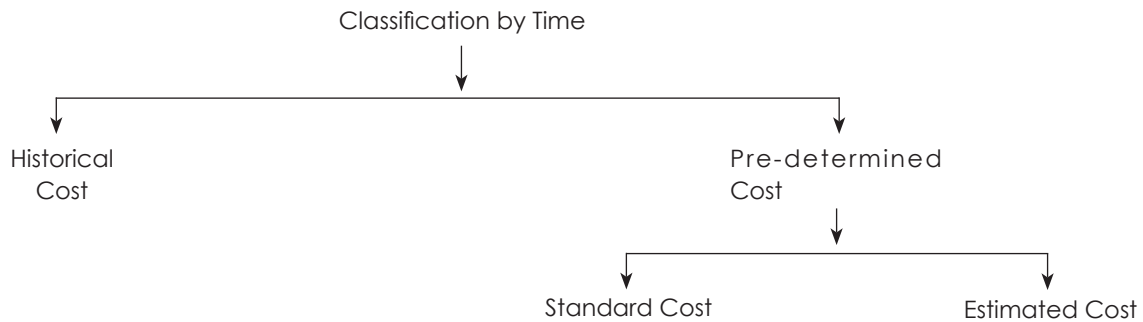
Joint Costs: Joint costs are the common cost of facilities or services employed in the output of two or more simultaneously produced or otherwise closely related operations, commodities or services. When a production process is such that from a set of same input two or more distinguishably different products are produced together, products of greater importance are termed as Joint Products and products of minor importance are

termed as By-products and the costs incurred prior to the point of separation are called Joint Costs. For example in petroleum industry petrol, diesel, kerosene, naphtha, tar is produced jointly in the refinery process.

By-product Cost: By-product Cost is the cost assigned to by-products till the split-off point.

(g) Classification by Time:

A cost item is related to a specific period of time and cost can be classified according to the system of assessment and specific purpose as indicated in the following ways :-



Historical Costs: Historical Costs are the actual costs of acquiring assets or producing goods or services. They are post-mortem costs ascertained after they have been incurred and they represent the cost of actual operational performance. Historical Costing follows a system of accounting to which all values are based on costs actually incurred as relevant from time to time.

Predetermined Costs: Pre-determined Costs for a product are computed in advance of production process, on the basis of a specification of all the factors affecting cost and cost data. Predetermined Costs may be either standard or estimated.

Standard Costs: A predetermined norm applies as a scale of reference for assessing actual cost, whether these are more or less. The Standard Cost serves as a basis of cost control and as a measure of productive efficiency, when ultimately posed with an actual cost. It provides management with a medium by which the effectiveness of current results is measured and responsibility of deviation placed. Standard Costs are used to compare the actual costs with the standard cost with a view to determine the variances, if any, and analyse the causes of variances and take proper measure to control them.

Estimated Costs: Estimated Costs of a product are prepared in advance prior to the performance of operations or even before the acceptance of sale orders. Estimated Cost is found with specific reference to product in question, and the activity levels of the plant. It has no link with actual and hence it is assumed to be less accurate than the Standard Cost.

3

MATERIAL & EMPLOYEE COST

MATERIAL COST (CAS-6)

Material is any substance (Physics term) that forms part of or composed of a finished product. i.e material refers to the commodities supplied to an undertaking for the purpose of consumption in the process of manufacturing or of rendering service or for transformation into products. The term 'Stores' is often used synonymously with materials, however, stores has a wider meaning and it covers not only raw materials consumed or utilized in production but also such other items as sundry supplies, maintenance stores, fabricated parts, components, tools, jigs, other items, consumables, lubricants.....etc. Finished and partly finished products are also often included under the term 'Stores'. Materials are also known as Inventory. The term Materials / Inventory covers not only raw materials but also components, work-in-progress and finished goods and scrap also.

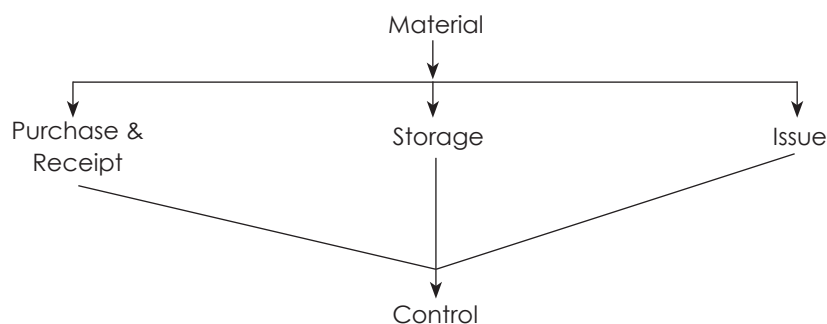
Material cost is the significant constituent of the total cost of any product. It constitutes 40% to 80% of the total cost. The percentages may differ from industry to industry. But for manufacturing sector the material costs are of greatest significance. Inventory also constitutes a vital element in the Working Capital. So it is treated as equivalent to cash. Therefore the analysis and control on Material Cost is very important.

Objectives of Material Control System:

Material Control: The function of ensuring that sufficient goods are retained in stock to meet all requirements without carrying unnecessarily large stocks.

The objectives of a system of material control are as following:-

- To make continuous availability of materials so that there may be uninterrupted flow of materials for production. Production may not be held up for want of materials.
- To purchase requisite quantity of materials to avoid locking up of working capital and to minimise risk of surplus and obsolete stores.
- To make purchase competitively and wisely at the most economical prices so that there may be reduction of material costs.
- To purchase proper quality of materials to have minimum possible wastage of materials.
- To serve as an information centre on the materials knowledge for prices, sources of supply, lead time, quality and specification.
- Study of Material can be better explained as follows:



Requisites of Material Control System:

- (a) Coordination and cooperation between the various departments concerned viz purchase, receiving, inspection, storage, issues and Accounts and Cost departments.
- (b) Use of standard forms and documents in all the stages of control.
- (c) Classification, coordination, standardization and simplification of materials.
- (d) Planning of requirement of material.
- (e) Efficient purchase organization.
- (f) Budgetary control of purchases.
- (g) Planned storage of materials, physical control as well as efficient book control through satisfactory storage control procedures, forms and documents.
- (h) Appropriate records to control issues and utilization of stores in production.
- (i) Efficient system of Internal Audit and Internal Checks.
- (j) System of reporting to management regarding material purchase, storage and utilization.

Purchase Flow:

The main functions of a purchase department are as follows :-

- (a) What to purchase? – Right Material with good quality
- (b) When to purchase? – Right Time
- (c) Where to purchase? – Right Source
- (d) How much to purchase? – Right Quantity
- (e) At what price to purchase? – Right Price

To perform these functions effectively, the purchasing department follows the following procedure:-

- (a) Receiving purchase requisitions.
- (b) Exploring the sources of supply and choosing the supplier.
- (c) Preparation and execution of purchase orders.
- (d) Receiving materials.
- (e) Inspecting and testing materials.
- (f) Checking and passing of bills for payment.

Purchase Organization:

Purchasing involves procurement of materials of requisite quantity and quality at economic price. It is of extreme importance particularly to a manufacturing concern because it has bearing on all vital factors of manufacture such as quantity, quality, cost, efficiency, economy, prompt delivery, volume of production and so on. Purchase department in a business concern can be organized into two types i.e Centralized Purchasing System and Decentralized Purchasing System. Purchasing process in most of the organisation is a centralised function because the advantages of a centralised purchasing out weight its disadvantages. Lets us see the merits and demerits of both the systems.

Merits of a centralised & De-merits of decentralized purchase organization:

- (a) When materials are purchased favourable terms (Trade discount, Economies of transport...etc) can be obtained because the quantity involved will be large. In case of decentralized system these benefits cannot be realized.
- (b) Specialised purchasing officer can be appointed with the specific purpose of highly efficient purchases functions of the concern. In case of decentralized purchase system, the business entity cannot afford a specialized purchasing officer in every location.
- (c) Effective control can be exercised over the stock of materials because duplication of purchase of the

same materials may easily be avoided in centralized purchase system, where as in decentralized purchase system, duplication of purchase of same material cannot be avoided.

- (d) Under centralized purchase system effective control can be exercised on the purchases of all the materials as the purchase function is channelized through one track which would make the system of receiving, checking and inspection efficient. Where as in decentralized purchase system it is very difficult to exercise controls.
- (e) Under centralized system of purchase materials, components and capital equipments can be suitably standardised so that the maximum purchasing benefits be availed of, storage facilities can be improved and available production facilities can be greatly utilized to the maximum possible extent. Under decentralized purchase system standardization of materials, storage facilities.....etc is very difficult to achieve.
- (f) Under centralized system of purchase closer cooperation between the financial and purchasing departments can be achieved which may not be easy under decentralized purchase system.

De-Merits of a centralized & Merits of decentralized purchase organization :

- (a) It may take unnecessarily long time to place a purchase order under centralized purchase system because to collect the relevant data from various departments/ branches/locations may take more time, These delays can be avoided under decentralized purchase system.
- (b) In case of centralized purchasing system, branches at different places cannot take advantage of localized purchasing, whereas under decentralized purchase system localization savings can be realized.
- (c) Due to the Chances of misunderstanding / miscommunication between the branch and the centralized purchasing office may result in wrong purchase of material also. Whereas under decentralized purchase system, the chances of miscommunication/ misunderstanding is very limited.
- (d) Centralized system will lead to high initial costs because a separate purchasing department for purchase of materials is to be setup. No such costs are required to be incurred in the decentralized system.
- (e) Replacement of a defective item may take long time resulting in strain on smooth production flow under centralized system of purchase. No such delay in decentralized system.

Now let us see the various material control documents in detail.

Purchase Requisition:

Purchases Requisition is a request made to the Purchase Department to procure materials of given description and of the required quality and quantity within a specified period. It is a formal request and it authorizes the Purchase Department to issue a Purchase Order to secure materials intended for periodic requirements of a given material or materials to provide guidance to the Purchase Department to estimate the future requirements in order to secure maximum purchase benefits in the form of higher discount and better credit terms. The extent and range of materials requirements provide a basis for preparation of a purchase budget. The actual requirements of a given period can be summarised from the purchases requisition and compared with the purchase budget in order to determine the variances and the reasons thereof. This form is prepared by storekeeper for regular items and by the departmental head for special materials not stocked as regular items.

The Purchase Requisition is prepared in three copies. Original will be sent to Purchase department, Duplicate copy will be retained by the indenting (request initiating) department and the triplicate will be sent to approver for approving the purchase requisition.

Purchase Requisition provides the three basic things :-

- (a) What type of material is to be purchased?
- (b) When to be purchased?
- (c) How much is to be purchased?

The specimen form of Purchase Requisition is as shown below :

Modern Ltd					
Purchase Requisition or Indent					
Purchase Req Type: Special / Regular :					
Purchase Req No :			Purchase Requisition Date :		
Department :					
S.No	Material Code	Description of the Goods	Quantity Required	Material Required by date	Remarks
Requested by			Approved by		
For use in Purchase Dept. Quotations from (1) PO Placed : Yes /No (2) PO No: (3)					

Purchase Order:

Purchase Order (PO) is a request made in writing to selected supplier to deliver goods of requisite quality, quantity, (as per the purchase requisition) at the prices, terms and conditions agreed upon. It is a commitment on the part of the purchaser to accept the delivery of goods contained in the Purchase Order if the terms included therein, are fulfilled. Purchase Order contains the following details :-

(a) Purchase Order No; (b) PO Date; (c) Supplier Name and Address; (d) Material Code; (e) Material description; (f) Grade & Other particulars of the material; (g) Quantity to be supplied; h) Price; i) Place of delivery; j) Taxes; k) Terms of Payment (Credit period) etc

Usually a purchase order is made in five copies, one each for suppliers, Receiving/Stores Department, Originating Department, Accounts Department and filing. Thus we see that all the departments concerned with the materials are informed fully about all the details of every purchases and it becomes easier for everyone to follow up on any relevant matter.

Modern Ltd	
Purchase Order	
To Supplier XXXXXX Address	PO No: PO date: Quotation Reference: PR No:
Please supply the following items in accordance with the instructions mentioned there in on the following terms and conditions.	

S.No	Material Code	Material Description	Quantity	Rate per Unit	Amount	Delivery Date	Remarks
Packing & Freight							
Taxes							
Total Amount							
Delivery: Goods to be delivered at Delivery date: Payment Terms:							
Authorised signatory							

Receipt & Inspection of Materials:*Goods Received cum Inspection Note:*

The stores department will receive the material after the gate entry. It will compare the quantities received with the PO Quantity. It is a valuable document as it forms the basis of accounting entry in the stores ledger and stock records. It is the document basis for quality control department to carry inspection of the material in warded.

It also forms the basis of payments to be made to the supplier in respect of the materials supplied by him. Suppliers invoices are checked with goods received notes which such for actual receipt of the goods supplied by the supplier. One copy of such note is also sent to Inspection Department who after inspection of materials approves the note for Stores Department to receive the materials. Outstanding Goods Received Notes which are not linked with supplier's bills enable the Accounts Department to estimate at the year end the liability for goods purchased for which supplier's bills not received.

The specimen copy of the Goods Received cum Inspection Note as below:

New India Ltd							
Goods Received cum Inspection Note							
Received from:				GRN No:			
Received at:				GR Date:			
				PO Ref No:			
				Gate Entry No:			
S.No	Material code	Material Description	Quantity Received	Quantity Accepted	Qty Rejected	Reason for Rejection	Remarks

Prepared by				Inspected by			
Received by				Storekeeper			

Purchase Quantity:

Important requirement for an efficient system of purchase control is to ensure that only the correct quantity of materials is purchased. The basic factors to be considered while fixing the ordering quantity are as follows :-

- There should be no overstocking.
- Materials should always be available in sufficient quantity to meet the requirements of production and to avoid plant shut down.
- Purchases should be made in economic lots.

Other factors to be considered are quantity already ordered, availability of funds, business cycle... etc.

Purchase department in manufacturing concerns is usually faced with the problem of deciding the quantity of various items, which they should purchase basing on the above factors. If purchases of material are made in bulk then inventory cost will be high. On the other hand if the order size is small each time then the ordering cost will be very high. In order to minimise ordering and carrying costs it is necessary to determine the order quantity which minimises these two costs.

Economic Order Quantity: (EOQ)

The total costs of a material usually consist of Buying Cost + Total Ordering Cost + Total Carrying Cost.

Economic Order Quantity is 'The size of the order for which both ordering and carrying cost are minimum'.

Ordering Cost: The costs which are associated with the ordering of material. It includes cost of staff posted for ordering of goods, expenses incurred on transportation, inspection expenses of incoming material....etc

Carrying Cost: The costs for holding the inventories. It includes the cost of capital invested in inventories. Cost of storage, Insurance.....etc

The assumptions underlying the Economic Ordering Quantity (EOQ): The calculation of economic order of material to be purchased is subject to the following assumptions:-

- Ordering cost per order and carrying cost per unit per annum are known and they are fixed.
- Anticipated usage of material in units is known.
- Cost per unit of the material is constant and is known as well.
- The quantity of material ordered is received immediately i.e lead time is Zero.

The famous mathematician 'WILSON' derived the formula used for determining the size of order for each purchases at minimum ordering and carrying costs, which is as below :-

$$\text{Economic Ordering Quantity} = \sqrt{\frac{2AO}{C}}$$

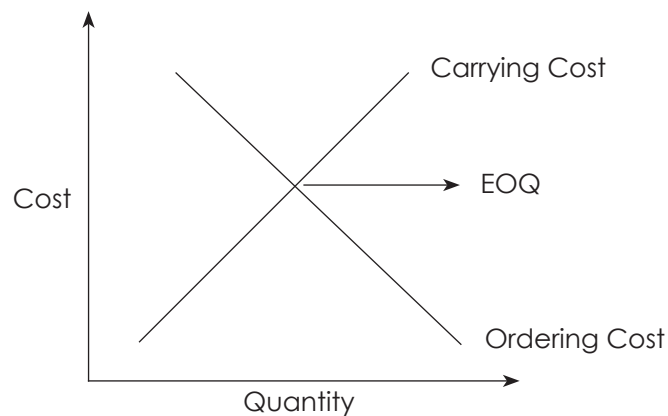
Where,

A = Annual demand /Consumption

O = Ordering Cost per order

C = Carrying Cost per unit per annum.

Graphical representation of EOQ:

**Illustration 1**

Calculate the Economic Order Quantity from the following information. Also state the number of orders to be placed in a year.

Consumption of materials per annum	:	10,000 kg
Order placing cost per order	:	₹ 50
Cost per kg. of raw materials	:	₹ 2
Storage costs	:	8% on average inventory

Solution:

$$EOQ = \sqrt{\frac{2 \times A \times O}{C}}$$

A = Units consumed during year = 10,000 Kg.

O = Order cost per order = ₹50

C = Inventory carrying cost per unit per annum $2 \times 8\% = ₹ 0.16$

$$EOQ = \sqrt{\frac{2 \times 10,000 \text{ (units)} \times ₹ 50}{₹ 0.16}}$$

EOQ = 2,500 kg.

$$\begin{aligned}
 \text{No. of orders to be placed in a year} &= \frac{\text{Total consumption of materials per annum}}{\text{EOQ}} \\
 &= \frac{10,000 \text{ kg}}{2,500 \text{ kg}} \\
 &= 4 \text{ Orders per year}
 \end{aligned}$$

Illustration 2

The average annual consumption of a material is 18,250 units at a price of ₹ 36.50 per unit. The storage cost is 20% on an average inventory and the cost of placing an order is ₹ 50. How much quantity is to be purchased at a time?

Solution:

$$\begin{aligned}\text{EOQ} &= \sqrt{\frac{2 \times 18,250 (\text{units}) \times ₹ 50}{20\% \text{ of } ₹ 36.50}} \\ &= \sqrt{\frac{18,25,000}{7.3}} \\ &= 500 \text{ Units}\end{aligned}$$

Material Storage & Control:

Once the material is received, it is the responsibility of the stores-in-charge, to ensure that material movements in and out of stores are done only against the authorized documents. Stores-in-charge is responsible for proper utilization of storage space & exercise better control over the material in the stores to ensure that the material is well protected against all losses such as theft, pilferage, fire, misappropriation ...etc.

Duties of store keeper:

The duties of store-keeper are as follows :-

- (a) To exercise general control over all activities in stores department.
- (b) To ensure safe storage of the materials.
- (c) To maintain proper records.
- (d) To initiate purchase requisitions for the replacement of stock of all regular materials, whenever the stock level of any item in the store reaches the Minimum Level.
- (e) To initiate the action for stoppage of further purchasing when the stock level approaches the Maximum Level.
- (f) To issue materials only in required quantities against authorized requisition documents.
- (g) To check and receive purchased materials forwarded by the receiving department and to arrange for storage in appropriate places.

Different classes of stores:-

Broadly speaking, there are three classes of stores

- (a) Central Stores
- (b) Decentralized stores
- (c) Sub-Store (Imprest Store)

Centralized stores:

The usual practice in most of the concerns is to have a central store. Separate store to meet the requirements of each production department are not popular because of the heavy expenditure involved. In case of centralized stores materials are received by and issued from one stores department. All materials are kept at one central store. The advantages and disadvantages of this type of store are set out as follows:

Advantages of centralized stores:

- (a) Better control can be exercised over stores because all stores are housed in one department. The risk of obsolescence of stores can be minimised.
- (b) The economy of staff-experts, or clerical, floor space, records and stationery are available.
- (c) Better supervision is certainly possible.
- (d) Obsolescence of the stores items can be kept under strict vigil and control.
- (e) Centralized material handling system can be put into operation thus further economising on space, personnel and equipments.
- (f) Investment in stocks can be minimized.

Disadvantages of centralized stores:

- (a) The transportation costs of the materials may increase because the movements of the stores may be for a greater distance since the storing is centralized.
- (b) If the user departments are far away from the stores there may be delay in receipt of the stores by those departments.
- (c) Breakdown of inter-departmental transport system may hold up the entire process, and similarly labour problem in the centralized stores may bring the entire concern to standstill.
- (d) There is greater chance of losses through fire, burglary or some other unhappy incidents.
- (e) It may not be safe to have some hazardous elements bunched together in the centralized stores.

Decentralized stores:

Under this type of stores, independent stores are situated in various departments. Handling of stores is undertaken by the store keeper in each department. The departments requiring stores can draw them from their respective stores situated in their departments. The disadvantages of centralized stores can be eliminated, if there are decentralized stores. But these types of stores are uncommon because of heavy expenditure involved.

Central stores with sub-stores:

In large organizations, factories / workshops may be located at different places which are far from the central stores. So in order to keep the transportation costs and handling charges to the minimum level, sub-stores should be situated near to the factory. For each item of materials a quantity is determined and this should be kept in the stock at the beginning of any period. At the end of a period, the store keepers of each sub-store will requisition from the central stores the quantity of the materials consumed to bring the stock up to the predetermined quantity. In short this type of stores operates in a similar way to a petty cash system, so this system of stores is also known as the imprest system of stores control.

Advantages:

- (a) It ensures the prompt issue of stores.
- (b) It confines the advantages of centralized stores with sub-stores and at the same time it does not sacrifice the centralized control.
- (c) It reduces handling cost of materials.
- (d) It avoids the maintenance of elaborate inventory records.

Control of the Stores:**Classification and Codification of Material:**

In case of large organizations the number and types of materials used is considerable and unless each item is distinguished and stored separately it would be impossible to find them out when they are required for production or any other operation. It may happen that either one type of material is in excess or another type may be altogether non-existent. It is therefore, essential that a proper system of classification and codification.

Classified into different categories according to their nature or type, viz., mild steel, tool steel, brass, bronze, copper, glass, timber, etc., and then again within such broad classification into rounds; bars, strips; angles, etc. There are two steps in the classification and codification of materials - determination of the number of items, their nature, other characteristics and classification of the items of comparable nature or type into suitable groups or classes.

Various classes of coding are in practice and the common types are stated below:

- (a) **Alphabetical Scheme:** Alphabets are only used for codification. Like Mild Steel Sheets are coded as MSS.
- (b) **Numeric Scheme :** In this scheme numerals are used instead of alphabets, For example If steel is given main code of 300 mild steel may be coded as 310 and mild steel sheet may be coded as 311, mild steel bar may be coded as 3112.
- (c) **Decimal Scheme:** It is similar to the numeric scheme in which the groups are represented by number and digits after the decimal indicate sub-groups of items. For example, where the steel is coded as 3.00 mild steel may be coded as 3.10 and mild steel sheet can be coded as 3.11 and mild sheet bar as 3.12 and so on.

- (d) **Block Scheme:** In this case block of number are allotted for classification of specific groups such as for material classification the block of number 1 to 999 may be reserved, for raw materials; 1000 to 1999 for stores and spares; 2000 to 2999 for finished goods.
- (e) **Combination Scheme :** Here the code structure takes in account both alphabetic and numeric schemes and strikes a balance between the two. Mild steel by coded as MS and the sheets, bars, strips, rounds of mild steel may be coded as MS01, MS02, MS04 and so on. This code is most commonly used because this system has got the advantage of both the alphabetic and numeric systems and is quite flexible in nature.

Advantages of Classification & Codification of materials:

- (a) The procedure assists in the easy identification and location of the materials because of their classification.
- (b) It minimises the recording of the nature/ type of the materials with detailed description on every document relating to the transaction of materials.
- (c) Codification is a must in the case of mechanisation of the stores accounting.
- (d) The method is simple to operate and definitely saves time and money in respect of both physical location/ identification of materials as well as recording of the materials.

After the material classification and codification is done for all the materials, for each material code we have to fix the Minimum Level, Maximum Level, Re-order Level and Re-order Quantity. It is the storekeeper's responsibility to ensure inventory of any material is maintained between the Minimum Level and Maximum Level.

Maximum Level:

The Maximum Level indicates the maximum quantity of an item of material that can be held in stock at any time. The stock in hand is regulated in such a manner that normally it does not exceed this level. While fixing the level, the following factors are to be taken into consideration:

- (a) Maximum requirement of the store for production purpose, at any point of time.
- (b) Rate of consumption and lead time.
- (c) Nature and properties of the Store: For instance, the maximum level is necessarily kept low for materials that are liable to quick deterioration or obsolescence during storage.
- (d) Storage facilities that can be conveniently spared for the item without determinant to the requirements of other items of stores.
- (e) Cost of storage and insurance.
- (f) Economy in prices: For seasonal supplies purchased in bulk during the season, the maximum level is generally high.
- (g) Financial considerations: Availability of funds and the price of the stores are to be kept in view. For costly items, the maximum level should be as low as possible. Another point to be considered is the future market trend. If prices are likely to rise, the concern may like to stock-piling for keeping large stock in reserve for long-term future uses and in such a case, the level is pushed up.
- (h) Rules framed by the government for import or procurement. If due to these and other causes materials are difficult to obtain and supplies are irregular the maximum level should be high.
- (i) The maximum level is also dependent on the economic ordering quantity.

Maximum Level = Re-Order Level + Re-Order Qty – (Minimum Rate of Consumption X Minimum Re-Order Period)

Minimum Level:

The Minimum Level indicates the lowest quantitative balance of an item of material which must be maintained at all times so that there is no stoppage of production due to the material being not available. In fixing the minimum level, the following factors are to be considered :-

- (a) Nature of the item: For special material purchased against customer's specific orders, no minimum level is necessary. This applies to other levels also.
- (b) The minimum time (normal re-order period) required replenishing supply: This is known as the Lead Time and are defined as the anticipated time lag between the dates of issuing orders and the receipt of materials. Longer the lead time, lower is minimum level, the re-order point remaining constant.
- (c) Rate of consumption (normal, minimum or maximum) of the material.

Minimum Level = Re-Order level – (Normal Rate of Consumption X Normal Re-Order Period)

Re-Order Level:

When the stock in hand reach the ordering or re-ordering level, store keeper has to initiate the action for replenish the material. This level is fixed somewhere between the maximum and minimum levels in such a manner that the difference of quantity of the material between the Re-ordering Level and Minimum Level will be sufficient to meet the requirements of production up to the time the fresh supply of material is received.

The basic factors which are taken into consideration in fixing a Re-ordering Level for a store item include minimum quantity of item to be kept, rate of consumption and lead time which are applied for computing of this level.

Re-Ordering level= Minimum Level + Consumption during lead time

= Minimum Level + (Normal Rate of Consumption × Normal Re-order Period)

Another formula for computing the Re-Order level is as below

Re-Order level = Maximum Rate of Consumption X Maximum Re-Order period (lead time)

Danger Level:

It is the level at which normal issue of raw materials are stopped and only emergency issues are only made. This is a level fixed usually below the Minimum Level. When the stock reaches this level very urgent action for purchases is indicated. This presupposed that the minimum level contains a cushion to cover such contingencies. The normal lead time cannot be afforded at this stage. It is necessary to resort to unorthodox hasty purchase procedure resulting in higher purchase cost.

The practice in some firms is to fix danger level below the Re-Ordering Level but above the Minimum Level. In such case, if action for purchase of an item was taken when the stock reached the Re-Ordering Level, the Danger Level is of no significance except that a check with the purchases department may be made as soon as the Danger Level is reached to ensure that everything is all right and that delivery will be made on the scheduled date.

Danger Level = Normal Rate of Consumption × Maximum Reorder Period for emergency purchases

Illustration 3

The components A and B are used as follows:

Normal usage	 300 units per week each
Maximum usage	 450 units per week each
Minimum usage	 150 units per week each
Reorder Quantity	 A 2,400 units; B 3,600 units.
Reorder period	 A 4 to 6 weeks, B 2 to 4 weeks.

Calculate for each component:

(a) Re-order Level (b) Minimum Level (c) Maximum Level (d) Average Stock Level.

Solution:

	Particulars	A	B
a)	Reorder Level [Max. Consumption × Max. Re-order Period]	2700 units (450 × 6)	1800 units (450 × 4)
b)	Minimum Level [ROL – (Normal Consumption × Normal Re-order period)]	1200 units [2700 – (300×5)]	900 units [1800 – (300×3)]
c)	Maximum Level [ROL + ROQ – (Min. Consumption × Min. Re-order Period)]	4500 units [2700 + 2400 – (150×4)]	5100 units [1800 + 3600 – (150 × 2)]

d)	Average Stock Level [Min. Level + Max. Level] / 2 OR [Min. Level + ½ Re-order Quantity]	2850 units [4500 + 1200]/2 (or) 2400 units 1200 + ½ (2400)	3000 units [5100 + 900]/2 (or) 2700 units 900 + ½ (3600)

Stores Records

The bin cards and the stores ledger are the two important stores records that are generally kept for making a record of various items.

Bin Card:

Bin Card is a quantitative record of receipts, issues and closing balance of items of stores. Separate bin cards are maintained for each item and are placed in shelves or bins. This card is debited with the quantity of stores received, credited with the quantity of stores issued and the balance of quantity of store is taken after every receipt or issue. The balance quantity of the item may be easily known at any time. To have an up to date balance of stores, the principle of '*before touching the item, bin card should be touched*'. For each item of stores, Material Code, Minimum Quantity, Maximum Quantity, Ordering Quantity, Balance Quantities are stated on the bin card. Bin card is also known as 'Bintag' or 'Stock card'.

BIN CARD OF APHME LTD							
Material Code:				Maximum Level:			
Mat. Description:				Minimum Level:			
Location:				Re-ordering level:			
Unit of Measurement:							
Date	Doc No.	Received from / Issued to	Receipts	Issue	Balance	Verification with Stores ledger Date & Verified By	

Stores Ledger:

Stores Ledger is maintained by the costing department to make record of all receipts, issues of materials with quantities, values (Sometimes unit rates also). Ledger resembles with bin cards except that receipts, issues and balances are shown along with their money value. The ledger contains an account for every item of stores in which receipts, issues and balances are recorded both in quantity and value.

Stores Ledger of Krishna Engineering Ltd.	
Material code:	Minimum Qty:
Bin No:	Maximum Qty:
Material Description:	Ordering Qty:
Location:	

Date	Receipts				Issues				Balance		
	GR No	Qty	Rate	Amount	SR No	Qty	Rate	Amount	Qty	Rate	Amount

Difference between Bin Card and Stores Ledger:-

Bin Card	Stores Ledger
(a) It is maintained by the store keeper.	(a) It is maintained in the Costing department.
(b) It contains only quantitative details of materials received, issued and returned to stores.	(b) It contains information both in quantity and value.
(c) Entries are made when transactions take place.	(c) It is always posted after the transaction.
(d) Each transaction is individually posted.	(d) Transactions may be summarized and then posted.
(e) Inter-department transfers do not appear in Bin-card.	(e) Material transfers from one job to another job are recorded for costing purpose.

Reconciliation of Stores ledger and Bin Card:

Normally there should not be any difference between the quantities shown in the Bin Card and the Stores Ledger. However, in practice differences arise mainly due to the following reasons :-

- Arithmetical error in working out the balances.
- Non-posting of a document either in a bin card or in the stores ledger may be due to non receipt of a document.
- Posting in the wrong bin card or in the wrong sheet (code) of the stores ledger.
- Posting of receipts under issue and vice-versa.
- Materials issued or received on loan or for approval are sometimes entered in bin card, but not in stores ledger.

Any difference between the stores ledger and bin card defeats the purpose for which the two separate sets are maintained and renders physical stocking ineffective as the correct book balance for the purpose of comparison with physical balance is not available. So to control or reduce the mismatch between the stores ledger and bin card and maintain the correct balance in the books of accounts various methods are followed.

Perpetual Inventory System:

Perpetual Inventory System may be defined as 'a system of records maintained by the controlling department, which reflects the physical movements of stocks and their current balance'. Thus it is a system of ascertaining balance after every receipt and issue of materials through stock records to facilitate regular checking and to avoid closing down the firm for stock taking. To ensure the accuracy of the perpetual inventory records (bin card and Stores ledger), physical verification of stores is made by a programme of continuous stock taking.

The operation of the perpetual inventory system may be as follows :-

- The stock records are maintained and up to date posting of transactions are made there in so that current balance may be known at any time.
- Different sections of the stores are taken up by rotation for physical checking. Every day some items are

checked so that every item may be checked for a number of times during the year.

- (c) Stores received but awaiting quality inspection are not mixed up with the regular stores at the time of physical verification, because entries relating to such stores have not yet been made in the stock records.
- (d) The physical stock available in the store, after counting, weighing, measuring or listing as the case may be, is properly recorded in the bin cards / Inventory tags and stock verification sheets.

Perpetual inventory system should not be confused with continuous stock taking; Continuous stock taking is an essential feature of perpetual inventory system. *Perpetual inventory means the system of stock records and continuous stock taking, where as continuous stock taking means only the physical verification of the stock records with actual stocks.*

In continuous stock taking, physical verification is spread throughout the year. Everyday 10 to 15 items are taken at random by rotation and checked so that the surprise element in stock verification may be maintained and each item may be checked for a number of times each year. On the other hand the surprise element is missing in case of periodical checking, because checking is usually done at the end of year.

Advantages of perpetual inventory system:

- (a) The system obviates the need for the physical checking of all items of stock and stores at the end of the year.
- (b) It avoids the dislocation of the routine activities of the organisation including production and despatch.
- (c) A reliable and detailed check on the stores is maintained.
- (d) Errors, irregularities and loss of stock through other methods are quickly detected and through necessary action recurrence of such things in future is minimised.
- (e) As the work is carried out systematically and without undue haste the figures are readily available.
- (f) Actual stock can be compared with the authorised maximum and minimum levels, thus keeping the stocks within the prescribed limits. The disadvantages of excess stocks are avoided and capitalised up in stores materials cannot exceed the budget.
- (g) The recorder level of various items of stores are readily available thus facilitating the work of procurement of stores.
- (h) For monthly or quarterly financial statements like Profit and Loss Account and Balance Sheet the stock figures are readily available and it is not necessary to have physical verification of the balances.

Periodical Stock Verification:

This system envisages physical stock verification at a fixed date/period during the year. Generally under this system the activity takes place at the end of the accounting period or a date close to such date. Usually the system is opened in the following manner :-

- (a) A period of 5/7 days, depending on the magnitude of the work is chosen during which all the items under stock are verified physically and such period is known as 'cut-off' period. During this period there are no movements of stock items and neither 'receipts' nor are 'issues permitted.
- (b) The items are physically counted/measured depending on their nature and are noted down in records which are signed by the auditors if they are present in stock verification.
- (c) The bin cards balances are also checked and initiated. Generally the physical balances and bin card balances of various items should be same unless shortage/excesses are there or the recording/ balancing in the cards are incorrect.
- (d) After the physical verification is completed work sheets are countersigned by the godown supervisors and the stock verified.
- (e) Thereafter reconciliation statement is prepared item wise where the physical balances and bin card balances are different.
- (f) Then the balance as per bin cards and as per stores ledger is also compared and necessary adjustments are made to show the correct position of stock at the year end.
- (g) Finally the shortages/excess statement is prepared by the concerned departments and are placed before the higher management for their approval for adjustments.

Valuation of Material Receipts:

Principles of valuation of receipt of materials as per CAS-6 (limited Revision 2017) are as follows:-

- (a) The material receipt should be valued at purchase price including duties and taxes, freight inwards, insurance and other expenditure directly attributable to procurement (net of trade discounts, rebates, taxes and duties refundable) that can be quantified with reasonable accuracy at the time of acquisition.
- (b) Finance costs incurred in connection with the acquisition of materials shall not form part of the material cost.
- (c) Self manufactured item shall be valued including the direct material, direct labour, direct expenses, factory overheads, share of administrative overheads relating to the production but excluding share of other administrative overheads, finance cost and marketing overheads. In case of captive consumption, valuation shall be in accordance with Cost Accounting Standard-4.
- (d) Spares which are specific to an item of equipment shall not be taken into inventory, but shall be capitalized with cost of specific equipment. Cost of Capital spares and / or insurance spares, whether procured with the equipment or subsequently, shall be amortized over a period, not exceeding the useful life of the equipment.
- (e) Normal loss or spoilage of material prior to reaching the factory or at places where the services are provided shall be absorbed in the cost of balance materials net of amounts recoverable from suppliers, insurers, carriers or recoveries from disposal.
- (f) Losses due to shrinkage or evaporation and gain due to elongation or absorption or moisture ...etc before the material is received is absorbed in material cost to the extent they are normal, with corresponding adjustment in quantity.
- (g) The foreign exchange component of imported material cost is converted at the rate on the date of transaction (material / service recording in books of accounts). Any subsequent change in the exchange rate till payment or otherwise shall not form part of the material cost.
- (h) Any demurrage or detention charges, or penalty levied by transport or other authorities shall not form part of the cost of materials.
- (i) Subsidy/grant/incentive and any such payment received / receivable with respect to any material shall be reduced from cost for ascertainment of the cost of the cost object to which such amounts are related.

Valuation of Material Issues:

Principles of valuation of issue of materials as per CAS-6 (Limited Revision, 2017) are as follows :-

- (a) Issues shall be valued using appropriate assumptions on cost flow such as FIFO, LIFO, and Weighted average rate. The method of valuation shall be followed on a consistent basis.
- (b) Where materials are accounted at standard cost, the price variances related to materials shall be treated as part of material cost.
- (c) Any abnormal cost shall be excluded from the material cost.
- (d) Wherever the material cost includes the transportation costs, determination of transportation cost shall be based on CAS-5, i.e Equalized Transportation Costs.
- (e) Material cost may include imputed costs not considered in Financial Accounts.
- (f) Self manufactured components and sub-assemblies item shall be valued including the direct material, direct labour, direct expenses, factory overheads, share of administrative overheads relating to the production but excluding share of other administrative overheads, finance cost and marketing overheads. In case of captive consumption, the valuation shall be in accordance with Cost Accounting Standard-4.
- (g) The material cost of normal scrap / defectives which are rejects shall be included in the material cost of goods manufactured. The material cost of actual scrap / defectives, not exceeding the normal shall be adjusted in the material cost of good production. Material cost of abnormal scrap/ defectives should not be included in material cost but treated as loss after giving credit to the realisable value of such scrap / defectives.

Materials issued from stores should be priced at the price at which they are carried in inventory. Material may be purchased from different suppliers at different prices in different situations, where as consumption may happen the entire inventory at a time or at different lots....etc. So issue of materials should be valued after considering the following factors:-

- (a) Nature of business and production process.
- (b) Management policy relating to the closing stock valuation.
- (c) Frequency of purchases and price fluctuations.

Several methods of pricing of material issues have been evolved; these may be classified into the following:-

Cost Price Method

- (a) First in First out
- (b) Last-in-first out
- (c) Base Stock Method

Specific price method

- (a) Average Price Method
- (b) Simple Average Price Method
- (c) Weighted Average Price Method
- (d) Moving Simple Average Method
- (e) Moving Weighted Average Method

Market Price Methods

- (a) Replacement Method
- (b) Realisable Price Method

Notional Price Methods:

- (a) Standard Price Method
- (b) Inflated Price Method

We may now briefly discuss all the above methods

(1) First in – First Out Method:

It is a method of pricing the issue of materials in the order in which they are purchased. In other words the materials are issued in the order in which they arrive in the store. This method is considered suitable in times of falling price because the material cost charged to production will be high while the replacement cost of materials will be low. In case of rising prices this method is not suitable.

Advantages of FIFO:-

- (a) It is simple and easy to operate.
- (b) In case of falling prices, this method gives better results.
- (c) Closing stocks represents the market prices.

Disadvantages:-

- (a) If the prices fluctuate frequently, this method may lead to clerical errors.
- (b) In case of rising prices this method is not advisable.
- (c) The material costs charged to same job are likely to show different rates.

(2) Last-in-First Out Method:

Under this method the prices of last received batch (lot) are used for pricing the issues, until it is exhausted and so on. During the inflationary period or period of rising prices, the use of LIFO would help to ensure the cost of production determined approximately on the above basis is approximately the current one. Under LIFO stocks would be valued at old prices, but not represent the current prices.

Advantages:-

- (a) The cost of materials issued will be either nearer to and/or will reflect the current market price.
- (b) In case of falling prices profit tends to rise due to lower material cost

Disadvantages:

- (a) The computations become complicated if too many receipts are there.
- (b) Companies having JIT system will face this problem more.

(3) Base Stock Method:

A minimum quantity of stock under this method is always held at a fixed price as reserve in the stock, to meet a state of emergency, if arises. This minimum stock is known as Base Stock and is valued at a price at which the first lot of materials is received and remains unaffected by subsequent price fluctuations. The quantity in excess of the base stock may be valued either on the LIFO basis or FIFO basis. This method is not an independent method as it uses FIFO or LIFO. Its advantages and disadvantages therefore will depend upon the use of the other method.

(4) Specific Price Method:

This method is useful, especially when the materials are purchased for a specific job or work order, and as such these materials are issued subsequently to that specific job or work order at the price at which they were purchased. The cost of materials issued for production purposes to specific jobs represent actual and correct costs. This method is specific for non-standard products. This method is difficult to operate, especially when purchases and issues are numerous.

(5) Simple Average Price Method:

Under this method materials issued are valued at average price, which is computed by dividing the total of all units rate by the number of units.

Material Issue Price = Total of unit prices of each purchase / Total No of Units

This method is useful, when the materials are received in uniform lots of similar quantity and prices do not fluctuate considerably.

(6) Weighted Average Price Method:

This method removes the limitation of Simple Average Method in that it also takes into account the quantities which are used as weights in order to find the issue price. This method uses total cost of material available for issue divided by the quantity available for issue.

Issue Price = Total Cost of Materials in stock / Total Quantity of Materials in stock

(7) Moving Simple Average Price Method:

Under this method the rate for material issue is determined by dividing the total of the periodic simple average prices of a given number of periods by the number of periods. For determining the moving simple average price, it is necessary to fix up first period to be taken for determining the average. Suppose a three monthly period is decided upon and moving average rate for the month of April is to be computed. Under such situation, we have to make a simple list of the simple average price from January to March, add them up, and divide the total by three. To compute the moving average for May, we have to omit simple average rate pertains to January and add the rate relating to the April and divide the total by three.

(8) Moving Weighted Average Price Method:

Under this method, the issue, rate is computed by dividing the total of the periodic weighted average price of a given number of periods by the number of periods.

(9) Replacement Method:

Replacement price is defined as the price at which it is possible to purchase an item, identical to that which is being replaced or revalued. Under this method, materials issued are valued at replacement cost of the items. Advantage of this method is issue cost reflects the current market price. But the difficult involved under this method is determination of market price of material before each issue.

(10) Realisable Price method:

Realisable price means a price at which the material to be issued can be sold in the market. This price may be more or less than the cost price, at which it was originally purchased.

(11) Standard Price Method:

Under this method, materials are priced at some predetermined rate of standard price irrespective of the actual

purchase cost of the materials. Standard cost is usually fixed after taking into consideration the current price, anticipated market trends. This method facilitates the control of material cost and task of judging the efficiency of purchase department. But it is very difficult to fix the standard price when the prices fluctuates frequently.

(12) Inflated Price Method:

In case of materials that suffers loss in weight due to natural or climatic factors ex: evaporation...etc the issue price of the materials is inflated to cover up the losses.

Illustration 5

Prepare a statement showing the pricing of issues, on the basis of

(a) Simple Average and

(b) Weighted Average methods from the following information pertaining to Material-D

2016 March	1	Purchased 100 units @ ₹10 each
	2	Purchased 200 units @ ₹ 10.2 each.
	5	Issued 250 units to Job X vide M.R.No.12
	7	Purchased 200 units @ ₹10.50 each
	10	Purchased 300 units @ ₹10.80 each
	13	Issued 200 units to Job Y vide M.R.No.15
	18	Issued 200 units to Job Z vide M.R.No.17
	20	Purchased 100 units @ ₹11 each
	25	Issued 150 units to Job K vide M.R.No.25

Solution:

(a) Simple Average Method:

Stores Ledger Account

Date	Receipts			Issue			Balance	
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Value ₹
2016								
March 1	100	10	1000	--	--	--	100	1000
March 2	200	10.2	2040	--	--	--	300	3040
March 5	--	--	--	250	10.10 ⁽¹⁾	2525	50	515
March 7	200	10.5	2100	--	--	--	250	2615
March 10	300	10.8	3240	--	--	--	550	5855
March 13	--	--	--	200	10.50 ⁽²⁾	2100	350	3755
March 18	--	--	--	200	10.65 ⁽³⁾	2130	150	1625
March 20	100	11	1100	--	--	--	250	2725
March 25	--	--	--	150	10.90 ⁽⁴⁾	1635	100	1090

Working Notes:

- Calculation of Price for Issue on March 5th

$$= (10 + 10.2) / 2 = ₹10.10$$
- Calculation of Price for Issue on March 13th

$$= (10.2 + 10.5 + 10.8) / 3 = ₹10.5$$
- Calculation of Price for Issue on March 18th

$$= (10.5 + 10.8) / 2 = ₹10.65$$

4. Calculation of Price for Issue on March 25th

$$= (10.8 + 11) / 2 = ₹10.90$$

(b) Weighted Average Method:**Stores Ledger Account**

Date	Receipts			Issue			Balance	
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Value ₹
2016								
March 1	100	10	1000	--	--	--	100	1000
March 2	200	10.2	2040	--	--	--	300	3040
March 5	--	--	--	250	10.13 ⁽¹⁾	2533	50	507
March 7	200	10.5	2100	--	--	--	250	2607
March 10	300	10.8	3240	--	--	--	550	5847
March 13	--	--	--	200	10.63 ⁽²⁾	2126	350	3721
March 18	--	--	--	200	10.63 ⁽³⁾	2126	150	1595
March 20	100	11	1100	--	--	--	250	2695
March 25	--	--	--	150	10.78 ⁽⁴⁾	1617	100	1078

Working Notes:

1. Calculation of price for Issue on March 5th
 $= 3040/300 = ₹10.13$
2. Calculation of price for Issue on March 13th
 $= 5847/550 = ₹10.63$
3. Calculation of price for Issue on March 18th
 $= 3721/350 = ₹10.63$
4. Calculation of price for Issue on March 25th
 $= 2695/250 = ₹10.78$

Illustration 6

The stock of material held on 1-4-2015 was 400 units @ 50 per unit. The following receipts and issues were recorded. You are required to prepare the Stores Ledger Account, showing how the values of issues would be calculated under Base Stock Method, both through FIFO AND LIFO base being 100 units.

- 2-4-2015 Purchased 100 units @ ₹55 per unit
- 6-4-2015 Issued 400 units
- 10-4-2015 Purchased 600 units @ ₹55 per unit
- 13-4-2015 Issued 400 units
- 20-4-2015 Purchased 500 units @ ₹65 per unit.
- 25-4-2015 Issued 600 units
- 10-5-2015 Purchased 800 units @ ₹70 per unit
- 12-5-2015 Issued 500 units
- 13-5-2015 Issued 200 units
- 15-5-2015 Purchased 500 units @ ₹75 per unit
- 12-6-2015 Issued 400 units
- 15-6-2015 Purchased 300 units @ ₹ 80 per unit

Solution:

Stores Ledger Account [under Base Stock through FIFO Method]

Date	Receipts			Issue			Balance		
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹
1-4-2015	--	--	--	--	--	--	100	50	5,000
							300	50	15,000
2-4-2015	100	55	5,500	--	--	--	100	50	5,000
							300	50	15,000
							100	55	5,500
6-4-2015	--	--	--	300	50	15,000			
				100	55	5,500	100	50	5,000
10-4-2015	600	55	33,000	--	--	--	100	50	5,000
							600	55	33,000
13-4-2015	--	--	--	400	55	22,000	100	50	5,000
							200	55	11,000
20-4-2015	500	65	32,500	--	--	--	100	50	5,000
							200	55	11,000
							500	65	32,500
25-4-2015	--	--	--	200	55	11,000	100	50	5,000
				400	65	26,000	100	65	6,500
10-5-2015	800	70	56,000	--	--	--	100	50	5,000
							100	65	6,500
							800	70	56,000
12-5-2015	--	--	--	100	65	6,500	100	50	5,000
				400	70	28,000	400	70	28,000
13-5-2012	--	--	--	200	70	14,000	100	50	5,000
							200	70	14,000
15-5-2015	500	75	37,500	--	--	--	100	50	5,000
							200	70	14,000
							500	75	37,500
12-6-2015	--	--	--	200	70	14,000	100	50	5,000
				200	75	15,000	300	75	22,500
15-6-2015	300	80	24,000	--	--	--	100	50	5,000
							300	75	22,500
							300	80	24,000

Stores Ledger Account [under Base Stock through LIFO Method]

Date	Receipts			Issue			Balance		
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹
1-4-2015	--	--	--	--	--	--	100	50	5,000
							300	50	15,000
2-4-2015	100	55	5,500	--	--	--	100	50	5,000
							300	50	15,000
							100	55	5,500
6-4-2015	--	--	--	100	55	5,500			
				300	50	15,000	100	50	5,000
10-4-2015	600	55	33,000	--	--	--	100	50	5,000
							600	55	33,000
13-4-2015	--	--	--	400	55	22,000	100	50	5,000
							200	55	11,000
20-4-2015	500	65	32,500	--	--	--	100	50	5,000
							200	55	11,000
							500	65	32,500
25-4-2015	--	--	--	500	65	32,500	100	50	5,000
				100	55	5,500	100	55	5,500
10-5-2015	800	70	56,000	--	--	--	100	50	5,000
							100	55	5,500
							800	70	56,000
12-5-2015	--	--	--	500	70	35,000	100	50	5,000
							100	55	5,500
							300	70	21,000
13-5-2015	--	--	--	200	70	14,000	100	50	5,000
							100	55	5,500
							100	70	7,000
15-5-2015	500	75	37,500	--	--	--	100	50	5,000
							100	55	5,500
							100	70	7,000
							500	75	37,500
12-6-2015	--	--	--	400	75	30,000	100	50	5,000
							100	55	5,500
							100	70	7,000
							100	75	7,500
15-6-2015	300	80	24,000	--	--	--	100	50	5,000
							100	55	5,500
							100	70	7,000
							100	75	7,500
							300	80	24,000

Other Important concepts under Materials

1. Valuation of Work-in-Progress:

Unlike closing stock of finished goods, which is valued at cost or market price, whichever is lower, work-in-progress is always valued on the basis of cost. The problem arises whether overheads should be included in the costs of work-in-progress.

There are three ways of valuing work-in-progress.

(a) At Prime Cost :

This is a conservative method of valuation. Overheads are not added to prime cost for valuing work-in-progress. As a result of the exclusion of overheads, the cost of the subsequent period is understated and the cost of production for the current period is inflated to that extent.

(b) Prime Cost plus Variable Overheads:

Under Marginal Costing method, work-in-progress is valued at prime cost plus variable overheads. Fixed overheads are excluded on the basis that these are period costs and should be recovered from revenue, i.e., sales, only.

(c) At Total Cost :

The valuation is done at full costs inclusive of both variable and fixed overheads. The logic behind this method is that work-in-progress should carry the proportionate cost of the overheads and cost of production of completed items should not be burdened. This method is most commonly used.

2. Abnormal and Normal Wastage of Materials

Wastage may be classified as normal or abnormal according to the circumstances.

Normal wastage denotes that part of the wastage which is generally bound to arise in a manufacturing processing on account of evaporation, shrinkage of basic raw materials or on account of typical manufacturing process being involved. Usually such wastage remains within certain normal ratio or percentage of the input.

On the other hand, abnormal wastage is that loss which does not arise in the ordinary course of manufacturing process but is the result of certain adverse circumstances such as power failure, major breakdown of machinery non-availability of the basic raw materials, etc. It is generally not possible to estimate the extent of such wastage before as they are much more than the normal ratio/percentage of loss compared to the input of basic materials.

Since the normal wastage of the materials is an unavoidable and uncontrollable issue, it should be recovered through good production. The cost of such normal wastages will be recovered as production overhead and apportioned on the number of units produced. Necessary allowance should however be made for any amount which the wastage should realize when it is disposed of. On the contrary, the cost of abnormal wastage should be separately collected and charged off to the Costing Profit and Loss Account so as not to vitiate the Production Cost of good units produced.

3. Material Requisition Note:

Material Requisition is a document issued by a department in charge requesting the Storekeeper to issue certain materials to a job or standing order number. It is an important document as it authorises issue of materials from stores and thereby should be authenticated by appropriate authority. It forms the basis of crediting the Marginal Account in the stores ledger as the materials are taken out on the strength of such documents. The corresponding debit to work-in-progress account or Job Account for standing order number is also made on the basis of such documents. This document enables the Accounts Department to value the issue of the materials to find out the cost of materials issued. The storekeeper uses this department to check total item wise issues made by him during a certain period by adding up the details of issue from this document.

4. Material Transfer Note:

Material Transfer Note is a document used for transferring the material from one department to other department or one site to other site or one job to other job. The need for Material Transfer Note arises under the following conditions:

- Great urgency for such materials as normal procedure for requisitioning the materials may result in delay in completion of the job.
- Where two jobs are being executed side by side or very near to each other and stores department is situated at a great distance, adoption of normal procedure for requisitioning the materials may mean

unnecessary expenditure in handling and transportation, especially in cases of heavy materials (e.g. iron rails).

- (c) Frequent shifting of materials (for returning to stores and for re-issue) may result in wastage or breakage.
- (d) If the goods are of perishable nature (e.g. Vegetable or Fruits) and refrigeration may not keep them fresh for a long time.

Procedure to be followed to transfer the material is as follows:

- (a) Transferring supervisor will prepare a Material Transfer Note giving all the details of the materials transferred and will send this note to the supervisor of the job to which materials being transferred.
- (b) Transferee supervisor will sign the note in token of receipt of the materials and send it back to the transferring supervisor.
- (c) This note will then be send to Cost Office where necessary entries will be passed and respective job accounts debited and credited.

5. Bill of Material:

Bill of Material is a complete schedule of parts and materials required for a particular order prepared by the Drawing Office and issued by it together with necessary blue prints of drawings. For standard products, printed copies of Bill of Material are kept with blank spaces for any special details of modification to be filled in for a particular job/order. The schedule details everything, even to bolts and nuts, sizes and weights. The document solves a number of useful purposes, such as:

- (a) It provides a quantitative estimate of budget of material required for a given job, process or operation which might be used for control purposes.
- (b) It substitutes material requisitions and expedite issue of materials.
- (c) The store-keeper can draw up a programme of material purchases and issue for a given period.
- (d) It provides the basis for charging material cost to the respective job/process.

6. Waste:

Definition : This is the residue such a smoke, dust, gases, slag, etc., which arises in course of manufacturing process and practically no measurable sale or utility value. In certain types of processes and operations, some material physically disappears on account of shrinkage, evaporation etc., with the result that the quantity of the output is less than the input. Such wastage is termed invisible waste where the residual instead of fetching any value, creates a problem for its dispose which entails further costs. Special arrangements have to be made for disposal and refuse, effluent, obnoxious gases, etc.

Accounting: As waste has practically no value, its accounting is relatively simple. The effect of the waste is to reduce the quantity of output; In order to arrive at the unit cost of the process, operation, or job, the total cost of the process, etc., is distributed over the reduced output, i.e., the units of good production only. The cost of abnormal waste, should, however, be excluded from the total cost and charged to the Profit and Loss Account. The actual waste is observed against standards and periodically reported to the management.

7. Scrap:

This is also in the form of incidental material residue coming out of certain types of manufacturing processes but it is usually in small amounts and has low measurable utility or market value, recoverable without further processing. Numerous examples of scrap may be given; scrap may arise in the form of turnings, borings, trimmings, fillings, shavings etc., from metals on which machine operations are carried out; saw dust and trimmings in the timber industry; dead heads and bottom ends in foundries; and cuttings, pieces, and split in leather industries. Scrap should always be physically available unlike waste which may or may not be present in the form of a residue.

Accounting treatment of scrap is as follows:

(a) Sales Credited to Revenue:

In this method, the scrap is not cost and its value does not, therefore, appear separately in the Cost Accounts. Only a quantitative record of the scrap returned to storeroom from the shops is maintained and the sale value realised from time to time is credited to the Profit and Loss Account as miscellaneous revenue.

(b) Credit to Overhead:

In this method and in the following method the scrap is assigned a cost. The cost is usually the sale value of the scrap less selling and distribution costs. If the scrap has no ready market but has only utility or use value, and is

taken as a credit to manufacturing overhead. The effect of this credit is to reduce the overhead recovery rate. When predetermined overhead rates are in use, it is more expedient to credit an estimated allowance for the scrap instead of the amount of actual scrap.

(c) Credit to Jobs:

The scrap is assigned a cost and is traced to the job which yielded the scrap. This affords a reasonable amount of credit to the jobs and widely different.

(d) Transfer to Other Jobs:

Scrap arising in one job may be issued for utilization in another job. Such transfers of scrap from one job to another should be affected through Material Transfer Notes. Alternatively, scrap may be returned to store room and subsequently issued to another job for utilization. The latter method is more appropriate when some further processing is required on the scrap before it can be utilized for other jobs.

Control of Scrap:

Scrap is also an unavoidable residue material arising in the process of manufacture. The basic difference between scrap and waste is that while waste may not have any value, scrap must necessarily have a value, though a comparatively small one. Scrap may be sold or re-used in some process. In some industries, arising of scraps of various types in significant quantities is a regular feature and in such cases, it would be worth while having a proper administrative set-up for control of scrap. A Scrap Survey Committee may be constituted which would be responsible for such matters as (1) classifying the various types of scrap; (2) Assessing the quantum of each; and (3) Deciding upon the manner of their use or disposal.

Control of scrap should start from the designing stage of the products. At the designing stage, the type, shape and form of materials which all result in the minimum of waste or the least quantity of scrap in manufacturing process are decided. The quantity of scrap resulting from a process also depends upon the manufacturing equipment used and the efficiency of the operative who performs the work. In order to minimise scrap, production should be planned so that the best possible equipment is used and properly trained personnel are employed on the job.

8. Spoilage :

Definition:

When production does not come up to the standard specifications or quality it has to be rejected outright. The components or materials are so damaged in the manufacturing process that they cannot be brought back to the normal specifications by repairs or reconditioning. Some spoiled work may be sold as seconds but in most cases, the entire production is sold for small value in the form of scrap or treated as waste if it has no market value. Spoilage involves not only loss of materials but also of labour and manufacturing overhead incurred up to the stage when the spoilage incurred.

Accounting and Control of Spoilage:

Spoilage arises when the production output is damaged in such a manner and to such an extent that it cannot be used for the original purpose for which it was designed but is to be disposed off in some suitable manner without further processing. The distinction between scrap and spoiled work is that while normal scrap arises mostly as a result of the processing of materials, spoilage occurs due to some defect in operations or materials which may or may not be inherent in the manufacturing process or operation. Further, scrap has always a relatively low but some definite value, but the value of spoilage may range from low, if it is a waste, to comparatively high values if the spoilage is to be sold as seconds.

Spoilage involves not only the loss of material but also labour and manufacturing overheads.

9. Treatment of Packing Cost:

Packing materials is of two types - primary and secondary. Primary containers are essential to put the goods in a saleable condition like ink in a bottle, jam in a jar, etc. Secondary containers are required for delivery/ transportation like crates, etc., they are returnable and reusable.

The cost of primary containers should be charged off as a production overhead and included in production cost. On the other hand, the cost of secondary containers should charge as a selling and distribution overhead. The cost of reusable container should be charged when they could not be used any more due to damage, wear and tear, etc.

In some cases, the primary packing materials may be made decorative with a view to promote sales, and in such a case a part of the primary packing materials should be apportioned as a selling cost.

10. Carriage and Cartage Expenses:

Carriage and Cartage Expenses are incurred in the course of movement of materials or goods. Materials may mean direct materials or indirect materials. The treatment of the Carriage and Cartage Expenses differ with the kind of materials/goods transported. The carriage and cartage expenses relating to raw materials are treated as a part of direct materials cost and those relating to distribution of materials or finished goods are treated as distribution overhead. In case where the carriage and cartage are abnormal due to any reason the same is charged off to be costing Profit and Loss Account.

11. Treatment of Tools Cost:

Tools may be classified as (i) large tools and (ii) small tools, large tools are normally capitalised and depreciation charged to Factory Overheads. For small tools the following treatment may apply:

- (a) Capitalization Method: In line with large tools.
- (b) Revaluation Method: At the end of the year revaluation for unused life of the tools is made and the difference between original cost and revalued cost is charged as factory overheads.
- (c) Write-off-Method: Whenever such small tools are issued the department is debited with the cost. Alternatively cost of tools issued during a period is accumulated and distributed to various departments on some suitable basis, e.g., hours worked.

12. Treatment of Discount Allowed by Suppliers for Bulk Purchases:

Discounts Allowed on purchases are of two types, viz., Cash Discount and Quantity and Trade Discount. Cash Discount is usually allowed for prompt payment and the Quantity and Trade Discount for heavy purchases. The amount of the latter discount is already credited in the invoice and the net landed cost of the material exclusive of the discount is considered as the material cost.

13. Treatment of Variance Detected at Stock Taking:

If the variances are due to normal causes, i.e., due to normal dry age, shrinkage, evaporation, etc., these are valued at the ruling ledger rates of the items of material concerned and the amount is taken as an item of stores overhead and recovered from production as a percentage of direct material cost consumed. If the variances are due to abnormal causes, viz., theft, fraud, misappropriation etc., these are valued by writing off to Costing Profit and Loss Account.

Illustration 7

Prepare a Stores Ledger Account from the following information adopting FIFO method of pricing of issues of materials.

2016 March	1.	Opening Balance 500 tonnes @ ₹200
	3.	Issue 70 tonnes
	4.	Issue 100 tonnes
	5.	Issue 80 tonnes
	13.	Received from suppliers 200 tonnes @ ₹190
	14.	Returned from Department A 15 tonnes.
	16.	Issued 180 tonnes
	20.	Received from supplier 240 tonnes @ ₹195
	24.	Issue 300 tonnes
	25.	Received from supplier 320 tonnes @ ₹200
	26.	Issue 115 tonnes
	27.	Returned from Department B 35 tonnes
	28.	Received from supplier 100 tonnes @ ₹200

Solution:

Stores Ledger Account [FIFO Method]

Date	Receipts			Issue			Balance		
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹
2016 March 1	--	--	--	--	--	--	500	200	1,00,000
March 3	--	--	--	70	200	14,000	430	200	86,000
March 4	--	--	--	100	200	20,000	330	200	66,000
March 5	--	--	--	80	200	16,000	250	200	50,000
March 13	200	190	38,000	--	--	--	250	200	50,000
							200	190	38,000
March 14	15	200	3,000	--	--	--	250	200	50,000
							200	190	38,000
							15	200	3,000
March 16	--	--	--	180	200	36,000	70	200	14,000
							200	190	38,000
							15	200	3,000
March 20	240	195	46,800	--	--	--	70	200	14,000
							200	190	38,000
							15	200	3,000
							240	195	46,800
March 24	--	--	--	70	200	14,000	--	--	--
				200	190	38,000	--	--	--
				15	200	3,000	--	--	--
				15	195	2,925	225	195	43,875
March 25	320	200	64,000	--	--	--	225	195	43,875
							320	200	64,000
March 26	--	--	--	115	195	22,425	110	195	21,450
							320	200	64,000
March 27	35	195	6,825	--	--	--	110	195	21,450
							320	200	64,000
							35	195	6,825
March 28	100	200	20,000	--	--	--	110	195	21,450
							320	200	64,000
							35	195	6,825
							100	200	20,000

Illustration 8

From this information provided as under, you are required to prepare a statement showing how the issues would be priced if LIFO method is followed.

- 2016 Feb:
1. Opening Balance 100 units at ₹10 each.
 2. Received 200 units at ₹10.50 each.
 3. Received 300 units at ₹10.60 each.
 4. Issued 400 units to Job A vide M.R.No.015.
 6. Issued 120 to Job B vide M.R.No.020.
 7. Received 400 units at ₹11 each.

8. Issued 200 units to Job B vide M.R.No.031
12. Received 300 units at ₹11.40 each.
13. Received 200 units at ₹11.50 each.
17. Issued 400 units to Job D vide M.R.No.040.

Solution:

Stores Ledger Account [LIFO Method]

Date	Receipts			Issue			Balance		
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹
2016 Feb 1	--	--	--	--	--	--	100	10.00	1,000
Feb 2	200	10.50	2,100	--	--	--	100	10.00	1,000
							200	10.50	2,100
Feb 3	300	10.60	3,180	--	--	--	100	10.00	1,000
							200	10.50	2,100
							300	10.60	3,180
Feb 4	--	--	--	300	10.6	3,180	100	10.00	1,000
				100	10.50	1,050	100	10.5	1,050
Feb 6	--	--	--	100	10.50	1050	--	--	--
				20	10.00	200	80	10.00	800
Feb 7	400	11.00	4,400	--	--	--	80	10.00	800
							400	11.00	4,400
Feb 8	--	--	--	200	11.00	2200	80	10.00	800
							200	11.00	2,200
Feb 12	300	11.40	3,420	--	--	--	80	10.00	800
							200	11.00	2,200
							300	11.40	3,420
Feb 13	200	11.50	2,300	--	--	--	80	10.00	800
							200	11.00	2,200
							300	11.40	3,420
							200	11.50	2,300
Feb 17	--	--	--	200	11.50	2300	80	10.00	800
				200	11.40	2280	200	11.00	2,200
							100	11.40	1,140

Illustration 9

Prepare Stores Ledger Account showing pricing of material issues on Replacement Price basis from the following particulars.

Opening balance 400 units at ₹4 each

10-3-2016 Received 100 units at ₹4.10 each

15-3-2016 Issued 300 units to Job XY vide M.R.No.14 17-3-2016 Received 200 units at ₹4.30 each

20-3-2016 Issued 250 units to Job AB vide M.R.No.20

25-3-2016 Received 400 units @ ₹4.50 each

26-3-2016 Issued 200 units to Job JK vide M.R.No.27 27-3-2016 Received 100 units @ ₹4.60 each.

30-3-2016 Issued 300 units to Job PQ vide M.R.No.32.

Replacement Price on various dates :
 15-3-2016 ₹4.20
 20-3-2016 ₹4.40
 26-3-2016 ₹4.60 &
 30-3-2016 ₹4.80.

Solution:

Stores Ledger Account [Replacement Price Basis]

Date	Receipts			Issue			Balance		
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹
2016 Mar 1	--	--	--	--	--	--	400	4.00	1,600
10-3-2016	100	4.10	410	--	--	--	500	4.02	2,010
15-3-2016	--	--	--	300	4.20	1260	200	3.75	750
17-3-2016	200	4.30	860	--	--	--	400	4.03	1,610
20-3-2016	--	--	--	250	4.40	1,100	150	3.40	510
25-3-2016	400	4.50	1,800	--	--	--	550	4.20	2,310
26-3-2016	--	--	--	200	4.60	920	350	3.97	1,390
27-3-2016	100	4.60	460	--	--	--	450	4.11	1,850
30-3-2016	--	--	--	300	4.80	1,440	150	2.7310	410

Illustration 10

Stocks are issued at a standard price and the following transactions occurred for a specific material:

1st January	Opening Stock	10	tonnes at ₹240 per ton
4th January	Purchased	5	tonnes at ₹260 per ton
5th January	Issued	3	tons
12th January	Issued	4	tons
13th January	Purchased	3	tons at ₹250 per ton
19th January	Issued	4	tons
26th January	Issued	3	tons
30th January	Purchased	4	tons at ₹280 per ton
31st January	Issued	3	tons.

The debit balance of price variation on 1st January was ₹20. Show the stock account for the material for the month of January, indicating how you would deal with the difference in material price variance, when preparing the Profit and Loss Account for the month.

Solution:

$$\text{Standard Price} = \frac{(240 \times 10) + 20}{10} = ₹ 242$$

Stores Ledger Account

Date	Receipts			Issue			Balance	
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Price ₹
1st January	--	--	--	--	--	--	10	2,400
4th January	5	260	1,300	--	--	--	15	3,700
5th January	--	--	--	3	242	726	12	2,974
12th January	--	--	--	4	242	968	8	2,006
13th January	3	250	750	--	--	--	11	2,756
19th January	--	--	--	4	242	968	7	1,788
26th January	--	--	--	3	242	726	4	1,062
30th January	4	280	1,120	--	--	--	8	2,182
31st January	--	--	--	3	242	726	5	1,456

Material price variance is ₹ 246 which is to be transferred to debit of costing P & L A/c.

Working :

$$\begin{aligned}
 \text{Stock at standard price} &= 5 \times 242 &= 1,210 \\
 \text{Material Price Variance} &= 1,210 - 1,456 &= 246 \text{ (A)}
 \end{aligned}$$

Illustration 11

Receipts and issues of an item of stores are made as follows: There was no balance before 9th January.

	Receipts		Issues	
	Quantity	Price (₹)	Quantity	
January 9th	10	17.0		
19th	25	10.0		
20th			10	
29th			20	
30th	15	8.0		
February 13th	20	12.0		
27th	10	16.9		
28th			40	
March 30th	20	20.0		
31st			20	

- What is the simple average of February receipts ?
- What are the moving monthly simple average price for January -February and February-March?
- If a weighted average is used for pricing issues how does the value of the balance in stock change during January?
- If a weighted average price is calculated at the end of each month and is then used for pricing the issued of that month, what will be the value of the month-end balance?

Solution:

(i) Simple Average Price of February Receipts.

Simple Average Price of February Receipts = $(12 + 16.9) / 2 = ₹ 14.45$

(ii) Simple Average Price of January Receipts

Simple Average Price of January Receipts = $(17 + 10 + 8) / 3 = ₹ 11.67$

Moving monthly average for Jan-Feb = $(11.67 + 14.45) / 2 = ₹ 13.06$

Moving monthly average for Feb-March = $(14.45 + 20) / 2 = ₹ 17.225$

(iii) Stores Ledger Account (under weighted average method for January)

Date	Receipts			Issue			Balance	
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Value ₹
Jan 9th	10	17	170	--	--	--	10	170
Jan 19th	25	10	250	--	--	--	35	420
Jan 20th	--	--	--	10	12	120	25	300
Jan 29th	--	--	--	20	12	240	5	60
Jan 30th	15	8	120	--	--	--	20	180

(iv) Calculation of the Value of month-end balance

Date	Quantity	Value
Jan 9th	10	170
Jan 19th	25	250
Jan 30th	15	120
	50	540
(-) Issues	30 (10.8)	324
Jan-Balance	20	216
Feb 13th	20	240
Feb 27th	10	169
Feb Balance	50	625
(-) Issues	40 (12.5)	500
	10	125
March 30th	20	400
	30	525
(-) Issues	20 (17.5)	350
Balance	10	175

Illustration 12

Two components A and B are used as follows:

Normal usage = 50 per week each

Re-order quantity = A- 300; B-500

Maximum usage = 75 per week each

Minimum usage = 25 per week each

Re-order period: A - 4 to 6 weeks; B - 2 to 4 weeks

Calculate for each component

(a) Re-order level; (b) Minimum level; (c) Maximum level; (d) Average stock level.

Solution:

	Particulars	A	B
a)	Reorder Level [Max. Consumption × Max. Re-order Period]	450 units (75 × 6)	300 units (75 × 4)
b)	Minimum Level [ROL – (Normal Consumption × Normal Re-order period)]	200 units [450 – (50 × 5)]	150 units [300 – (50 × 3)]
c)	Maximum Level [ROL + ROQ – (Min. Consumption × Min Re-order period)]	650 units [450 + 300 – (25 × 4)]	750 units [300 + 500 – (25 × 2)]
d)	Average Stock Level [Min. Level + Max. Level] / 2 or [Min. Level + $\frac{1}{2}$ × ROQ]	425 units [200 + 650] / 2 (or) or 350 units 200 + $\frac{1}{2}$ (300)	450 units [150 + 750] / 2 (or) or 400 units 150 + $\frac{1}{2}$ (500)

Illustration 13

Anil company buys its annual requirement of 36,000 units in six installments. Each unit costs ₹1 and the ordering cost is ₹25. The inventory carrying cost is estimated at 20% of unit value. Find the total annual cost of the existing inventory policy. How much money can be saved by using E.O.Q?

Solution:

$$\begin{aligned}
 \text{EOQ} &= \sqrt{\frac{2 \cdot \text{A.O} \cdot \text{C}}{\text{C}}} \\
 &= \sqrt{\frac{2 \times 36,000 \text{ (units)} \times ₹ 25}{₹ 1 \times 20\%}} \\
 &= \sqrt{\frac{18,00,000}{0.2}} \\
 &= 3,000 \text{ units}
 \end{aligned}$$

Statement Showing computation of comparative inventory cost of existing policy and proposed EOQ policy:

	Particulars	Existing Policy		EOQ	
(i)	Purchase Cost	(36000 × 1)	36000	(36000 × 1)	36000
(ii)	Ordering Cost	[36000/6000 × 25]	150	[36000/3000 × 25]	300
(iii)	Carrying Cost	[1/2 × 6000 × 1 × 20%]	600	[1/2 × 3000 × 1 × 20%]	300
			36,750		36,600

Saving by using EOQ = 36,750 – 36,600 = ₹ 150

Illustration 14

The annual demand for an item is 3,200 units. The units cost is ₹6 and inventory carrying charges is 25% p.a. If the cost of one procurement is ₹150, determine:

- (a) E.O.Q (b) No. of orders per year (c) Time between two consecutive orders.

Solution:

$$\begin{aligned}
 \text{(a) } EOQ &= \sqrt{\frac{2 \cdot A \cdot O}{C}} \\
 &= \sqrt{\frac{2 \times 3,200 \text{ (units)} \times ₹ 150}{₹ 6 \times 25\%}} \\
 &= \sqrt{\frac{9,60,000}{1.5}} \\
 &= 800 \text{ units}
 \end{aligned}$$

$$\text{(b) No. of orders per year} = A / EOQ = 3200 / 800 = 4 \text{ orders (A = Annual demand)}$$

$$\begin{aligned}
 \text{(c) Time between two consecutive orders} &= \text{No. of months in years} / \text{No. of orders} \\
 &= 12/4 = 3 \text{ Months}
 \end{aligned}$$

Illustration 15

A company manufactures a special product which requires a component 'Alpha'. The following particulars are collected for the year 2015.

1.	Annual demand of Alpha	8,000 units
2.	Cost of placing an order	₹ 200 per order
3.	Cost per unit of Alpha	₹ 400
4.	Carrying cost % p.a.	20%

The company has been offered a quantity discount of 4% on the purchase of 'Alpha' provided the order size is 4,000 components at a time.

Required:

- Compute the economic order quantity.
- Advise whether the quantity discount offer can be accepted.

Solution:
(a) Calculation of Economic Order Quantity

$$\begin{aligned}
 EOQ &= \sqrt{\frac{2AO}{C}} \\
 EOQ &= \sqrt{\frac{2 \times 8,000 \text{ (units)} \times ₹ 200}{₹ 400 \times 20\%}} \\
 &= 200 \text{ units}
 \end{aligned}$$

(b) Evaluation of Profitability of Different Options of Order Quantity

- When EOQ is ordered

Purchase Cost	(8,000 units x ₹ 400)	32,00,000
Ordering Cost	[(8,000 units / 200 units) x ₹ 200]	8,000
Carrying Cost	(200 units x ₹ 400 x ½ x 20/100)	8,000
Total Cost		32,16,000

(ii) When quantity discount is accepted

Purchase Cost	(8,000 units x ₹ 384)	30,72,000
Ordering Cost	[(8,000 units / 4000 units) x ₹ 200]	400
Carrying Cost	(4000 units x ₹ 384 x ½ x 20/100)	1,53,600
Total Cost		32,26,000

Advise:

The total cost of inventory is lower if EOQ is adopted. Hence, the company is advised not to accept the quantity discount.

Illustration 16

From the following particulars with respect to a particular item of materials of a manufacturing company, calculate the best quantity to order:

Ordering quantities (tonne)	Price per ton ₹
Less than 250	6.00
250 but less than 800	5.90
800 but less than 2,000	5.80
2,000 but less than 4,000	5.70
4,000 and above	5.60

The annual demand for the material is 4,000 tonnes. Stock holding costs are 20% of material cost p.a. The delivery cost per order is ₹6.00

Solution:

Statement showing computation of total inventory cost at different order sizes (Annual Demand = 4000 tonnes)

	Particulars	Ordering Quantities				
		200	250	800	2000	4000
(i)	Purchasing cost	24000 (4000×6)	23600 (4000×5.9)	23200 (4000×5.8)	22800 (4000×5.7)	22400 (4000×5.6)
(ii)	No. of orders	20	16	5	2	1
(iii)	Ordering Cost (₹ 6)	120	96	30	12	6
(iv)	Average size of order	100	125	400	1000	2000
(v)	Inventory Carrying cost per unit	1.2 (6×20%)	1.18 (5.9×20%)	1.16 (5.8×20%)	1.14 (5.7×20%)	1.12 (5.6×20%)
(vi)	Inventory carrying cost (iv x v)	120	147.5	464	1140	2240
(vii)	Total Inventory Cost (iii + i + vi)	24240	23843.5	23694	23952	24646

For the above computations the best quantity to order is 800 units.

Illustration 17

The particulars relating to 1,200 kgs. of a certain raw material purchased by a company during June, were as follows:-

Lot prices quoted by supplier and accepted by the Company for placing the purchase order :

Lot upto 1,000 kgs. @ ₹22 per kg.

Between 1,000 - 1,500 kgs, @ ₹20 per kg.

Between 1500 -2000 kgs. @ ₹18 per kg.

Trade discount – 20%.

Additional charge for containers @ ₹10 per drum of 25 kgs.

Credit allowed on return of containers, @ ₹8 per drum.

Sales tax at 10% on raw material and 5% on drums.

Total freight paid by the purchaser ₹240/-

Insurance at 2.5% (on net invoice value) paid by the purchaser.

Stores overhead applied at 5% on total purchase cost of material.

The entire quantity was received and issued to production.

The containers are returned in due course. Draw up a suitable statement to show :-

- Total cost of material purchased and
- Unit cost of material issued to production.

Solution:

Statement showing computation of total cost of material purchased and unit cost of material issued for production.

Particulars	Unit Cost ₹	Total Cost ₹ (1,200 kgs)
Basic price of material	20.00	24,000.00
(-) Trade discount (20%)	4.00	4,800.00
	16.00	19,200.00
(+) Drum charges (1,200/25 x 10)	0.40	480.00
(+) Sales tax 19,200 x 10% = 1920 480 x 5% = 24 = 1944	1.62	1,944.00
Net Invoice Value	18.02	21,624.00
(+) Insurance (21,624 x 2.5%)	0.4505	540.60
(+) Freight paid	0.2000	240.00
	18.6705	22,404.60
(-) Credit for drums returned (1,200 / 25 x 8)	0.3200	384.00
Total Cost of Material Purchased	18.3505	22,020.60
(+) Stores overhead (22,020.6 x 5%)	0.9200	1,101.03
Material cost issued to production	19.2705	23,121.63

Illustration 18

From the following data for the year ended 31st Dec, 2016, calculate the inventory turnover ratio of the two items, and put forward your comments on them.

	Material A ₹	Material B ₹
Opening stock on 1-1-2016	10,000	9,000

Purchase during the year 2016	52,000	27,000
Closing on 31-12-2016	6,000	11,000

Solution:

$$\text{Material Inventory Turnover Ratio} = \frac{\text{Cost of Material used}}{\text{Average Stock}}$$

$$\text{For A} = \frac{10,000 + 52,000 - 6,000}{(10,000 + 6,000)/2}$$

$$= 7 \text{ times}$$

$$\text{For B} = \frac{9,000 + 27,000 - 11,000}{(9,000 + 11,000)/2}$$

$$= 25,000 / 10,000$$

$$= 2.5 \text{ times}$$

Material Inventory turnover ratio indicates the efficiency of the management with which they are able to utilize their inventory. It indicates the existence or non-existence of non moving items, dormant items, slow moving items etc. in inventory. If the ratio is high, the efficiency is said to be high and on the other hand if the ratio is low, the efficiency is said to be low.

In view of above, in the instant case, we may say that Material A used better than Material B.

Illustration 19

From the details given below, calculate:

- (i) Re-ordering level
- (ii) Maximum level
- (iii) Minimum level
- (iv) Danger level

Re-ordering quantity is to be calculated on the basis of following information:

- (a) Cost of placing a purchase order is ₹ 20
- (b) Number of units to be purchased during the year is 5,000
- (c) Purchase price per unit inclusive of transportation cost is ₹ 50
- (d) Annual cost of storage per units is ₹ 5
- (e) Details of lead time: Average 10 days, Maximum 15 days, Minimum 6 days.
For emergency purchases 4 days
- (f) Rate of consumption: Average: 15 units per day,
Maximum: 20 units per day

Solution:

$$\text{EOQ} = \sqrt{\frac{2 \times 5,000 \text{ (units)} \times ₹ 20}{₹ 5}}$$

$$= 200 \text{ units}$$

$$\text{Min. Rate of Consumption} = (15 \times 2) - 20$$

$$= 10 \text{ units per day}$$

(i) Re-order Level (ROL)	= Maximum usage per period x Maximum Re-order Period = 20 units per day x 15 days = 300 units
(ii) Maximum level	= ROL + ROQ – (Min. Rate of Consumption x Min. Re-order Period) = 300 units + 200 units – (10 units per day x 6 days) = 440 units
(iii) Minimum level	= ROL – (Average Rate of Consumption x Average Re-order Period) = 300 units – (15 units per day x 10 days) = 150 units
(iv) Danger level	= Average Consumption x Lead time for Emergency Purchases = 15 units per day x 4 days = 60 units

Illustration 20

M/s Tubes Ltd. are the manufacturers of picture tubes for T.V. The following are the details of their operation during the year 2015:

Average monthly market demand	2,000 Tubes
Ordering Cost	₹100 per order
Inventory carrying cost	20% per annum
Cost of tubes	₹ 500 per tube
Normal usage	100 tubes per week
Minimum usage	50 tubes per week
Maximum usage	200 tubes per week
Lead time to supply	6 – 8 weeks

Compute from the above:

- Economic order quantity. If the supplier is willing to supply quarterly 1,500 units at a discount of 5% is it worth accepting?
- Re-order level
- Minimum level of stock
- Maximum level of stock

Solution:

A = Annual usage of tubes = Normal usage per week x 52 weeks
= 100 tubes x 52 weeks = 5,200 tubes

O = Ordering cost per order = ₹ 100 per order

C = Inventory carrying cost per unit per annum
= 20% x ₹ 500 = ₹ 100 per unit, per annum

Economic Order Quantity:

$$\text{E.O.Q} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 5,200 \text{ units} \times ₹100}{₹100}} = 102 \text{ tubes (approx.)}$$

If the supplier is willing to supply 1,500 units at a discount of 5% is it worth accepting?

Total cost (when order size is 1,500 units) = Cost of 5,200 units + Ordering cost + Carrying cost.

$$5,200 \text{ units} \times ₹ 475 + \left(\frac{5,200 \text{ units}}{1,500 \text{ units}} \times ₹ 100 \right) + (1,500 \text{ units} \times 20\% \times ₹ 475) \div 2$$

$$= ₹ 24,70,000 + ₹ 346.67 + ₹ 71,250$$

$$= ₹ 25,41,596.67$$

Total cost (when order size is 102 units)

$$= 5,200 \text{ units} \times ₹ 500 + \left(\frac{5,200 \text{ units}}{102 \text{ units}} \times ₹ 100 \right) + (102 \text{ units} \times 20\% \times ₹ 500) \div 2$$

$$= ₹ 26,00,000 + ₹ 5,098.03 + ₹ 5,100$$

$$= ₹ 26,10,198.03$$

Since the total cost under quarterly supply of 1,500 units with 5% discount is lower than that when order size is 102 units, the offer should be accepted. While accepting this offer capital blocked on order size of 1,500 unit per quarter has been ignored.

Re-order Level:

$$= \text{Maximum Consumption} \times \text{Maximum Re-order Period}$$

$$= 200 \text{ units} \times 8 \text{ weeks} = 1,600 \text{ units.}$$

Minimum level of Stock:

$$= \text{Re-order Level} - \text{Normal Usage} \times \text{Average Re-order Period}$$

$$= 1,600 \text{ units} - 100 \text{ units} \times 7 \text{ weeks} = 900 \text{ units.}$$

Maximum level of Stock:

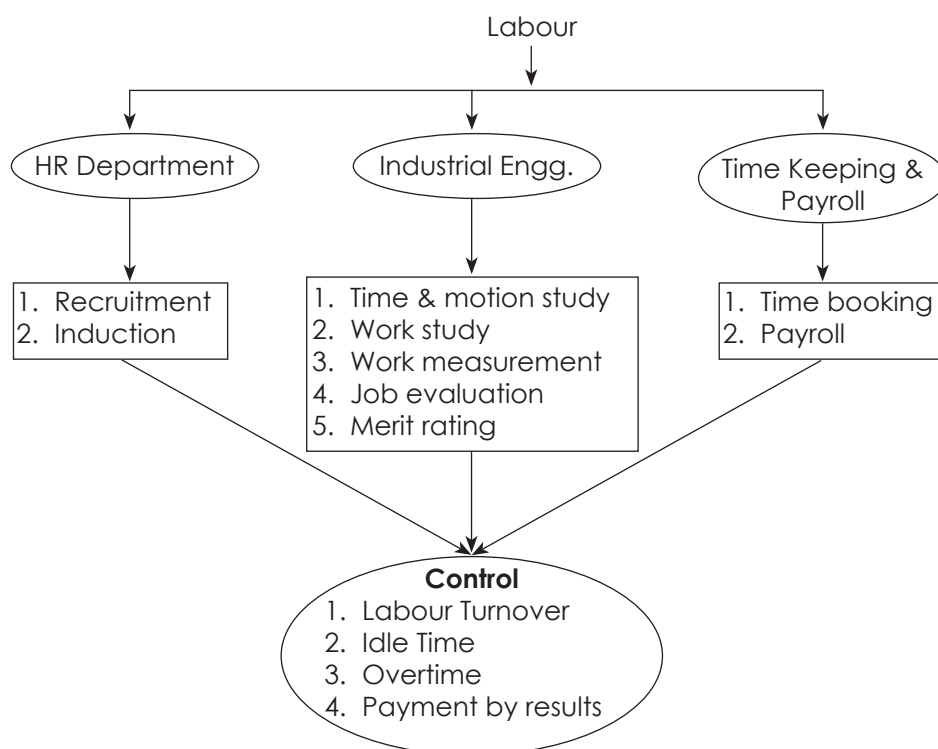
$$= \text{Re-order Level} + \text{Re-order Quantity} - \text{Min. Usage} \times \text{Min.-Re-order Period}$$

$$= 1,600 \text{ units} + 102 \text{ units} - 50 \text{ units} \times 6 \text{ weeks}$$

$$= 1,402 \text{ units.}$$

EMPLOYEE COSTS (CAS - 7)

Labour is an important element of cost and for overall cost control and cost reduction, Labour Cost is of paramount importance. Labour Cost is also called as Employee Cost. However, for control and reduction of Labour Cost, it is essential to compute the Labour Cost in a scientific manner and hence there should be proper systems and processes and documentation, which will help computation of Labour Cost in a scientific manner. It should be remembered that Labour is not like material as there is a human aspect involved in it. Therefore, there should be a comprehensive study of all related aspects of Labour Cost and then only computation and control over the same will be possible. Attention should also be paid to the productivity aspect. Low productivity results in higher Labour Cost per unit while higher productivity will reduce the Labour Cost per unit. All these aspects of Labour Cost are discussed in detail in this chapter. Study of Labour or Employee Cost can better be explained as follows:



As per CAS-7, (limited Revision - 2017) Employee cost is the benefits paid or payable in all forms of consideration given for the service rendered by employee (including temporary, part time and contract employee) of an entity.

Various aspects of Labour Cost Control

In the modern competitive environment, it is essential to make efforts for controlling and reducing the Labour Cost. Systematic efforts are required in order to achieve this target. The following steps will be useful in controlling and reducing the Labour Cost.

A. Classification of Labour cost:

The first step in the direction of controlling and reducing the Labour Cost is proper classification of the same. The Labour Cost is classified into Direct Cost and Indirect Cost. Direct Labour Cost is the cost that can be identified with a product unit. It can also be described as cost of all Labour incurred for altering the construction, composition or condition of the product. Indirect Labour Cost is the cost, which cannot be identified with a product unit. It represents the amount of wages which is paid to the workers who are not directly engaged on the production but it includes wages paid to the workers and assistants working in departments like purchasing, store keeping, time office, maintenance, and other service and production departments. In other words, indirect wages are the wages paid to the workers who facilitate the production rather than actually engaged in production. The Direct Labour Cost can be charged directly to the job or product units and is included in the prime cost. Indirect Labour Cost is included in the overhead cost. Direct Labour Cost is variable in nature and can be controlled by strictly adhering to the norms and standards set by the management. Indirect Labour Cost can be controlled by establishing Labour budgets and comparing the actual Indirect Labour Cost with the budgeted Labour Cost. Any difference between the two is analysed carefully and suitable corrective action is taken.

B. Production Planning:

Effective control over the Labour Cost Can be achieved through proper production planning. Production planning includes activities like planning, scheduling, routing, machine loading, product and process engineering, work study etc. With the help of work study, time and motion study can be conducted which will help in fixation of standard time for a particular job. A comparison between the standard time and actual time is constantly made to find out the difference between the two. Suitable corrective action can be taken if it is noted that the actual time taken is constantly more than the standard time allowed for the job.

C. Labour Budget:

Budget and budgetary control are effective tools for cost control and cost reduction. A Labour budget can be prepared which will set the target for the Labour Cost which will again facilitate comparison between the

Budgeted Labour Cost and the Actual Labour Cost.

D. Labour Standards:

Standards can be set for Labour Cost against which the Actual Labour Cost can be compared. Standard Labour Cost is the cost, which should have been incurred for producing a particular quantity of production. While fixing the Standard Labour Cost, use of time and motion study is made to fix up the standard time that should be taken for the actual production.

E. Labour Performance Report:

There should be a system of periodic Labour efficiency and utilisation reports. These reports will give an idea about the efficiency and productivity of the Labour.

F. Incentive Schemes:

Improving the Labour productivity is one of the important ways to reduce the Labour Cost per unit. Productivity can be improved by motivating the workers. Offering monetary and non monetary incentives can help to improve the productivity substantially. However, there should be a periodic review of the incentive schemes and therefore incentive schemes report should be prepared at periodic intervals.

G. Labour Cost Accounting:

There should be a proper cost accounting system, which will identify the Direct and Indirect Labour Cost. Similarly the cost accounting department should be able to generate and maintain records for time keeping, time booking, idle and overtime, impact of incentive schemes, per unit of Labour, cost due to Labour Turnover and other relevant records.

Thus from the above mentioned points, it will be clear that there is a need to control the Labour Cost and it can be done by the combined efforts of various departments.

Principles of measurement of Employee (CAS-7) (Limited Revision 2017):

The guide lines for ascertaining the Labour Cost / Employee Cost are as follows:-

- (a) Employee Cost shall be ascertained taking into account the gross pay including all allowances payable along with the cost to the employer of all the benefits.
- (b) Bonus whether payable as a statutory minimum or on a sharing of surplus shall be treated as part of Employee Cost. Ex-gratia payable in lieu of or in addition to bonus shall also be treated as part of the Employee Cost.
- (c) Remuneration payable to managerial personnel including executive directors on board and other officers of a corporate body under a statute will be considered as part of the Employee Cost of the year under reference, whether the whole or part of the remuneration is considered as a percentage of profits.
Explanation: Remuneration paid to non executive directors shall not form part of employee cost but shall form part of administrative overhead.
- (d) Separation costs related to voluntary retirement, retrenchment, termination...etc shall be amortized over the period of benefitting from such costs.
- (e) Employee Cost shall not be included any Imputed Costs.
- (f) Any subsidy, grant, incentive or any such received or receivable with respect to any employee cost shall be reduced from ascertainment of Cost of the cost project to which such amounts are related.
- (g) Any abnormal cost where it is material and quantifiable shall not form part of the Employee Cost.
- (h) Penalties, damages paid to statutory authorities or other third parties shall not form part of the Employee Cost.
- (i) The cost of free housing, free conveyance and any other similar benefits provided to an employee shall be determined at the total cost of all resources consumed in providing such benefits.
- (j) Any recovery from employees towards the facilities provided shall be reduced from the Employee Cost.
- (k) Cost of idle time is ascertained by the idle hours multiplied by the hourly rate applicable to idle employee or a group of employee.
- (l) Where Employee Cost is accounted at standard cost, variances due to normal reasons related to employee cost shall be treated as part of Employee Cost. Variances due to abnormal reasons shall be treated as part of abnormal cost.
- (m) Any change in the cost accounting principles applied for the determination of the Employee Cost should

be made only if it is required by law or for compliance with Cost Accounting Standard or change would result in a more appropriate way of presentation of Cost Statement.

Labour Turnover

Labour Turnover of an organisation is change in the labour force during a specified period measured against a suitable index. The rate of Labour Turnover in an industry depends upon several factors such as, nature of the industry, its size, location and composition of the labour force. A controlled level of Labour Turnover is considered desirable because it helps the firm to adjust the size of its labour force in response to needs such as for seasonal changes or changes in technology.

Causes of Labour Turnovers:

The causes giving rise to high labour turnover may be broadly classified under the following the heads:

(i) **Personnel Causes:** Workers may leave employment purely on personal grounds, e.g.,

- (a) Dislike for the job, locality or environments.
- (b) Domestic troubles and family responsibilities.
- (c) Change of line for betterment.
- (d) Retirement due to old age and ill health.
- (e) Death.

In all such cases, personal factors count the most and employer can practically do nothing to help the situation.

(ii) **Unavoidable Causes :** In certain circumstances it becomes obligatory on the part of the management to ask some of the workers to leave. These circumstances are:

- (a) Retrenchment due to seasonal trade, shortage of any material and other resources, slack market for the product, etc.
- (b) Discharge on disciplinary grounds.
- (c) Discharge due to continued or long absence.

(iii) **Avoidable Causes:** Under this head, may be grouped the causes which need the attention of the management most so that the turnover may be kept low by taking remedial measures. The main reasons for which workers leave are:

- (a) Unsuitability of job.
- (b) Low pay and allowance.
- (c) Unsatisfactory working conditions.
- (d) Unhappy relations with co-workers and unsatisfactory behaviour of superiors.
- (e) Dispute between rival trade unions.
- (f) Lack of transport, accommodation, medical and other factors.
- (g) Lack of amenities like recreational centres, schools, etc.

The above causes may also be classified in a different manner under three heads, viz., Financial Causes, Social and Economic Causes and Psychological Causes relating to human relationship.

Measurement of Labour Turnover:

It is essential for any organisation to measure the Labour Turnover. This is necessary for having an idea about the turnover in the organisation and also to compare the Labour Turnover of the previous period with the current one. The following methods are available for measurement of the Labour Turnover:-

(a) **Additions Method:** Under this method, number of employees added during a particular period is taken into consideration for computing the Labour Turnover. The method of computing is as follows.

$$\text{Labour Turnover} = (\text{Number of additions} / \text{Average number of workers during the period}) \times 100$$

(b) **Separation Method:** In this method, instead of taking the number of employees added, number of employees left during the period is taken into consideration. The method of computation is as follows.

Labour Turnover = Number of separations/Average number of workers during the period) × 100

- (c) **Replacement Method:** In this method neither the additions nor the separations are taken into consideration. The number of employees replaced is taken into consideration for computing the Labour turnover.

Labour Turnover = (Number of replacements/Average number of workers during the period) × 100

- (d) **Flux Method:** Under this method Labour Turnover is computed by taking into consideration the additions as well as separations. The turnover can also be computed by taking replacements and separations also. Computation is done as per the following methods.

Labour Turnover = $\frac{1}{2}$ [Number of additions + Number of separations] / Average number of workers during the period × 100

Labour Turnover = $\frac{1}{2}$ [Number of replacements + Number of separations] / Average number of workers during the period × 100

Cost of Labour Turnover

Increasing Labour Turnover is a double edged malady. It reduces the productivity of labour and resulting in high costs. The cost of Labour Turnover may be analyzed under two broad headings, Preventive Cost and Replacement Costs. Preventive Costs refer to all those items of expenditure which are incurred in order to keep the workers satisfied and thus to act as discouragement against leaving employment. Replacement Costs are those costs which are incurred for the recruitment and training of new hands and the resulting losses, wastages and lowering of productivity due to the inexperience and inefficiency of the new labour force.

Preventive Costs may be further grouped under the following heads:

1. Personnel administration

Most concerns would have a Personnel Department which is entrusted with recruitment, training, and other problems arising out of the employment of the labour force. Obviously, the entire expenditure of the department cannot be treated as labour turnover costs but a portion of the costs which related to the efforts of the Personnel Manager in maintaining good relationship between the management and the staff should be treated as Preventive Labour Turnover Cost. The labour force remains satisfied if properly looked after and if grievances are sympathetically considered.

2. Medical Service (Preventive and Curative)

Care for own health and that of family members gets prior consideration with the workers who prefer those concerns where medical services are available. Further, a healthy worker is an asset of the firm as he is able to make substantial contribution towards higher efficiency and productivity.

3. Welfare activities and Schemes:

These include facilities like subsidised canteens, co-operative store, laundry and washing services, sports, housing schemes, transport, and educational facilities. These facilities are as good as higher wages offering incentive to the worker to stay with the firm.

4. Miscellaneous Schemes such as Pension or Provident Fund Schemes, Bonus, High Wage and Other Incentive Schemes

Greater the advantage these prerequisites offer, the lower will be the rate of Labour Turnover.

Replacement Costs consist of the following:

1. Loss of output due to delay in obtaining new workers

As suitable workers may not be available readily, there is a time gap before a new worker can replace the old one. During this period, some output may be maintained by retaining surplus labour force to meet such contingencies or by working overtime. All such extra cost should be taken as labour turnover cost.

2. Employment Department Expenses

With the increase in the tempo of recruitment, additional work is thrown on the Employment or Personnel Department. Administrative expenditure is incurred for the selection, test and medical examination of the new hands for writing initial document like service records, fund accounts, etc.

3. Induction Training for new workers

Unless skilled workers are recruited (more likely on higher rates of pay) who can be at right way put on jobs, the average worker has to be given some induction training before he is fit to be put on his assigned work. For certain categories of skilled and highly skilled jobs, intensive training for some period may be essential.

4. Inefficiency of new workers

The efficiency of new hands be generally low, productivity is reduced and cost increases.

5. Cost of tool and machine breakage:

While on training and the initial stages of work after completion of training, the worker is likely to break tools more frequently on account of his inexperience.

6. Cost of Scrap and Defective Work:

A new worker is likely to spoil work and although in most cases responsibility can be fixed on him and no wages paid for the scrapped work, the expenditure incurred on material and wages for the earlier operations done on the job becomes waste.

7. Cost of Accidents:

On account of his inexperience, the new worker is apt to disregard safety rules and he is thus more prone to accidents. It may be noted that the increases in labour costs due to high Labour Turnover contribute to create an inflationary trend in the industry.

Measures to reduce Labour Turnover:

Labour Turnover may be reduced by removing its avoidable causes and taking preventive remedial measures. The various measures may be summarised as follows:

- (i) Efficient, sympathetic and impartial personal administration.
- (ii) Effective communication system to keep the workers informed on matters that affect them.
- (iii) Improving working conditions and placing the right man on the right jobs.
- (iv) Job enrichment to reduce boredom and monotony and to provide job satisfaction.
- (v) Introducing fair rates of pay and allowance and incentives, pensions, gratuity, etc.
- (vi) Strengthening welfare measures.
- (vii) Augmenting recreational activities and schemes.

Illustration 1

During October 2015, the following information is obtained from the Personnel Department of a manufacturing company. Labour force at the beginning of the month 1900 and at the end of the month 2100. During the month, 25 people left while 40 persons were discharged. 280 workers were engaged out of which only 30 were appointed in the vacancy created by the number of workers separated and the rest on account of expansion scheme. Calculate the Labour Turnover by different methods.

Solution:

Computation of Labour Turnover

Additions Method:

Number of Additions/Number of average workers during the period = $280 / 2000 \times 100 = 14\%$

Separation Method:

Number of Separations/Number of average workers during the period = $(25+40)/2000 \times 100 = 3.25\%$

Replacement Method:

Number of Replacements / Number of average workers during the period = $30/2000 \times 100 = 1.5\%$

Flux Method:

$\frac{1}{2} [\text{Number of Additions} + \text{Number of Separations}] / \text{Number of average workers during the period} = [\frac{1}{2}(280 + 65) / 2000] \times 100 = 173/2000 \times 100 = 8.63\%$

Note: Average number of workers in all the above methods is computed by taking Opening number of workers + Closing number of workers / 2 = $1900 + 2100/2 = 2000$

Illustration 2

The management of XYZ Ltd. is worried about the increasing Labour Turnover in the factory and before analyzing the causes and taking remedial steps; they want to have an idea of the profit foregone as a result of Labour Turnover during the last year. Last year's sales amounted to ₹83, 03,300 and the profit/volume ratio was 20%. The total number of actual hours worked by the direct Labour force was 4.45 lakhs. As a result of the delays by the Personnel department in filling vacancies due to Labour Turnover, 1,00,000 potentially productive hours were lost. The Actual Direct Labour hours included 30, 000 hours attributable to training new recruits, out of which, half of the hours were unproductive. The cost incurred consequent on Labour turnover revealed, on analysis the following. Settlement cost due to leaving: ₹43, 820 & Recruitment costs: ₹26,740. Selection costs: ₹12,750, & Training costs: ₹30,490

Assuming that the potential production lost as a consequence of Labour Turnover could have been sold at prevailing prices, find the profit foregone last year on account of Labour Turnover.

Solution:

We will have to calculate the profit foregone by calculating the amount of contribution lost and the additional cost that was incurred as a result of the Labour Turnover. This is done in the following manner.

- I. Actual productive hours: Actual hours worked – Unproductive training hours

$$= 4,45,000 - 15,000 \text{ [50\% of 30, 000]}$$

$$= 4,30,000 \text{ actual productive hours.}$$

- II. Total hours lost: 1,00,000 hrs

$$\text{Sales lost } [₹83,03,300 \times 1,00,000] / 4,30,000 = ₹19,31,000$$

$$\text{Loss of contribution} - 20\% \text{ of } ₹19,31,000 = ₹3,86,200$$

Statement Showing Profit Foregone

	₹
Contribution lost:	3,86,200
Settlement cost due to leaving:	43,820
Recruitment cost:	26,740
Selection cost:	12,750
Training cost:	<u>30,490</u>
Profit foregone:	<u>5,00,000</u>

Overtime Wages / Overtime Premium

The Factories Act provides for payment of overtime wages at double usual rates of wages. Even where the Act is not applicable, the practice is to pay for overtime work at higher rates usually in accordance with a standing agreement between the employer and the workers. Hence, payment of overtime consists of two elements, viz., the normal (i.e., usual) amount and the extra payment, i.e., the premium. As per CAS-7, the overtime. Overtime premium is defined as 'Overtime is the time spent beyond the normal working hours which is usually paid at a higher rate than the normal time rate. The extra amount payable beyond the normal wages & salaries for beyond the normal working hours is called Overtime Premium'.

Treatment of Overtime in Cost Records

As per CAS-7 (Limited Revision 2017), Overtime Premium shall be assigned directly to the cost object or treated as overheads depending on the economic feasibility and specific circumstances requiring such overtime.

When overtime is worked due to exigencies or urgencies of the work, the basic / normal payment is treated as Direct Labour Cost and charged to Production or cost unit on which the worker is employed. Whereas the amount of premium (extra amount) is treated as overhead.

If overtime is spent at the request of the customer, then the entire amount (including overtime premium) is treated as direct wages and should be charged to the job.

When the overtime is worked due to lack of capacity as general policy of the company, then the total amount paid is treated as direct wages which is computed at the estimated rate based on the figures of the previous years.

Overtime worked on account of the abnormal conditions such as flood, earthquake, etc., should not be charged to cost, but to costing Profit and Loss Account if integrated accounts are maintained.

It will thus be seen that overtime involves payment of increased wages and should be resorted to only when extremely essential. The disadvantages attached to overtime working are as follows :

- (a) It involves excess labour cost.
- (b) There is decrease in productivity. Output is usually proportionate to the excess time worked as efficiency during late hours is diminished.
- (c) Work in the evenings increases lighting cost.
- (d) Continuous work for long periods leads to fatigue and defective work.
- (e) It falls upon the health of the workers.
- (f) Overtime work if not properly distributed among the workers may lead to discontentment.
- (g) There is an unusual strain on plant and machinery.
- (h) Once overtime is resorted to for some time, the workers take the overtime wages as part of their normal earnings and resist future attempts to discontinue overtime work.
- (i) There is a tendency to keep the work pending to be done during overtime period or to intentionally slow down in order to compel the management to sanction overtime.

It may, however, be said in favour of overtime work that it increases the productive capacity of the concern as more work is done with the existing resources. Overtime work is particularly useful in pulling up backlog in production arising due to shutdown, breakdown, power failure and such other contingencies.

Though overtime work cannot be completely eliminated, it is essential that proper control should be exercised to keep it to the minimum. The following steps should be taken to control the Overtime:

- (a) All overtime work should be duly authorised after investigating the necessity thereof.
- (b) Overtime cost should be recorded separately and shown against the department incurring it. This will enable proper investigation and planning of production in future.
- (c) If overtime tends to be a permanent feature, the necessity of recruiting more men and shifting working should be considered.
- (d) If overtime is due to lack of plant or machinery or other resources, steps may be taken to install more machines, or to give subcontracts alternatively, to restrict production so as to complete it within the normal time.

Idle Time

Idle Time Cost represents the wages paid for the time lost during which the worker does not work, i.e time for which wages are paid, but no work is done. As per CAS-7 (Limited Revision 2017), Idle Time is 'The difference between the time for which the employees are paid/payable to employees and the employees time booked against the cost object'. This happens because due to various causes for which he is not responsible, the worker remains idle but full wages are paid to him. Even for workers who are paid on the basis of output, idle time payment may be required to be made.

The causes leading to idle time may be broadly classified into four categories, viz. :-

- (i) *Normal, inherent or unavoidable idle time:* Time lost between the gate and place of work, break for tea, time interval between one job and another, time for tool setting, adjustment of machine, etc.
- (ii) *Normal idle time* such as waits for jobs, tools, materials or instructions, small power failures, small breakdown of machines and tools, and atmospheric conditions.
- (iii) *Abnormal idle time* such as those arising due to breakdown for considerable period, non-availability of raw materials, slack supervision, strikes or lock-outs, fire flood, storm, etc.
- (iv) *Concealed idle time* such as manipulation of job breaking, wastage of time due to under-employment, i.e., unnecessary work like cleaning, grass cutting and gardening to employ idle men, and employment of skilled workers on unskilled jobs.

Idle time should not be booked directly to jobs or production orders because such a practice not only increases the cost of direct labour, but also vitiates comparison of idle time costs from time to time. In booking of time, idle

or waiting time should not normally record in the job card but on separate idle time cards. Separate cards or registers may be provided for recording idle time according to the causes which give rise to it.

Treatment of Idle Time

As per CAS-7 (Limited Revision 2017), Idle Time Cost shall be assigned direct to the cost object or treated as overheads depending on the economic feasibility and specific circumstances causing such idle time.

Treatment of different categories of Idle Time are as below:-

- (a) Unavoidable idle time above would be for insignificant periods. In Cost Accounts, this is allowed to remain merged in the Production Order or Standing Order Number on which the worker was otherwise employed.
- (b) Normal Idle Time is booked to factory or works overhead. For the purpose of effective control, each type of idle time, i.e., idle time classified according to the causes is allocated to a separate Standing Order Number.
- (c) Abnormal Idle Time would usually be heavy in amount involves longer periods and would mostly be beyond the control of the management. Payment for such idle time is not included in cost and is adjusted through the Costing Profit and Loss Account or included in Profit and Loss Account, when the accounts are integrated.
- (d) Tendency to conceal Idle Time should be discouraged. It is a non-effective time and the resultant loss of profit due to reduced production activity but also increases the cost per unit of production as the fixed costs continue to be incurred, irrespective of the reduced quantum of production due to loss of labour time. Idle Time should, therefore, be highlighted prominently so that action can be taken to remove the causes thereof. Although for obvious reasons, it is not possible to record minor details, vigilance is necessary for finding out long-term idleness among the workers.

Idle Time Preventive Measures

Idle Time may be eliminated or reduced to a large extent by taking suitable preventive measures such as (a) proper planning of production in advance, thus reducing imbalances in production facilities, (b) timely provisioning of materials, (c) regular maintenance of machines so as to avoid breakdown, and (d) careful watch over the labour utilization statement. The remedial measure to be taken will, no doubt, depend upon the particular factor or situation which caused the Idle Time.

General principles in designing the system of remuneration to Employee

Remuneration is the reward for labour under normal circumstances and is generally based on either time spent or on the result produced. The former is called "time-related" remuneration and the latter is known as "Piece-related" remuneration. The fixation of method of remuneration in a proper manner is vitally important for any organisation because it deals with the most sensitive item of the input, i.e., Labour.

The general principles which should be considered in designing a proper method of labour remuneration is summarized below:-

- (a) The basis should be simple to understand and the various segments of the system, should clearly mention in detail.
- (b) The employees should be able to accept the method without any doubts or hesitation in their mind.
- (c) The method should be flexible enough to adopt any changes or variation which may become inevitable at a later stage.
- (d) The method should be able to cut down/stabilize the labour turnover which is often causes due to unsatisfactory or unacceptable method of remuneration.
- (e) The method should assure fair wages to the employees so that both the employers and the employees can gain by such methods, the former by way of higher productivity and the latter by way of higher earnings.
- (f) Incentive payments should be a part of the method of remuneration with a view to increase the labour productivity.
- (g) The method should be able to minimise the level of absentees so that avoidable wastages in labour cost can be reduced.
- (h) The method should ultimately result into higher production and improved quality of the output.

Methods of Wage Payment

One of the important components of Labour Cost Control is the wages system. A system of wage payment, which takes care of both, i.e. providing guarantee of minimum wages as well as offering incentive to efficient workers helps to motivate the workers to a great extent. It should also be remembered that high wages do not necessarily mean high labour cost because it may be observed that due to high wages the productivity of workers is also high and hence the per unit cost of production is actually decreased. On the other hand, if low wages are paid, it may result in lower productivity and hence higher wages do not necessarily mean high cost.

The following are the various methods of payment of wages.

A. Time Rate System

- (a) At ordinary levels.
- (b) At high wage levels and
- (c) Graduated Time Rate.

B. Piece Rate

- (a) Straight Piece Rate.
- (b) Piece Rate with Guaranteed Day Rates and
- (c) Differential Piece Rates.

C. Bonus Systems

- (a) Individual Bonus for Direct Workers.
- (b) Group Bonus for Direct Workers and
- (c) Bonus for Indirect Workers.

D. Indirect Monetary Incentives

- (a) Profit Sharing and
- (b) Co-partnerships.

E. Non monetary incentives like job security, social and general welfare, sports, medical facilities etc.

These methods are discussed in the following paragraphs:-

i. Time Rate Method

Time Rate at Ordinary Levels

Under this method, rate of payment of wages per hour is fixed and payment is made accordingly on the basis of time worked irrespective of the output produced. However, overtime is paid as per the statutory provisions. The main benefit of this method for the workers is that they get guarantee of minimum income irrespective of the output produced by them. If a worker is not able to work due to genuine reasons like illness or physical disability, he will continue to get the wages on the basis of time taken for a particular job. This method is used in the following situation:-

- (a) Where the work requires high skill and quality is more important than the quantity.
- (b) Where the output/services is not quantifiable, i.e. where the output/services cannot be measured.
- (c) Where the work done by one person is dependent upon other person, in other words where a individual worker has no control over the work.
- (d) Where the speed of production is governed by time in process or speed of a machine.
- (e) Where the workers are learners or inexperienced.
- (f) Where continuous supervision is not possible.

The main advantage of this method is that the worker is assured of minimum income irrespective of the output produced. He can focus on quality as there is no monetary incentive for producing more output. However, the

main limitation of this method is that it does not offer any incentive to the efficient workers. Efficient and inefficient workers are paid at the same rate of wages and hence there is a possibility that even an efficient worker may become inefficient due to lack of incentive.

Time Rate at High Wage Levels

This system is a variation of time rate at ordinary levels in the sense that in this system, workers are paid at time rate but the rate is much higher than that is normally paid in the industry or area. In this method, the workers are paid according to the time taken and overtime is not normally allowed. This method offers a very strong incentive to workers and it can attract talented workers in the industry. However, care should be taken that productivity also increases; otherwise the cost will go on increasing.

Graduated Time Rate

Under this method payment is made at time rate, which varies according to personal qualities of the workers. The rate also changes with the official cost of living index.

Thus this method is suitable for both employer and employees.

ii. Piece Rate Method

This method is also called as payment by results where the workers are paid as per the production achieved by them. Thus if a worker produces higher output, he can earn higher wages.

Under the piece rate system of wage payment the workers receive a flat rate of wages either for time worked or for units manufactured.

The **advantages** of such a system are summarised below:-

- (a) As the workers are paid on the basis of the results, i.e., for each unit produced, job performed or number of operations completed, there is a tendency on their part to increase their production so that they may earn more wages.
- (b) The increased production thus achieved results in the reduction of overhead expenses per unit of production even though total overheads may increase. The increase in overheads will be relatively small as compared to the increase in turnover.
- (c) The wages being paid on the basis of production, the management know the labour cost per unit or per job.
- (d) The workers are rewarded for their efficiency because the inefficient workers will not get as much as the efficient workers.
- (e) The workers are very careful in handling their tools and machinery, etc., because on the proper maintenance of these depends their higher efficiency and in turn, their higher wages.
- (f) This method is very simple to operate.

The **Disadvantages** on the other hand are as follows:-

- (a) It is not easy to determine the piece work rate on an equitable basis. When a rate has been fixed and later on it is found to be too high, it is very difficult to reduce it as its reduction will cause dissatisfaction and friction among the workers.
- (b) As the labour cost per unit remains the same, the employees do not gain as a result of increase in productivity except to some extent in the form of reduction in overheads. As such if the overhead expenses per unit are relatively small, the advantage to the employer will not be significant.
- (c) Sometimes quantity may increase at the cost of quality. For the reason, a strict inspection has to be maintained in the form of quality control. This will result into additional expenditure.
- (d) Materials may be used in excessive quantities and may be handled carelessly on account of the workers' efforts to achieve high output.
- (e) This method may cause discontentment amongst those who are slow and those who are paid on time basis.
- (f) The workers may in an attempt to increase production, handle the machines carelessly causing major damage or breakdown.

The following are the variations of this method.

iii. Straight Piece Rate

In this method, rate per unit is fixed and the worker is paid according to this rate. For example, if the rate per unit is fixed at ₹10, and the output produced is 300 units, the remuneration to the worker will be ₹10 X 300 units = ₹3,000. This method thus offers a very strong incentive to the workers and is particularly suitable where the work is repetitive. The benefits of this method are as follows:-

- (a) The method is simple and provides a very strong incentive to the workers by linking the monetary reward directly to the results.
- (b) Productivity can be increased substantially if the rate of pay includes a really adequate incentive.
- (c) Higher productivity will result in lowering the cost per unit.

However, the main limitation of this method is that if a worker is not able to work efficiently due to reasons beyond his control, he will be penalized in the form of lower wages.

iv. Differential Piece Rates

Under these methods, the rate per standard hour of production is increased as the output level rises. The increase in rates may be proportionate to the increase in output or proportionately more or less than that as may be decided. In other words, a worker is paid higher wages for higher productivity as an incentive. The rate per unit will be higher in this case as compared to the rate paid to a worker with lower productivity. For deciding the efficiency, comparison is made between the standard production and actual production of the worker. If the actual production is more, the worker qualifies for higher rate of wages. The Differential Piece Rate methods will be useful when the production is of repetitive type, methods of production are standardized and the output can be identified with individual workers. The following are the major systems of differential piece rate system:-

- (i) Taylor (ii) Merrick (iii) Gantt Task and Bonus

v. Taylor's Differential Piece Rate System

Taylor is regarded as father of scientific management and he has recommended a system of Differential Piece Rate. According to him, there are only two classes of workers, efficient and inefficient. He suggests that while efficient workers should be encouraged to the maximum possible extent, the inefficient workers should be penalized. In order to do this, he has suggested two rates for the two classes of workers. Thus according to Taylor, if the workers are efficient, they should be paid @ 120% of the normal piece rate and if they are inefficient, they should be paid @ 80% of the normal piece rate. For measuring efficiency, each worker will be given a standard production quantity to be produced in the time allowed and the actual production should be compared with the same. If a worker exceeds the standard, he will be regarded as efficient while if he fails to do so, he will be regarded as inefficient. The positive and negative points of this system are as follows:-

Merits:-

- (a) There is a very strong incentive to the workers, which helps to achieve higher productivity.
- (b) Due to the incentive, best workers are attracted to the company.
- (c) This method is quite simple and hence easy to understand.

Limitations:

- (a) Slow workers and beginners are penalized severely. Similarly workers get penalized for reasons beyond their control, e.g. medical reasons, accidents etc. Therefore it is said that there is no human element in this system.
- (b) In an anxiety to produce more, quality may be neglected in order to achieve higher quantity of production.

Illustration 3

From the following particulars, calculate the earnings of workers X and Y and also comment on the labour cost.

Standard time allowed: 20 units per hour

Normal time rate: ₹30 per hour

Differential Rate to be applied:

80% of piece rate when below standard

120% of piece rate at or above standard

In a particular day of 8 hours, X produces 140 units while Y produces 165 units.

Solution:

Standard production per day is 20 units × 8 hours = 160 units

Worker 'X' produces 140 units which means he is below standard and will get wages @ 80% of the normal piece rate.

X's earnings:

Normal piece rate = ₹30 per hour/20 units = ₹1.5 per unit

80% of the normal piece rate = ₹1.20 per unit

Earnings = ₹1.20 × 140 units = ₹168

Labour cost per unit = ₹168/140 units = ₹1.20

Y's Earnings:

Y has produced more than the standard production of 160 units and hence he will get wages @ 120% of normal piece rate. His earnings will be as shown below.

Normal piece rate = ₹30 per hour/20 units = ₹1.50 per unit

120% of normal piece rate = ₹1.80 per unit

Earnings = ₹1.80 × 165 units = ₹297

Labour cost per unit = ₹297/165 units = ₹1.80

Comment: Labour cost increases from ₹1.20 per unit to ₹1.80 per unit. Taylor's system is resisted on this ground as well as on the ground that it is very harsh on the workers.

vi. Merrick Differential Piece Rate System

Merrick's system is modification of Taylor's system and is comparatively less harsh on the workers. The scale of remunerations is as follows:-

Production Rates of Payment

Up to 83% of production - Normal piece rate

83% to 100% of production - 110% of ordinary piece rate

Above 100% of production - 120% of ordinary piece rate

As mentioned earlier, this method is less harsh on the workers as compared to Taylor's system. It is particularly useful to beginners and also offers an incentive who have potential of higher productivity.

vii. Gantt Task Bonus Plan

In this method, there is a combination of time rate, bonus and piece rate plan. The remuneration is computed as shown below:

Production below standard - Guaranteed time rate

Production at standard - Bonus of 20% [normally] of time rate

Production above standard - High piece rate for the entire output

This method assures minimum wages for even too less efficient workers and hence is a preferred method of payment of wages. It also offers reasonably good incentive to efficient workers. However, the main limitation is that the method is complicated to understand by the workers and hence may create confusion amongst them.

Illustration 4

X, Y and Z are three workers working in a manufacturing company and their output during a particular 40 hours week was 96, 111 and 126 units respectively. The guaranteed rate per hour is ₹10 per hour, low piece rate is ₹4 per unit, and high piece rate is ₹6 per unit. High task is 100 units per week. Compute the total earnings and labour cost per unit under Taylor, Merrick and Gantt Task Bonus Plan.

Solution:

(a) Taylor Plan:

High task is 100 units

Worker X = Actual output is 96 units, which is less than the standard. This means he is inefficient and will get 80% of the normal piece rate i.e. @ ₹4.80 per unit. His wages will be = ₹4.80 × 96 units = ₹460.80.

Worker Y = Actual output is 111 units which is more than the standard. This means he is efficient and will get 120% of the normal piece rate i.e. ₹7.20 per unit. His wages will be = ₹7.20 × 111 units = ₹799.20

Worker Z = Actual output is 126 units, more than the standard. This means his wages will be = ₹7.20 × 126 units = ₹907.20.

(b) Merrick Plan:

Worker X = High task is 100 units, actual output is 96, this means that the efficiency level is 96%. As per Merrick Plan, wages of X will be 110% of normal piece rate which is ₹6.60 per unit = ₹6.60 × 96 units = ₹633.6

Worker Y = High task is 100 units, actual output is 111 units, efficiency level is 111%. Y will be entitled for wages @ 120% of normal piece rate i.e. @ ₹7.20 per unit. His wages will be, ₹7.20 × 111 units = ₹799.2

Worker Z = High task is 100 units, actual output is 126 units, efficiency level is 126%. Z will get at higher piece rate @ ₹7.20 per unit. His wages will be ₹7.20 × 126 units = ₹907.2

(c) Gantt Task and Bonus Plan:

Worker X = ₹10 × 40 hours = ₹400 [X will get guaranteed time rate as his output is below the high task]

Worker Y = ₹6 × 111 units = ₹666 [High piece rate as output is above standard]

Worker Z = ₹6 × 126 units = ₹756 [High piece rate as output is above standard]

viii. Individual Bonus Plans:

We have seen earlier that in the time rate system, the workers are paid according to the time taken while in case of piece rate system, the output produced by the worker decides his wages as rate per unit is fixed rather than rate per hour. In the premium bonus plan, the gain arising out of increased productivity is shared by both, the employer and employee.

The bonus to be paid to the workers is computed on the basis of savings in the hours, i.e. the difference between the time allowed and time taken. The time allowed is the standard time, which is fixed by conducting a time and motion study by the work-study engineers. While fixing the standard time, due allowance is given for physical and mental fatigue as well as for normal idle time. The actual time taken is compared with this standard time and bonus is payable to the worker if the time taken is less than the standard time.

The individual bonus schemes commonly used are as follows.

- (a) Halsey Premium Plan
- (b) Halsey-Weir Premium Plan
- (c) Rowan Plan
- (d) Barth Variable Sharing Plan

These methods are discussed below:-

(a) Halsey Premium Plan

This plan was introduced by F.A. Halsey, an American engineer. In this plan, bonus is paid on the basis of time saved. Standard time is fixed for a job and if the actual time taken is less than the same, the worker becomes eligible for bonus. However bonus is paid equal to wages of 50% of the time saved. A worker is assured of time wages if he takes longer time than the allowed time. The formula for computing the total wages is as follows.

$$\text{Total Earnings} = H \times R + 50\% [S - H] R$$

Where, H = Hours worked, R = Rate per hour, S = Standard time

Illustration 5

Time allowed for a job is 48 hours; a worker takes 40 hours to complete the job. Time rate per hour is ₹15. Compute the total earnings of the worker.

Solution:

$$\text{Total Earnings} = H \times R + 50\% [S - H] R$$

$$\text{Total Earnings} = 40 \times ₹15 + 50\% [48 - 40] ₹15$$

$$\text{Total Earnings} = ₹600 + ₹60 = ₹660$$

(b) Halsey – Weir Plan

Under this method, there is only one difference as compared to the Halsey Plan and that is instead of 50% bonus for the time saved, it is $33\frac{1}{3}$ rd % of the time saved. Accordingly the formula for this method is modified as follows.

$$\text{Total Earnings} = H \times R + 33\frac{1}{3} [S-H]R$$

H = Hours worked. R = Rate per hour, S = Standard time

(c) Rowan Plan

This premium bonus plan was introduced by Mr. James Rowan. It is similar to that of Halsey Plan in respect of time saved, but bonus hours are calculated as the proportion of the time taken which the time saved bears to the time allowed and they are paid for at time rate. The formula for computation of total earnings is as follows:-

$$\text{Total Earnings} = H \times R + [S - H]/S \times H \times R$$

Where H = Hours worked, R = Rate per hour, S = Standard time,

(d) Barth Variable Sharing Plan:

In this system, the total earnings are calculated as follows:

$$\text{Total Earnings} = R \times \sqrt{S \times H}$$

H = Hours worked, R = Rate per hour, S = Standard time.

ix. Group Bonus Plan:

The plans described above are all individual bonus plans. Many times output of individuals cannot be measured. Similarly, the output of individual is dependent on the performance of the group. In such cases, rather than implementing individual bonus systems, group bonus system is implemented. The total amount of bonus, which is determined according to productivity, can then be shared equally or in agreed proportion between the group members. The main objects of group bonus system are as follows:-

- Creation of team spirit.
- Elimination of excessive waste of materials and time.
- Recognition of group efforts.
- Improving productivity.

Different Group Bonus Schemes in use are as follows:-

- Budgeted Expenses Bonus:** Under this system, bonus is based on the savings in actual total expenditure compared with the budgeted expenditure.
- Cost Efficiency Bonus:** In this method, standards are set for expenses like material, labour and overheads. The actual expenditure against these standards is measured and if there is a savings in actual expenditure as compared to the standards, a portion of such savings is distributed as bonus amongst the workers.
- Pristman System:** In this method, production standards are set in units or points and actual production is compared with the standards. If the actual production exceeds the standard, the workers are paid additional wages equal to the percentage of output over standard. Obviously no bonus is payable if actual production does not exceed the standard production. This method is mainly used in foundries.
- Towne Profit Sharing Plan:** In this method standards are set for costs [mainly labour cost] and the actual cost is compared with the standards. If there is a saving in the costs, the saving is shared by workers and supervisory staff in agreed proportion. The principle behind this method is that if there is a saving in the cost, not only the workers but the supervisory staff should also get the reward because the cost reduction is the joint efforts of both the types of staff. Hence both, workers and supervisors share it.
- Waste Reduction Bonus:** This system of bonus is based on savings in the material cost. If there is a saving in the material cost, the workers share the same in the agreed proportion. This system is generally used in industries where cost of material is very high.

- (vi) **Rucker Plan:** The amount of bonus is linked with 'value added' in this system. The 'value added' is obtained by deducting the cost of material and services from sales value. In other words, value added is the total of labour, overheads and profits. Under this plan, employees receive a constant proportion of value added. For example, if the target ratio of labour cost to value added is 70%, and the actual ratio comes to 68%, 2% of the actual value added is distributed as group bonus, so that the ratio of direct labour cost to value added is maintained at 70%. Normally instead of distributing the entire bonus, some proportion is distributed and the remaining is transferred to reserve fund.
- (vii) **Scanlon Plan:** This method is similar to the Rucker plan as discussed above except that the ratio of labour cost to the sales is taken instead of direct labour cost to added value. Normally bonus is paid based on average of last three years ratios. A part of the bonus may be transferred to bonus equalization fund for future use when the workers do not get bonus under this scheme.

Bonus System for Indirect Workers:

Indirect workers do not take part in the production process directly but they play important role in the production process. It is difficult to chalk out a bonus system for indirect workers, as there is a difficulty in measuring their output. However it is advisable to plan a bonus system for indirect workers in order to motivate them for better productivity. Bonus to indirect workers is paid on the basis of output of the department, saving in time or expenditure against the budgeted, product quality, reduction of waste and scrap and reduction of labour turnover.

Indirect Monetary Incentives:

These methods aim at giving additional remuneration based on the prosperity of the concern. The following schemes fall in this category:-

- (a) **Profit Sharing:** In this system, the profits of the organization are shared by workers in agreed proportion. The Payment of Bonus Act 1965 in India makes it mandatory to pay minimum bonus of 8.33% of salary and maximum bonus of 20% of salary to the workers.
- (b) **Co-partnership:** In this system, the workers get an opportunity to participate in the ownership of the organization and to receive the part of share of profits. The employees are given assistance to purchase shares of the company. Thus the employees get dividend and bonus also. These schemes help to boost the morale of workers to a great extent.

Non-Monetary Incentives

These incentives are given in addition to monetary incentives for further boosting the moral of the employees. Though these benefits do not result in additional remuneration, they help to improve productivity by boosting the morale of the employees.

Some of the non-monetary incentives are as follows:-

- (a) Free education and training.
- (b) Medical benefits.
- (c) Subsidized canteens.
- (d) Superannuation benefits like pensions, gratuity, life assurance schemes etc.
- (e) Sports and recreation facilities, housing facilities, long service awards.
- (f) Job security, promotion schemes.
- (g) Benevolent funds and welfare fund.

Treatment of some of the Employee Cost items in Costing:

(a) Supervisors salary / Foreman's Salary

The foreman is mainly concerned with the supervision of man and machines in the workshop and so his salary is 'works indirect expenses' and must be charged to Works Expenses Account and included in works overhead. It is apportioned on the basis of degree of supervision required on such machine or men.

If he devotes equal time for all the machines his salary should be equally charged off against all of them. In case he devoted more time to a particular machine or to a particular batch of workers, proportionately higher share of his salary should be borne by that particular machine or batch of workers.

(b) Bonus Under Payment of Bonus Act, 1965

The Payment of Bonus Act, 1965 provides that to the eligible employees a minimum bonus @ 8-1/3% of

gross annual earning will have to be paid irrespective of profits made or losses incurred. If there is adequate profit a higher bonus is paid but upto the maximum limit of 20% of gross earnings. Therefore it is clear that the minimum bonus is a definite charge against profit because even in case of loss this bonus is payable and according to the classification of labour-direct or indirect- should be included in direct labour cost or production overhead. The portion of bonus over and above the minimum is based on profit and should be charged off to Costing Profit and Loss Account and not taken into the cost at all. However, some accountants argued that this portion of bonus should also be taken into the cost in appropriate heads of Direct Labour or Production Overhead. But the former treatment should be taken as more sensible.

(c) Leave Travel Assistance

Leave Travel Assistance is paid to practically all the employees presently and therefore can be considered as a regular element of labour or staff cost as the case may be. This expenditure is of a fixed nature and can be easily predetermined. Depending whether the assistance is payable to direct labour, indirect labour or staff the expenditure should be treated as Direct Labour Cost, Production Overhead Cost or Administrative Selling Overhead Cost and should be appropriately charged.

(d) Night Shift Allowance

It is customary practice that the persons working in night shifts are paid some extra and such an allowance is known as night shift allowance. Such additional expenditure caused by general pressure of work in excess of normal capacity are charged to general production overhead because otherwise job performed during days will be cheaper than the jobs completed during night which by no means a fair proposition. If the additional expenditure is incurred extremely as a result of pressing demands from customers such expenditure should directly be charged to the job concerned. On the other hand if the night shifts are run for a fault of the particular department the night shift allowance should be charged as the departmental overhead applicable to the concerned department.

(e) Fringe Benefits

Fringe benefits are those expenses which are spent by an employer against the individual employees for their welfare. Normally such expenses do not form a part of their pay packet, e.g., ESI contribution made by an employer. Such expenses may be recovered separately as a percentage on labour cost or at an hourly rate. Alternatively, those may be treated as overheads and apportioned to cost centres on the basis of wages/salary cost.

(f) Work on Holidays and Weekly off Days

Usually work on such days is to be paid at a higher rate than the normal days' rate. The extra payment involved is treated in the same manner as in the cases of **overtime premium** as stated before (refer treatment of overtime). Normal wages are charged direct to the work orders/ job/process handled during the period.

(g) Attendance Bonus

This is paid to workers based on satisfactory attendance over a stated period and is a fringe benefit. The cost is to be collected under a standing order number and charged as a departmental overhead as the expenses cannot be allocated to cost units directly.

In case the cost is disproportionate from months to months, a proportionate amount may be charged in each period to avoid variation in cost.

When the cost is of a regular nature it may be booked as direct wages and charged by an inflated rate over the Direct Labour Cost. But this is however, not a sound policy.

(h) Employer's contribution to Employees' Provident Fund

This is an obligatory charge under the Employees Provident Fund Act of 1952 and the scheme framed there under. This should be treated as part of direct wages of workers. The direct wages paid should be inflated for the cost involved and the products of jobs charged at an inflated rate. An alternative treatment can be made as such that the contribution for the indirect workers is an item of overhead.

(i) Lost time due to a major overhauling of a machine as result of severe breakdowns

Manufacturing concerns having a number of machines in the factory usually follow a maintenance schedule whereby the entire factory is overhauled once a year. The related cost of such period consisting mainly of fixed cost is estimated and apportioned as a manufacturing/factory overhead over the annual production. But a sudden and severer breakdown may upset the production plan and call for major overhaul of machine. Such an occurrence is certainly abnormal and all costs related to the breakdown and overhaul should be collected through a separate standing order number and transferred to the costing Profit and Loss Account thereby into distorting the normal cost of production

Illustration 6

Calculate the total earnings and effective rate of earnings per hour of three operators under Rowan System and Halsey System from the following particulars.

The standard time fixed for producing 1 dozen articles is 50 hours. The rate of wages is ₹1/- per hour.

The actual time taken by three are as follows:-

A 45 hours

B 40 hours

C 30 hours.

Solution:

Computation of Total Earnings of workers under Halsey Plan

Earnings under Halsey Plan = Hours worked × Rate per hour + (50% × Time saved × Rate per hour)

Worker	Earnings	Effective Rate
A	$E = (45 \times 1) + 50/100 (50-45) \times 1$ = 47.5	Effective Rate = $47.5/45$ = 1.06
B	$E = (40 \times 1) + 50/100 (50-40) \times 1$ = 45	Effective Rate = $45/40$ = 1.125
C	$E = (30 \times 1) + 50/100 (50-30) \times 1$ = 40	Effective Rate = $40/30$ = 1.33

Computation of Total Earnings of workers under Rowan Plan

Earnings under Rowan Plan =

$$\text{Hours worked} \times \text{Rate per hour} + \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Hours worked} \times \text{Rate per hour} \right)$$

	Earnings	Effective Rate
A	$E = (45 \times 1) + [50-45 / 50] 45 \times 1$ = 45 + 4.5 = 49.5	Effective Rate = $49.5/45$ = 1.1
B	$E = (40 \times 1) + [50-40 / 50] 40 \times 1$ = 40 + 8 = 48	Effective Rate = $48/40$ = 1.2
C	$E = (30 \times 1) + [50-30 / 50] 30 \times 1$ = 30 + 12 = 42	Effective Rate = $42/30$ = 1.4

Illustration 7

A workman takes 9 hours to complete a job on daily wages and 6 hours on a scheme of payment by results. His hourly rate is 25 p. The Material cost of the product is ₹4 and factory overheads are recovered at 150% of the total direct wages. Calculate the factory cost of the product under following methods:-

(a) Time rate system (b) Halsey Plan (c) Rowan Plan.

Solution:

Computation of factory cost under three systems:

	Time Rate System ₹	Halsey Plan ₹	Rowan Plan ₹
Material	4.00	4.00	4.00
Labour (working notes)	2.25	1.88	2.00
Overheads (150% of total direct wages)	3.38	2.82	3.00
Factory Cost	9.63	8.70	9.00

Working Notes:

	Time Rate System ₹	Halsey Plan ₹	Rowan Plan ₹
Labour	9×0.25	$6 \times 0.25 + 1/2 (9-6) \times 0.25$	$6 \times 0.25 + (9-6 / 9) \times 6 \times 0.25$
	2.25	1.88	2.00

Illustration 8

A worker under the Halsey method of remuneration has a day rate of ₹12 per week of 48 hours, plus a cost of living bonus of 10 p. per hour worked. He is given 8 hours task to perform, which he performs in 6 hours, he is allowed 30% of the time saved as premium bonus. What would be his earnings under Halsey Plan and Rowan Plan.

Solution:**Computation of earnings of worker under Halsey Plan:**

$$\begin{aligned}
 \text{Earnings under Halsey Plan} &= \text{Hours worked} \times \text{Rate per hour} + (30\% \times \text{Time Saved} \times \text{Rate per hour}) \\
 &= (6 \times 0.25) + 30/100 (8-6) \times 0.25 &= 1.65 \\
 (+) \text{ Cost of Living Bonus } (6 \times 0.1) & &= 0.60 \\
 \text{Earnings under Halsey Plan} & &= \underline{\underline{₹2.25}}
 \end{aligned}$$

Computation of earnings of worker under Rowan Plan:

$$\text{Earnings under Rowan Plan} =$$

$$\begin{aligned}
 \text{Hours worked} \times \text{Rate per hour} + \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Hours worked} \times \text{Rate per hour} \right) \\
 &= (6 \times 0.25) + (8-6 / 8) \times 6 \times 0.25 &= 1.88 \\
 (+) \text{ Cost of Living Bonus } (6 \times 0.1) & &= 0.60 \\
 & &= \underline{\underline{₹2.48}}
 \end{aligned}$$

$$\text{Earnings under Halsey Plan} = ₹2.25$$

$$\text{Earnings under Rowan Plan} = ₹2.48$$

Illustration 9

In a factory guaranteed wages at the rate of ₹ 1.80 per hour are paid in a 48 hour week. By time and motion study it is estimated that to manufacture one unit of a particular product 20 minutes are taken, the time allowed is increased by 25% . During the week A produced 180 units of the product. Calculate his wages under the following methods:

- Time Rate.
- Piece Rate with a guaranteed weekly wage.
- Halsey premium Bonus.
- Rowan Premium Bonus.

Solution:**(a) Calculation of wages under Time Rate System**

$$\begin{aligned}
 \text{Earnings under time wages} &= \text{TR} \\
 &= 48 \times 1.8 = ₹86.4
 \end{aligned}$$

(b) Calculation of wages under Piece Rate with a Guaranteed Wage Rate

$$\begin{aligned}
 \text{Normal Time for one unit} &= 20 \text{ minutes} \\
 (+) \text{ Relaxation allowance @ 25\%} &= 5 \text{ minutes} \\
 \text{Standard Time} &= 25 \text{ minutes} \\
 \text{No. of pieces per hour} &= 60/25 \text{ pieces.} \\
 \text{Piece Rate} &= \text{Hourly Rate} / \text{No. of pieces per hour}
 \end{aligned}$$

$$= 1.8 \div (60/25)$$

$$= 0.75$$

$$\text{Earnings under Piece Rate} = 180 \times 0.75 = ₹ 135$$

(c) Calculation of wages under Halsey Premium Bonus

$$\text{Standard time for actual production} = 180 \times 25 / 60 = 75 \text{ hours}$$

$$\begin{aligned} \text{Earnings under Halsey Plan} &= \\ &= (48 \times 1.8) + 50/100 (75-48) \times 1.8 \\ &= 86.4 + 24.3 = ₹ 110.70 \end{aligned}$$

(d) Calculation of wages under Rowan Premium Bonus

$$\text{Standard time for actual production} = 180 \times 25 / 60 = 75 \text{ hours}$$

$$\begin{aligned} \text{Earnings under Rowan Plan} &= (48 \times 1.8) + (75-48 / 75) \times (48 \times 1.8) \\ &= 86.4 + 31.104 = ₹ 117.50 \end{aligned}$$

Illustration 10

Calculate the earnings of workers A and B under Straight Piece Rate system and Taylor's Differential Piece Rate system from the following particulars:-

Normal rate per hour - ₹1.80

Standard time per unit 20 seconds

Differentials to be applied are:

80% of the piece rate below the standard;

120% of the piece rate at or above standard.

A produced 1,300 units per day of 8 hours & B - 1,500 units per day of 8 hours.

Solution:

$$\text{Pieces per minute} = 60/20 = 3 \text{ units}$$

$$\text{Units per hour} = 60 \times 3 = 180 \text{ units}$$

$$\text{Normal piece rate} = 1.8 / 180 = ₹ 0.01$$

$$\text{Standard production in actual time} = 8 \times 180 = 1440 \text{ units}$$

Earnings under Straight Piece Rate:

$$\text{Earnings of A} = 1300 \times 0.01 = ₹ 13.00$$

$$\text{Earnings of B} = 1500 \times 0.01 = ₹ 15.00$$

Earnings under Taylor's Differential Piece Rate:

$$\text{A's efficiency} = 1300 / 1440 \times 100 = 90.28\%$$

$$= < 100\%$$

$$\text{A's Earnings} = 1300 \times 0.01 \times 80\%$$

$$= ₹ 10.42$$

$$\text{B's efficiency} = 1500 / 1440 \times 100 = 104.17\%$$

$$= > 100\%$$

$$\text{B's Earnings} = 1500 \times 0.01 \times 120\%$$

$$= ₹ 18$$

Illustration 11

The following particulars apply to a particular job:

Standard production per hour - 6 units

Normal rate per hour	-	₹ 1.20
Mohan produced	32 units	
Ram produces	42 units	
Prasad produces	50 units	

Calculate the wages of these workers under Merrick Differential Piece Rate System.

Solution:

Calculation of wages of workers under Merrick Differential Piece Rate System

Normal Piece rate	= 1.2 / 6	= 0.20
Standard Production	= 6 x 8 (assumed hrs)	= 48 units
Mohan's efficiency	= 32/48 x 100	= 66.67% (< 83%)
Mohan's Earnings	= 32 x 0.2	= ₹ 6.4
Ram's efficiency	= 42/48 x 100	= 87.5% (> 83 but < 100%)
Ram's Earnings	= 42 x 0.2 x 110/100	= ₹ 9.24
Prasad's efficiency	= 50/48 x 100	= 104.17 (> 100%)
Prasad's Earnings	= 50 x 0.20 x 120/100	= ₹ 12

Illustration 12

In a manufacturing concern the daily wage rate is ₹2.50. The standard output in a 6 day week is 200 units representing 100% efficiency. The daily wage rate is paid without bonus to those workers who show up to 66 2/3% of the efficiency standard. Beyond this there is a bonus payable on a graded scale as below:-

- 82% efficiency - 5% bonus
- 90% Efficiency - 9% bonus
- 100% efficiency - 20% bonus

Further increase of 1% for every 1% further rise in efficiency. In a 6 day week A produced 180 units; B 164 units; C 200 units; D 208 units and E 130 units.

Calculate the earnings of these workers.

Solution:

A's efficiency	= (180 / 200) x 100 = 90%	
A's Earnings	= (6 x 2.5) + 9% of (6 x 2.5)	= ₹ 16.35
B's efficiency	= (164 / 200) x 100 = 82%	
B's Earnings	= (6 x 2.5) + 5% of (6 x 2.5)	= ₹ 15.75
C's efficiency	= (200 / 200) x 100 = 100%	
C's Earnings	= (6 x 2.5) + 20% of (6 x 2.5)	= ₹ 18.00
D's efficiency	= (208 / 200) x 100 = 104%	
D's Earnings	= (6 x 2.5) + 24% of (6 x 2.5)	= ₹ 18.60
E's efficiency	= (130 / 200) x 100 = 65%	
E's Earnings	= 6 x 2.5	= ₹ 15.00

Illustration 13

Workmen of a particular grade working on 8 hour shift duty are guaranteed a wage of ₹ 32. An incentive scheme is in operation according to which production bonus is earned directly proportional to performance but only after 100% performance is reached. Four workmen A,B,C and D produce 48, 60, 75 and 90 units respectively in 6 hours

working on a job which has standard time of 6 minutes per unit as measured work content. Remaining 2 hours of the shift are spent in doing unmeasured work for which no incentive bonus can be paid. Find for each workman:

- The production performance level achieved;
- Total earnings for the day.

Solution:

Statement showing computation of performance achieved and total earnings of 4 workers:

	Particulars	A	B	C	D
I	Standard output (6 x 60 / 6)	60	60	60	60
II	Actual output	48	60	75	90
III	Performance level	80%	100%	125%	150%
IV	Wages for measured work (6 x 4)	24	24	24	24
V	Bonus [C = 24 x 25%] [D = 24 x 50%]	--	--	6	12
VI	Wages for unmeasured work (2 x 4)	8	8	8	8
VII	Total earnings (IV + V + VI)	32	32	38	44

Illustration 14

The following particulars for the first week of September, 2015 relate to X and Y two workers employed in a factory:

	X	Y
a) Job Completed — units	3,600	4,200
b) Out of above output rejected and unsalable	540	420
c) Time allowed	12 Mts/dozen	3 Hrs./200 units
d) Basic wage rate per hour	₹ 5	₹ 6
e) Hours worked	45	50

The normal working hours per week are fixed at 42 hours. Bonus is paid @ 2/3 of the basic wage rate for gross time worked and gross output produced without deduction for rejected output. The rate of overtime for first 4 hours is paid at time plus 1/3 and for next 4 hours is paid at time plus 1/2.

From the above data calculate for each employed

- Number of bonus hours and amount of bonus earned;
- Total wages earned including basic wages overtime premium and bonus;
- Direct wages cost per 100 saleable units.

Solution:

	Particulars	X	Y
1.	No. of units completed	3,600	4,200
2.	Rejected units	540	420
3.	Saleable units	3,060	3,780
4.	Standard time	60 hrs	63 hrs
5.	Actual time worked	45 hrs	50 hrs
6.	Bonus hours	15 hrs	13 hrs
7.	Amount of bonus	50 (15 x 5 x 2/3)	52 (13 x 6 x 2/3)
8.	Overtime wages	20 (3 x 5 x 4/3)	68 [(4 x 6 x 4/3) + (4 x 6 x 3/2)]
9.	Basic wages	210 (42 x 5)	252 (42 x 6)
10.	Total wages (7 + 8 + 9)	280	372

11.	Direct wage cost of 100 saleable units.	9.15 (280 / 3060) x 100	9.84 (372 / 3780) x 100

Illustration 15

From the following particulars work out the earnings for the week of a worker under

- (a) Straight Piece Rate
 - (b) Differential Piece Rate
 - (c) Halsey Premium System
 - (d) Rowan System
- Number of working hours per week — 48
 Wages per hour — ₹3.75
 Normal time per piece — 20 Min
 Normal output per week — 120 pieces
 Actual output for the week — 150 pieces
 Differential piece rate — 80% of the piece rate when output is below standard and 120% above standard.

Solution:**Computation of earnings for the week of a worker**

- (a) Piece rate = $(48 \times 3.75) / 120 = ₹ 1.5$
 Earnings under Straight Piece Rate = $150 \times 1.5 = ₹ 225$
- (b) Efficiency = $(150 / 120) \times 100 = 125\% (> 100\%)$
 Earnings under Differential Piece Rate = $150 \times 1.5 \times 120/100 = ₹ 270$
- (c) Standard time for actual production = $48 \times (150 / 120) = 60 \text{ hrs}$
 Earnings under Halsey Plan = $(48 \times 3.75) + 50/100(60 - 48) \times 3.75 = 180 + 22.5 = ₹ 202.5$
- (d) Earnings under Rowan Plan = $(48 \times 3.75) + [(60-48 / 60) \times (3.75 \times 48)] = 180 + 36 = ₹ 216$

Illustration 16

Ten men work as a group. When the weekly production of the group exceeds standard (200 pieces per hour) each man in the group is paid a bonus for the excess production in addition to his wages at hourly rates. The bonus is computed thus:

The percentage of production in excess of the standard amount is found and one-half of this percentage is considered as the men's share. Each man in the group is paid as bonus this percentage of a wage rate of ₹ 3.20 per hour. There is no relationship between the individual workman's hourly rate and the bonus rate. The following is the week's records.

	Hours Worked	Production
Monday	90	22,100
Tuesday	88	22,600
Wednesday	90	24,200

Thursday	84	20,100
Friday	88	20,400
Saturday	<u>40</u>	<u>10,200</u>
	<u>480</u>	<u>1,19,600</u>

- (a) Compute the rate and amount of bonus for the week;
 (b) Compute the total pay of Jones who worked 41 ½ hours and was paid ₹2 per hour basic and of Smith who worked 44 ½ hours and was paid ₹ 2.50 per hour basic.

Solution:

Standard production in actual time = 480 x 200 = 96,000

Excess of actual production over standard = 1,19,600 – 96,000 = 23,600.

% of excess over standard = (23,600 / 96,000) x 100 = 24.58%

% of bonus = 1/2 x 24.58 = 12.29%

Bonus rate per hour = 3.2 x 12.29% = 0.393

Total bonus for week = 480 x 0.393 = ₹ 188.64

Computation of Total Earnings of Jones & Smith:

Particulars		Jones		Smith
Basic wages	41.5 x 2	83.00	44.5 x 2.5	111.25
Bonus	41.5 x 0.393	16.31	44.5 x 0.393	17.49
Total Earnings		99.31		128.74

Illustration 17

A manufacturer introduces a new machinery into his factory with the result that production per worker is increased. The workers are paid by results and it is agreed that for every 2% increase in average individual output, an increase of 1% on the rate of wages will be paid.

At the time the machinery is installed the selling price of the products falls by 8-1/3%. Show the net saving in production costs which would be required to offset the losses expected from the turnover and bonus paid to workers.

	I st period	II nd period
No. of workers	175	125
Number of articles produced	16,800	14,000
Wages paid	33,600	
Total Sales	75,600	

Solution:

No. of units per worker in period I	—	= 16,800 / 175 = 96
No. of units per worker in period II	—	= 14,000 / 125 = 112
Increase in production per worker	—	= 16 units
% of increase in output	= 16/96 x 100	— = 16 2/3 %
Wages in Period I	= 33,600	
Wages in Period II	= 33,600 x (125 / 175)	= 24,000
Increase in wages	= 24,000 x 8.33% [16.67 x ½ = 8.33]	= 2,000
Sales in Period I	= 75,600	
Sales in Period II	= 75,600 x (14,000 / 16,800)	= 63,000
Decrease in Sales	= 63,000 x 8 1/3 %	= 5,250

$$\begin{aligned}\text{Total loss due to increase in wages \& reduction in sales} &= 5,250 + 2,000 \\ &= 7,250\end{aligned}$$

To offset the loss, the saving in other must be ₹ 7,250

Illustration 18

A work measurement study was carried out in a firm for 10 hours and the following information was generated.

Units produced	:	350
Idle time	:	15%
Performance rating	:	120%
Allowance time	:	10% of standard time.

What is the standard time for task?

Solution:

Calculation of standard time for task

$$\begin{aligned}\text{Total time} &= 10 \times 60 &&= 600 \text{ minutes} \\ (-) \text{ Down time or Idle time @ 15\%} &&&= \underline{90 \text{ minutes}} \\ \text{Actual time} &&&= \underline{510 \text{ minutes}} \\ \text{Normal Time} &= 510 \times 120\% &&= 612 \text{ minutes} \\ (+) \text{ Relaxation allowance} &&& \\ \text{(10\% or 1/10 on standard time)} &&& \\ \text{i.e. 1/9 on normal time)} &&&= \underline{68 \text{ minutes}} \\ \text{Standard time for job} &&&= \underline{680 \text{ minutes}} \\ \text{Standard time for each unit} &= 680/350 &&= 1.943 \text{ minutes}\end{aligned}$$

Illustration 19

The extracts from the payroll of M/s. Maheswari Bros. is as follows:-

Number of employees at the beginning of 2015	150
“ “ “ “ “ “ end of 2015	200
“ “ resigned	20
“ “ discharged	5
“ replaced due to resignation and discharges	20

Calculate the Labour Turnover Rate for the factory by different methods.

Solution:

- 1) Separation Method $= 25 \div (150 + 200 / 2) \times 100$
 $= 0.1429 \times 100$
 $= 14.29 \%$
- 2) Replacement Method $= (20 / 175) \times 100$
 $= 11.43\%$
- 3) Flux Method $= (25 + 20) \div 175 \times 100$
 $= 25.71\%$

Illustration 20

In a factory bonus to workman is paid according to Rowan Plan. Time allotted for a job is 40 hours and the normal rate of wages is ₹ 1.25 per hour. The factory overhead charges are 50 paise per hour for the hours taken.

The factory cost of a work order, executed by a worker is ₹ 161.875. The cost of material in each case is ₹100.

Calculate the hours of time taken by the workman to complete the work order.

Solution:

Let 'T' be the time taken by worker.

$$\begin{aligned}\text{Earnings} &= 1.25 T + [(40-T) / 40] \times [1.25 T] \\ &= 1.25 T + [(50T - 1.25 T^2) / 40] \\ &= [50T + 50 T - 1.25T^2] / 40 \\ &= [100 T - 1.25T^2] / 40\end{aligned}$$

Materials + Wages + Factory Overheads = Factory Cost

$$\Rightarrow 100 + [100 T - 1.25T^2] / 40 + 0.5 T = 161.875$$

$$\Rightarrow 4000 + 100 T - 1.25T^2 + 20T = 6475$$

$$\Rightarrow 1.25T^2 - 120 T + 2475 = 0$$

$$\Rightarrow 5T^2 - 480 T + 9900 = 0$$

$$\Rightarrow T^2 - 96T + 1980 = 0$$

$$T = \frac{96 \pm \sqrt{9216 - 7920}}{2}$$

$$T = \frac{96 \pm 36}{2}$$

$$T = 66 \text{ (or) } 30$$

T = 30 hours (because actual time should not be more than standard time).

Illustration 21

Two fitters, a labourer and a boy undertake a job on piece rate basis for ₹1,290. The time spent by each of them is 220 ordinary working hours. The rates of pay on time rate basis, are ₹1.50 per hour for each of the two fitters, ₹1 per hour for the labourer and ₹0.50 per hour for the boy.

The amount of piece-work premium and the share of each worker, when the piece -work premium is divided proportionately to the wages paid.

Compute the selling price of the above job on the basis of the following additional data:-

Cost of the direct material ₹2,010; works overhead at 20% of prime cost; selling overhead at 10% of works cost and profit at 25% on cost of sales.

Solution:

Statement showing computation of earnings of each person

Particulars	F ₁	F ₂	Labourer	Boy	Total
Basic wages	330 (220x1.5)	330	220 (220x1)	110 (220x0.5)	990
Bonus	100	100	67	33	300

	430	430	287	143	1290

Computation of Selling Price of Job

Particulars	Amount (₹)
Materials	2,010
Labour	1,290
Prime Cost	3,300
(+) Works Overhead @ 20%	660
Works cost	3,960
(+) S & D overheads @ 10%	396
Cost of sales (or) Total Cost	4,356
(+) Profit @ 25%	1,089
Selling Price	5,445

Illustration 22

Two workmen, Vishnu and Shiva, produce the same product using the same material. Their normal wage rate is also the same. Vishnu is paid bonus according to the Rowan System, while Shiva is paid bonus according to Halsey System. The time allowed to make the product is 100 hours. Vishnu takes 60 hours while Shiva takes 80 hours to complete the product. The factory overhead rate is ₹10 per man-hour actually worked. The factory cost for the product for Vishnu is ₹7,280 and for Shiva it is ₹7,600.

You are required:-

- to find the normal rate of wages;
- to find the cost of materials;
- to prepare a statement comparing the factory cost of the products as made by the two works men.

Solution:

Let 'R' be the wage rate and 'M' be the material cost.

$$\begin{aligned}\text{Earnings of Vishnu} &= 60R + [(100-60) / 100] \times [60R] \\ &= 60R + 24R = 84R\end{aligned}$$

Material + Wages + Factory Overheads = Factory Cost.

$$M + 84R + 600 = 7,280$$

$$\Rightarrow M + 84R = 6,680 \quad \rightarrow (1)$$

$$\begin{aligned}\text{Earnings of Shiva} &= 80R + 50\% \text{ of } (100-80) \times R \\ &= 80R + 10R \\ &= 90R\end{aligned}$$

Material + Wages + Factory Overheads = Factory Cost.

$$M + 90R + 800 = 7,600$$

$$\Rightarrow M + 90R = 6,800 \quad \rightarrow (2)$$

Solving Equation (1) & (2), we get

$$M + 84R = 6,680$$

$$M + 90R = 6,800$$

$$-6R = -120$$

$$R = 20$$

Substitute the value of 'R' in Equation (2), we get

$$M + 90 R = 6,800$$

$$\Rightarrow M + 90 (20) = 6,800$$

$$\Rightarrow M + 1800 = 6,800$$

$$\Rightarrow M = 5,000$$

$$\begin{aligned} \text{Wages of Vishnu} &= (60 \times 20) + [(100-60) / 100] \times [60 \times 20] \\ &= 1200 + 480 = ₹ 1680 \end{aligned}$$

$$\begin{aligned} \text{Wages of Shiva} &= (80 \times 20) + 50\% (100 - 80) \times 20 \\ &= 1600 + 200 = ₹ 1800 \end{aligned}$$

(a) Normal Rate of wages = ₹ 20

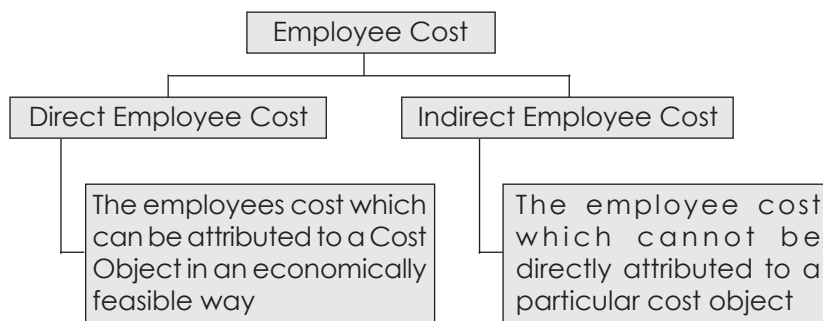
(b) Material Cost = ₹ 5,000

(c) Statement comparing the factory cost of the products as made by the two workmen.

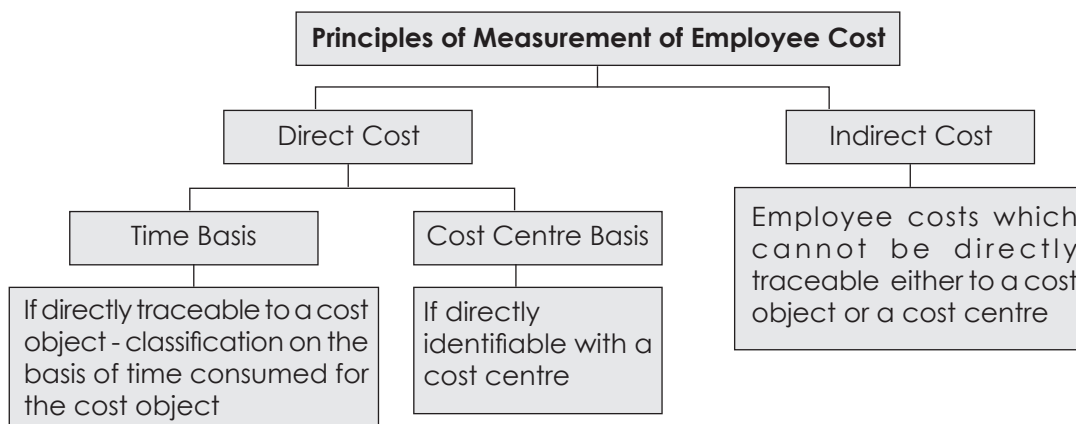
Particulars	Vishnu	Shiva
Material	5,000	5,000
Labour	1,680	1,800
Overheads	600	800
Factory Cost	7,280	7,600

COST ACCOUNTING STANDARD-7 (Limited Revision 2017): EMPLOYEE COST

Employee cost: The aggregate of all kinds of consideration paid, payable and provisions made for future payments for the services rendered by employees of an enterprise (including temporary, part time and contract employees). Consideration includes wages, salary, contractual payments and benefits, as applicable or any payment made on behalf of employee. This is also known as Labour Cost.



Principles of Measurement of Employee Cost: The principles to be followed for measurement of employee cost are:



Measurement of Employee Cost: Inclusions and Exclusions:

The following items are to be '**included**' for the purpose of measuring employee cost:

- (i) Any payment made to an employee either in cash or kind
- (ii) Gross payments including all allowances payable and includes all benefits
- (iii) Bonus, ex-gratia, sharing of surplus, remuneration payable to Managerial personnel including Executive Directors and other officers
- (iv) Any amount of amortization arising out of voluntary retirement, retrenchment, termination, etc
- (v) Variance in employee payments/costs, due to normal reasons (if standard costing system is followed)
- (vi) Any perquisites provided to an employee by the employer

The following items are to be '**excluded**' for the purpose of measuring employee cost:

- (i) Remuneration paid to Non-Executive Director
- (ii) Cost of idle time [= Hours spent as idle time x hourly rate]
- (iii) Variance in employee payments/costs, due to abnormal reasons (if standard costing system is followed)
- (iv) Any abnormal payment to an employee – which are material and quantifiable
- (v) Penalties, damages paid to statutory authorities or third parties
- (vi) Recoveries from employees towards benefits provided – this should be adjusted/reduced from the employee cost
- (vii) Cost related to labour turnover – recruitment cost, training cost and etc
- (viii) Unamortized amount related to discontinued operations.

Illustration 23**Measurement of Employee Cost**

Basic pay ₹5,00,000; Lease rent paid for accommodation provided to an employee ₹2,00,000, amount recovered from employee ₹40,000, Employer's Contribution to P.F. ₹75,000, Employee's Contribution to P.F. ₹75,000; Reimbursement of Medical expenses ₹67,000, Hospitalisation expenses of employee's family member borne by the employer ₹19,000, Festival Bonus Rs.20,000, Festival Advance ₹30,000. Compute the Employee cost.

Solution:

Computation of Employee Cost

	Particulars	Amount (₹)
	Basic Pay	5,00,000
Add	Net cost to employer towards lease rent paid for accommodation provided to an employee [= lease rent paid less amount recovered from employee] = [2,00,000 (-) 40,000]	1,60,000
Add	Employer's Contribution to PF	75,000
Add	Reimbursement of Medical Expenses	67,000
Add	Hospitalisation expenses of employee's family member paid by the employer	19,000
Add	Festival Bonus	20,000
	Employee Cost	8,41,000

Note:

- (i) Festival advance is a recoverable amount, hence not included in employee cost.
- (ii) Employee's contribution to PF is not a cost to the employer, hence not considered.

Illustration 24

Measurement of Employee Cost (with special items)

Gross pay ₹10,30,000 (including cost of idle time hours paid to employee ₹25,000); Accommodation provided to employee free of cost [this accommodation is owned by employer, depreciation of accommodation ₹1,00,000, maintenance charges of the accommodation ₹90,000, municipal tax paid for this accommodation ₹3,000], Employer's Contribution to P.F. ₹1,00,000 (including a penalty of ₹2,000 for violation of PF rules), Employee's Contribution to P.F. ₹75,000. Compute the Employee cost.

Solution:

Computation of Employee Cost

	Particulars	Amount (₹)
	Gross Pay (net of cost of idle time) =[10,30,000 (-) 25,000]	10,05,000
Add	Cost of accommodation provided by employer = Depreciation (+) Municipal Tax paid (+) maintenance charges = 1,00,000 + 90,000 + 3,000 = 1,93,000	1,93,000
Add	Employer's Contribution to PF excluding penalty paid to PF authorities [= 1,00,000 (-) 2,000]	98,000
	Employee Cost	12,96,000

Note:

- Assumed that the entire accommodation is exclusively used by the employee. Hence, cost of accommodation provided includes all related expenses/costs, since these are identifiable/traceable to the cost centre.
- Cost of idle time hours is assumed as abnormal. Since it is already included in the gross pay, hence excluded.
- Penalty paid to PF authorities is not a normal cost. Since, it is included in the amount of contribution, it is excluded.

Illustration 25

Measurement of Employee Cost (with special items)

Trial Balance as on 31.3.2017 (relevant extracts only)

Particulars	Amount (₹)	Particulars	Amount (₹)
Materials consumed	25,00,000		
Salaries	15,00,000	Special Subsidy received from Government towards Employee salary	2,75,000
Employee Training Cost	2,00,000	Recoverable amount from Employee out of perquisites extended	35,000
Perquisites to Employees	4,50,000		
Contribution to Gratuity Fund	4,00,000		
Lease rent for accommodation provided to employees	3,00,000		
Festival Bonus	50,000		
Unamortised amount of Employee cost related to a discontinued operation	90,000		

Solution:

Computation of Employee Cost

	Particulars	Amount (₹)
	Salaries	15,00,000
Add	Net Cost of Perquisites to Employees = Cost of Perquisites (-) amount recoverable from employee = 4,50,000 (-) 35,000	4,15,000
Add	Lease rent paid for accommodation provided to employee	3,00,000
Add	Festival Bonus	50,000
Add	Contribution to Gratuity Fund	4,00,000
Less	Special subsidy received from Government towards employee salary	(2,75,000)
	Employee Cost	23,90,000

Note:

- (i) Recoverable amount from employee is excluded from the cost of perquisites.
- (ii) Employee training cost is not an employee cost. It is to be treated as an Overhead, hence, not included.
- (iii) Special subsidy received is to be excluded, as it reduces the cost of the employer.
- (iv) Unamortized amount of employee cost related to a discontinued operation is not an includible item of cost.

Employee cost reporting and measurement of efficiency**Employee cost reporting:**

- Direct Employee costs shall be presented as a separate cost head in the cost statement:** Direct employees are those who work on a product directly, either manually or by using machines. They are directly involved in the production of a finished product, that can be easily traced to the product. Examples are assembly-line workers in an automobile factory or employee working on spindle / loom in textile industry. Direct Employee cost is to be presented as a separate item in the cost statement.
- Indirect Employee costs shall be presented in cost statements as a part of overheads relating to respective functions e.g. manufacturing, administration, marketing etc:** Indirect employee cost is not directly traceable to a cost object / product and forms part of overheads. The word 'overheads' is used for a type of cost that cannot be directly allocated to a cost object or product, but can be assigned to cost objects.

Employees whose services are indirectly related to production include product designers, job supervisors, foreman, product inspectors, and the like. Employee cost of such employees is considered part of Production overheads. Salaries of employees working on administrative activities such as administration, personnel, accounts, and the like are classified as part of administrative overheads. Similarly, salaries of employees engaged in marketing / selling activities and distribution activities are part of Selling and Distribution Overheads.
- The cost statement shall furnish the resources consumed on account of Employee cost, category wise such as wages salaries to permanent, temporary, part time and contract employees piece rate payments, overtime payments, Employee benefits (category wise) etc wherever such items form a material part of the total Employee cost:** Direct employee cost is to be exhibited as a separate item in the cost statement as per CAS 7 (Limited Revision 2017).

Measurement of efficiency:

For many businesses, including most small businesses, the most significant cost is labour. Salaries and wages comprise the major line-item expense for most retail and small-scale manufacturing companies, but labour also tends to be responsive to productivity improvements. To reduce labour costs, entrepreneurs should consider measuring employee efficiency and setting aggressive performance targets to get most of their Employee Costs.

Measuring Productivity

Productivity is simply the amount of units of a product or service that an employee handles in a defined time frame. An employee who makes mechanical device might make 20 mechanical devices per hour, or an employee at a coffee shop might service 15 customers per hour. Simple productivity is neither good nor bad,

and in service industries, it might vary according to factors beyond the employee's control, like the number of customers who present for service. Productivity is the basic measure of employee work output.

Determining Unit of Service (UOS)

Productivity and efficiency require a defined unit of service. UOS analysis is usually job-specific, and is most relevant to employees who have jobs that are repetitive. For example, a spot welder might have "welds completed" or "parts completed" as his UOS, whereas a housekeeper in a hotel might have "rooms cleaned per shift" as her UOS. Some jobs, particularly professional jobs that have variable output, defy reasonable UOS measurements.

Measuring Efficiency

Efficiency is a ratio of an employee's actual time to perform each UOS against the theoretical time needed to complete it. For example, an employee who packages DVDs might put together 80 DVDs in one hour. If the best-practice target is 100 DVDs in an hour--measured by a time study--then the employee is 80 percent effective and has the capacity to produce 20 more units per hour. It is usually helpful to report separately the percentage of an employee's paid time that is actually spent performing direct work. For example, an employee who is paid for working 8.0 hours but because of meetings and lunch breaks only works 6.0 hours only spends 75 percent of her time being "productive" in terms of UOS analysis. Only the six hours spent working should be factored into efficiency scoring.

Benchmarks and Targets

Some industries have basic benchmarks already established. For example, telephone call centers have service levels that identify the ideal amount of time that common transactions should take, that are consistent across industries. However, most companies will have to establish for themselves how long basic tasks should take, and set performance targets accordingly. The task of baseline measuring should be done with a time study, which averages the amount of time that multiple transactions take or assesses the amount of time an average employee performs the task. It may not be ideal to require employees to be 100 percent efficient, particularly when the employees lack control over their own productivity--like in customer-service jobs when employees wait for customers to call or stop by. If an employee can never hit 100 percent, then morale may suffer.

Longitudinal Reporting

The real benefit to measuring employee efficiency is in longitudinal reporting. Calculating efficiency over a period of time can identify opportunities to reorganize staffing, or add or remove employees based on the company's volume of business, and an individual employee's long-term productivity can factor into merit increases and bonuses. Efficiency scoring can also help with predictive modeling. If it takes 90 seconds to produce a mechanical device, and employees are operating at 75 percent efficiency, then instead of producing 40 widgets per hour, only 30 will be produced.

4

COST OVERHEAD

OVERHEADS (CAS - 3)

An overhead is the amount which is not identified with any product. The name overhead might have come due to the reason of over and above the normal heads of expenditure. It is the aggregate of indirect material, indirect labour and indirect expenditure. The generic term used to denote indirect material, indirect labour and indirect expenses. Thus overheads forms a class of cost that cannot be allocated or absorbed but can only be apportioned to cost units.

In earlier days, overheads were not given much importance, because the prime cost constitutes 50-80% of the total cost. However, with the modern trend towards the mechanisation, automation, and mass production, overhead costs have grown considerably in size and in many undertakings the proportion of overhead costs to the total costs of products is appreciably high. High overheads do not indicate inefficiency if the increase in overheads is due to the following likely causes:

- Improved methods of managerial control like Accountancy, Production Control, Work Study, Cost and Management Accountancy...etc. In the process of reducing costs of other elements, viz. direct material and direct labour, overhead costs are likely to increase.
- Large scale production or mass production.
- Use of costly machines and equipments increases the amounts of depreciation, maintenance expenditure and similar other items of overhead costs.
- Less human efforts are necessary with automatic machines. A major portion of the cost is allocated direct to machines, thus increasing the machine overhead costs.
- Increased efficiency and productivity of labour has the effect of pushing up the overhead to direct labour ratio.

According to CIMA, overhead costs are defined as, 'the total cost of indirect materials, indirect labour and indirect expenses'. Thus all indirect costs like indirect materials, indirect labour, and indirect expenses are called as 'overheads'. Examples of overhead expenses are rent, taxes, depreciation, maintenance, repairs, supervision, selling and distribution expenses, marketing expenses, factory lighting, printing stationery etc. **As per CAS-3, overheads are defined as follows 'Overheads comprise costs of indirect materials, indirect employees and indirect expenses which are not directly identifiable or allocable to a cost object in an economically feasible manner'**

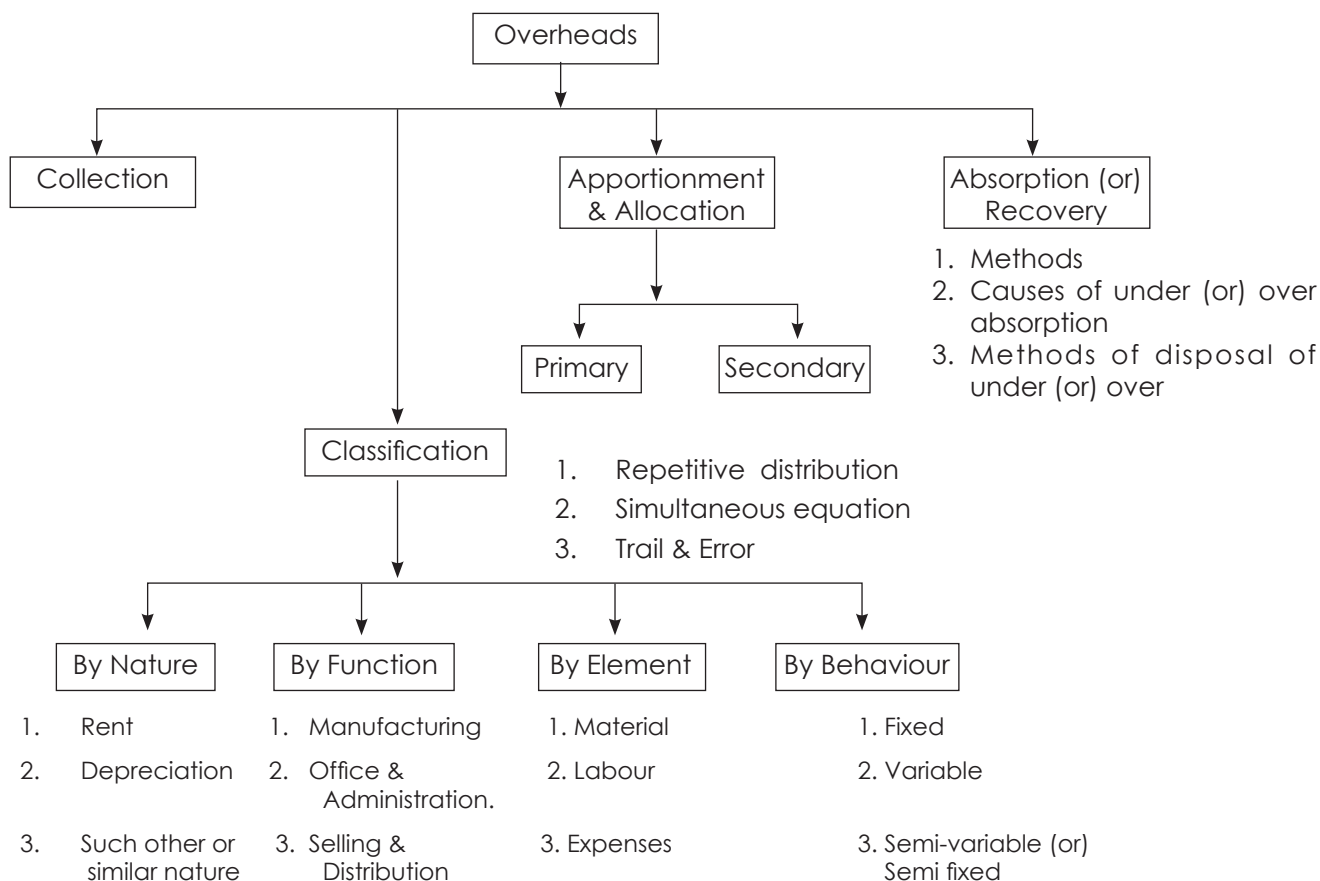
Overhead Accounting

The ultimate aim of Overhead Accounting is to absorb them in the product units produced by the firm. Absorption of overhead means charging each unit of a product with an equitable share of overhead expenses. In other words, as overheads are all indirect costs, it becomes difficult to charge them to the product units. In view of this, it becomes necessary to charge them to the product units on some equitably basis which is called as 'Absorption' of overheads. The important steps involved in Overhead Accounting are as follows:-

- Collection, Classification and Codification of Overheads.
- Allocation, Apportionment and Reapportionment of overheads.
- Absorption of Overheads.

As mentioned above, the ultimate of Overhead Accounting is 'Absorption' in the product units. This is extremely important as accurate absorption will help in arriving at accurate cost of production. Overheads are indirect costs and hence there are numerous difficulties in charging the overheads to the product units.

Study of Overheads can be better understood from the following diagram:



(a) Collection, Classification and Codification of Overheads: -

These concepts are discussed below:-

Collection of Overheads:

Document	Overhead Costs	Nature
Stores Issue note, purchase voucher	Indirect material	Consumables, lubricants etc.
Payroll sheets, time sheets	Indirect labour	Wages, salaries, contribution to statutory benefits, bonus, incentives, idle time
Cash books	Indirect material, Indirect labour & indirect expenses	All type of costs
Subsidiary records – journal	Indirect material, Indirect labour & indirect expenses	For provisions of costs that are not actually paid for
Other reports	Indirect expenses	Depreciation, scrap, wastage etc.

Overheads collection is the process of recording each item of cost in the records maintained for the purpose of ascertainment of cost of each cost centre or unit.

The following are the source documents for collection of overheads:-

- (i) Stores Requisition
- (ii) Wages Sheet
- (iii) Cash Book
- (iv) Purchase Orders and Invoices
- (v) Journal Entries
- (vi) Other Registers and Records

Source document and the nature of overheads are enumerated as below.

For the purpose of overhead accounting, collection of overheads is very important. It is necessary to identify the indirect expenses and the above mentioned source documents are used for this. Proper collection of overhead expenses will help to understand accurately the total overhead expenses.

Classification of Overheads

Classification is defined by CIMA as, 'the arrangement of items in logical groups having regard to their nature (subjective classification) or the purpose to be fulfilled (Objective classification). In other words, classification is the process of arranging items into groups according to their degree of similarity. Accurate classification of all items is actually a prerequisite to any form of cost analysis and control system. Classification is made according to the following basis:

Based on Elements: Indirect Materials, Indirect labour and Indirect expenses.

Based on Functions of the organisation: Manufacturing overheads, Administrative overheads, Selling and Distribution overheads, Research & Development overheads.

Based on the Behaviour: Fixed Overheads, Variable Overheads & Semi variable overheads.

Classification according to Elements

According to this classification overheads are divided according to their elements. The classification is done as per the following details:-

Indirect Materials

Materials which cannot be identified with the given product unit of cost centre is called as indirect materials. As per CAS-3 indirect material cost is defined as 'Materials, the cost of which cannot be directly attributed to a particular cost object'. For example, lubricants used in a machine is an indirect material, similarly thread used to stitch clothes is also indirect material. Small nuts and bolts are also examples of indirect materials.

Indirect Labour

As per CAS-3, indirect employee cost is the employee cost, which cannot be directly attributed to a particular cost object. Wages and salaries paid to indirect workers, i.e. workers who are not directly engaged on the production are examples of indirect wages.

Indirect Expenses

As per CAS-3, Indirect Expenses are expenses, which cannot be directly attributed to a particular cost object. Expenses such as rent and taxes, printing and stationery, power, insurance, electricity, marketing and selling expenses etc. are the examples of indirect expenses.

Functional Classification

Overheads can also be classified according to their functions.

This classification is done as given below:-

Manufacturing Overheads

As per CAS-3, Indirect Cost involved in the production process or in rendering service. Manufacturing overheads has different names such as Production Overheads, Works Overheads, Factory Overheads. Indirect expenses incurred for manufacturing are called as Manufacturing Overheads. For example, factory power, works manager's salary, factory insurance, depreciation of factory machinery and other fixed assets, indirect materials used in production etc. It should be noted that such expenditure is incurred for manufacturing but cannot be identified

with the product units.

Manufacturing is a separate function like administration, selling and distribution. The term manufacturing stands for activities, which begin with receipt of order and end with completion of finished product. Manufacturing Overhead represents all manufacturing costs other than direct materials and direct labour. These costs cannot be identified specifically with or traced to cost object in an economically feasible way. In other words, manufacturing overhead are indirect manufacturing costs. The term overhead is peculiar and therefore, there is a growing tendency to prefer the term indirect manufacturing cost to overhead. Following synonyms have been used for Manufacturing Overhead:-

- (i) Factory overhead;
- (ii) Manufacturing overhead;
- (iii) Factory on cost;
- (iv) Works on cost;
- (v) Factory burden and;
- (vi) Manufacturing expenses.

Given below are a few examples of different items included in different groups of manufacturing overhead:

Indirect Material Cost: Glue, thread, nails, rivets, lubricants, cotton waste, etc.

Indirect Labour Cost: Salaries and wages of foremen and supervisors, inspectors, maintenance, labour, general labour; idle time etc.

Indirect Services Costs: Factory Rent, factory insurance, depreciation, repair and maintenance of plant and machinery, first aid, rewards for suggestions for welfare, repair and maintenance of transport system and apportioned administrative expenses etc.

Manufacturing Overhead further explains in apportionment, allocation and absorption.

Administrative Overheads

Indirect expenses incurred for running the administration are known as Administrative Overheads. As per CAS-3, *Administrative Overheads are defined as Cost of all activities relating to general management and administration of an organisation.*

As per the functional classification, Administration Overheads comprise of those indirect costs which are related to the general administrative function in the company. Such functions are related to policy formulation, directing the organisation and controlling the operations of the company. Administration overheads are incurred for the benefit of organisation as a whole. Controlling them is difficult for they do not vary with most of the variables viz. production or sales. Examples of such overheads are, office salaries, printing and stationery, office telephone, office rent, electricity used in the office, salaries of administrative staff etc. The size as well as control over these overheads depends largely on decisions of management. Organisations growing very fast face the problem of controlling Administrative Overheads. Multi-location set up leads to duplication of many administrative costs.

Collection and Absorption of Administration Overheads

The collection of overheads is done firstly by nature of the expenses through the chart of accounts. Administrative departments in an organisation could be Corporate Office, Finance and Accounts, Company Secretary, Human resources, Legal, General Administration. The overheads that are common to all these departments are apportioned on some suitable basis e.g. in the following manner:

- (a) For Office rent, rates & taxes - Floor space as the basis,
- (b) For Depreciation on office building - Floor space as the basis
- (c) For Legal fees - No of cases handled as the basis
- (d) For Salaries of common staff - Ratio of salaries of departments as the basis
- (e) For Typist pool - No of documents typed as the basis

Absorption of the Administrative Overheads into cost units is very difficult. Many times it is advised that these overheads may not be absorbed into product units because of the difficulty and non-relevance of them with production activity. Normally, the Administrative Overheads are totalled together and then using a suitable basis, a rate of recovery is arrived at to absorb the same. It could be mostly a percentage of Works cost or factory cost. Based on the principle of 'charging what the traffic can bear', the absorption could be on the basis of a

percentage of gross profit. Whatever method selected, it will be arbitrary and could lead to erroneous conclusions. A Cost Accountant has to use all the experience and history of the organisation before he selects a particular method to adopt.

Treatment of Administration Overheads

There are three different ways of treating the administration overheads as follows:-

1) Apportion between Production and Selling & Distribution functions:

This treatment is based on the logic that the administrative functions are for the entire company and these functions facilitate both production as well as selling. In other words, the absorption of Administration Overheads would happen through Production and Selling Overheads. This means these overheads lose their identity. The problem is of course, selection of basis to divide these overheads over the two principal functions of production and selling.

2) Transfer to P & L Account

This method agrees that administrative costs are all time based costs and as such bear no relation what is produced or what is sold. These are mainly of fixed nature. Hence there is no point in dividing them further to be included in the cost of production or cost of selling. They should be simply charged to the P & L Account. However, this may lead to undervaluation of stocks.

3) Treating as a separate addition to cost of production & sales

In this method, administration is treated as a separate function and is added as a separate line in the cost computation sheet for a job or an order. Here again, the basis for inclusion as a part of cost of a job is a difficult choice. Generally, a percentage of factory cost is taken as a basis. A care needs to be taken to ensure that the Administration Overheads are charged equitably to Cost of Sales, FG stock and WIP as well.

Controlling Administration Overheads

Given the nature of these expenses, they cannot be controlled at the lower level of management. They can be better controlled by top management as they pertain to formulating policy and directing the organisation. The first step in the control mechanism is proper classification of expenses & departmentalisation. The actual expenses are collected for each department and then compared with a bench mark. Deviation are analysed and causes for increase are mitigated by fixing responsibility on the departmental head.

The control benchmarking can be done with respect to:

- (i) Figures of the previous year. Expenses could be compared with the figures of previous year and increase or decrease are analysed. However, comparison with previous year may not help as the condition may have totally changed from one year to the other.
- (ii) Use of budgets. Budgets are estimates for the current year, and they take into account the changed conditions. They also built in the year's complete plan which would factor all changes in the cost structure. It is advisable to compare budgeted overheads with actual for control purpose.
- (iii) Use of standards. Although very scientific, this method is difficult to operate. Administrative activities (being very subjective) cannot be standardised. On a certain level it can be applied e.g. the time taken to process a voucher by accountant can be standardised, or time taken for processing a payment could be standardised.

Selling and Distribution Overheads

As per CAS-3, *Selling Overheads*, also known as *Selling Costs*, are the expenses related to sale of products and include all *Indirect Expenses in sales management for the organization*. Overheads incurred for getting orders from consumers are called as Selling Overheads. On the other hand, overheads incurred for execution of order are called as Distribution Overheads. As per CAS-3, *Distribution Overheads*, also known as *Distribution Cost*, are the cost incurred in handling a product from the time it is ready for dispatch until it reaches the ultimate consumer. Examples of Selling Overheads are sales promotion expenses, marketing expenses, salesmen's salaries and commission, advertising expenses etc. Examples of Distribution Overheads are warehouse charges, transportation of outgoing goods, packing, commission of middlemen etc.

The magnitude of S & D Overheads in the total cost would depend on many factors such as nature of the product, type of customers, spread of market, statutory restrictions etc. A consumer product needs heavy expense on

advertising. A sale to institutions rather than individual customers needs a different selling effort. Distribution Costs will increase if the spread of the market is large. Some activities cannot be advertised at all such as a Doctor, a Cost Accountant. The total magnitude of S & D Costs and the proportion of selling and distribution efforts will decide the treatment thereof and control mechanisms to be used. For some of selling expenses there may not be a direct relationship with the product. If a company incurs expense on advertising, it may be difficult to relate to a specific product unless it's a product advertisement. But further, there may be a substantial time lag between the expense and the benefit arising out of that. In case of Distribution Costs many of them may be possibly linked to the product.

Collection and Absorption of S&D Overheads

While classifying the S & D Costs are properly bifurcated and coded accordingly. This could be done by having separate account codes for Selling Overheads such as: advertising, sale commission, travelling expense, communication, exhibition, market survey, free samples, credit & collection costs, bad debts, and Distribution expenses such as: transportation vehicle related expenses, warehousing and storage at different places, depreciation. Depending upon the size of the organization, there may be proper departmentalization of S&D activities. The departments could be:

- Sales head office
- Sales regional offices
- Depots
- Direct selling department
- Dealers management
- Credit and collection (commercial)

The costs are collected through various source documents under the above heads and for the above departments. For absorption, the basis to be used will have practical difficulties, as one will have to look for a relationship between the expenses and the cost unit. Some expenses like sales commission, shipping costs, and direct selling expenses can be absorbed directly. The other expenses can be absorbed on the basis of either sales value, cost of goods sold, gross profit or number of units sold. Out of these the sales value method is the most commonly used.

Control over S & D Expense

The S & D Expenses are related to sales and distribution activity which is externally focused. The extent of these expenses depend mainly on external factors like consumer profile, changing habits, technology improvements etc. Controlling these expenses does not mean capping them. It aims at increasing the effectiveness of these expenses e.g. getting maximum sales per rupee of S & D Expenses. For control purpose, a great care should be taken to ensure correct classification and collection of S & D Overheads. The collected expenses must be analysed to assess the effect of them on sales. Such analysis could be done as follows:

- (a) Analysis of sales and S & D Expenses by geographical locations – This could be regions, zones, domestic and international etc.
- (b) Analysis by type of customers - This could be done as institutional, government, retail etc.
- (c) Analysis by products or services – This may be done as range of products, the application of products, brands etc.
- (d) Analysis by salesmen.
- (e) Analysis by channel of distribution – This analysis pertains to wholesalers, retailers, commission agents etc.

The analysis of sales, profits and S & D expenses on the basis of above factors will give a good insight into the performance as well as control over expenses. All these three parameters may be compared with

- Previous year;
- Budget for the current year or
- Standards for the current year

Research and Development Overheads

Research Cost is defined as the cost of searching for new or improved products, new applications of material, or new or improved methods, process, systems or services. In the modern days, firms spend heavily on Research and Development. Expenses incurred on research and development is known as Research and Development

Overheads. Research may be of the following types:

- (i) Pure or basic research to gain general know-how regarding the production or market, not directed towards any particular product.
- (ii) Applied research which applies the basic knowledge in practice. i.e improvement of existing products, new process, exploring of new products, improved measures of safety, etc.

Development cost is the cost of the process which begins with the implementation of the decision to use scientific or technical knowledge to produce a new or improved product or to employ a new or improved method, process, system, etc. and ends with the commencement of formal production of that product by that method. Development starts where the research ends. Development cost is the expenditure incurred for putting the results of research on a practical commercial basis.

Special features of Research & Development Costs

The features are as follows:-

- (a) Expenditure is incurred ahead of the actual production and may not be charged to current production.
- (b) The amount of expenditure may often be substantial.
- (c) The expenditure may at times be entirely fruitless, yielding no tangible results.
- (d) Benefit of the expenditure may be realized over a number of years.
- (e) Difficulty in fixation of standards for control.

Collection of R&D Overheads

Accumulation of Research and Development Overheads is essential for the following reasons:-

- (a) For review cost to date.
- (b) For planning the activities subsequent to research.
- (c) For evaluation of performance with relation to past performance or for inter-firm comparison.

The collection of R&D Overheads is made through the following documents. Material requisitions, labour time cards, invoices, vouchers (royalty, patent, license. etc). Research & Development expenditure may be identified by its nature i.e basic or applied research or development by the elements of cost, by business sector, by project. Each Research & Development project is allotted a project work order number. Separate series of work orders or codes should be used to distinguish from regular work orders.

R & D overheads can be accumulated as follows:-

- (a) All expenditure under the direct elements (direct material, labour and expenses) must be charged to the work orders.
- (b) Expenses like supervisor salary, material handling charges, maintenance of equipments can be directly allocated to particular research work order.
- (c) Items of general overheads like depreciation of building, depreciation of maintenance equipment, share of purchase department expenses may be suitably apportioned to the research work order.

Accounting of R&D Overheads

Accounting of Research & Development Cost arise due to the following causes:-

- (a) The expenditure is in the nature of pre-production costs and there is a considerable time lag between the incidence and expenditure and realization of benefit.
- (b) There is no immediate production, or the production is so small that it becomes difficult to charge such costs to products.

It is because of these difficulties that the accounting of Research and Development Costs has been a subject of some controversy. Three methods are available for charging Research and Development Costs as:

- (a) Charging off to the current year Profit & Loss Account.
- (b) Capitalization so that cost may be amortized on a long term basis.

(c) Deferment and charge-off to costs of the next two or three years—a short/medium term amortization.

Research and Development may be regarded as a function of production and the Research & Development Costs may be charged to costs to be recovered through the general overhead rates. There are many arguments for and against charging the Research & Development Costs in current revenue. The arguments in support of this method are as follows:-

- (a) All research & development expenses may not result in new processes or saleable products.
- (b) Some of the research & development projects may result in failures.
- (c) These expenses may be incurred simply to maintain the present competitive position of the concern.
- (d) It is difficult to assess the period over which the know-how or knowledge acquired may be spread over.
- (e) It may be more advantageous to recover a substantial portion of the cost immediately, as the life of the new products are uncertain.
- (f) In certain cases, the effect of these research costs on future revenues may be doubtful.

The classification used for cost collection is mostly combination of elemental and functional. The behavioural classification cannot be used for booking of costs; it is used only for analysis and decision making.

Elements	Material	Labour	Expense
Factory or production or manufacturing or works overheads	Nuts & bolts, consumables, lubricants, welding electrodes, cleaning materials, nails, threads, ropes etc.	Salaries & wages to foremen, supervisors, inspectors, maintenance labour, idle time	Factory lighting & heating, factory rent, power & electricity, factory insurance, depreciation on machinery, repairs
Administrative Overheads	Printing & stationery, office supplies	Salary of office staff, managers, directors, and other administrative departments as IT, audit, credit, taxation	General office rent, insurance, telephones, fax, travel, legal fees, depreciation on office assets
Selling Overheads	Price lists, catalogues, mailings, advertising material such as leaflets, danglers, samples, free gifts, exhibition material	Salaries of sales staff & managers, commission on sales, bonus on schemes	Sales office expenses, travelling, subscription to sales magazines, bad debts, rent & insurance of showrooms, cash discount, brokerage, market research
Distribution overheads	Secondary packing, material items used in delivery vans	Salaries of delivery staff such as drivers, dispatch clerk, logistic manager	Carriage outwards, forwarding expenses, rent & insurance of warehouses & depots, insurance, running expenses & depreciation of delivery vans

Classification based on behaviour

Fixed Overheads

The amount of overhead tends to remain fixed for all volumes of production within a certain range. Examples of Fixed Overheads are Audit fee, Interest on capital, Depreciation of plant & machinery, Insurance, Rent of buildings,

etc. A fixed overhead represents constant expenditure incurred during a period without regarding to the volume of production during that period. Even when production completely ceases in a particular period, this constant amount of expenditure will continue to be incurred partially, if not wholly. Therefore the Fixed Overheads are also known as Period Costs. Sometimes these costs are also termed as Shutdown or Stand-by Costs.

Features of Fixed Costs

Fixed Costs are stated to be by and large uncontrollable, in the sense they are not influenced by the action of a specified member of an undertaking. For example, the supervisor has practically no control over the fixed costs like depreciation of plant & machinery. The production supervisor can only see that the maximum possible utilization of the assets is made.

The fixed overhead amount is constant per period; the cost per unit of production varies with the volume. This variation is inverse since with increase in production, cost per unit decreases as the same amount of fixed overheads is spread over larger units of production.

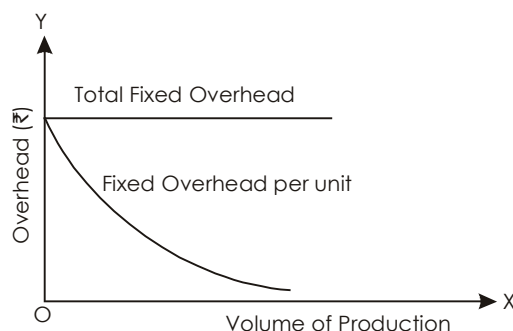
Factors affecting the Fixed Overheads

When a plant or a department is completely idle and there is no production, several items of Fixed Overheads disappear. Fixed Overheads are thus, of two types, viz. a lower standing fixed cost when production is nil and a higher running fixed cost when the plant is running. For instance, maintenance expenditure incurred at plant shutdown has to be increased to a higher level when production starts.

Any long term change in the productive capacity of an undertaking also affects the basic characteristic of fixed overhead. Fixed costs are constant for short term periods only, within a limited range of capacity.

Another factor that affects the fixed nature of fixed overhead is the change in basic price level.

Graphical representation of Fixed Costs is depicted as below:



Fixed Costs may be broadly classified into three basic types:-

- (i) Fixed costs that have no casual relationship with the volume of output and are incurred mainly as results of policy decisions of the management. Research, development, design, employee training, advertisement and marketing expenses are examples of this expenditure. Accountants term such costs as discretionary fixed costs (also known as programmed costs or managed costs).
- (ii) Fixed costs that do not change significantly in the short term such as depreciation, rent, etc.
- (iii) Fixed costs that are fixed for short period for a particular capacity, but change considerably when there is a long-term change in the volume or capacity.

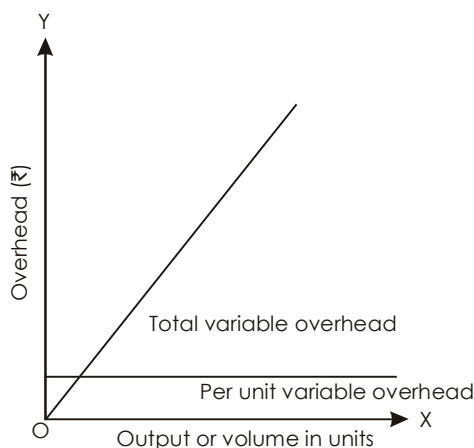
Variable Overheads

Variable Costs are those which vary in total direct proportion to the volume of output. These costs per unit remain relatively constant with changes in production. Thus Variable Costs fluctuate in total amount but tend to remain constant per unit as production activity changes. Examples are indirect material, indirect labour, lubricants, cost of utilities, etc.

The variable overhead costs seldom reveal the characteristics of perfect variability. i.e an expenditure which varies directly with variation in the volume of output. They simply tend to vary rather than vary directly in direct proportion of output. We come across three types of variable overhead expenses in actual practice as explained below:-

- (i) 100% variable expenses. For all production the variable expenditure remains constant.
- (ii) The expense per unit of production is low at lower ranges of output but gradually increases as production goes up.
- (iii) The expenses per unit of production are more at lower ranges of output but gradually decrease with the decrease with the increase in production.

Nature of variable expenses is shown as below:-



The relationship of fixed and variable overheads with the volume of output is exhibited in the following table. The range of output is considered as 5000-10000 units. Variable overheads are taken at ₹2 per unit and fixed overheads are assumed to be at the level of ₹25000. Can you check for yourself how the graph will look like for the following figures?

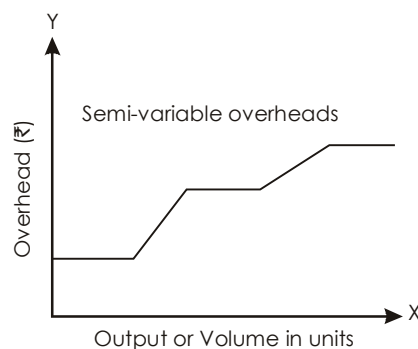
Output units	Fixed Overheads	Variable Overheads	Total Overheads	Overheads per unit		
				Fixed	Variable	Total
5000	25000	10000	35000	5.00	2.00	7.00
6000	25000	12000	37000	4.17	2.00	6.17
7500	25000	15000	40000	3.33	2.00	5.33
8000	25000	16000	41000	3.13	2.00	5.13
9000	25000	18000	43000	2.78	2.00	4.78
10000	25000	20000	45000	2.50	2.00	4.50

Semi-Variable Overheads:

These are a sort of mixed or hybrid costs, partly fixed and partly variable costs. For example Telephone expenses, include a fixed portion of annual charge plus variable charge according to the calls. Thus total telephone expenses are semi-variable.

Semi-variable overheads are of two types:-

- (i) The expenses which change with the change in volume of output, but the variation cost is less than proportionate to change in output. Examples are power & fuel, lighting, repairs and maintenance of buildings, etc.
- (ii) The costs tend to remain constant within certain range of output, then jump up and remain constant for another range and so on.



Semi variable cost need to be classified into fixed and variable due to the following reasons:

- (a) **Effective Cost Control:** Fixed costs are in the nature of policy costs or discretionary costs and as such can be controlled by the management. However variable costs can be controlled at lower levels. Separation of two elements facilitate the fixation of responsibility, preparation of overhead budget and exercise effective control.
- (b) **Decision Making:** The classification is very useful in management decisions relating to utilization of capacity. If cost information is to be of use in such problems, it is essential that fixed and variable costs which behave differently with changes in volume should be segregated.
- (c) **Preparation of Break-even Charts:** Separation of fixed and variable cost is essential for the study of cost volume profit relationship and for the preparation of breakeven charts and profit charts.
- (d) **Marginal Costing:** The basic requirement of the technique of Marginal Costing is the separation of fixed and variable costs. While the latter are taken into consideration for the determination of Marginal Cost and contribution, the fixed costs are treated separately.
- (e) **Method of Absorption Costing:** Separate method may be adopted for determination of rates for fixed and variable costs for absorption in production. Further a separate fixed overhead rate also serves as a measure of utilization of the facilities of the undertaking; any under recovery or under absorption denotes the idle or surplus capacity or production efficiency.
- (f) **Flexible Budget:** In a Flexible Budget, the budgeted amounts vary with the levels of activity & fixed cost remains constant. It is the variable cost that varies. Breakup of overhead cost into fixed and variable is therefore necessary for establishment of budget and for the purpose of variance analysis.

Methods of classification of semi variable cost in fixed and variable

- (a) **Graphical Method** – The costs at number of levels are plotted on a graph, x-axis represents the volume and y-axis represents the amount of expenditure. A straight line known as regression line or line of best fit is drawn between the points, plotted in such a manner that there are equal number of points on both the sides of a line and as far as practicable, pairs of points on either side are in equal distance from the line. Points falling far beyond the line are erratic and are not considered. If the regression line is drawn carefully so that most of the plotted points are on the line or not far from it, the scatter chart provides a fairly accurate method for the separation of fixed and variable.
- (b) **Simultaneous Equations** – This uses the straight line equation of $y = m x + c$ where y represents total cost, m is variable cost per unit, x is the level of output and c is fixed costs. The total costs at two different volumes are put into these equations which are solved for the values of m and c.
- (d) **High and Low Method** – The highest and lowest levels of output and costs are taken and the differential is found. This difference arises only due to variable costs. The remaining portion will be fixed costs. Under this method the variable cost per unit will be computed first and then the fixed cost will be derived. Variable cost per unit is computed by dividing the difference in cost at highest level and lowest level with the difference in volume between highest and lowest level.
- (d) **Least Square Method** – This statistical tool uses straight line equation and finds the line of best fit to solve the equations. Also known as Simple Regression Method. Under this method first the mean of volume and mean of costs are computed. The deviations in volume (x) from the mean and deviation in cost (y) from mean are computed.

Codification of Overheads

It is always advisable to codify the overhead expenses. Codification helps in easy identification of different items of overheads. There are numerous items of overheads and a code number to each one will facilitate identification of these items easily. Codification can be done by allotting numerical codes or alphabetical codes or a combination of both. Whatever system is followed, it should be remembered that the system is simple for understanding and easy to implement without any unnecessary complications.

Cost Centre codes	Department name
1100	Turning department
1200	Grinding Department
1300	Components manufacturing
1400	Assembly
2100	Maintenance
2200	Quality control
2300	Stores
3100	HR & Administration
3200	Accounts

You may observe the logic in giving the codes. All codes starting with 1 are production departments, all codes starting with 2 are factory related services and all codes starting with 3 are general services. This coding helps collection of costs on functional basis and also to identify an item of expense directly to a department or cost centre.

Allocation, Apportionment and Reapportionment of Overheads

After the collection, classification and codification of overheads, the next step is allocation and apportionment of overheads into the product units. The following steps are required to complete this process.

Departmentalization

Before the allocation and apportionment process starts, the first step in this direction is 'Departmentalization' of overhead expenses. Departmentalization means creating departments in the firm so that the overhead expenses can be conveniently allocated or apportioned to these departments. For efficient working and to facilitate the process of allocation, apportionment and reapportionment process, an organization is divided into number of departments like, machining, personnel, fabrication, assembling, maintenance, power, tool room, stores, accounts, costing etc and the overheads are collected, allocated or apportioned to these departments. This process is known as 'departmentalization' of overheads which will help in ascertainment of cost of each department and control of expenses.

Allocation

CIMA defines Cost Allocation as, 'the charging of discrete, identifiable items of cost to cost centres or cost units'. In simple words *complete distribution of an item of overhead to the departments or products on logical or equitable basis is called allocation*. Where a cost can be clearly identified with a cost centre or cost unit, then it can be allocated to that particular cost centre or unit. In other words, allocation is the process by which cost items are charged directly to a cost unit or cost centre. For example, electricity charges can be allocated to various departments if separate meters are installed, depreciation of machinery can be allocated to various departments as the machines can be identified, salary of stores clerk can be allocated to stores department, cost of coal used in boiler can be directly allocated to boiler house division. Thus allocation is a direct process of identifying overheads to cost units or cost centres. So the term allocation means allotment of whole item of cost to a particular cost centre or cost object without any division.

Apportionment

Cost Apportionment is the allotment of proportions of items to cost centers. Wherever possible, the overheads are to be allocated. However, if it is not possible to charge the overheads to a particular cost centre or cost unit, they are to be apportioned to various departments on some suitable basis. This process is called as 'Apportionment' of overheads. The basis for apportionment is normally predetermined and is decided after a careful study of

relationships between the base and the other variables within the organisation. The Cost Accountant must ensure that the selected basis is the most logical. A lot of quantitative information has to be collected and constantly updated for the purpose of apportionment. The basis selected should be applied consistently to avoid vitiations. However, there should be a periodical review of the same to revise the basis if needed.

In simple words, distribution of various items of overheads in portions to the departments or products on logical or equitable basis is called apportionment.

A general example of various bases that may be used for the purpose of apportionment is shown below:

Overhead item	Basis
Rent and building	Floor space occupied by each department
General Lighting	No. of light points in each department
Telephones	No. of extensions in a department
Depreciation of factory building	Floor space
Material handling	No. of material requisitions or Value of material issued

The above list is not exhaustive and depending upon peculiarities of the organisation, it could be extended. *This allocation and/or apportionment is called as **primary distribution of overheads**.*

Distinction between Allocation & Apportionment

Although the purpose of both allocation and apportionment is identical, i.e. to identify or allot the costs to the cost centres or cost unit, both are not the same.

Allocation deals with the whole items of cost and apportionment deals with proportion of items of cost.

Allocation is direct process of departmentalization of overheads, where as apportionment needs a suitable basis for sub-division of the cost.

Whether a particular item of expense can be allocated or apportioned does not depends on the nature of expense, but depends on the relation with the cost centre or cost unit to which it is to be charged.

Principles of Apportionment of Overhead Cost

(i) Services Rendered

The principle followed in this method is quite simple. A production department which receives maximum services from service departments should be charged with the largest share of the overheads. Accordingly, the overheads of service departments are charged to the production departments.

(ii) Ability to Pay

This method suggests that a large share of service department's overhead costs should be assigned to those producing departments whose product contributes the most to the income of the business firm. However the practical difficulty in this method is that, it is difficult to decide the most paying department and hence difficult to operate.

(iii) Survey or Analysis Method

This method is used where a suitable base is difficult to find or it would be too costly to select a method which is considered suitable. For example, the postage cost could be apportioned on a survey of postage used during a year.

(iv) Efficiency Method

Under this method, the apportionment of expenses is made on the basis of production targets. If the target is exceeded, the unit cost reduces indicating a more than average efficiency. If the target is not achieved, the unit cost goes up, disclosing there by, the inefficiency of the department.

Illustration 1

A factory has 3 production departments (P1, P2, P3) and 2 service departments (S1 & S2). The following overheads & other information are extracted from the books for the month of January 2016.

Expense	Amount ₹
Rent	6,000
Repair	3,600
Depreciation	2,700
Lighting	600
Supervision	9,000
Fire Insurance for stock	3,000
ESI contribution	900
Power	5,400

Particulars	P1	P2	P3	S1	S2
Area sq ft	400	300	270	150	80
No. of workers	54	48	36	24	18
Wages	18,000	15,000	12,000	9,000	6,000
Value of plant	72,000	54,000	48,000	6,000	
Stock Value	45,000	27,000	18,000		
Horse power of plant	600	400	300	150	50

Allocate or apportion the overheads among the various departments on suitable basis.

Solution:

The primary distribution of overheads is as follows:-

₹

Expense	Total	Basis	P1	P2	P3	S1	S2
Rent	6,000	Area sq ft	2,000	1,500	1,350	750	400
Repair	3,600	Plant value	1,440	1,080	960	120	-
Depreciation	2,700	Plant value	1,080	810	720	90	-
Lighting	600	Area sq ft	200	150	135	75	40
Supervision	9,000	No of workers	2,700	2,400	1,800	1,200	900
Fire Insurance for stock	3,000	Stock value	1,500	900	600	-	-
ESI contribution	900	Wages	270	225	180	135	90
Power	5,400	Horse power	2,160	1,440	1,080	540	180
Total	31,200		11,350	8,505	6,825	2,910	1,610

Secondary Distribution of Production Overheads

After the primary distribution as shown above is over, the next step is to re-distribute the service department costs over the production departments. This also needs to be done on some suitable basis, as there may not be a direct linkage between services and production activity. The products actually do not pass through the service departments. So does it mean that the service cost is not a part of cost of production? It very much is the part of production cost! Hence the loading of service costs onto the production departments is necessary. *This process is called secondary distribution of overheads.*

The basis for secondary distribution is dependent on:-

- The nature of service given e.g. it may be maintenance department or stores.
- Measurement of service based on surveys or analysis.
- General use indices

In the above Illustration No. 1, the costs of S1 (₹2910) and that of S2 (₹1610) will have to be loaded on to the totals of P1, P2 and P3.

Some examples of the bases that can be used to distribute cost of different service departments:

Service department	Basis
Quality	No of inspection done
Maintenance	No of maintenance calls or Material usage for maintenance or Time spent on maintenance
Stores	Indirect material cost or No of issue slips or Quantity of material issued or Value of stock handled
Canteen, welfare	No workers
Internal transport	No. of trucks or trolleys used or Tonne-miles consumed
Payroll office	No. of labour hours
Purchase office	No of purchase orders or Value of material purchased

Again this is not an exhaustive list and could differ from company to company. Many times percentage estimation is also done for such distribution if the service cannot be measured on the basis of any of the above bases. It may be decided that the cost of S1 is to be distributed as P1-40%, P2-25% and P3-35%. Such arbitrary method should be avoided as far as possible.

Methods of Secondary Distribution

(a) Direct Distribution Method

This method is based on the assumption that one service department does not give service to other service department/s. Thus between service departments there is no reciprocal service exchange. Hence under this method, service costs are directly loaded on to the production departments. This is simple, but the assumption may not be correct. Can we say that the canteen service is not available to other service departments like labour office or stores or maintenance department? This is incorrect and thus the method should not be used as far as possible.

In the above example consider that if the S1 and S2 costs are to be distributed on assumption of services rendered as S1 to P1- 40%, P2-30% and P3-10% and the S2 costs are on the basis of 5:3:2, then the table for redistribution of S1 and S2 costs over the production departments P1, P2 and P3 will be as given below.

Department	Total	Basic	P1	P2	P3
Overheads as per primary distribution	26,680		11,350	8,505	6,825
Distribution of S1	2,910	40%;30%;30%	1,164	873	873
Distribution of S2	1,610	5:3:2	805	488	322
Total	31,200		13,319	9,861	8,020

(b) Step Distribution Method

This method does away with the assumption made under above method, but only partly. It recognises that a service department may render service to the other service department, but does not receive service from it. In above example, S1 may render services to S2 but not vice versa, i.e. S2 may not render service to S1. In such situation, cost of that service department will be distributed first which render services to maximum number of other service departments. After this, the cost of service department serving the next large number of departments is distributed. This process is continued till all service departments are over. Because it is done in steps, it is called as Step Method of Distribution.

Illustration 2

A manufacturing company has two production departments Fabrication and Assembly and 3 service departments as Stores, Time Office and Maintenance. The departmental overheads summary for the month of March 2016 is given below:

Fabrication	- ₹24000
Assembly	- ₹16000
Stores	- ₹5000
Time office	- ₹4000
Maintenance	- ₹3000

Other information relating to the department was:

Particulars	Production departments		Service departments		
	Fabrication	Assembly	Stores	Time office	Maintenance
No of employees	40	30	20	16	10
No of stores requisition slips	24	20			6
Machine Hours	2400	1600			

Apportion the costs of service departments to the production departments.

Solution:

We will have to determine the sequence in which the service departments should be selected for distribution and the bases on which each of them will be distributed. The following logical bases are decided based on the additional information given:

Time office	- No of employees
Stores	- No of stores requisitions
Maintenance	- Machine hours

Also, it can be easily noticed that the time office serves maximum departments (i.e. both production departments, stores & maintenance departments). Stores serve the next larger number of departments (i.e. both production departments and maintenance department).

Maintenance department serves only production departments. Hence the sequence for distribution will be time office, stores and maintenance. This is shown in the following table:

₹

Particulars	Total	Basis	Fabrication	Assembly	Time office	Stores	Maintenance
As per primary distribution	52,000	as given	24,000	16,000	4,000	5,000	3,000
Time office	4,000	no of employees	1,600	1,200	(4,000)	800	400
Stores	5,800	no of req. slips	2,784	2,320		(5,800)	696
Maintenance	4,096	Machine hours	2,458	1,638			(4,096)
		Total	30,842	21,158			

Please notice when we distribute the time office costs first, the charge to stores department is ₹800. This makes the total cost of stores to be distributed as ₹5800 (5000+800). Same is the logic for ₹4096 of Maintenance department.

(c) Reciprocal Service Method: This method takes cognizance of the fact that service departments may actually give as well as receive services from and to the other service departments on reciprocal basis. Such inter-departmental exchange of service is given due weight in the distribution of the overheads. *There are two methods used for distribution under this logic. One is called Repeated Distribution Method and the other Simultaneous Equation Method.*

(d) Repeated Distribution Method: This is a continuous distribution of overhead costs over all departments. The decided ratios are used to distribute the costs of service departments to the production and other service departments. This is continued till the figures of service departments become 'nil' or 'negligible'.

Illustration 3

The summary as per primary distribution is as follows:

Production departments A- ₹2400; B- ₹2100 & C- ₹1500

Service departments X – ₹700; Y- ₹900

Expenses of service departments are distributed in the ratios of:

X dept. : A- 20%, B- 40%, C- 30% and Y- 10%

Y dept. : A- 40%, B- 20%, C- 20% and X- 20%

Show the distribution of service costs among A, B and C under repeated distribution method.

Solution:

Particulars	Production departments			Service departments	
	A	B	C	X	Y
As per primary distribution	2400	2100	1500	700	900
Service dept X	140	280	210	(700)	70
Service dept Y	388	194	194	194	(970)
Service dept X	38.8	77.6	58.2	(194)	19.4
Service dept Y	7.76	3.88	3.88	3.88	(19.4)
Service dept X	0.776	1.552	1.164	(3.88)	0.388
Total	2975.336	2657.032	1967.244	0	0.388

It can be noticed that the undistributed balance in service department is very negligible and thus can be ignored for further distribution

(e) Simultaneous Equations Method: Under this method, simultaneous equations are formed using the service departments' share with each other. Solving the two equations will give the total cost of service departments after loading the inter-departmental exchange of services. These costs are then distributed among production departments in the given ratios.

In the above Illustration No. 3, service dept X gives 10% of its service to Y and receives 20% of Y's service.

Let 'x' be the total expenses of dept X (its own + share of Y) and

'y' be the total expenses of dept Y (its own + share of X)

This can be expressed as:

$$'x' = 700 + 20\% \text{ of 'y' and}$$

$$'y' = 900 + 10\% \text{ of 'x'}$$

$$\text{i.e. } x = 700 + 0.2y \text{ and}$$

$$y = 900 + 0.1x$$

Multiplying both equations by 10, we get

$$10x = 7000 + 2y \text{ i.e. } 10x - 2y = 7000 \text{ and}$$

$$10y = 9000 + x \text{ i.e. } -x + 10y = 9000$$

Now multiplying 2nd equation by 10, and then adding the two equations we get,

$$98y = 97000$$

Thus $y = 990$ and $x = 898$

Based on this we distribute the service department costs over production departments.

Redistribution Statement

	Department				
	A	B	C	X	Y
Primary Distribution	2400	2100	1500	700	900
X	180	359	269	(898)	90
Y	396	198	198	198	(990)
Total	2976	2657	1967	—	—

(f) Trial and Error method

This method is to be followed when the question of distribution of costs of service cost centres which are interlocked among them arises. In the first stage, gross costs of services of service cost centres are determined. In the second stage cost of service centres are apportioned to production cost centres.

Limitations of Apportionment

Whichever method we may use, it still depends on a suitable basis used. The basis will always lead to approximations. If an approximate data is used for analysis, control and decision-making, it may cause erroneous results. Thus one has to be careful in relating the cost data to cost centre or cost unit. The natural relation of most of the indirect costs i.e. overheads is to a time period. In other words, almost all overheads are period costs and hence an attempt to link it to cost unit will always be arbitrary. As such, the traditional methods of allocation and apportionment are often challenged by many in the industry. The techniques like Marginal Costing owe their origin to such limitations of Traditional Costing.

Capacity of Overhead Rate

Influence of activity level on overhead rate

In determination of overhead rate, a good deal depends upon the activity level, which is assumed. In other words, capacity consideration influence overhead rate. Overhead rate will be different at different capacity levels. Efficient utilization of capacity is desirable both for society and management. Following capacity concepts merit consideration for overhead rate determination:-

Theoretical or Maximum Plant Capacity

Maximum Capacity or the Ideal Capacity is the capacity for which plant is designed to operate. It is only Theoretical Capacity. It does not give allowance for waiting, delays and shut-down. The capacity is significant for designing the plant mechanically. For cost considerations, this capacity is not important. Ideal Capacity is never used to determine overhead rates for its disregard to even necessary interruptions in production process.

Practical Capacity

When this capacity is determined, allowance is given for unavoidable interruptions like time lost for repairs, inefficiencies, breakdown, delay in delivery of raw material and supplies, labour shortages and absence, Sunday, holidays, vacation, inventory taking, etc. Thus, Practical Capacity is the maximum Theoretical Capacity with minor unavoidable interruptions. These unavoidable interruptions are based mostly on internal influences and do not consider main external causes like lack of customers orders. The Practical Capacity is determined with reference to nature of industry and circumstances in which a particular factory is situated. Normal unavoidable interruptions account for 15% to 25% of the maximum capacity. The Practical Capacity, thus, ranges between 75% and 85% of maximum capacity after giving allowance for normal unavoidable interruptions.

Normal Capacity

Idle capacity due to long-term sales trend only is reduced from Practical Capacity to get Normal Capacity. Calculation of Normal Capacity of a plant presents considerable problems. Normal Capacity is determined for the business as a whole. Then, it is broken down by plants and departments. For Normal Capacity determination, prime considerations are physical capacity and average sales expectancy. It should be noted that average sales expectancy to be considered for this purpose takes into account a period enough to level out cyclical fluctuations. The determination of Normal Capacity helps in: i) the preparation of flexible budgets and computation of predetermined factory overhead rates. ii) the use of Standard Costing, iii) estimating sales price etc., iv) scheduling production, v) inventory valuation, vi) determination of breakeven point, vii) controlling costs.

Importance of determining Normal Capacity

The Normal Capacity considerations are important for:

- (a) budget preparation;
- (b) determination of overhead rate;
- (c) determination of standard cost, and
- (d) preparation of operation of operational plans.

For determining the Normal Capacity, machinery purchased for future use and outmoded machinery should be excluded for consideration.

Capacity based on Sales Expectancy

Capacity may be based on sales expectancy for the year. The distinction between Normal Capacity and capacity based on sales expectancy should be properly understood. While Normal Capacity considers the long-term trend analysis of sales, which is based on sales of a cycle of years, the capacity based on sales expectancy is based on sales for the year only. When long-term sales trends are determined, cycle of years long enough to even out cyclical fluctuations is considered. Capacity based on sales expectancy is influenced more by general economic conditions and forecast of industry than long term sales trends. The main advantages of determining overhead rate based on sales expectancy are i) Overhead rate is linked with actual sales expectancy, ii) Overhead costs are adequately spread over the production and iii) Overhead rate determined for this purpose is very useful for making decisions like price fixation, etc.

Idle Capacity and Excess Capacity

Practical Capacity is determined after giving allowance to unavoidable interruptions like time lost for repairs, inefficiencies, breakdown and labour shortage, etc.,. Even this Practical Capacity is not normally fully achieved. Some losses due to idleness of workers and plant facilities to occur even in most carefully administered companies. These losses are not taken into account for determining the Practical Capacity, because for the purpose of determining Practical Capacity only unavoidable interruptions are considered. Thus, the difference between Practical Capacity and Normal Capacity, i.e., the capacity based on long-term sales expectancy is the Idle Capacity. However, if Actual Capacity happens to be different from capacity based on sales expectancy, the idle capacity will represent difference between Practical Capacity and Actual Capacity. Idle Capacity is that part of Practical Capacity which is not utilized due to factors like temporary lack of orders, bottlenecks and machine breakdown, etc. Idle Capacity represents unused productive potential, which fails to be realized due to interruptions that are not unavoidable. Idle capacity is that part of Practical Capacity which is not utilized due to irregular interruptions.

Idle Capacity is different from Excess Capacity. Idle Capacity refers to temporary idleness of available resources due to irregular interruptions. Excess Capacity results either from managerial decision to retain larger production capacity or from unbalanced equipment or machinery within departments. Excess Capacity refers to that portion of Practical Capacity which is available, but no attempt is made for its utilization for strategic or other reasons. If the Excess Capacity results from purchase of assets not required, it will be a prudent policy for company to dispose of the assets which cause Excess Capacity. Alternatively, action should be taken for utilization of resources in the form of Excess Capacity. Excess Capacity also results from imbalance or bottlenecks in certain departments. This situation can be remedied by attempting synchronization in the working of various departments, working overtime, running double shift and temporary off-loading to departments having spare capacity. While overhead rate includes cost of Idle Capacity, Excess Capacity is excluded from overhead rate consideration.

Idle time is distinguished from Idle Capacity and its cost is separated in the accounts. Idle time represents lost time of men and machines arising from lack of business or of material, a breakdown of equipment, faulty supervision or other similar causes whether avoidable or not. Idle Capacity is the difference between Practical Capacity and Actual Capacity and represents the unused production potential.

Idle Capacity costs are represented mostly by the fixed charges of owning and maintaining plant and equipment and of employing services, which are not used to their maximum potential. The principal causes of idle capacity are:

Production Causes

These causes primarily result from poor organization of operational plan. Following production causes often lead to Idle Capacity:-

- (a) Repetitive machine adjustment - i) Setup and change-over. ii) Repairs and adjustment.
- (b) Lack of materials or tools - i) Internal ii) External

- (c) Lack of supervision, inspection and instruction.
- (d) Lack of power – i) Internally produced. ii) Externally produced

Administrative Causes:

Sometimes various administrative decisions taken at various level of management result in Idle Capacity. Major administrative causes that lead to Idle Capacity are: a) Excess plant for anticipated expansion, b) Special machines prepared for particular jobs, and c) Strikes / Lockouts.

Economic Causes

Sometimes demand for the goods is seasonal as in case of wool, ice cream and furs and production cannot be evenly distributed. This is especially true, when there exists danger of deterioration of the product or where carrying charges for stock are too large. Thus, seasonal, cyclical and industrial causes also lead to Idle Capacity.

Various practices are followed in different companies for disposing of Idle Capacity cost. It is often agreed in principle that normal production losses should be absorbed in product costs. Abnormal losses should be treated as non-operating expenses in product costs. Abnormal losses should be treated as non-operating expenses by direct debit to Profit and Loss Account. Certain companies follow the practice of computing idle time costs on their leading products by use of statistical techniques. Cost Accountants should particularly analyse the reasons for idle plant and equipment not used during the period for non-con-controllable causes. The review of practices of different companies reveals that Idle Capacity is a somewhat flexible concept. It is an individual problem which should be considered after taking into account the special situations. For the growth and survival of the organisation, the management is keenly interested to know the idleness, its causes, its cost and its available remedies. Normally different companies follow a bit varying restricted accounting concept of Idle Capacity. In many cases unabsorbed fixed overhead represents losses due to managerial decisions and it becomes a subjective matter to refer it as idle capacity cost. Overhead rates of different capacity levels will be different due to influence of fixed overhead.

Absorption of Overheads

Once the steps of primary and secondary distribution are carried out, what we get is total indirect costs of production departments. The next step is to assign these totals to the individual product units. A job or a product passes through all or many production departments before it is formed into a finished saleable product. It is necessary to know the cost of each department it passes through per unit. The absorption of overhead enables a Cost Accountant to recover the overhead cost spent on each product department through each unit produced. Overhead absorption is also known as levy or recovery of overheads. How is this done? Suppose in turning department a total of 1200 tubes are turned and the cost of turning department overheads (after secondary distribution) are ₹72000, then can we say the cost of turning per tube is ₹6/-? Most probably yes. This ₹6 per unit is called as *Overhead Absorption Rate*.

Absorption means 'recording of overheads in Cost Accounts on an estimated basis with the help of a predetermined overhead rate, which is computed at normal or average or maximum capacity'

In general, the formula for overhead absorption rate is give as:-

Overhead Rate = Amount of Overhead / No of units of the base

Overhead Absorption Rates: For the purpose of absorption of overhead in costs of jobs, processes, or products overhead rates related to suitable factors or bases to be determined. There are several methods in use for determining the overhead rates i.e Actual or Predetermined Overhead Rate, Blanket or Multiple Rates.

Actual Overhead Rate

Actual Overhead Rate is obtained by dividing the overhead expenses incurred during the accounting period by actual quantum on the base selected. Assuming that the rates are worked out on a monthly basis the formula is:-

Overhead Rate = Actual overhead during the month ÷ Value/Quantity of the base during the month

Absorption of overheads based on actual rates may not be adopted due to the following reasons:-

- (a) Actual overhead rate can be computed only after the accounting period is over.
- (b) The incidence of some of the items of expenses like repairs, overhauling, etc is not uniformly spread over all the accounting periods.
- (c) Actual overhead rates do not provide any basis for cost control.

Pre-determined Overhead Rate

Predetermined Rate is computed by dividing the budgeted overhead expenses for the accounting period by the budgeted base (quantity, hours, etc)

Overhead Rate = Budgeted overhead expenses for the period / Budgeted Base for the period

Advantages of Predetermined Overhead Rate

- (a) Enables prompt preparation of cost estimates, quotations and fixation of selling prices.
- (b) Cost data is available to management along with financial data.
- (c) In case of Cost-plus contracts prompt billing is possible through pre-determined recovery rates.
- (d) In concerns having budgetary control system, no extra clerical efforts are required in computing the pre-determined overhead rate.

Blanket (Single) Overhead Rate

A single overhead rate for the entire factory may be computed for the entire factory. So this is known as factory wide or Blanket Overhead Rate Method.

Blanket Rate = Overhead Cost for the factory / Total Quantum of the base.

Blanket Rate of overheads may be applied suitable in a small size concerns. Blanket Rates are easy to compute. The use of Blanket Rate of overheads gives erroneous and misleading results, where several products passing through number of different departments. With Blanket Rate of overhead, satisfactory level of managerial control is not possible.

Multiple Rates:

This method is most commonly used to determine the multiple overhead rates, i.e separate rates:

- (a) For each producing department;
- (b) For each service department;
- (c) For each Cost Centre; and
- (d) For each product line.

The multiple rates are worked out according to the below formula:

Overhead Rate = Overhead cost allocated & apportioned to each product, dept / Corresponding Base

The number of overhead rates a firm may compute would be fixed taking into consideration of two opposing factors viz clerical costs involved and the degree of accuracy level desired.

Production Unit Method

Simply put the concept here is to average out the total overheads on total units produced. In a tube manufacturing unit the total overheads are ₹72000 and total tubes processed are 12000. The overhead absorption rate is: $72000/12000$ i.e. ₹6 per tube. If this rate is based on the budgeted costs and number of units, and if the factory now gets an order for 2500 tube processing, the amount of production overheads to be charged to that order will be $(2500 * 6)$ i.e. ₹15000/-

Percentage of Direct Wages

Under this method, overhead for a job is recovered on the basis of a predetermined percentage of direct wages. This method is used when the component of direct wages is higher. If the overhead to be absorbed is ₹120000 and the direct wages are estimated at ₹800000, the predetermined rate will be calculated as $(120000/800000)$ i.e. 15%. If a job is received where direct wages are estimated at ₹9000/- then the production overheads to be absorbed will be 15% of ₹9000 i.e. ₹1350 This method is useful if the direct labour hours can be standardised and the labour rates do not fluctuate too much. However, this method ignores the contribution made by other resources like machinery. The method also ignores the fact that there may be different types or grades of workers and each may cost differently. It also sidelines the fact that most of the production overheads are time-related.

Percentage of Direct Material Cost

Here the absorption rate is expressed as a percentage of direct material cost. This method is useful when the proportion of material cost is very high and that of labour cost is comparatively negligible. It is useful if material grades and rates do not fluctuate too much. If production overhead to be absorbed is ₹2000 and the material cost is expected to be ₹4000, then the absorption rate will be $(2000/4000)$ i.e. Thus 50% of direct material cost.

Thus for a job requiring direct material of ₹200, the production overheads to be absorbed will be ₹100 i.e. 50% of ₹200. However, many overhead items bear no relationship with material cost, and also the fact of time dimension of overheads is not taken into account by this method.

Percentage of Prime Cost

This method combines the benefits of direct wages and direct material cost methods as we know prime cost means direct material plus direct wages plus direct expenses. This method could be used when prime cost constitutes a major proportion of the cost and the rates of material & labour are stable. It is needed that the product made is standard product. If the prime cost is expected to be ₹50000 and the production overheads are estimated at ₹2500, then the absorption rate will be 5% of prime cost. If a job has a prime cost of ₹800, then overhead absorbed on that job will be ₹40/-

Direct Labour Hour

Under this method, the absorption rate is calculated by dividing the overhead amount by the actual or predetermined direct labour hours. This is extremely useful when the production is labour intensive. This method is superior to the earlier ones, because it takes cognizance of the time factor. If the direct labour hours for a month amount to 10000 and the overheads to be absorbed are ₹5000, then the absorption rate is ₹0.50 per hour (i.e. 5000/10000). If a job is going to require a labour time of 250 hours, the production overheads to be loaded on the job will be ₹125 (i.e. 250 * 0.50). The data related to labour hours has to be properly collected or estimated. The labour hour rate may be calculated as a single rate or different for different group of workers.

Machine Hour Rate

In the days of mechanised production processes, the most relevant rate to be applied is the machine hour rate. This is the rate calculated by dividing the actual or budgeted overhead cost related to a machine or a group of machines by the appropriate number of machine hours. These hours could be actual hours or budgeted hours. When budgeted hours are used they are taken at average capacity at which a factory normally operates. You cannot take full capacity hours as the factory may not operate at that level and then the absorption rate may be unnecessarily fixed at a lower level. The overheads in a highly mechanised factory are mostly related to the number of hours a machine runs. Hence this is supposed to be the best method for absorbing overhead costs into the cost unit. If a machine normally runs for 2000 hours in a month and monthly overheads to be absorbed are ₹15000, then the machine hour rate will be calculated as (15000/2000) i.e. ₹7.50 per machine hour. If a job take 75 hours on that machine, then ₹562.50 (75 * 7.5) will have to be loaded as cost of using the machine for that job.

A machine hour rate may be calculated using only those overheads which are directly related to the machine e.g. power, fuel, repairs, maintenance, depreciation etc. These expenses are totalled and then divided by the hours to compute the rate. This is called as *Ordinary Machine Hour Rate*. Whereas, if costs not related to machine are also included (e.g. supervision, rent, lighting, heating etc.) for the rate calculation, such rate is called as *Composite Machine Hour Rate*. While calculating machine hour rate, the wages paid to machine operators may be added to the total costs. This is because these operators directly work on the machines & thus related to machine operation. At times a factory may have more than one similar machines simultaneously working. In such case, a *group machine hour rate* may be calculated.

Factors influencing the selection of Overhead Recovery Rate

The particular method or methods selected for application in a company would depend upon the factors mentioned below. Selection of the most equitable method is of paramount importance since a method that is not suitable will distort costs and thus make them useless for control and decision making purpose.

Selection of Overhead Recovery Rates depends on the following factors:-

- Nature of the product and process of manufacture.
- Nature of overhead expenses.
- Organisational set-up of the undertaking into departments and or cost centers.
- Individual requirements with regard to the circumstances prevailing.
- Policy of the management.
- Accuracy vis-a-vis cost of operating the method. Some of the methods are comparatively more accurate and provide equitable bases for overhead absorption.

The main features of a satisfactory overhead rate are as follows:-

- Simple, easy to operate, practical and accurate;

- (b) Economic in application;
- (c) Fairly stable so that cost from period to period does not vary;
- (d) Related to time factor as far as practical;
- (e) Departmental rates are preferable to blanket rates;
- (f) Area of activity selected for computation of the rate should be homogeneous cost unit;
- (g) Base for the rate should lay stress on the main production element of the concern.

Under-absorption and Over-absorption of Overhead

The amount of overhead absorbed in costs is the sum total of the overhead costs allotted to individual cost units by application of the overhead rate. When a predetermined rate worked out on the basis of anticipated or budgeted overhead and base is applied to the actual base, the amount absorbed may not be identical with the amount of overhead expenses incurred if either the actual base or the actual expenses or both deviate from the estimates or the budget.

If the amount absorbed is less than the amount incurred, which may be due to actual expenses exceeding the estimate and / or the output or the hours worked may be less than the estimate, the difference denotes under-absorption.

On the other hand if the amount absorbed is more than the expenditure incurred, which may be due to the expense being less than estimate and / or the output or hours worked may be exceeding the estimate, this would indicate over-absorption, which goes to inflate the costs.

Under or over absorption of overhead may arise due to one or the other of the causes given below:-

- (a) Error in estimating overhead expenses.
- (b) Error in estimating the level of production, i.e the base.
- (c) Major unanticipated changes in the methods of production.
- (d) Unforeseen changes in the production capacity.
- (e) Seasonal fluctuations in the overhead expenses from period to period.
- (f) Overhead rate may be applied to the Normal Capacity which may be less than the full operating capacity of the undertaking.

How does one deal with the situation of over or under absorption. There are three ways to handle it:

- (a) *Write-off (in case of under absorption) or write back (in case of over-absorption) to the P & L Account.* This treatment is valid if most of the overhead items are related to time.
- (b) *Carry forward to the next period through a reserve account.* This method is not recommended on the logic that it is inconsistent with Accounting Standards.
- (c) *Use of supplementary rates* to adjust the effect to the cost of sales, finished stocks and Work in Process stocks. This sounds logical as it does not carry forward the unabsorbed or over absorbed overheads to the next accounting period entirely. It aims at splitting the total effect between the cost of sale (which is charged to current year's profits) and stocks (which get carried forward to the next year).

Illustration 4

Overhead incurred	₹ 1,50,000
Overhead recovered	₹ 1,00,000
Cost of sales	₹ 10,00,000
Finished goods	₹ 8,00,000
Work in process	₹ 7,00,000

Solution:

Here, the overheads under-absorbed are (1,50,000-1,00,000) ₹50,000.

Total of Cost of sales, FG stock & WIP is ₹25,00,000

The supplementary rate will be 50,000/25,00,000 i.e. ₹0.020

This will be distributed as:

₹20,000 to cost of sales (i.e. 10,00,000 x 0.020)

₹16,000 to FG stock (i.e. 8,00,000 x 0.020) and

₹14,000 to WIP (i.e. 7,00,000 x 0.020)

Reporting of overhead costs:

Presentation:

- Overheads shall be presented as separate cost heads like production, administration and marketing.
- Element wise and behavior wise details of the overheads shall be presented, if material.
- Any under-absorption or over-absorption of overheads shall be presented in the reconciliation statement.

Disclosure:

- The basis of assignment of overheads to the cost objects.
- Overheads incurred in foreign exchange.
- Overheads relating to resources received from or supplied to related parties
- Any Subsidy / Grant / Incentive or any amount of similar nature received / receivable reduced from overheads.
- Credits / recoveries relating to the overheads.
- Any abnormal cost not forming part of the overheads.
- Any unabsorbed overheads.

Illustration 5

In an Engineering Factory, the following particulars have been extracted for the quarter ended 31st December, 2015. Compute the departmental overhead rate for each of the production departments, assuming that overheads are recovered as a percentage of direct wages.

	Production Depts.			Service Depts.	
	A	B	C	X	Y
Direct Wages (₹)	30,000	45,000	60,000	15,000	30,000
Direct Material	15,000	30,000	30,000	22,500	22,500
No. of workers	1,500	2,250	2,250	750	750
Electricity KWH	6,000	4,500	3,000	1,500	1,500
Assets Value	60,000	40,000	30,000	10,000	10,000
No. of Light points	10	16	4	6	4
Area Sq. Yards	150	250	50	50	50

The expenses for the period were:

	₹
Power	1,100
Lighting	200
Stores Overhead	800
Welfare of Staff	3,000
Depreciation	30,000
Repairs	6,000
General Overheads	12,000
Rent and Taxes	550

Apportion the expenses of Service Dept. Y according to direct wages and those of Service Department X in the ratio of 5: 3 : 2 to the production departments.

Solution:

Statement showing apportionment of overheads and computation of OH rates:

Particulars	Basis	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Material	Actual	45,000	—	—	—	22,500	22,500
Wages	Actual	45,000	—	—	—	15,000	30,000
Power	KWH (4:3:2:1:1)	1,100	400	300	200	100	100
Lighting	Light Points (5:8:2:3:2)	200	50	80	20	30	20
Stores overhead	Materials (2:4:4:3:3)	800	100	200	200	150	150
Welfare of staff	No. of workers (2:3:3:1:1)	3,000	600	900	900	300	300
Depreciation	Assets Value (6:4:3:1:1)	30,000	12,000	8,000	6,000	2,000	2,000
Repair	Assets Value (6:4:3:1:1)	6,000	2,400	1,600	1,200	400	400
General Over-heads	Direct Wages (2:3:4:1:2)	12,000	2,000	3,000	4,000	1,000	2,000
Rent & Taxes	Area (3:5:1:1:1)	550	150	250	50	50	50
		1,43,650	17,700	14,330	12,570	41,530	57,520
Costs of 'X'	5:3:2		20,765	12,459	8,306	(41,530)	—
Costs of 'Y'	2:3:4		12,782	19,173	25,565	—	(57,520)
			51,247	45,962	46,441	—	—

Overhead Rate as % on direct wages

$$A = [51,247/30,000] \times 100 = 170.82\%$$

$$B = [45,962/45,000] \times 100 = 102.14\%$$

$$C = [46,441/60,000] \times 100 = 77.40\%$$

Illustration 6

The New Enterprises Ltd. has three producing departments A,B and C two service Departments D and E. The following figures are extracted from the records of the Co.

	₹
Rent and Rates	5,000
General Lighting	600
Indirect Wages	1,500
Power	1,500
Depreciation on Machinery	10,000
Sundries	10,000

The following further details are available:

	A	B	C	D	E
Floor Space (Sq.Mts.)	2,000	2,500	3,000	2,000	500
Light Points	10	15	20	10	5
Direct Wages	3,000	2,000	3,000	1,500	500
H.P. of machines	60	30	50	10	--
Working hours	6,226	4,028	4,066	--	--
Value of Material	60,000	80,000	1,00,000	--	--
Value of Assets	1,20,000	1,60,000	2,00,000	10,000	10,000

The expenses of D and E are allocated as follows:

	A	B	C	D	E
D	20%	30%	40%	--	10%
E	40%	20%	30%	10%	--

What is the factory cost of an article if its raw material cost is ₹50, labour cost ₹30 and it passes through Departments A, B and C. For 4, 5 & 3 hours respectively.

Solution:

Statement showing apportionment of overheads to departments

Particulars	Basis	Total (₹)	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)
Rent & Rates	Space (4:5:6:4:1)	5,000	1,000	1,250	1,500	1,000	250
Lighting	Light Points (2:3:4:2:1)	600	100	150	200	100	50
Indirect wages	Direct wages (6:4:6:3:1)	1,500	450	300	450	225	75
Power	Horse Power (6:3:5:1)	1,500	600	300	500	100	--
Depreciation	Value of Asset (12:16:20:1:1)	10,000	2,400	3,200	4,000	200	200
Sundries	Direct wages (6:4:6:3:1)	10,000	3,000	2,000	3,000	1,500	500
Wages	Actual	2,000	--	--	--	1,500	500
		30,600	7,550	7,200	9,650	4,625	1,575

Repetitive Distribution Method ₹

Particulars	A	B	C	D	E
Totals	7,550	7,200	9,650	4,625	1,575
Cost of D (2:3:4:1)	925	1,387	1,850	(4,625)	463
	8,475	8,587	11,500	--	2,038
Cost of E (4:2:3:1)	815	408	611	204	(2,038)
	9,290	8,995	12,111	204	--
Cost of D (2:3:4:1)	41	61	82	(204)	20
	9,331	9,056	12,193	--	20
Cost of E (4:2:3:1)	8	4	6	2	(20)
	9,339	9,060	12,199	2	--
Cost of D (2:3:4:1)	--	1	1	(2)	--
	9,339	9,061	12,200	--	--
Working Hours	6,226	4,028	4,066		
Rate per hour	1.5	2.25	3.00		

Computation of Factory Cost of the Article ₹

Particulars	Amount

Material	50.00
Labour	30.00
Overheads	
Dept A (4 x 1.5)	6.00
Dept B (5 x 2.25)	11.25
Dept C (3 x 3)	9.00
Factory Cost	106.25

Simultaneous Equation Method

Let total cost of Service Department D be ₹ 'd'.

Let total cost of Service Department E be ₹ 'e'.

$$d = 4625 + 10/100 e$$

$$e = 1575 + 10/100 d$$

$$\Rightarrow 100 d = 462500 + 10 e$$

$$\Rightarrow 100 d - 10 e = 462500 \quad \rightarrow (1)$$

$$\Rightarrow 100 e = 157500 + 10 d$$

$$\Rightarrow -10 d + 100 e = 157500 \quad \rightarrow (2)$$

$$\text{Equ. (1)} \quad 100 d - 10 e = 462500$$

$$\text{Equ. (2) } \times 10 \quad -100 d + 1000 e = 1575000$$

$$990 e = 2037500$$

$$e = 2037500 / 990$$

$$= 2,058$$

Substituting the value of 'e' in Equation (1), we get

$$\Rightarrow 100 d - 10 (2058) = 462500$$

$$\Rightarrow d = 483080 / 100$$

$$\Rightarrow d = 4831$$

Particulars	A	B	C	D	E
Totals	7,550	7,200	9,650	4,625	1,575
Costs of D (2:3:4:1) (4831)	966	1,450	1,932	(4,831)	483
Costs of E (4:2:3:1) (2,058)	823	412	617	206	(2058)
	9,339	9,062	12,199	--	--

Illustration 7

The following information relates to the activities of a production department of factory for a certain period.

	₹
Material used	36,000
Direct Wages	30,000
Labour hours	12,000
Hours of Machinery-operation	20,000
Overhead Chargeable to the Dept	25,000

On one order carried out in the department during the period the relevant data were:-

Material used (₹)	6,000
Direct Wages (₹)	4,950
Labour hours worked	1,650 Hrs.
Machine Hours	1,200

Calculate the overheads chargeable to the job by four commonly used methods.

Solution:

The four commonly used methods of absorbing or recovering overheads are as follows:

1. % of overheads on material = $(25,000 / 36,000) \times 100 = 69.44\%$
2. % of overheads on direct wages = $(25,000 / 30,000) \times 100 = 83.33\%$
3. Overhead rate per labour hour = $25,000 / 12,000 = 2.083$
4. Machine hour rate method = $25,000 / 20,000 = 1.25$

The overheads chargeable to job under the above methods is as follows:

1. Material = $6,000 \times 69.44\% = 4,166.40$
2. Wages = $4,950 \times 83.33\% = 4,125$
3. Labour hour rate = $1,650 \times 2.083 = ₹ 3,437$
4. Machine hour rate = $1,200 \times 1.25 = ₹ 1,500$

Illustration 8

In a machine department of a factory there are five identical machines. From the particulars given below; prepare the machine hour rate for one of the machines.

Space of the department	10,000 sq.mts.
Space occupied by the machine	2,000 sq.mts.
Cost of the machine (₹)	20,000
Scrap value of the machine (₹)	300
Estimated life of the machine	13 years
Depreciation charged at	7 ½ % p.a
Normal running of the machine	2,000 hours
Power consumed by the machine as shown by the meter	3,000 p.a
Estimated repairs and maintenance throughout the working life of the machine (₹) 5,200 Sundry supplies including oil, waste etc. charged direct to the machine amount to ₹ 600 p.a.	
Other expenses of the department are :	₹
Rent and Rates	9,000
Lighting (to be apportioned according to workers employed)	400
Supervision	1,250
Other charges	5,000

It is ascertained that the degree of supervision required by the machine is $\frac{2}{5}$ th and $\frac{3}{5}$ th being devoted to other machines.

There are 16 workers in the department of whom 4 attended to the machine and the remaining to the other machines.

Solution:

Computation of Machine Hour Rate

₹

Particulars		Rate per hr.
Standing Charges		
Rent & Rates	$9000 \times (2000 / 10000) = 1800$	
Lighting	$400 \times (4 / 16) = 100$	
Supervision	$1250 \times (2/5) = 500$	
Other Charges	$5000 \times (1/5) = 1000$	
	= 3400	
Standing charges per hour	$3,400 / 2,000 =$	1.70
Machine Expenses		
Depreciation	$(20000 \times 7.5\%) \div 2,000 = 0.750$	2.75
Power	$(3,000 / 2,000) = 1.500$	
Repairs & Maintenance	$(5200 / 13) \div 2,000 = 0.200$	
Sundry Supplies	$(600 / 2,000) = 0.300$	
Machine Hour Rate =		4.45

Illustration 9

From the following particulars given below compute Machine hour rate for a machine.

- Cost ₹ 24,000
- Scrap value ₹ 4,000
- Estimated Working life 40,000 hours
- Estimated cost of repairs and maintenance during the whole life ₹2,000
- Standard charges of the shop for 4 weekly period ₹ 3,000
- Working hours in 4 weekly period 100 hours
- No. of machines in the shop each of which is liable for equal charge are 30 machines.
- Power used per hour 4 units @ 10p. per unit.

Solution:

Computation of Machine Hour Rate ₹

Particulars		Rate per hr.
Standing Charges		
Standing Charges	$[3,000 / (100 \times 30)]$	1.00
Machine Expenses		
Depreciation	$[(24,000 - 4,000) / 40,000] = 0.50$	
Repairs	$[2,000 / 40,000] = 0.05$	
Power	$[4 \times 0.1] = 0.40$	0.95
Machine Hour Rate =		1.95

Illustration 10

The following particulars relate to a processing machine treating a typical material. You are required to calculate the machine hour rate.

The cost of the machine	₹ 10,000
Estimated life	10 years
Scrap value	₹1,000
Working time (50 weeks of 44 hrs. each)	2,200 hrs.
Machine maintenance per annum	200 hrs
Setting up time estimated @ 5% of total productive time	
Electricity is 16 units per hour @ 10 paise per unit.	
Chemicals required weekly	₹20
Maintenance cost per year	₹1,200

Two attendants control the operations of the machine together with 6 other machines, their combined weekly wages are ₹ 140. Departmental overhead allocated to this machine per annum ₹ 2,000.

Solution:

Annual Working hours: 50 weeks X 44 hrs.	2,200
Less : Maintenance time	<u>200</u>
Productive hours	2,000
Less : 5% Setting up time	<u>100</u>
Effective hours	<u>1,900</u>

Computation of Machine Hour Rate ₹

Particulars		Rate per hr.
Standing Charges		
Chemical Solution	(50 x 20) = 1,000	
Attendants wages	(140 x 50 x 1/7) = 1,000	
Departmental overheads	= <u>2,000</u>	
	= <u>4,000</u>	
Rate per hour	4,000 / 2,200	1.82
Machine Expenses		
Depreciation	[(10,000 – 1,000)/10] ÷ 1900 = 0.47	
Maintenance	(1,200 / 1,900) = 0.63	
Power	(16 x 0.1) = 1.60	2.70
Machine Hour Rate =		4.52

Illustration 11

Your company uses a historical cost system and applies overheads on the basis of "Predetermined" rates. The following are the figures from the Trial Balance as at 30-9-2015:

	Dr. (₹)	Cr. (₹)
Manufacturing overheads	4,26,544 ---	
Manufacturing overheads-applied ---		3,65,904

Work-in-progress	1,41,480	---
Finished Goods Stock	2,30,732	---
Cost of Goods Sold	8,40,588	---

Give two methods for the disposal of the under absorbed overheads and show the profit implications of the method.

Solution:

	₹
Overheads incurred	= 4,26,544
Overheads absorbed	= <u>3,65,904</u>
Under absorption	= <u>60,640</u>

The following are the 3 methods for disposing off this under absorbed overheads:

1. Transferring to the costing P & L A/c under this method, the profit will decrease by ₹ 60,640.
2. The amount may be disposed off by carrying forward to the next year. In this case, there will be no effect on profit.
3. Applying Supplementary Overhead Rate and further absorbing, which may be shown as follows. Under this method also, the profit will decrease by ₹ 60,640.

$$\begin{aligned}\text{Supplementary OH Rate} &= [60,640 / 12,12,800] \times 100 \\ &= 5\%\end{aligned}$$

		₹	
		Suppl. OH (5%)	Total
Work in Progress	1,41,480	7,074	1,48,554
Finished Goods	2,30,732	11,537	2,42,269
Cost of goods sold	8,40,588	42,029	8,82,617
	12,12,800	60,640	12,73,440

Illustration 12

In a factory the expenses of factory are charged on a fixed percentage basis on wages and office overhead expenses are calculated on the basis of percentage of works cost.

	I Order (₹)	II Order (₹)
Material	12,500	18,000
Wages	10,000	14,000
Selling price	44,850	61,880
Percentage of profit on cost	15%	12%

Find the rate of Factory OH and Office OH.

Solution:

Let 'X' and 'Y' be the % of Works Overhead on wages and Office Overhead on works cost respectively.

Particulars	Order I	Order II
Material	12,500	18,000
Wages	10,000	14,000
Prime Cost	22,500	32,000
(+) Factory OH's	$(10,000 \times X/100) = 100X$	$(14,000 \times X/100) = 140X$
Works Cost	$22,500 + 100X$	$32,000 + 140X$

(+) Office Overheads [(100 X + 22,500) x Y/100] [(140 X + 32,000) x Y/100]	XY + 225Y	1.4XY + 320Y
Total Cost	100X + XY + 225Y + 22,500	140X + 1.4XY + 320Y + 32,000
Cost	44,850 x (100/115) = 39,000	61,880 x (100/112) = 55,250

$$100X + XY + 225Y + 22,500 = 39,000$$

$$\Rightarrow 100X + XY + 225Y = 16,500 \quad \rightarrow \text{Equ. (1)}$$

$$140X + 1.4XY + 320Y + 32,000 = 55,250$$

$$\Rightarrow 140X + 1.4XY + 320Y = 23,250 \rightarrow \text{Equ. (2)}$$

$$\text{Equ. (1)} \times 1.4 \quad \Rightarrow 140X + 1.4XY + 315Y = 23,100$$

$$\text{Equ. (2)} \quad \Rightarrow 140X + 1.4XY + 320Y = 23,250$$

$$\begin{array}{r} (-) \quad (-) \quad (-) \quad (-) \\ \hline 5Y = 150 \end{array}$$

$$\text{Therefore, } Y = 150/50 = 30$$

Substituting the value of Y in Equ. (1), we get X

$$100X + 30X + 225 \times 30 = 16,500 \quad \rightarrow \text{Equ. (1)}$$

$$130X + 6750 = 16,500$$

$$130X = 9,750$$

$$X = 9,750/130 = 75$$

% of Factory OH on wages = 75%

% of Office OH on works cost = 30%

Illustration 13

Self-help Ltd. has gensets and produced its own power Data for power costs are as follows :-

	Production Depts.		Service Depts.	
	A	B	X	Y
Horse Power Hours	10,000	20,000	12,000	8,000
Needed at capacity production used during the month of May	8,000	13,000	7,000	6,000

During the month of May costs for generating power amounted to ₹9,300, of this ₹2,500 was considered to be fixed. Dept X renders service to other Depts. in the ratio of 13:6:1, while Y renders service at A & B in the ratio of 31:3. Given that the direct labour hours in Depts. A and B are 1,650 hours and 2,175 hours respectively, find the power cost per labour hour in each of these two departments.

Solution:

Statement Showing apportionment of power cost and computation of cost per hour

₹

Particulars	Basis	Total	A	B	X	Y
Fixed Cost	(5:10:6:4)	2,500	500	1,000	600	400
Variable Cost (9,300 – 2,500)	(8:13:7:6)	6,800	1,600	2,600	1,400	1,200
		9,300	2,100	3,600	2,000	1,600
Costs of X [(as it renders to more depts. (3))]	(13:6:1)		1,300	600	(2,000)	100
			3,400	4,200	--	1,700

Costs of Y	(31:3)		1,550	150	--	(1,700)
			4,950	4,350	--	--
Labour Hours			1,650	2,175		
Cost of power per labour hour			3	2		

Illustration 14

At Ltd engineering Co. having 25 different types of automatic machines, furnishes you the following data for 2016-17 in respect of machine B:

- Cost of the machine ₹ 50,000
Life - 10 years
Scrap value is nil
- Overhead expenses are:

Factory Rent	₹	50,000	p.a.
Heating and Lighting	₹	40,000	
Supervision	₹	1,50,000	p.a.
Reserve equipment of machine B	₹	5,000	p.a.
Area of the factory	80,000	sq.ft.	
Area occupied by machine B	3,000	sq.ft.	
- Wages of operator is ₹24 per day of 8 hours including all fringe benefits. He attends to one machine when it is under set up and two machines while under operation.
- Estimated production hours 3,600 p.a.
Estimated set up time 400 hrs. p.a.
Power 0.5 per hour

Prepare a schedule of comprehensive machine hour rate and find the cost of the following jobs:

	JOB 1102	JOB 1308
Set up time (Hrs.)	80	40
Operation time (Hrs.)	130	160

Solution:**Computation of machine hour rate when machine is in operation**

Particulars		Amount
Standing Charges:		
Rent	$50,000 \times 3/80 = 1875$	
Heating & Lighting	$40,000 \times 3/80 = 1500$	
Supervision	$1,50,000 \times 1/25 = 6000$	
Reserve equipment	$= 5000$	
	$= 14375$	
Cost per hour	$14375/4000$	3.59
Machine Expenses:		
Depreciation	$[50,000 \div (10 \times 3600)] = 1.39$	3.39
Wages	$[24/8 \times 1/2] = 1.50$	
Power	$= 0.50$	

Machine Hour Rate	6.98

Computation of machine hour rate when machine is under setup

Particulars		Amount
Standing Charges:		
Rent	50,000 x 3/80 = 1875	
Heating & Lighting	40,000 x 3/80 = 1500	
Supervision	1,50,000 x 1/25 = 6000	
Reserve equipment	= 5000	
	= 14375	
Cost per hour	14375/4000	3.59
Machine Expenses:		
Depreciation	[50,000 x (10 x 3600)] = 1.39	4.39
Wages	[24/8] = 3.00	
Power	= ----	
Machine Hour Rate		7.98

Computation of cost of the jobs

Particulars	Job 1102	Job 1308
Setup cost		
Job 1102 : 80 x 7.98	638.40	
Job 1308 : 40 x 7.98		319.20
Operation Cost		
Job 1102 : 130 x 6.98	907.40	
Job 1308 : 160 x 6.98		1,116.80
Total Cost of the Job	1,545.80	1,436.00

Illustration 15

Ganges Printing Co. has three operating departments:

1. Printing and Binding
2. Lithographing and
3. Engraving.

The company has a job order cost system using a single predetermined expense rate. The management has been made aware of the deficiencies of using such a rate and is now interested in departmentalising factory overhead. A study reveals that:

Department 1 has 3 similar machines representing a large investment and calling for high repairs and depreciation charges.

Department 2 has the workers perform similar tasks and are therefore paid the same hourly wage.

Department 3 however has several classes of workers, each group being paid the same hourly wage.

The estimated factory overhead and production data costs are as follows

	Printing & Binding	Litho-Graphing	Engraving
Factory overhead (₹)	40,000	68,750	1,20,000
Direct labour hours	10,000	20,000	40,000
Direct labour cost (₹)	25,000	55,000	80,000

Machine hours	20,000	NIL	NIL

Required:

- 1) An analysis to advice the management regarding the types of rates to be used in these departments.
- 2) A computation of the rates recommenced.

Solution:

1. It is appropriate to use machine hour rate method of absorbing overheads in Dept 1 because there is large investment in machine and therefore they are predominant.
OH rate per machine hour = $40,000 / 20,000 = ₹ 2$ per hour.
2. In Dept 2, it is better and appropriate to use labour hour rate of overheads because all the workers are paid at uniform wage rate.
OH rate per labour hour = $68,750 / 20,000 = ₹ 3.4375$ per hour.
3. In Dept 3, it is better and appropriate to use overhead rate based on certain % of wages because workers are paid at different rates.
OH % on wages = $(1,20,000 / 80,000) \times 100 = 150\%$

Illustration 16

For a department the standard overhead rate is ₹2.50 per hour and the overhead allowances are as follows:

Activity Level (Hours)	Budget overhead Allowance (₹)
3,000	10,000
7,000	18,000
11,000	26,000

Calculate:

- a) Fixed cost
- b) The standard activity level on the basis of which the standard overhead rate has been worked out.

Solution:**(a) Fixed Cost**

$$\begin{aligned}
 \text{Variable OH per hour} &= \frac{\text{High level cost} - \text{Low level cost.}}{\text{High level hours} - \text{Low level hours}} \\
 &= [(26,000 - 10,000) / (11,000 - 3,000)] \\
 &= ₹ 2 \text{ per hour} \\
 \text{Fixed Cost} &= 10,000 - (3,000 \times 2) = ₹ 4,000
 \end{aligned}$$

(b) Standard activity level at which the rate has been determined

$$\begin{aligned}
 &\text{Standard activity level at which the rate has been determined} \\
 &= \text{Fixed Cost} / \text{Fixed OH per hour} \\
 &= 4,000 / (2.5 - 2) = 8,000 \text{ hours}
 \end{aligned}$$

Illustration 17

In a certain factory three products are made from different materials by similar process. For a typical period production costs are as under:

Product A	Product B	Product C

	₹	₹	₹
Material used	1,600	2,000	800
Direct labour cost	1,200	1,000	400
Overhead (actual)	800	650	350

Overhead is charged to cost of each product at the rate of 25% on prime cost.

Do you see anything wrong in principle in this method of charging overheads? If so, suggest a preferable method.

Solution:

Since, different materials are used for producing products, it is advisable, preferable and appropriate to use the method of absorbing overheads based on % of materials instead of % on prime cost which is shown as follows:

₹

	A	B	C
Materials	1,600	2,000	800
Labour	1,200	1,000	400
Prime Cost	2,800	3,000	1,200
OH @ 25% on prime cost	700	750	300

% of OH on Material Cost:

$$A = [700/1600 \times 100] = 43.75\%$$

$$B = [750/2000 \times 100] = 37.5\%$$

$$C = [300/800 \times 100] = 37.5\%$$

Illustration 18

A company produced a simple product in three sizes A, B and C. Prepare a statement showing the selling and distribution expenses apportioned over these three sizes applying the appropriate basis for such apportionment in each case from the particulars indicated:

Express the total of the costs so apportioned to each size as:

- Cost per unit sold (nearest paise)
- A percentage of sales turnover (nearest to two places for decimal).

The Expenses are:

Expenses	Amount	Basis of apportionment
	₹	
Sales salaries	10,000	Direct charge
Sales commission	6,000	Sales turnover
Sales office expenses	2,096	Number of orders
Advt. General	5,000	Sales turnover
Advt. specific	22,000	Direct charge
Packing	3,000	Total volume cu.ft. product sold
Delivery expenditure	4,000	--- do ---

Warehouse expenses	1,000	--- do ---
Expenses credit collection	1,296	Number of orders

Data available relating to the three sizes are as follows :

	TOTAL	SIZE A	SIZE B	SIZE C
1. No. of salesmen, all paid same salary	10	4	5	1
2. Units sold	10,400	3,400	4,000	3,000
3. No. of orders	1,600	700	800	100
4. % of specific advt.	100%	30%	40%	30%
5. Sales turnover	2,00,000	58,000	80,000	62,000
6. Volume of cu.ft. per unit of finished products --	5	8	17	

Solution:

Statement Showing apportionment of selling expenses over the sizes and computation of cost per unit and % on sales:

Particulars	Basis	Total	A	B	C
Sales Salaries	(4:5:1)	10,000	4,000	5,000	1,000
Sales Commission	(29:40:31)	6,000	1,740	2,400	1,860
Sales Office expenses	(7:8:1)	2,096	917	1,048	131
Advt. General	(29:40:31)	5,000	1,450	2,000	1,550
Advt. Specific	(3:4:3)	22,000	6,600	8,800	6,600
Packing	(17:32:51)	3,000	510	960	1,530
Delivery	(17:32:51)	4,000	680	1,280	2,040
Warehouse	(17:32:51)	1,000	170	320	510
Credit collection	(7:8:1)	1,296	567	648	81
		54,392	16,634	22,456	15,302

	Particulars	A	B	C
a)	Cost per unit sold	$(16,634/3,400) \times 100$ = 4.89	$(22,456/4,000) \times 100$ = 5.614	$(15,302/3,000) \times 100$ = 5.10
b)	% on sales	$(16,634/58,000) \times 100$ = 28.67%	$(22,456/80,000) \times 100$ = 28.07	$(15,302/62,000) \times 100$ = 24.68

Working:

	A	B	C
Volume of cu. ft. per unit of finished products	5	8	17
Units sold	3,400	4,000	3,000
Total volume of cu. ft.	17,000	32,000	51,000

Illustration 19

For a production department of a manufacturing company you are required to :

- Prepare a fixed budget of overhead;
- Prepare a flexible budget of overhead, at 70% and 110% of budget volume;
- Calculate a departmental hourly rate of overhead absorption as per (a) and (b) above.

The budgeted level of activity of the department is 5,000 hours per period and the study of the various items of expenditure reveals the following :

	₹	₹ per hour
Indirect wages		0.40
Repairs upto 2,000 hours	100	
for each additional 500 hours		
upto a total of 4,000 hours	35	
Additional from 4,001 to 5,000 hours	60	
Additional above 5,000 hours	70	
Rent and Rates	350	
Power Upto 3,600 hours	0.25	
for hours above 3,600	0.20	
Consumable supplies		0.24
Supervision Upto 2,500 hours		400
Additional for each extra 600 hours		
above 2,500 and upto 4,900 hours		100
Additional above 4,900 hours		150
Depreciation upto 5,000 hours		650
above 5,000 hours and upto 6,500 hours	820	
Cleaning upto 4,000 hours	60	
above 4,000 hours	80	
Heat and lighting from 2,100 hours to 3,500 hours	120	
from 3,500 hours to 5,000 hours	150	
above 5,000 hours	175	

Solution:

Fixed and Flexible Budget showing overhead cost per hour:

	₹		
Particulars	(3,500) 70%	(5,000) 100%	(5,500) 110%
Indirect wages (0.4 / hrs.)	1,400	2,000	2,200
Repairs	205	300	370
Rent & Rates	350	350	350
Power	875	1,180	1,280
Consumable Supplies	840	1,200	1,320
Supervision	600	950	950
Depreciation	650	650	820
Cleaning	60	80	80

Heating & Lighting	120	150	175
	5,100	6,860	7,545
OH rate per hour	$[5,100/3,500]$ = 1.457	$[6,860/5,000]$ = 1.372	$[7,545/5,500]$ = 1.372

1. If under absorbed OH is 10% or more of actual OH incurred – Supplementary OH rate is applied. (or)
2. If the amount is considerable, supplementary OH rate applied otherwise we may follow, transferring to P & L A/c or carry forward to next year.

Working Notes:

₹

Repairs	$100 + (3 \times 35)$ = 205	$100 + (4 \times 35) + 60$ = 300	$100 + (4 \times 35) + 60 + 70$ = 370
Power	(3500×0.25) = 875	$(900 + 280)$ = 1,180	$900 + 280 + 100$ = 1,280
Supervision	$400 + (2 \times 100)$ = 600	$400 + (4 \times 100) + 150$ = 950	$400 + (4 \times 100) + 150$ = 950

Illustration 20

In a manufacturing unit, overhead was recovered at a predetermined rate of ₹25 per man-day. The total factory overhead incurred and the man-days actually worked were ₹ 41,50,000 and 1,50,000 respectively.

Out of the 40,000 units produced during a period 30,000 units were sold. There were also 30,000 uncompleted units which may be reckoned at 66.67% complete.

On analysing the reasons, it was found that 40% of the unabsorbed overheads were due to defective planning and the rest were attributable to increase overhead costs.

How would unabsorbed overhead be treated in Cost Accounts?

Solution:

₹

Overheads incurred	= 41,50,000
Overheads absorbed $(1,50,000 \times 25)$	= <u>37,50,000</u>
Under absorption	= <u>4,00,000</u>

The under absorption of ₹ 4,00,000 being considerable whether due to defective planning or due to increase in prices, would be disposed off by applying supplementary OH rate in the following manner:

$$\begin{aligned} \text{Supplementary OH rate} &= \frac{4,00,000}{30,000 + 10,000 + (30,000 \times \frac{2}{3})} \\ &= 4,00,000 / 60,000 = 20/3 \\ \text{To be absorbed on cost of goods sold} &= 30,000 \times 20/3 = 2,00,000 \\ \text{To be absorbed on closing stock} &= 10,000 \times 20/3 = 66,667 \\ \text{To be absorbed on Work in progress} &= 30,000 \times 2/3 \times 20/3 = 1,33,333 \\ &= 4,00,000 \end{aligned}$$

5

PREPARATION OF COST SHEET

Cost Accumulation

The logic of Cost Accumulation is to track costs in the same sequence as the resources get used. See the following flow of activities:

- (a) Raw material & other material are purchased and stored
- (b) The material is used up in process of conversion
- (c) People or machines work upon the material while in the process
- (d) The process results into some products that are finished

The cost data needs to be collected along this whole chain that ends when a final product is produced. The cost accumulation is done based on the source documents which are used in booking the costs. Depending upon the type of business, a cost unit is determined for which costs must be accumulated. The departmentalisation of the business organisation is done to suit the production process. For example, in a fruit processing industry, the costs would be accumulated as per different process involved i.e. cutting, pulp formation, blending, purifying and final packing. As the physical flow of material happens from one process to the other, costs are also passed on from one process to the next in line.

As we know all the direct element of cost together make Prime Cost. Sequentially, production overheads are added to get Factory Cost or Works Cost. Then Administration overheads are added to the Factory Cost to get Cost of Production. Once the product is ready for sale, the selling and distribution overheads are added to get Cost of Sales or Cost of Goods Sold. When this is deducted from Sales revenue we get profit or loss.

Process of accumulation of cost comprises of:

- Identification of costs to the cost centers or departments.
- Apportionment of service costs to production costs.
- Absorption of costs into cost units.

Cost Collection

Cost Collection is the process of booking costs against a particular Cost Account code under a particular cost center or directly under a cost unit, as the case may be. Source documents are used to generate the record of the costs incurred or to be incurred. These source documents are properly authorised and numbered. They act as the primary source of entry. In additions to these documents there could be other documents and reports such as allocation sheets, labour utilisation reports, idle time & overtime analysis, scrap reports etc which help in identifying costs. Let us see how the costs are collected.

Material costs

These costs are identified with cost unit with the help of 'stores issue summary'. In case of job costing, there will be job-wise summary prepared on the basis of 'material issue notes'. In case of contracts, the summary will be made contract-wise. At times instead of procuring & storing material, it may be procured and directly used on contract site. 'Purchase Invoice' may be the basis to capture such direct material costs. In case of process industry, the

material is issued to different processes. Here, the costs input to a process may be collected based on the cost of materials processed in the previous process. A process-wise summary of material issues is maintained. Some material may get added to a process but may not become part of final product. The cost of such material is apportioned on the output of that process. The indirect material costs may be gathered on the basis of consumable issues, scrap reports, standard parts list etc. Care should be taken to account for material losses. Normal material losses are to be apportioned to the good units produced, whereas, abnormal losses should be excluded from computation of cost of good units and should be directly taken to P & L Account.

Labour Cost

Salaries and wages summary prepared after the monthly payroll run is the main basis for labour cost collection. The summary shows department-wise break up, so that the Direct Labour Cost of production department is separately known and that for the other indirect departments is also available to be charged as overheads. In case of contracting business, labour force is usually dedicated to various sites. The cost of labour used on different contracts can be found based on wages sheet maintained for each contract site. In addition, the idle time reports, overtime reports are used for booking of the costs of idle time & overtime. In case labourers are common to various jobs or contracts or processes, an estimate of the time that they spend on each of them is made and the costs are allocated accordingly.

Expenses

Accounting entries in cash book or journal proper help to collect the expenses. Direct expenses which are job or contract or process specific may be collected on the basis of vouchers. The indirect expenses are collected and then apportioned in a summarised form using apportionment sheets.

Collection of Budgeted costs

The cost calculation for the selected cost unit could be either of actual cost or budgeted cost. While actual costs are collected on the basis of documents explained above, the budgeted costs are computed using the standard bill of material, and predetermined overhead rates. For budgeted direct material, a bill of material is prepared for each product (including sub-assemblies). This is a quantitative estimate. Based on the estimates a budgeted material price is considered to value the material cost. Estimated labour hours are costed using estimated Labour Hour Rates. Pre-determined overheads are also computed considering the base selected for absorption. Thus an estimate of total cost with full composition may be made.

Cost Accountant & Cost Data collection

The Cost Accountant must play a pivotal role in ensuring that the process of cost data collection is very strong. The cost analysis and reporting will not be useful for managerial decision-making if the data collection process is wrong. Presence of a strong and robust Costing System is needed to ensure comprehensive data collection process. The Costs Account may carry out periodical checks to evaluate the system and also may do the Internal Audit. He can use all his expertise in the process of establishing cost estimates which will help in decision making.

Cost data collected must be reported in proper format to make it more informative and meaningful. As can be understood, the report must serve the purpose for which it was sought. A complete cost sheet may not be always necessary. The production manager may require the cost of production only. The cost report should be able to give this figure separately broken up into all its elements. The sales and marketing cost may be given for each channel of distribution, customers, regions etc in addition to the product-wise break up.

The cost data should be collected in a manner that will make available cost information to all those who are responsible for the costs. A cost sheet should give the figures of each element of cost broken up into direct and indirect and also according to functions like production, administration and selling & distribution. It is therefore logical that the format of the Cost Sheet is derived from the requirements for which it is to be used. Apart from exhibiting the total cost deducted logically, it should highlight other cost also, so that comparison with budget can be made, variances analysed and cost could be controlled to increase profits.

Cost Sheet Formats & Preparation

The cost concept itself being subjective, there is no standard format in which the collected costs can be presented. It has to suit the type of business, need of the details, and management's requirement of control over costs. Yet a simple way to show the Total Cost of any cost unit is shown below:

Specimen Cost Sheet

Period From	Cost Units	
To		
Cost Items	Amount (₹)	Amount (₹)
Direct Material		
Opening Stock	xxxxx	
Add: Purchases	xxxxx	
Add: Incidental charges	xxxxx	
Less: Closing Stock	xxxxx	xxxxx
Direct Labour		xxxxx
Direct Expenses		xxxxx
PRIME COST		xxxxx
Add: Production Overheads	xxxxx	
Add: Opening work in process	xxxxx	
Less: Closing work in process	xxxxx	xxxxx
FACTORY COST OR WORKS COST		xxxxx
Add: Administrative Overheads		xxxxx
COST OF GOODS MANUFACTURED		xxxxx
Add: Opening Finished goods stock	xxxxx	
Less: Closing Finished goods stock	xxxxx	xxxxx
COST OF FINISHED GOODS SOLD		xxxxx
Add: Selling & Distribution overheads		xxxxx
COST OF GOODS SOLD		xxxxx

You can observe the logical way in which the cost flow has been shown in the above chart. The focus in this specimen is on elements and functions split further into direct and indirect costs with respect to the cost units. Although the formats could be different, the contents of a cost sheet must be understood and interpreted correctly so that one can analyse it for control and decision making. For example if it has to be prepared for a process industry, the format would reflect the portion up to factory cost for each process separately. Then the administration costs will be added together. The cost per unit will be computed for every process separately. The stock for processes subsequent to process one will mean stocks transferred from earlier processes and stocks transferred to the next processes. The objective here is to compute the cost per process. The cost sheet format here could be:

Specimen Cost Sheet

Period From To	Cost Units	
Cost Items	Amount (₹)	Amount (₹)
Direct Material		
Opening Stock	xxxxx	
Add: Purchases	xxxxx	
Add: Incidental charges	xxxxx	
Less: Closing Stock	xxxxx	xxxxx
Direct Labour		xxxxx

Direct Expenses		XXXXX
PRIME COST		XXXXX
Add: Production overheads	XXXXX	
Add: Opening work in process	XXXXX	
Less: Closing work in process	XXXXX	XXXXX
FACTORY COST OR WORKS COST		XXXXX
Add: Administrative Overheads		XXXXX
COST OF GOODS MANUFACTURED		XXXXX
Add: Opening Finished goods stock	XXXXX	
Less: Closing Finished goods stock	XXXXX	XXXXX
COST OF FINISHED GOODS SOLD		XXXXX
Add: Selling & Distribution overheads		XXXXX
COST OF GOODS SOLD		XXXXX

Depending on number of processes, the working will be shown up to factory cost. Subsequently, the administration, selling & distribution overheads are added like that shown in the first format. Some process companies may prepare a different cost sheet for each process. When it is available process wise, control of process costs and process losses could be better controlled by the concerned process managers.

Important Components of Cost Sheet

- Cost sheet has reference to the job or contract or a batch or production or a service undertaken to be rendered. If the completion of the job at hand relates to more than one accounting period, it is better that separate columns are provided to mention figures for those period. The job or batch reference should also be mentioned on the header.
- If there is an estimate made for the costs, a separate column must be provided for estimated costs against which the actual costs should be plotted to get ready comparison. This will make cost sheets more user-friendly and meaningful.
- In certain cases, material may not form any significant portion of the total cost and as such may be treated as an overhead item. In such cases, the Prime Cost will mainly constitute as labour and other expenses.
- Treatment of raw material stocks should be carefully understood. As the costs are to be linked to the units produced, the material consumption, completion of earlier period's semifinished goods and the finished goods sold needs to be properly computed.

Raw Material Consumed: Opening Stock + Purchases – Closing Stock

One has to go into the depth of this arithmetical formula. Where do we get the figure of purchases from? It is from the suppliers invoices for purchase of stockable material. It also should include all charges incidental to purchase of goods like carriage, insurance, customs duty etc. which is directly associated with the incoming material.

As we know that the stocks are always valued at cost or market price whichever is less. This norm has to be applied to the rates of all the items of material in stock, and then the total valuation of stock is done. The stock ledger records all receipts and issues of the quantity and rate of material items. The valuation of material issues has to be properly done based on correctly chosen method of issue pricing. This summary figure as per the issue column should exactly match with the raw material consumed figure as included in the cost sheet.

The normal losses on account of material shortages must be included in the cost of raw material consumed. Care should be taken to remove the abnormal losses there from.

- Treatment of work in process is another important step. If the format is carefully seen, it will be noticed that the cost of WIP stocks is adjusted specifically after adding Factory Overheads! Why adjusted? And why at that stage only? Please note that Cost Sheet is prepared for a period of time for a cost unit. At the beginning of that period, if the job has been carried forward from the previous period, there may be some partly finished work that is carried forward. At the same time there may be partly finished production at the end of current period. These stocks must be adjusted to reflect the cost consumed during the current period. Further, the work in process is normally valued at Factory Cost. It does not include Administration Overheads as the production of goods is not yet fully complete. Administration costs are absorbed at the stage of finished production. Hence the adjustment of WIP stocks is to be done before adding the Administration Overheads.

- (f) Similarly, the adjustment for the opening and closing stocks of finished goods should be done. This has to be done after the stage of cost of production.
- (g) One could have separate columns for total costs and per unit costs side by side. This will help have a quick glance at the per unit figures. Management at operating level will find this very helpful.

Illustration 1

Following data is available from the cost records of a company for the month of March 2017:

- (1) Opening stock of job as on 1st March 2017
 Job no. A 99: Direct Material ₹80, Direct Wages ₹150 and Factory Overheads ₹200
 Job no. A 77: Direct Material ₹420, Direct Wages ₹450 and Factory Overheads ₹400
 - (2) Direct material issued during the month of February 2017 was:
 Job no A 99 ₹120
 Job no A 77 ₹280
 Job no A 66 ₹225
 Job no A 55 ₹300
 - (3) Direct labour details for March 2017 were:

Job no	Hours	Amount (₹)
A 99	400	600
A 77	200	450
A 66	300	675
A 55	100	225
 - (4) Factory Overheads are applied to jobs on production according to direct labour hour rate which is ₹2 per hour.
 - (5) Factory Overhead incurred in March 2017 were ₹2100.
 - (6) Job numbers A 99 & A 77 were completed during the month. They were billed to the customers at a price which included 15% of the price of the job for Selling & Distribution expenses and another 10% of the price for Profit.
- Prepare:
- (a) Job cost sheet for job number A 77 and A 99.
 - (b) Determine the selling price for the jobs.
 - (c) Calculate the value of work in process.

Solution:

Remarks :

- (1) The Factory Overheads actually incurred are ₹ 2100. This amount to be apportioned on the basis of labour hours. So the rate to be considered as ₹ 2.1 per unit = (2100/1000) and not ₹2 per unit. If we consider the above mentioned point the calculations for Job Sheets & for the work in progress will change accordingly.
- (2) Work in progress is to be calculated for the incomplete jobs hence job no. A 66 and A 55 should only be included in the calculations of work in progress.

Job Cost Sheets for the month of March 2017

₹

Cost Items	Job A 77	Job A 99
Direct Material issued	280	120
Direct labour spent	450	600

Prime Cost	730	720
Factory Overheads @ ₹ 2.1 per hour	(200×2.1) 420	(400×2.1) 840
Add: Opening WIP (Material + Labour + Overheads)	1,270	430
Factory Cost	2,420	1,990
Add: Selling & Distribution Overheads (Note 1)	484	398
Cost of Sales	2,904	2,388
Profit (Note 1)	323	265
Billing price for the job	3,227	2,653

Note 1

S&D and profit are given in indirect way.

Assume Selling price as 100

Less: S & D @ 15% (15)

Less: Profit @ 10% (10)

Balance has to be the Factory Cost 75

S & D price will be 15/75 of Factory Costs

Profit will be 10/75 of Factory Cost

480

320

300

200

Computation of Work in Process for March 2017

₹

Items			
Opening balance as on 1 st March	Job A 99	430	
	Job A 77	1,270	1,700
Material issued during the month of March	Job A 99	120	
	Job A 77	280	
	Job A 66	225	
	Job A 55	300	925
Direct Labour	Job A 99	600	
	Job A 77	450	
	Job A 66	675	
	Job A 55	225	1,950
Factory Overheads on 1000 hours @ ₹ 2.1			2,100
Factory Cost			6,675
Less: Factory Cost of completed jobs	Job A 77	2,420	
	Job A 99	1,990	4,410
Closing work in process as on 28 th March 2017			2,265

Another way to calculate WIP is

Job A 66 and A 55 are in progress & WIP includes only incomplete Jobs.

Direct Material (225+300) 525

Direct Labour (675+225) 900

Factory Overheads $[2.1 \times (300+100)]$	<u>840</u>
Total WIP	<u>2,265</u>

Illustration 2

Prepare Cost Sheet for an engineering company which produces standard components in batches of 1000 pieces each. A batch passes through three processes viz. Foundry, Machining & Assembly.

The materials used for a batch number 001 were: Foundry 1300 tonnes @ ₹50 per tonne of which 50 tonnes were sent back to stores.

Other details

Process	Direct Labour	Overheads
Foundry	200 Hrs @ ₹ 10	₹ 15 per Labour Hour
Machining	100 Hrs @ ₹ 5	₹ 20 per Labour Hour
Assembly	100 Hrs @ ₹ 15	₹ 10 per Labour Hour

A comparison of actual costs with estimated cost discloses that material and overheads have exceeded the estimates by 20% whereas the estimated labour cost is 10% more than the actual. Show the variances with respect to the estimates

Solution:

Cost sheets for the Batch number 001

Standard batch size 1000 pieces

	Actual	Estimated	Variance	F/A
Direct material issued (1250 x 50)	62,500	52,083	(10,417)	A
Direct labour spent				
Foundry - 200 x 10	2,000	2,200	200	F
Machining - 100 x 5	500	550	50	F
Assembly - 100 x 15	1,500	1,650	150	F
Prime Cost	66,500	56,483	(10,017)	A
Factory Overheads applied				
Foundry - 200 x 15	3,000	2,500	(500)	A
Machining - 100 x 20	2,000	1,667	(333)	A
Assembly - 100 x 10	1,000	833	(167)	A
Factory Cost	72,500	61,483	(11,017)	A
Cost per unit (Factory Cost/1000)	72.5	61.48	11.02	

Illustration 3

An advertising agency has received an enquiry for which you are supposed to submit the quotation. Bill of material prepared by the production department for the job states the following requirement of material:

Paper 10 reams @ ₹1800 per ream

Ink and other printing material ₹5000

Binding material & other consumables ₹3000

Some photography is required for the job. The agency does not have a photographer as an employee. It decides to hire one by paying ₹10000 to him. Estimated job card prepared by production department specifies that service of following employees will be required for this job:

Artist (₹12000 per month)	80 hours
Copywriter (₹10000 per month)	75 hours
Client servicing (₹9000 per month)	30 hours

The primary packing material will be required to the tune of ₹4000. Production Overheads 40% of direct cost, while the S & D Overheads are likely to be 25% on Production Cost. The agency expects a profit of 20% on the quoted price. The agency works 25 days in a month and 6 hours a day.

Solution:

Quotation for a Printing Job

Items	Amount ₹	Amount ₹
Direct material required:		
Paper 10 x 1800	18,000	
Ink & other printing material	5,000	
Binding material & consumables	3,000	
Primary packing material	4,000	30,000
Direct labour spent		
Artist [12,000/(25 x 6)] x 80	6,400	
Copy writer [10,000 / (25 x 6)] x 75	5,000	
Client Servicing [9,000 / (25 x 6)] x 30	1,800	13,200
Photographer's charges		10,000
Prime Cost		53,200
Factory Overheads applied @ 40% on Direct Cost		21,280
Production Cost		74,480
S & D overheads applied @ 25% on Production Cost		18,620
Total Cost		93,100
Profit (20% on price i.e. 25% on cost)		23,275
Price to be quoted		1,16,375

Illustration 4

The following figures were extracted from the Trial Balance of a company as on 31st December 2016.

Particulars	Debit (₹)	Credit (₹)
Inventories		
Raw Material	1,40,000	
WIP	2,00,000	
FG	80,000	
Office Appliances	17,400	
Plant and Machinery	4,60,500	
Buildings	2,00,000	
Sales		7,68,000
Sales Returns	14,000	
Material purchased	3,20,000	
Freight on materials	16,000	
Purchase returns		4,800
Direct labour	1,60,000	
Indirect labour	18,000	
Factory supervision	10,000	
Factory repairs & upkeep	14,000	
Heat, light & power	65,000	
Rates & taxes	6,300	
Misc factory expenses	18,700	
Sales commission	33,600	
Sales travelling	11,000	
Sales Promotion	22,500	
Distribution department salaries & wages	18,000	
Office salaries	8,600	
Interest on borrowed funds	2,000	

Further details are given as follows:

Closing inventories are Material ₹180000, WIP ₹192000 & FG ₹115000.

Accrued expenses are Direct Labour ₹8000, Indirect Labour ₹1200 & interest ₹2000.

Depreciation should be provided as 5% on Office Appliances, 10% on Machinery and 4% on Buildings.

Heat, light and power are to be distributed in the ratio of 8:1:1 among factory, office and distribution respectively.

Rates & taxes apply as 2/3rd to the factory and 1/3rd to office.

Depreciation on building to be distributed in the ratio of 8:1:1 among factory, office and distribution respectively

Prepare a Cost Sheet showing all important components and also a condensed P & L Account for the year.

Solution:

Particulars	Amount (₹)	Amount (₹)

Direct Materials		
Opening stock	1,40,000	
Add: Purchases	3,20,000	
Add: Freight	16,000	
Less: Returns	(4,800)	
Less: Closing Stock	(1,80,000)	2,91,200
Direct Labour	1,60,000	
Add: Accrued	8,000	1,68,000
Prime Cost		4,59,200
Factory Overheads:		
Indirect labour	18,000	
Accrued indirect labour	1,200	
Factory supervision	10,000	
Repairs & upkeep	14,000	
Heat, Light & power	52,000	
Rates & taxes	4,200	
Misc. Factory expenses	18,700	
Depreciation on plant & machinery	46,050	
Depreciation on buildings	6,400	
	1,70,550	
Add: Opening WIP	2,00,000	
Less: Closing WIP	(1,92,000)	1,78,550
Factory Cost		6,37,750
Administration Overheads		
Heat Light & power	6,500	
Rates & taxes	2,100	
Depreciation on buildings	800	
Depreciation on office appliances	870	
Office salaries	8,600	
	18,870	
Add: Opening FG stock	80,000	
Less: Closing FG Stock	(1,15,000)	(16,130)
Cost of Production of saleable units		6,21,620

Selling & Distribution overheads		
Heat & light	6,500	
Depreciation on buildings	800	
Sales commission	33,600	
Sales travelling	11,000	
Sales promotion	22,500	
Distribution department expenses	18,000	92,400
Cost of Sales		7,14,020

Condensed P & L Account for the year ended 31-12-2016		
Sales Income	7,68,000	
Less: Returns	(14,000)	7,54,000
Cost of Sales as above		7,14,020
Interest on borrowings (2,000 + 2,000)		4,000
Net Profit		35,980

Illustration 5

PR Ltd. manufactures and sells a typical brand of Tiffin Boxes under its own brand name. The installed capacity of the plant is 1,20,000 units per year distributable evenly over each month of calendar year. The Cost Accountant of the company has informed the following cost structure of the product, which is as follows:

Raw Material ₹ 20 per unit.

Direct Labour ₹ 12 per unit

Direct Expenses ₹ 2 per unit

Variable Overheads ₹ 16 per unit.

Fixed Overhead ₹ 3,00,000.

Semi-variable Overheads are as follows:

₹ 7,500 per month upto 50% capacity & Additional ₹ 2,500 per month for every additional 25% capacity utilization or part thereof.

The plant was operating at 50% capacity during the first seven months of the calendar year 2016, at 100% capacity in the remaining months of the year.

The selling price for the period from 1st Jan, 2016 to 31st July, 2016 was fixed at ₹ 69 per unit. The firm has been monitoring the profitability and revising the selling price to meet its annual profit target of ₹ 8,00,000. You are required to suggest the selling price per unit for the period from 1st August 2016 to 31st December 2016.

Prepare Cost Sheet clearly showing the total and per unit cost and also profit for the period.

- from 1st Jan. to 31st July, 2016
- from 1st Aug. to 31st Dec, 2016.

Solution:

Cost Sheet for the period

₹

Particulars	50% capacity utilization (10000 units P.M) – 35000 units, seven months 1 st Jan to 31 st July, 2016	100% capacity utilization – 50000 units, Five months 1 st Aug to 31 st Dec, 2016
Raw Materials	7,00,000	10,00,000
Direct Labour	4,20,000	6,00,000
Direct Expenses	70,000	1,00,000
Variable overheads	5,60,000	8,00,000
Fixed Overheads	1,75,000	1,25,000
Semi-Variable Overheads	52,500	62,500
Total Costs	19,77,500	26,87,500
Profit	4,37,500	3,62,500
Sales	24,15,000	30,50,000
Selling Price Per Unit	69.00	61.00
Cost Per Unit	56.50	53.75

Illustration 6

X Ltd. Provides you the following figures for the year 2015-16:

Particulars	₹
Direct Material	3,20,000
Direct Wages	8,00,000
Production Overheads (25% variable)	4,80,000
Administration Overheads (75% Fixed)	1,60,000
Selling and Distribution Overheads (2/3 rd Fixed)	2,40,000
Sales @ ₹ 125 per unit	25,00,000

For the year 2016-17, it is estimated that:

- Output and sales quantity will increase by 20% by incurring additional Advertisement Expenses of ₹ 45,200.
- Material prices will go up 10%.
- Wage Rate will go up by 5% along with, increase in overall direct labour efficiency by 12%.
- Variable Overheads will increase by 5%.
- Fixed Production Overheads will increase by 33 1/3 %

Required:

(a) Calculate the Cost of Sales for the year 2015-2016 and 2016-2017.

(b) Find out the new selling price for the year 2016-2017.

- If the same amount of profit is to be earned as in 2015-2016.
- If the same percentage of profit to sales is to be earned as in 2015-2016.
- If the existing percentage of profit to sales is to be increased by 25%.
- If Profit per unit ₹ 10 is to be earned.

Solution:

(a) Statement showing the Cost of Sales

₹

Particulars	For 20000 units	For 24000 units

A.	Direct Materials	3,20,000	4,22,400 [₹3,20,000 x 110% x 120%]
B.	Direct wages	8,00,000	9,00,000 [₹ 8,00,000 x (105/100) x (100/112) x 120%]
C.	Prime Cost	11,20,000	13,22,400
D.	Add: Production Overheads		
	Variable Production Overheads	1,20,000 [₹ 4,80,000 x 25%]	1,51,200 [₹1,20,000 x 105% x 120%]
	Fixed Production Overheads	3,60,000 [₹ 4,80,000 x 75%]	4,80,000 [₹ 3,60,000 x 133%]
E.	Works Cost (C + D)	16,00,000	19,53,600
F.	Add: Administration Overheads		
	Variable Admn. Overheads	40,000	50,400 [₹ 40,000 x 105% x 120%]
	Fixed Admn. Overheads	1,20,000	1,20,000
G.	Cost of Goods Produced	17,60,000	21,24,000
H.	Add: Selling and Distribution Overheads		
	Variable Selling & Distribution OHs	80,000	1,00,800 [₹ 80,000 x 105% x 120%]
	Fixed Selling & Distribution OHs	1,60,000	1,60,000
	Additional Advertisement Exp.		45,200
I.	Cost of Sales [G + H]	20,00,000	24,30,000

(b)

- (i) New Selling Price = (₹ 24,30,000 + ₹ 5,00,000)/24,000 units = ₹ 122.08
- (ii) New Selling Price = (₹ 24,30,000 + 25% or ₹ 24,30,000)/24,000 units = ₹ 126.5625
- (iii) New Selling Price = (₹ 24,30,000 + 1/3rd or ₹ 24,30,000)/24,000 units = ₹ 135
- (iv) New Selling Price = (₹ 24,30,000 + (24,000 x ₹ 10) / 24,000 units = ₹ 111.25

Illustration 7

The following are the costing records for the year 2017 of a manufacturer:

Production 10,000 units; Cost of Raw Materials ₹ 2,00,000; Labour Cost ₹ 1,20,000; Factory Overheads ₹80,000; Office Overheads ₹ 40,000; Selling Expenses ₹ 10,000, Rate of Profit 25% on the Selling Price.

The manufacturer decided to produce 15,000 units in 2017. It is estimated that the cost of raw materials will increase by 20%, the labour cost will increase by 10%, 50% of the overhead charges are fixed and the other 50% are variable. The selling expenses per unit will be reduced by 20%. The rate of profit will remain the same.

Prepare a Cost Statement for the year 2017 showing the total profit and selling price per unit.

Solution:

Statement of Cost & Profit (Cost Sheet) (Output 10,000 units)

Particulars	Cost per unit (in ₹)	Total Cost (in ₹)
Raw Materials	20	2,00,000
Labour	12	1,20,000
PRIME COST	32	3,20,000
Add: Factory Overhead	8	80,000
WORKS COST	40	4,00,000
Add: Office Overhead	4	40,000
COST OF PRODUCTION	44	4,40,000
Add: Selling Expenses	1	10,000
COST OF SALES	45	4,50,000
Add: Profit (25% on Selling Price or 33.33% on Cost of Sales)	15	1,50,000
SELLING PRICE	60	6,00,000

Statement of Cost & Profit (Cost Sheet)
(Output 15,000 units)

Particulars	Cost per unit (in ₹)	Total Cost (in ₹)
Raw Materials (₹ 20 x 120% x 15,000)	24.00	3,60,000
Labour (₹ 12 x 110% x 15,000)	13.20	1,98,000
PRIME COST	37.20	5,58,000
Add: Factory Overhead (₹ 80,000 x 50% + ₹ 4 x 15,000)	6.67	1,00,000
WORKS COST	43.87	6,58,000
Add: Office Overhead (₹ 40,000 x 50% + ₹ 2 x 15,000)	3.33	50,000
COST OF PRODUCTION	47.20	7,08,000
Add: Selling Expenses (₹ 1 x 80% x 15,000)	0.80	12,000
COST OF SALES	48.00	7,20,000
Add: Profit (25% on Selling Price or 33.33% on Cost of Sales)	16.00	2,40,000
SELLING PRICE	64.00	9,60,000

6

JOB/CONTRACT COSTING

JOB COSTING

Methods or Types of Costing

Costing is the technique and process of ascertaining costs. In order to do the same, it is necessary to follow a particular method of ascertaining cost. Different methods of costing are applied to different industries depending upon the type of manufacture and their nature. Broadly the costing methods are classified into the following:

- (a) Specific Order Costing (Job or Terminal Costing)
- (b) Operation Costing or Process or Period Costing

Specific Order Costing: Specific order costing is the category of basic costing methods applicable where the work consists of separate jobs, batches or contracts each of which is authorised by a specific order or contract. It includes job costing consisting batch costing and contract costing.

Job Order Costing:

Industries which manufacture products or render services against specific orders as distinct from continuous production for stock or sales use the job costing or job order method of cost accounting. The method is also known under various other names, such as specific order costing, production order costing, job lot costing or lot costing. Every order in job costing is separate and it is not essential that the same manufacturing operations be carried out or the same materials be utilized in respect of each. However, a number of identical orders or identical products may be combined together to form lots or batches, each such lot or batch constituting a job order. In the job costing system, an order or a unit, lot, or batch of a product may be taken as a cost unit, i.e. a job.

In job costing, there is no averaging of costs except to the extent that in the ascertainment of unit cost, the cost of a lot of products in one order is obtained. A job or an order may extend to several accounting periods and job costs are, therefore, not related to particular periods.

Job cost accounting is followed in three types of manufacturing organisations:

- (i) Jobbing concerns.
- (ii) Small firms.
- (iii) Large enterprises manufacturing a variety of products.

(i) Jobbing concerns:

Some concerns manufacture a variety of products according to customer's specifications and do not generally confine their activities to producing uniformly any specific product for sale in the market. The jobs, products or services are dissimilar or unique and non-repetitive having different specifications and methods of manufacture, and each one requires different types, sizes and quantities of materials and equipments and utilizes different labour hours. Such concerns must of necessity to use job cost accounting.

(ii) Small firms:

Though manufacturing a number of specific products, small manufacturing concerns may find process costing difficult to apply because due to small sales, no product can have a run long enough to establish

a product line. On account of the frequent changes from one product to another, job costing would be suitable for determining the cost of each lot of products.

(iii) Large enterprises manufacturing a variety of products:

A single department would be manufacturing several products, perhaps all at a time, so that none of the departments is specialized for continuous runs of product lines. As definite process departments cannot be established, job costing is more suitable in such cases.

Job costing is applicable to engineering concerns, construction companies, ship-building, furniture making, hardware and machine manufacturing industries, repair shops, automobile garages and several such other industries where jobs or orders can be kept separate.

Procedure for Job Cost Accounting:

On receipt of an order from the customer or an indication from the sales department for manufacturing a particular product, the production planning department prepares a suitable design for the product or job. It also works out the requirements of materials for the product and prepares a list of operations indicating the various operations to be carried out and their sequence, and the shops, departments, plants or machines to be entrusted with each of the operations.

A Production Order is issued giving instructions to the shops to proceed with the manufacture of the product. The production order constitutes the authority for work. Usually a production order contains all relevant information regarding production, such as detailed particulars of the job or product, the quantity or units to be manufactured, date of start of production, probable date of completion, details of materials required as per the bill of materials, the operations and the various shops involved in performing them and the route of the job should take.

The production order usually lays down only the quantities of materials required and the time allowed for the operations, but the values of materials and labour are also sometimes indicated. In the later case, the production order serves the combined purpose of an order for manufacture as well as the cost sheet on which the cost of the order is compiled.

The production order also provides for the material and labour on account of normal wastage or spoilage of the product in the final stage or during the various stages of manufacture.

Production orders may, in general, be of three types:

- (i) Assembly type of order.
- (ii) Sub-assembly type of order.
- (iii) Components or parts production type.

(i) Assembly type of order:

Where components are purchased and assembled into a product in the factory. A production order for assembly only is required.

(ii) Sub-assembly type of order:

Components are purchased and sub-assemblies and assemblies are made in the factory. Production orders for each sub-assembly and final assembly will be necessary.

(iii) Components or parts production type:

Components are manufactured and sub-assembled and the sub-assemblies are assembled into the final product. Separate production orders for each component, sub-assembly and final assembly are issued.

Copies of Production Orders May be Distributed as Follows:

- (a) One copy to the stores for provisioning and issue of materials on demand.
- (b) One copy each to the departments or shops concerned to undertake production by demanding materials and employing men and machines on the operations.
- (c) One copy to the cost department for working out the cost of the job.

Separate job cost sheets are maintained for each job. If a job consists of several major or important operations, separate cost sub-sheets for recording the costs of the various operations may be maintained and the aggregate cost, in summary, shown in the main cost sheet.

Material Cost:

On receipt of a production order, the shop draws the requisite materials from the stores. Surplus, excess or incorrect materials are returned from the shops to the stores on materials return notes. Scrap and waste arising in the course of manufacture are returned in a similar manner. The materials requisitions, materials return notes and materials transfer notes are 'costed' in accordance with the methods of pricing adopted by the concern.

Labour Cost:

Labour summaries or wages analysis sheets are prepared for each accounting period and the totals of these statements are debited to Work-in-Progress Account or Overhead Control Account by credit to Wages Control Account. Amounts on account of overtime, idle time, shift differential and fringe benefits may also be included in the wages analysis sheet. Direct labour costs are posted on the respective cost sheets and indirect labour is treated in the manner indicated for indirect material.

Manufacturing Overhead:

Overhead costs are accumulated against standing order numbers and against cost centres. Overhead rates, predetermined or actual as the case may be, are worked out for each such centre. The overhead applied to each job is obtained by multiplying the overhead rate by the actual base variable spent on the job.

Completion of Jobs:

Postings of direct material, direct labour, direct expenses and manufacturing overhead costs to the cost sheet for a job or production order are made periodically throughout the run of the job or order. The completion report is an indication that the manufacturing operations are over and further expenditure on the job should cease so that the cost sheet may not be closed.

Work-in-Progress:

The cost of an incomplete job i.e., a job on which some manufacturing processes or operations are still due before it can be made into the finished product is termed Work-in-Progress or Work-in-Process. If a production order has been only partly completed by the end of an accounting period, it is essential that the closing stock of the work-in-progress be determined.

Cost Control in Job Order System:

Control over job costs may be exercised by comparison of the actual costs with the estimated costs established as basis for fixing job prices. Here again, adequate cost control is available for direct material and direct labour only; overhead costs cannot be controlled in terms of individual jobs. Control of overhead is, therefore, confined to the department as a whole for which predetermined overhead rate has been determined.

Comparison may also be made with the costs of previous periods or of earlier batches of production, if any.

Standard costs may be used in job type plants, particularly where the product or the particular operations of the job are of a standardised nature.

Advantages of Job Costing:

Job costing offers the following advantages:

- (a) The cost of material, labour and overhead for every job or product in a department is available daily, weekly or as often as required while the job is still in progress.
- (b) On completion of a job, the cost under each element is immediately ascertained. Costs may be compared with the selling prices of the products in order to determine their profitability and to decide which product lines should be pushed or discontinued.
- (c) Historical costs for past periods for each product, compiled by orders, departments, or machines, provide useful statistics for future production planning and for estimating the costs of similar jobs to be taken up in future. This assists in the prompt furnishing of price quotations for specific jobs.
- (d) The adoption of predetermined overhead rates in job costing necessitates the application of a system of budgetary control of overhead with all its advantages.
- (e) The actual overhead costs are compared with the overhead applied at predetermined rates; thus, at the end of an accounting period, overhead variances can be analyzed.
- (f) Spoilage and defective work can be easily identified with specific jobs or products.

- (g) Job costing is particularly suitable for cost-plus and such other contracts where selling price is determined directly on the basis of costs.

Limitations of Job Costing:

The limitations of job costing are:

- Job costing is comparatively more expensive as more clerical work is involved in identifying each element of cost with specific departments and jobs.
- With the increase in the clerical processes, chances of errors are enhanced.
- The cost as ascertained, even where they are compiled very promptly, are historical as they are compiled after incidence.
- The cost compiled under job costing system represents the cost incurred under actual conditions of operation. The system does not have any scientific basis.

Reports in Job Costing System:

Report on profits on completed jobs:

A statement may be prepared monthly to indicate the gross profit earned on all jobs completed during the month. This statement is useful for the management for evaluating past performances. Net profit analysis may also be made in a similar manner if administration, selling and distribution overheads for the job are included in the statement.

Report on cost variances:

If cost estimates are developed, a cost variance report showing the deviations of actual costs from the estimated costs may be prepared in order that significant differences may be brought to light and investigated. The report may be prepared separately for a job, or for a department showing the variances in respect of all jobs undertaken by the department during a period.

Illustration 1:

As newly appointed Cost Accountant, you find that the selling price of Job No. 9669 has been calculated on the following basis:

Particulars	₹
Materials	12.08
Direct Wages – 22 hours at 25 paise per hour	5.50
Department A – 10 hours, B – 4 hours C – 8 hours	
	17.58
Plus 33% on Prime Cost	5.86
	23.44

An analysis of the previous year's profit and loss account shows the following:

Particulars	₹	Particulars	₹
Materials Used	77,500	Factory Overheads:	
Direct Wages:		A	2,500
A	5,000	B	4,000
B	6,000	C	1,000
C	4,000	Selling Costs	30,000

You are required to:

- Draw up a Job Cost Sheet;
- Calculate and enter the revised costs using the previous year's figures as a basis;
- Add to the total job cost 10% for profit and give the final selling price.

Solution:

In order to draw up Job Cost Sheet, the factory overhead rates of different departments and percentage of selling cost will have to be determined first on the basis of previous year's figures as follow:

Factory Overhead Rates:

Particulars	Department		
	A	B	C
	₹	₹	₹
Factory Overheads	2,500	4,000	1,000
Direct Labour Hours (D.W. x 4)	20,000	24,000	16,000
Factory Overhead Rates per hour	0.125	0.167	0.063

$$\text{Percentage of Selling Cost on Works Cost} = \frac{\text{₹30,000}}{\text{₹1,00,000}} \times 100 = 30\%$$

Cost Sheet

Job No. 9669		Period
Particulars		₹
Materials		12.08
Direct Wages:		
Dept. A	2.50	
Dept. B	1.00	
Dept. C	2.00	5.50
Prime Cost		17.58
Factory Overheads:		
Dept. A (10 hours. @ ₹ 0.125)	1.25	
Dept. B (4 hours. @ ₹ 0.167)	0.67	
Dept. C (8 hours. @ ₹ 0.063)	0.50	2.42
Works Cost		20.00
Selling Cost (30% of Works Cost)		6.00
Cost of Sales		26.00
Profit (10% on Cost)		2.60
Selling Price		28.60

Illustration 2:

A work order for 100 units of a commodity has to pass through four different machines of which the machine hour rates are: Machine P – ₹ 1.25, Machine Q – ₹ 2.50, Machine R – ₹ 3 and Machine S – ₹ 2.25

Following expenses have been incurred on the work order – Materials ₹ 8,000 and Wages ₹ 500.

Machine - P has been engaged for 200 hours. Machine - Q for 160 hours, Machine - R for 240 hours and Machine - S for 132 hours.

After the work order has been completed, materials worth ₹ 400 are found to be surplus and are returned to stores.

Office overhead used to be 40% of works costs, but on account of all-round rise in the cost of administration, distribution and sale, there has been a 50% rise in the office overhead expenditure.

Moreover, it is known that 10% of production will have to be scrapped as not being upto the specification and the sale proceeds of the scrapped output will be only 5% of the cost of sale.

If the manufacturer wants to make a profit of 20% on the total cost of the work order, find out the selling price of a unit of commodity ready for sale.

Solution:**Statement showing the selling price of a unit**

Particulars		₹
Materials used (₹ 8,000 – ₹400)		7,600
Direct Wages		500
Prime Cost		8,100
Works Overhead at machine hour rate:		
Machine - P For 200 hours @ ₹ 1.25 per hour	250	
Machine - Q For 160 hours. @ ₹ 2.50 per hour	400	
Machine - R For 240 hours. @ ₹ 3 per hour	720	
Machine - S For 132 hours. @ ₹ 2.25 per hour	297	1,667
Works Cost		9,767
Administration Overhead at 60% of works cost		5,860
		15,627
Less: Sale proceeds of Scrap (5% of 10% of ₹ 15,627)		78
Total Cost of the work order		15,549
Profit at 20% of total Cost		3,110
Selling Price of 100 units		18,659
Selling Price of a unit		186.59

Note: It was known before that 10% of production will have to be scrapped, therefore, inputs must have been made taking this factor into consideration. No other adjustment is necessary except deducting the value of scrap from the cost of production.

Illustration 3:

The data pertaining to Heavy Engineering Ltd. using are as follows at the end of 31.3.2017. Direct material ₹ 9,00,000; Direct wages ₹ 7,50,000; Selling and distribution overhead ₹ 5,25,000; Administrative overhead ₹ 4,20,000, Factory overhead ₹ 4,50,000 and Profit ₹ 6,09,000.

- Prepare a cost sheet showing all the details.
- For 2012-13, the factory has received a work order. It is estimated that the direct materials would be ₹ 12,00,000 and direct labour cost ₹ 7,50,000. What would be the price of work order if the factory intends to earn the same rate of profit on sales, assuming that the selling and distribution overhead has gone up by 15%? The factory recovers factory overhead as a percentage of direct wages and administrative and selling and distribution overheads as a percentage of works cost, based on the cost rates prevalent in the previous year.

Solution:**Statement of cost and profit**

Particulars	₹
Direct Materials	9,00,000
Direct Wages	7,50,000
Prime Cost	16,50,000
Factory Overheads (60% of wages)	4,50,000
Works Cost	21,00,000
Administration Overhead (20% of works cost)	4,20,000
Cost of Production	25,20,000

Selling & Distribution Overheads (25% of Works Cost)	5,25,000
Cost of Sales	30,45,000
Profit (1/5 of Cost)	6,09,000
Sales	36,54,000

Estimated price of work order

Particulars	₹
Direct Materials	12,00,000
Direct Wages (or labour)	7,50,000
Prime Cost	19,50,000
Factory Overheads (60% of wages)	4,50,000
Works Cost	24,00,000
Administration Overhead (20% of works cost)	4,80,000
Cost of Production	28,80,000
Selling & Distribution Overheads (40% i.e., 25 % + 15% of Works Cost)	9,60,000
Total Cost	38,40,000
Profit (1/5 of Total Cost)	7,68,000
Estimated Sales price	46,08,000

Illustration 4:

A manufacturing company is divided into three production departments – A, B and C. All production is to customers' orders. All orders are dissimilar and they go through all the three departments.

Manufacturing Costs for a given period were as follows:

Particulars	Dept A	Dept B	Dept C	Total
	₹	₹	₹	₹
Direct material				1,80,000
Direct labour	40,000	20,000	30,000	90,000
Indirect manufacturing costs	20,000	40,000	30,000	90,000

The cost of producing a particular order was determined as follows:

Particulars	₹	₹
Direct material		1,000
Direct Labour:	₹	
Department A	120	
Department B	280	
Department C	200	600
Indirect manufacturing Costs		600
		2,200

The General Manager had a hazy idea that the jobs executed on orders of this nature are under-priced. So, the services of a firm of cost accountants, of which you are a member, have been acquired for a thorough investigation.

Can you detect, after a careful perusal of the limited available information, the fundamental fallacy of the company's method assuming that the direct labour cost is an acceptable basis for distributing indirect

manufacturing costs?

Prepare a revised cost for order distributing indirect manufacturing costs in a manner you consider more correct than the company's procedure.

Solution:

The predominant fault is the adoption of a blanket rate for the distribution of the indirect manufacturing costs for all the three departments, i.e., 100% of total direct labour cost. This has been done despite of the fact that there are glaring differences of the direct labour cost of three departments. For calculating the revised cost of jobs, departmental rates based on indirect manufacturing cost percentage to direct labour costs are calculated:

Particulars	Departments		
	A	B	C
Indirect Mfg. Cost (₹)	20,000	40,000	30,000
Direct Labour (₹)	40,000	20,000	30,000
% of Mfg. Cost to Labour Cost $(1/2) \times 100$	50%	200%	100%

On the assumption that direct labour cost method is considered to be a reasonable method of absorption of overheads, it is quite possible that departmental application of overhead may be able to resolve the difficulty faced by the manager regarding the costing of the job given. On this basis the amended job cost sheet will be as under:

Revised Cost of Job

Particulars		₹	₹
Direct Materials (Given)			1,000
Direct Labour:			
Dept. A		120	
Dept. B		280	
Dept. C		200	600
			1,600
Indirect Manufacturing Cost: (Revised)			
Dept. A	50% of Direct Labour	60	
Dept. B	200% of Direct Labour	560	
Dept. C	100% of Direct Labour	200	820
Total Cost			2,420

Illustration 5:

A shop floor supervisor of a small factory presented the following cost for Job no.555 to determine selling price.

Particulars	Per unit (₹)
Materials	70
Direct Wages 18 hours at 2.5	45
Dept. X-8 hours	
Dept. Y-6 hours	
Dept. Z-4 hours	
Chargeable expenses (special stores items)	5
	120
Plus 33% Overheads	40
	160

Analysis of the Profit/Loss Account for 2016 shows the following

Particulars	₹	₹	Particulars	₹	₹
Materials		1,50,000	Sales		2,50,000
Direct Wages:					
Dept. X	10,000				
Dept. Y	12,000				
Dept. Z	8,000	30,000			
Special stores items		4,000			
Overheads:					
Dept. X	5,000				
Dept. Y	9,000				
Dept. Z	2,000	16,000			
		2,00,000			
Gross profit c/d		50,000			
		2,50,000	Gross profit b/d		2,50,000
Selling expenses		20,000			50,000
Net profit c/d		30,000			
		50,000			50,000

It is also noted that average hourly rates for the 3 departments, X, Y and Z are similar.

You are required:

- Draw up a job cost sheet;
- Calculate the entire revised cost using 2016 actual figures as basis;
- Add 20% to total cost to determine selling price.

Solution:

Calculation of Departmental Overhead Rates

Particulars	Departments		
	X ₹	Y ₹	Z ₹
(i) Direct Wages	10,000	12,000	8,000
(ii) Rate of wages per hour	2.5	2.5	2.5
(iii) Hours	4000	4800	3200
(iv) Actual Overheads in 8%	5000	9000	2000
(v) Department Overhead Rates per hour (iv ÷ iii)	1.250	1.875	0.625

Revised job cost sheet

Particulars			₹
Materials			70
Labour:			

Dept. X	8 x 2.5	20	
Dept. Y	6 x 2.5	15	
Dept. Z	4 x 2.5	10	45
Direct Expenses			5
Prime Costs			120
Overheads:			
Dept. X	8 x 1.250	10.00	
Dept. Y	6 x 1.875	11.25	
Dept. Z	4 x 0.625	2.50	23.75
Total Cost			143.75
Add: Profit 20%			28.75
Selling Price			172.50

Illustration 6 :

In a factory following the Job Costing Method, an abstract from the work in process as at 30th September, was prepared as under.

Job No.	Materials	Direct Labour	Factory Overheads Applied (₹)
115	1,325	400 hrs 800	640
118	810	250 hrs. 500	400
120	765	300 hrs 475	380
	2,900	1,775	1,420

Materials used in October were as follows:

Material requisitions No.	Job no.	Cost (₹)
54	118	300
55	118	425
56	118	515
57	120	665
58	121	910
59	124	720
		3,535

A summary of Labour Hours deployed during October is as under:

JOB NO.	NUMBER OF HOURS	
	SHOP A	SHOP B
115	25	25
118	90	30
120	75	10
121	65	-
124	20	10
	275	75
Indirect Labour:		

Waiting for material	20	10
Machine breakdown	10	5
Idle time	5	6
Overtime premium	6	5
	316	101

A shop credit slip was issued in October, that material issued under requisition No.54 was returned back to stores as being not suitable. A material transfer note issued in October indicated that material issued under requisition No.55 for Job 118 was directed to Job 124.

The hourly rate in shop A per labour hour is ₹3 while at shop B it is ₹ 2 per hour. The factory overhead is applied at the same rate as in September; Jobs 115, 118 and 120 were completed in October.

You are asked to compute the factory cost of the completed jobs. It is practice of the management to put a 10% on the factory cost to cover administration and selling overheads and invoice the job to the customer on a total cost plus 20% basis what would be the invoice price of these three jobs?

Solution:

Calculation of selling price of the Job

Job No.	115	118	120
	₹	₹	₹
Costs in September:			
Material	1,325	810	765
Labour	800	500	475
Overheads	640	400	380
Total (A)	2,765	1,710	1,620
Costs in October:			
Material	-	515	665
Labour			
(25 x 3)+(25 x 2)	125		
(90 x 3)+(30 x 2)		330	
(75 x 3)+(10 x 2)			245
Overheads (80%)	100	264	196
Total (B)	225	1,109	1,106
Total Factory Cost (A+B)	2,990	2,819	2,726
Add: Admn. Overheads' 10%	299.0	281.9	272.6
	3,289.0	3,100.9	2,998.6
Profit 20%	651.80	620.18	599.72
Selling Price	3,946.80	3,721.08	3,598.32

CONTRACT COSTING

Contract Costing or Terminal Costing as it is often termed, is a variant of the job costing system, which is applied in businesses engaged in building or other construction work. The jobs are usually the contracts entered into with the customers. As the number of such contracts handled at a time by a business may not be usually large, Contract Costing is comparatively simpler in operation than job costing system. The basic principles applied in Contract Costing are the same as those used in job costing except that these are modified to suit the particular requirements of the contracts.

Differences between Job costing and Contract costing:

- While the number of jobs in hand at any time in a concern may be large, only a few contracts may be undertaken at a time.
- The accumulation, analysis, apportionment, allocation and control of costs is simplified in Contract Costing.

- (c) Most of the expenses are chargeable direct to the Contract Account. Direct allocation to such an extent is not possible in job costing.
- (d) As contracts may run for long periods, there arises the problem of assessment and crediting of profits on incomplete contracts at the end of the accounting period.

Contract Costing is a type of costing used in constructional activities such as construction of buildings, roads, bridges etc. The person who takes contract for a price is called the **Contractor** and the person from whom it is taken is called the **Contractee**. We are mainly concerned with the books of the contractor. To find out profit earned or loss incurred on the contract, the contractor prepares a nominal account in his books called 'Contract Account'. In this account, all the expenses incurred by the contractor are debited and the income i.e. mainly work certified is credited; the difference represents profit or loss.

The items generally debited are materials, wages, establishment expenses & other expenses. Depreciation of assets used in the contract will also be debited, but unlike in other types of accounts it is customary in Contract Accounts to debit the opening balance of the assets and credit the closing balance of the same instead of depreciation, wherever it is convenient to do so. Amounts credited are work-in-progress, which consists of work certified and cost of work uncertified and any scrap of materials etc. Further some special items which are discussed here under will also be taken care of.

The contracts run for or number of years; however it is necessary to find out the profit or loss at the end of every year. The profit earned on a Contract Account is primarily called **Notional Profit** and a portion of which would be kept on reserve against contingencies. The profit to be transferred to Profit & Loss Account out of notional profit is ascertained by taking into consideration the degree of completion of the work, cash received etc.

Some special items under contract accounting are explained below:

(i) Sub-Contract:

Sub-contracting, usually of a part of the work, is another essential feature which we frequently come across in contract work. Sub-contracting may be necessary under the following circumstances:

- (a) Work of a specialized nature for which facilities are not internally available within the concern is offered to a sub-contractor.
- (b) It may be advantageous to get a part or component from outside, if it is costlier to manufacture it.
- (c) Consideration of opportunity cost; the management may not like to invest capital which may be utilized for other more profitable lines.
- (d) The capacity of the firm may be limited and in order to keep time schedule, work may be speeded by offering it to sub-contractors.

The payments made to sub-contractors are charged in totals to the concerned Contract Account as direct expense and no detailed records or break-up of the sub-contract amount is necessary for cost purposes.

(ii) Surveyor's Certificate and Retention Money:

In the case of contracts running for long periods of time, it is customary for the contractor's firm to get 'on account' payments against the portion of contract completed. The amount received depends upon the extent of work certified by the technical assessor i.e. on the surveyor's certificates, as these are called. Normally such payments are not received to the full extent of the work completed but a small percentage is held back as retention money, payable on completion of the contract. The retention money is a sort of safeguard available to the contractee in case the contractor is not able to fulfill one or more of the conditions laid down in the contract.

(iii) Defective Work:

Defective work will not evidently be paid for by the contractee but the cost of such defective work should be charged to the Contract Account. Sometimes, rectification of the defective work is required to be made at the contractor's cost; the cost of such rectification should also be charged to the Contract Account but shown separately.

(iv) Escalation Clause:

Escalation clauses are often provided in contracts as safeguards against any likely changes in price or utilisation of material and labour. Such a clause in a contract would provide that in the event of a specified contingency happening, the contract price would be suitably enhanced. This clause is particularly necessary where the price of certain raw materials are likely to rise, where labour rates are anticipated to increase,

or where the quantity of material or labour time cannot be properly assessed or estimated unless the work has sufficiently advanced. There may also be '**De-escalation or Reserve Clause**' to provide for any future decrease in price etc. so that the benefit may be passed on to the contractee.

(v) Work-in-progress:

In Contract Accounts, the value of the work-in-progress consists of:-

- the cost of work completed, both certified and uncertified,
- the cost of work not yet complete, and
- the amount of profit taken as credit.

In the Balance Sheet, the work-in-progress is usually shown under two heads, viz. certified and uncertified. The cost of work completed and certified and the profit credited will appear under the head 'certified' work-in-progress, while the completed work not yet certified and the cost of labour, material and expenses of work which has not reached the stage of completion are shown under the head 'uncertified' work-in-progress.

(vi) Profit on incomplete contracts:

For the purpose of finding out the portion of the profit out of notional profit to be transferred to Profit and Loss Account, the contracts are divided in the following manner:-

(A) Contracts which have just commenced:

In this case no portion of the notional profit shall be transferred to Profit and Loss Account and the entire amount is kept as reserve. There are no hard and fast rules to determine that a particular contract is just commenced or reasonably advanced or almost complete. However, as per general norms, the contracts in which less than 1/4th work is done are regarded as the contracts which have just commenced.

(B) Contracts which have reasonably advanced:

In this case the profit to be transferred to Profit and Loss Account out of notional profit is based on the degree of completion of the contract. The degree of completion of the contract can be found out by comparing work certified and the contract price.

- If the degree of the completion of the contract is less than or equal to 1/4th no portion of the notional profit shall be transferred to Profit and Loss Account and the entire amount would be kept as reserve.
- If the degree of completion of work is ($> 1/4$ and $< 1/2$), 1/3 of the notional profit shall be transferred to Profit and Loss Account and the remaining amount would be kept as reserve.
- If the degree of completion of work is more than or equal to 1/2, 2/3rd of the notional profit shall be transferred to Profit and Loss Account and the remaining amount would be kept as reserve.

The profit so arrived in the above manner shall further be reduced in the ratio of cash received to work certified. Thus, the formula is as follows:

$$(\text{Notional Profit} \times \frac{2}{3} \text{ or } \frac{1}{3} \text{ (as the case may be)}) \times \frac{(\text{Cash received})}{(\text{Work certified})}$$

(C) Contracts which are almost complete:

In this case the portion of the profit to be transferred to Profit and Loss Account is calculated by using the estimated total profit which is ascertained by subtracting the total cost to date and the additional cost to complete the contract from the contract price. The different formulas for such computations of profit are as follows:-

- Estimated Profit $\times \frac{(\text{Work certified})}{(\text{Contract price})}$
- Estimated Profit $\times \frac{(\text{Work certified})}{(\text{Contract price})} \times \frac{(\text{Cash received})}{(\text{Work certified})}$
- Estimated Profit $\times \frac{(\text{Total cost to date})}{(\text{Total cost})}$

$$(iv) \text{ Estimated Profit} \times \frac{(\text{Total cost to date})}{(\text{Total cost})} \times \frac{(\text{Cash received})}{(\text{Work certified})}$$

Illustration 11:

A firm of Builders, carrying out large contracts kept in contract ledger, separate accounts for each contract on 30th June, 2017, the following were shown as being the expenditure in connection with Contract No. 555.

	₹
Materials purchased	1,16,126
Materials issued from stores	19,570
Plant, which has been used on other contracts	25,046
Additional plant	7,220
Wages	1,47,268
Direct expenses	4,052
Proportionate establishment expenses	17,440

The contract which had commenced on 1st February, 2017 was for ₹ 6,00,000 and the amount certified by the Architect, after deduction of 20% retention money, was ₹ 2,41,600 the work being certified on 30th June, 2017. The materials on site were ₹ 19,716. A contract plant ledger was also kept in which depreciation was dealt with monthly the amount debited in respect of that account is ₹ 2260. Prepare Contract Account showing profit on the contract.

Solution:

Dr.		Contract Account		Cr.
Particulars	Amount ₹	Particulars	Amount ₹	
To, Materials purchased A/c	1,16,126	By, Work in progress A/c		
To, Material issued A/c	19,570	- Work certified	3,02,000	
To, Depreciation A/c	2,260			
To, Wages A/c	1,47,268	By, Material stock A/c	19,716	
To, Direct expenses A/c	4,052			
To, Proportionate estab. expenses A/c	17,440			
To, P & L A/c [15,000 x 2/3 x 4/5]	8,000			
To, Reserve c/d	15,000			
	3,21,716		3,21,716	

Illustration 12:

A contractor has undertaken a construction work at a price of ₹ 5,00,000 and begun the execution of work on 1st January, 2016. The following are the particulars of the contract up to 31st December, 2016.

Particulars	Amount ₹	Particulars	Amount ₹
Machinery	30,000	Overheads	8,252
Materials	1,70,698	Materials returned	1,098

Wages	1,48,750	Work certified	3,90,000
Direct expenses	6,334	Cash received	3,60,000
Uncertified work	9,000	Materials on 31.12.2016	3,766
Wages outstanding	5,380		
Value of plant on 31.12. 2016	22,000		

It was decided that the profit made on the contract in the year should be arrived at by deducting the cost of work certified from the total value of the architects certificate, that 1/3 of the profit so arrived at should be regarded as a provision against contingencies and that such provision should be increased by taking to the credit of Profit and Loss Account only such portion of the 2/3rd profit, as the cash received to the work certified.

Solution:
Dr.
Contract Account
Cr.

Particulars	Amount ₹	Particulars	Amount ₹
To, Machinery A/c	30,000	By, Plant & Machinery A/c	22,000
To, Materials A/c	1,70,698	By, Materials returned A/c	1,098
To, Wages incl. outstanding A/c	1,54,130	By, Materials on hand A/c	3,766
To, Direct Expenses A/c	6,334	By, W.I.P A/c	
To, Overheads A/c	8,252	Work certified	3,90,000
To, P & L A/c	34,738	Work uncertified	<u>9,000</u>
To, Reserve c/d	21,712		3,99,000
	4,25,864		4,25,864

Illustration 13:

A contractor commenced the work on a particular contract on 1st April, 2016 he usually closes his books of accounts for the year on 31st December of each year. The following information is revealed from his costing records on 31st December, 2016.

	₹
Materials sent to site	43,000
Jr. Engineer	12,620
Labour	1,00,220

A machine costing ₹ 30,000 remained in use on site for 1/5th of year. Its working life was estimated at 5 years and scrap value at ₹ 2,000

All other expenses were ₹14,000 the materials on site were ₹ 2,500.

The contract price was ₹ 4,00,000. On 31st December, 2016 2/3rd of the contract was completed however, the architect gave certificate only for ₹ 2,00,000. On which 80% was paid. Prepare Contract Account.

Solution:

Contract Account

Dr.

Cr.

Particulars	Amount ₹	Particulars	Amount ₹
To, Material A/c	43,000	By, W.I.P A/c	
To, Jr. Engineer A/c	12,620	Work certified	2,00,000
To, Labour A/c	1,00,220	Work uncertified	<u>*44,365</u>
To, Dep. On plant A/c	1,120	By, Material at site	2,500
[(30,000-2,000)/5] x 1/5			
To, Supervisor (2,000 x 9 x 1/2)	9,000		
To, Other expenses A/c	14,000		
To, P & L A/c	35,683		
To, Reserve c/d	31,222		
	2,46,865		2,46,865

Working notes:

Work uncertified:

For 2/3rd - ₹1,77,460

For $1/6^{\text{th}}$ - ? $(2/3 - 1/2 = 1/6)$

$$* [(1,77,460 \div 2/3) \times 1/6] = ₹44,365$$

Illustration 14:

The following figures are supplied to you by contractor for the year ending 31st December, 2016.

Particulars	₹
Work-in-Progress on 31-12-2015	₹ 85,000
Less: Cash received from contractee	₹ <u>55,000</u>
During the year:	
Wages	8,500
Materials bought	6,000
Working expenses	1,500
Materials issued from stores	10,500
Administrative expenses (₹250 are chargeable to Profit and Loss Account)	1,250
Plant	2,500
Material returned to supplier	450
Material returned to stores	550
Work certified	15,000
Contracts finished	22,500
Profits taken upon contracts	11,500
Advances from contractee	40,000

Prepare Contract Ledger Accounts, and the total contractee's and show the work-in-progress as it would appear in the Balance sheet.

Solution:

Dr.		Contract Account		Cr.	
Particulars	Amount ₹	Particulars		Amount ₹	
To, Work-in-Progress A/c	85,000	By, W.I.P A/c			
To, Wages A/c	8,500	Work certified	15,000		
To, Materials A/c	6,000	Work uncertified	<u>88,000</u>	1,03,000	
To, Materials A/c	10,500	By, Material returned (supplier)		450	
To, Working Expenses A/c	1,500	By, Material returned (stores)		550	
To, Administration Expenses A/c	1,000	By, Contractee A/c		22,500	
To, Plant	2,500				
To, P & L A/c	11,500				
	1,26,500			1,26,500	

Dr.		Contractee Account		Cr.	
Particulars	Amount ₹	Particulars		Amount ₹	
To, Contract A/c	22,500	By, Balance b/d		55,000	
To, Balance c/d	72,500	By, Cash A/c		40,000	
	95,000			95,000	

Balance Sheet as on

Liabilities	Amount ₹	Assets	Amount ₹
		W.I.P	1,03,000
		(-) Cash received	72,500
			30,500

Illustration 15:

The information given under has been extracted from the books of a contractor relating to contract for ₹3,75,000.

	I YEAR	II YEAR	III YEAR
	₹	₹	₹
Materials	45,000	55,000	31,500
Direct Expenses	1,750	6,250	2,250
Indirect expenses	750	1,000	---
Wages	42,500	57,500	42,500
Total work certified	87,500	2,82,500	3,75,000
Uncertified work	---	5,000	---
Plant	5,000	---	---

The value of plant at the end of I year was ₹4,000 at the end of II year ₹2,500 and at the end of III year it was ₹1,000. It is customary to pay 90% in cash of the amount of work certified. Prepare the contract Account and show how the figures would appear in the balance sheet.

Solution:

Dr.

Contract Account
Cr.

Particulars	Amount ₹	Particulars	Amount ₹
Ist Year			
To, Materials A/c	45,000	By, W.I.P A/c	
To, Direct Expenses A/c	1,750	Work certified	87,500
To, Indirect Expenses A/c	750	Work uncertified	Nil
To, Wages A/c	42,500	By, Plant A/c	4,000
To, Plant A/c	5,000	By, P & L A/c	3,500
	95,000		95,000
IIInd Year			
To, Work in progress A/c	87,500	By, W.I.P A/c	
To, Materials A/c	55,000	Work certified	2,82,500
To, Direct Expenses A/c	6,250	Work uncertified	<u>5,000</u>
To, Plant A/c	4,000	By, Plant A/c	2,500
To, Wages A/c	57,500		
To, Indirect Expenses A/c	1,000		
To, P & L A/c	47,250		
To, Reserve c/d	31,500		
	2,90,000		2,90,000
IIIrd Year			
To, Work in progress A/c	2,87,500	By, Reserve b/d	31,500
To, Plant A/c	2,500	By, Contractee A/c	3,75,000
To, Materials A/c	31,500	By, Plant A/c	1,000
To, Direct expenses A/c	2,250		
To, Wages A/c	42,500		
To, P & L A/c	41,250		
	4,07,500		4,07,500

Balance Sheet as on

Liabilities	Amount ₹	Assets	Amount ₹
Ist Year		Work in progress	87,500
	----	(-) Cash received (90%)	<u>78,750</u>
		Plant	4,000
IIInd Year		Work in progress	2,87,500
	----	(-) cash received (90%)	<u>2,54,250</u>
			33,250
		(-) Reserve	31,500
IIIrd Year		Plant	2,500

Illustration 16:

A firm of engineers undertook three contracts beginning on 1st Jan, 1st May and 1st August 2015. Their accounts on 30th November, 2015 showed the following position:

Particulars	Contract I	Contract II	Contract III
	₹	₹	₹
Contract price	80,000	54,000	60,000
Materials	14,400	11,600	4,000

Wages	22,000	22,500	2,800
General expenses	800	550	200
Cash received for work certified	30,000	24,000	5,400
Work certified	40,000	32,000	7,200
Work uncertified	1,200	1,600	400
Wages outstanding	700	750	350
General expenses outstanding	150	100	50
Plant installed	4,000	3,200	2,400
Materials on hand	800	800	400

On the respective dates of the contracts, the plant was installed depreciation thereon being taken at 15% p.a. You are required to prepare:

(a) Accounts in the Contract Ledger;

Solution:

Dr.

Contract Account
Cr.

	I ₹	II ₹	III ₹		I ₹	II ₹	III ₹
To, Materials A/c	14,400	11,600	4,000	By, W.I.P A/c			
To, Wages (incl. o/s) A/c	22,700	23,250	3,150	Work certified	40,000	32,000	7,200
To, Gen Expenses A/c	950	650	250	Work uncertified	1,200	1,600	400
To, Dep. On plant A/c	550	280	120	By, Material on hand A/c	800	800	400
(4,000 x 15% x 11/12)				By, P & L A/c	--	1,380	--
(3,200 x 15% x 7/12)							
(2,400 x 15% x 4/12)							
To, Notional profit	3,400	--	480				
	42,000	35,780	8,000		42,000	35,780	8,000
To, P & L A/c				By, Notional profit	3,400	--	480
(3,400 x 2/3 x 3/4)	1,700	--	--				
To, Reserve c/d	1,700	--	480				
	3,400	--	480		3,400	--	480

Illustration 17:

The following is the Trial Balance of Premier Construction Company, engaged on the execution of contract No.747, for the year ended 31st December, 2015.

Contractee's Account	₹	₹
Amount received		3,00,000
Buildings	1,60,000	
Creditors		72,000
Bank Balance	35,000	
Capital Account		5,00,000
Materials	2,00,000	
Wages	1,80,000	
Expenses	47,000	
Plant	2,50,000	
	8,72,000	8,72,000

The work on Contract No.747 was commenced on 1st January, 2015 materials costing ₹ 1,70,000 were sent to the site of the contract but those of ₹ 6,000 were destroyed in an accident. Wages of ₹1,80,000 were paid during the year. Plant with a cost of ₹ 2 lakhs was used from 1st January to 30th September and was then returned to the stores. Materials of the cost of ₹ 4,000 were at site on 31st December, 2012.

The contract was for ₹ 6,00,000 and the contractee pays 75% of the work certified. Work certified was 80% of the total contract work at the end of 2012. Uncertified work was estimated at ₹ 15,000 on 31st December, 2015.

Expenses are charged to the contract at 25% of wages. Plant is to be depreciated at 10% for the entire year.

Solution:**Dr.**

Contract Account
Cr.

Particulars	Amount ₹	Particulars	Amount ₹
To, Materials A/c	1,70,000	By, Costing P & L A/c	6,000
To, Wages A/c	1,80,000	By, Materials returned	4,000
To, Dep. on plant A/c	20,000	By, W.I.P A/c	4,95,000
[2,50,000 x 9/12 x 10/100]		Work certified	4,80,000
[50,000 x 3/12 x 10/100]		Work uncertified	<u>15,000</u>
To, Expenses (25%)	45,000		
To, P & L A/c	45,000		
To, Reserve c/d	45,000		
	5,05,000		5,05,000

Dr.

Profit & Loss Account
Cr.

Particulars	Amount ₹	Particulars	Amount ₹
To, Contract A/c	6,000	By, Profit from Contract A/c	45,000
To, Dep. on Plant	5,000		
[2,00,000 x 10% x 3/12]			
To, Expenses (47,000 – 45,000) A/c	2,000		
To, Net Profit	32,000		
	45,000		45,000

Balance Sheet as on

Liabilities	Amount ₹	Assets	Amount ₹
To, Capital A/c	5,00,000	By, W.I.P A/c	4,95,000
To, P & L A/c	32,000	(-) Cash received	<u>3,00,000</u>
To, Creditors A/c	72,000		1,95,000
		(-) Reserve	<u>45,000</u>
		By, Buildings A/c	1,60,000
		By, Bank A/c	35,000
		By, Material stock A/c	34,000
		By, Plant A/c	2,25,000
	6,04,000		6,04,000

Illustration 18:

A company of builders took to a multi-storied structure for ₹ 40,00,000 estimating the cost to be ₹ 36,80,000. At the end of the year, the company had received ₹ 14,40,000 being 90% of the work certified; work done but not certified was ₹40,000. Following expenditure were incurred.

₹

Materials	4,00,000
Labour	10,00,000
Plant	80,000

Materials costing ₹ 20,000 were damaged. Plant is considered as having depreciated at 25%.

Prepare Contract Account and show all the possible figures that can reasonably be credited to Profit and Loss Account.

Solution:

Dr.

Contract Account
Cr.

Particulars	Amount ₹	Particulars	Amount ₹
To, Material	4,00,000	By, Costing P & L A/c	20,000
To, Labour	10,00,000	By, W.I.P A/c	
To, Depreciation	20,000	Work certified	16,00,000
To, Notional Profit	2,40,000	Work uncertified	40,000
	16,60,000		16,40,000
			16,60,000

- (i) $3,20,000 \times (1,420/3,680) = 1,23,478$
(ii) $3,20,000 \times (1,420/3,680) \times 90/100 = 1,11,130$
(iii) $3,20,000 \times 16/40 = 1,28,000$
(iv) $3,20,000 \times (16/40) \times (90/100) = 1,15,200$

Illustration 19:

The following Trial Balance was extracted on 31st December, 2015 from the books of Swastik Co. Ltd contractors:

	Dr.	Cr.
Share Capital:		
Shares of ₹10 each		3,51,800
P&L A/c on 1.1. 2015		25,000
Provision for Dep. on Machinery		63,000
Cash received on account Contract - 7		12,80,000
Creditors		81,200
Land and Buildings (Cost)	74,000	
Machinery (Cost)	52,000	
Bank	45,000	
Contract 7:		
Materials	6,00,000	
Direct Labour	8,30,000	
Expenses	40,000	
Machinery on site (Cost)	1,60,000	
	18,01,000	18,01,000

Contract 7 was begun on 1st Jan 2015. The contract price is ₹ 24,00,000 and the customer has so far paid ₹ 12,80,000 being 80% of the work certified.

The cost of the work done since certification is estimated at ₹ 16,000. On 31st December, 2015, after the above Trial Balance was extracted machinery costing ₹ 32,000 was returned to stores, and materials then on site were value at ₹27,000.

Provision is to be made for direct labour due ₹6,000 and for depreciation of all machinery at 12 1/2 % on cost.

You are required to prepare:

- The Contract Account;
- A Statement of Profit, if any, to be properly credited to profit and loss account for 2015 and
- The Balance Sheet of Swastik Co. Ltd as on 31st December.

Solution:

Dr.

Contract Account
Cr.

Particulars	Amount ₹	Particulars	Amount ₹
To, Material A/c	6,00,000	By, W.I.P A/c	
To, Direct labour A/c	8,36,000	Work certified	16,00,000
To, Expenses A/c	40,000	Work uncertified	<u>16,000</u>
To, Dep. on machinery A/c	20,000	By, Material at site A/c	27,000
To, P & L A/c	78,400		
To, Reserve c/d	68,600		
	16,43,000		16,43,000

Dr.

Profit and Loss Account

Cr.

Particulars	Amount ₹	Particulars	Amount ₹
To, Dep. on plant A/c	6,500	By, Balance b/d	25,000
To, Net profit	96,900	By, Profit from contract A/c	78,400
	1,03,400		1,03,400

Balance Sheet as on

Liabilities	Amount ₹	Assets	Amount ₹
Share Capital	3,51,800	Machinery	2,12,000
P & L A/c	96,900	(-) Provision	63,000
Creditors	81,200	C.Year Depreciation	<u>26,500</u>
O/s Labour	6,000		1,22,500
		W.I.P	16,16,000
		(-) Cash received	<u>12,80,000</u>
			3,36,000
		(-) Reserve	<u>68,600</u>
			2,67,400
		Land & Buildings	74,000
		Bank	45,000
		Stock of materials	27,000
	5,35,900		5,35,900

Illustration 20:

Kapur Engineering Company undertakes long term contract which involves the fabrication of pre stressed concrete block and the reaction of the same on consumer's life.

The following information is supplied regarding the contract which is incomplete on 31st March, 2017

Cost Incurred:

₹

Fabrication cost to date:

Direct materials	2,80,000
Direct Labour	90,000
Overheads	<u>75,000</u>
	4,45,000
Erection cost to date	<u>15,000</u>
Total	<u>4,60,000</u>

Contract price 8,19,000

Cash received on account 6,00,000

Technical estimate of work completed to date:

Fabrication: Direct materials 80%

Direct labour and overheads 75%

Erection 25%

You are required to prepare a statement for submission to the management indicating

(a) The estimated profit on the completion of the contract;

(b) The estimated profit to date on the contract.

Solution:

Statement showing computation of profit on completion of contract and profit to date:

Particulars	Incurred to date ₹	To be incurred ₹	Total ₹
Material	2,80,000	70,000	3,50,000
Labour	90,000	30,000	1,20,000
Overheads	75,000	25,000	1,00,000
Erection	15,000	45,000	60,000
	4,60,000	1,70,000	6,30,000
Profit *			* 1,89,000
Contract Price			8,19,000

Profit to date = $1,89,000 \times (6,00,000 / 8,19,000)$ = 1,38,461 (or)

= $1,89,000 \times (4,60,000 / 6,30,000)$ = 1,38,000

Illustration 21:

The following particulars are obtained from the books of Vinay Construction Ltd. as on March, 2017.

₹

Plant and equipment at cost 4,90,000

Vehicles at cost 2,00,000

Details of contract with remain uncompleted as on 31-3-2017.

Particulars	Contract nos.		
	V.29	V.24	V.25
	(₹lacs)	(₹lacs)	(₹lacs)
Estimated final sales value	8.00	5.60	16.00
Estimated cost	6.40	7.00	12.00
Wages	2.40	2.00	1.20
Materials	1.00	1.10	0.44
Overheads (excluding dep.)	1.44	1.46	0.58
	4.84	4.56	2.22
Value certified by architects	7.20	4.20	2.40
Progress payments received	5.00	3.20	2.00

Depreciation of plant and Equipment and Vehicle should be charged at 20% to the three contracts in proportion to work certified. You are required to prepare statements showing contract-wise and total.

(a) Profit/loss to be taken to the P & L A/c for the year ended 31st March, 2017.

(b) Work-in-progress as would appear in the Balance Sheet as at 31-03-2017.

Solution:

(₹ in Lacs)

Dr.**Contract Account**
Cr.

Particulars	V.29	V.24	V.25	Particulars	V.29	V.24	V.25
To, Expenses other than depreciation	4.84	4.56	2.22	By, W.I.P A/c			
To, Depreciation *	0.72	0.42	0.24	Work certified	7.20	4.20	2.40
To, Notional profit	1.64	--	--	By, P & L A/c	--	0.78	0.06
	7.20	4.98	2.46		7.20	4.98	2.46
To, P & L A/c	*1.00	--	--	By Notional profit	1.64	--	--
To, Reserve A/c	0.64	--	--				
	1.64	--	--		1.64	--	--

* V.29 $[6,90,000 \times 20\% \times 7.2/13.8] = 0.72$ and similarly for V.24 & V.25 also.

Profit to be transfer to Profit and Loss A/c = EP x CR/CP = $1.60 \times 5.00/8 = 1*$

Illustration 22:

A company is manufacturing building bricks and fire bricks. Both the products require two processes. Brick forming and Heat treatment. The requirements for the two bricks are:

	BUILDING BRICKS	FIRE BRICKS
Forming per 100 bricks	3 hrs.	2 hrs.
Heat treatment per 100 bricks	2hrs.	5 hrs.
Total costs of the two departments in one month were:		
Forming	₹ 21,200	
Heat Treatment	₹48,800	
Production during the month was:		
Building Bricks	1,30,000 Nos.	
Fire Bricks	70,000 Nos.	
Prepare statement of manufacturing costs for the two varieties of bricks.		

Solution:**Statement Showing Number of Hours**

Particulars	Buil. Bricks	Fire Bricks	Total
Forming			
(1,30,000/100) x 3	3,900	1,400	5,300
(70,000/100) x 2			
Heat treatment	2,600	3,500	6,100
(1,30,000/100) x 2			
(70,000/100) x 5			
Total	6,500	4,900	11,400

Cost of forming per hour = $21,200 / 5,300 = 4$

Cost of Heat treatment per hour = $48,800 / 6,100 = 8$

Statement showing computation of manufacturing cost per two varieties of bricks:

Particulars	Buil. Bricks (₹)	Fire Bricks (₹)	Total (₹)
Forming			
(3,900 x 4), (1,400 x 4)	15,600	5,600	21,200
Heat treatment	20,800	28,000	48,800
(2,600 x 8), (3,500 x 8)			
Total	36,400	33,600	70,000

Illustration 23:

Deluxe limited undertook a contract for ₹5,00,000 on 1st July, 2016. On 30th June 2017 when the accounts were closed, the following details about the contract were gathered:

Particulars	₹
Materials purchased	1,00,000
Wages paid	45,000
General expenses	10,000
Plant Purchased	50,000
Materials on hand 30-6-2017	25,000
Wages accrued 30-6-2017	5,000
Work certified	2,00,000
Cash received	1,50,000
Depreciation of Plant	5,000
Work uncertified	15,000

The above contract contained an escalator clause which read as follows:

"In the event of prices of materials and rates of wages increase by more than 5% the contract price would be increased accordingly by 25% of the rise in the cost of materials and wages beyond 5% in each case".

It was found that since the date of signing the agreement the prices of materials and wage rates increased by 25% the value of the work certify does not take into account the effect of the above clause.

Prepare the contract account. Working should form part of the answer.

Solution:

Cost of material & wages incurred	= ₹ (1,00,000 + 45,000 + 5,000 – 25,000)
	= ₹1,25,000
Cost of material & wages before increase in prices	= ₹ (1,25,000 x 100/125)
	= ₹1,00,000
Increase in contract price	= ₹25/100 [1,25,000 – ₹ (1,00,000 x 105/100)]
	= ₹5,000 *

Dr.
Cr.

Contract Account

Particulars	Amount ₹	Particulars	Amount ₹
To, Material purchased A/c	1,00,000	By, Material on hand	25,000
To, Wages A/c	50,000	Work certified	2,05,000
To, General Expenses A/c	10,000	Work uncertified	<u>15,000</u>
To, Depreciation on plant	5,000		
To, P & L A/c	19,512		
To, Reserve c/d	60,488		
	2,45,000		2,45,000

7 PROCESS COSTING

PROCESS COSTING

Process Costing

Process costing is that aspect of operation costing which is used to ascertain the cost of the product at each process or stage of manufacture. This method of accounting used in industries where the process of manufacture is divided into two or more processes. The objective is to find out the total cost of the process and the unit cost of the process for each and every process. Usually the industries where process costing used are textile, oil industries, cement, pharmaceutical etc.

Features of Process Costing:

- Production is done having a continuous flow of products having a continuous flow of identical products except where plant and machinery is shut down for repairs etc.
- Clearly defined process cost centres and the accumulation of all costs by the cost centres.
- The maintenance of accurate records of units and part units produced and cost incurred by each process.
- The finished product of one process becomes the raw material of the next process or operation and so on until the final product is obtained.
- Avoidable and unavoidable losses usually arise at different stages of manufacture for various reasons.
- In order to obtain accurate average costs, it is necessary to measure the production at various stages of manufacture as all the input units may not be converted into finished goods.
- Different products with or without by-products are simultaneously produced at one or more stages or processes of manufacture. The valuation of by-products and apportionment of joint cost before joint of separation is an important aspect of this method of costing.
- Output is uniform and all units are exactly identical during one or more processes. So the cost per unit of production can be ascertained only by averaging the expenditure incurred during a particular period.

Applications of Process Costing:

The industries in which process costs may be used are many. In fact a process costing system can usually be devised in all industries except where job, batch or unit or operation costing is necessary. In particular, the following are examples of industries where process costing is applied:

Chemical works	Textile, weaving, spinning etc.
Soap making	Food products
Box making	Canning factory
Distillation process	Coke works
Paper mills	Paint, ink and varnishing etc.

Biscuit works	Meat products factory
Oil refining	Milk dairy

Difference between Job Costing and Process Costing:

	Job Costing	Process Costing
(i)	The form of specific order costing which applies where the work is undertaken to customer's special requirements.	That form of costing which applies where standardised goods are produced and production is in continuous flow, the products being homogeneous.
(ii)	The job is the cost unit and costs are collected for each job.	Costs are collected by process or department on time basis and divided by output for a period to get an average cost per unit.
(iii)	Losses are generally not segregated.	Normal losses are carefully predetermined and abnormal losses are segregated.
(iv)	Overheads are allocated and apportioned to cost centres then absorbed by jobs, in proportion to the time taken.	Units pass through the same processes. Overheades are apportioned to processes on some suitable basis, some times, pre-determined rates may be used
(v)	Joint products / By-products do not usually arise in jobbing work.	Joint products/By-products do arise and joint cost apportionment is necessary.
(vi)	Standard costing is generally not suitable for jobbing work.	The standardised nature of products and processing methods lends itself to the adoption of standard costing.
(vii)	Work-in-progress valuation is specific and is obtained from analysis of outstanding jobs.	For WIP valuation operating costs have to be spread over fully complete output and partially complete products using the concept of equivalent units.
(viii)	Each job is separate and independent of others. Costs are computed when a job is complete.	Products lose their individual identity as they are manufactured in a continuous flow. Costs are calculated at the end of cost period.
(ix)	There are usually no transfers from one job to another unless there is a surplus work or excess production.	Transfer of costs from one process to another is made, as the product moves from one process to another.
(x)	There may or may not be work-in-progress at the beginning or end of the accounting period.	There is always some work-in-process at the beginning as well as at the end of the accounting period.
(xi)	Proper control is comparatively difficult as each product unit is different and the production is not continuous.	Proper control is comparatively easier, as the production is standardised and is more stable.
(xii)	It requires more forms and details.	It requires few forms and less details.

Normal Process Loss:

It is the loss which is unavoidable on account of inherent nature of production process. Such loss can be estimated in advance on the basis of past experience or available data. The normal process loss is recorded only in terms of quantity and the cost per unit of usable production is increased accordingly. Where scrap possesses some value as a waste product or as raw material for an earlier process, the value thereof is credited to the process account. This reduces the cost of normal output; process loss is shared by usable units.

Abnormal Process Loss:

Any loss caused by unexpected or abnormal conditions such as plants breakdown, sub-standard materials, carelessness, accident etc., or loss in excess of the margin anticipated for normal process

loss should be regarded as abnormal process loss. The units of abnormal loss or gain are calculated as under:

Abnormal loss (or gain) = Total Loss – Normal Loss

The valuation of abnormal loss should be done with the help of this formula:

$$\text{Value of Abnormal Loss} = \frac{(\text{Normal Cost of Normal Output})}{(\text{Normal Output})} \times \text{Units of Abnormal Loss}$$

Abnormal Gain:

We know that margin allowed for normal loss is an estimate, (i.e., on the basis of expectation in process industries in normal conditions) and slight differences are bound to occur between the actual output of a process and that anticipated. These differences will not always represent increased loss, on occasions the actual loss will be less than that expected. Thus, when actual loss in a process is smaller than that was expected, an abnormal gain results. The value of the gain will be calculated in similar manner to an abnormal loss.

The Abnormal Gain Account is to be debited for the loss of income on account of less quantity of sale of scrap available as a result of abnormal gain and Normal Process Loss Account credited accordingly. The balance is transferred to Costing Profit and Loss Account as abnormal gain.

Equivalent Production:

This represents the production of a process in terms of completed units. In other words it means converting the incomplete production units into its equivalent of complete units. In each process an estimate is made of the percentage completion of any work-in-progress. A production schedule and a cost schedule will then be prepared. The work-in-progress is inspected and an estimate is made of the degree of completion, usually on a percentage basis. It is most important that this estimate is as accurate as possible because a mistake at this stage would affect the stock valuation used in the preparation of final accounts. The formula for equivalent production is:

Equivalent units of work-in-progress

$$= \text{Actual no. of units in process of manufacture} \times \text{Percentage of work completed}$$

For example, if 20% work has been done on the average of 1,000 units still in process, then 1,000 such units will be equal to 200 completed units. The cost of work-in-progress will be equal to 200 completed units.

Calculation of Equivalent Production:

The following steps are worth noting in its calculation:

- State the opening work-in-progress in equivalent completed units by applying the percentage of work needed to complete the unfinished work of the previous period. If the opening work-in-progress is 100 units which is 40 percent completed, then the equivalent units of this will be $100 \times 60\%$ i.e. 60 units.
- Add to (a), the number of units started and completed during the period. This can be found out by deducting the units in the closing work-in-progress from the number of units put into the process.
- Add to the above, the equivalent completed units of closing work-in-progress. This can be found out by applying the percentage of work done on the finished units at the end of the period.

There are mainly three methods of calculating cost per unit, out of which FIFO method and Weighted Average Method is used in equivalent production.

First In First Out Method [FIFO]:

In this method, the assumption is that the incomplete units from the opening stock are completed first and then the units introduced in the process are completed. The costs added in each process during the current period is prorated to the production necessary to complete the opening work in progress, to complete the units added in the process and units in the work in progress. The objective of the first in first out method is to value the inventory at the current costs and as such the main problem is to calculate the equivalent production under this method.

Average Method:

Process costs are sometimes computed on the basis of average costs. Where degree of completion of opening work in progress is not given, average method is used. The average process cost is obtained by adding the cost of opening work in progress and the cost of units introduced in the process during the current period and dividing this total cost by total equivalent units obtained by adding the number of units completed and equivalent units of the closing work in progress of each element, material, labor and overheads. The main object of average method is to even out the fluctuations in prices and hence is used when the prices fluctuate widely during a particular period.

Weighted Average Method:

If a manufacturing unit is manufacturing two or more products, which are quite dissimilar to each other, weighted average method is used. Under this method, weighted average is computed and used in valuation of the incomplete units.

Illustration 24:

The following particulars for process II are given:

Particulars	UNITS	₹
Transfer to process II at cost	4,000	9,000
Direct wages		2,000
Direct material		3,000
Transfer to Finished stock	3,240	

Factory overheads in process are absorbed at a rate of 400% of direct material. Allowance for Normal loss is 20% of Units worked. Scrap value is ₹ 5 per unit.

Evaluate the cost of transfer to finished stock. Using the information supplied above, show the amount of gain or loss in the process to be taken to Cost Profit and Loss A/c.

Solution:

Dr.

PROCESS-II- Account

Cr.

Particulars	Units	₹	Particulars	Units	₹
To, Transfer from Process - I	4000	9,000	By Normal Loss A/c	800	4000
To, Direct Wages A/c		2,000	(4000 x 20%) x 5		
To, Direct Material A/c		3,000	By Transfer to Finished Stock A/c	3,240	22,275
To, Factory Overheads		12,000	@ 6.875 per unit		
3000x 400%					
To, Abnormal Gain A/c	40	275			
$\frac{(26000 - 4000)}{(4000 - 800)} \times 40 = 6.875$					

	4,040	26,275		4,040	26,275

Dr. Abnormal Gain Account
Cr.

Particulars	Units	₹	Particulars	Units	₹
To, Process - II A/c	40	200	By, Process II A/c	40	275
To, Costing Profit & Loss A/c	-	75			
	40	275		40	275

Illustration 25:

Product-X is obtained after it passes through three distinct processes. You are required to prepare process account from the following information:

	PROCESSES			
	TOTAL	I	II	III
Material	15,084	5,200	3,960	5,924
Direct wages	18,000	4,000	6,000	8,000
Production overheads	18,000	-	-	-

1,000 units @ ₹ 6 per unit was introduced in Process I production overhead to be distributed at 100% on direct wages.

ACTUAL OUTPUT	UNITS	NORMAL LOSS	VALUE OF SCRAP (₹ per unit)
Process-I	950	5%	4
Process-II	840	10%	8
Process-III	750	15%	10

Prepare Process Accounts for I, II & III

Solution:

Dr. PROCESS-I- Account
Cr.

Particulars	Units	₹	Particulars	Units	₹
To, Material introduced 1000 @ ₹ 6/-	1000	6,000	By, Normal Loss (5% of 950) × 4	50	200
To, Additional Material A/c		5,200	By, Transfer to Process-II A/c @ ₹20/- per unit	950	19,000
To, Direct Labour A/c		4,000			
To, Production Overheads A/c		4,000			
	1000	19,200		1000	19,200

Dr. PROCESS-II- Account
Cr.

Particulars	Units	₹	Particulars	Units	₹

To, Transfer from Process –I A/c	950	19,000	By, Normal Loss (10% of 840)×8	95	760
To, Direct Material		3,960	By, Abnormal Loss	15	600
To, Direct Labour		6,000			
To, Production Overheads		6,000	$\frac{34960-760}{950-95} \times 15$		
			By, Transfer to Process-III A/c @ ₹40/-	840	33,600
	950	34,960		950	34,960

Dr.
Cr.

PROCESS-III- Account

Particulars	Units	₹	Particulars	Units	₹
To, Transfer from Process –II A/c	840	33,600	By, Normal Loss (15% of 840)×10	126	1,260
To, Direct Material A/c		5,924	By, Transfer to Finished Stock A/c	750	57,000
To, Direct Labour A/c		8,000	@ ₹76 per unit		
To, Production Overheads A/c		8,000			
To, Abnormal Gain A/c	36	2,736			
$\frac{55524-1260}{840-126} \times 36$					
	876	58,260		876	58,260

Illustration 26 :

A product passes through three processes— A, B and C. 10,000 units at a cost of ₹1.10 were issued to Process A. The other direct expenses were as follows:

	PROCESS-A	PROCESS-B	PROCESS-C
Sundry materials	1,500	1,500	1,500
Direct labour	4,500	8,000	6,500
Direct expenses	1,000	1,000	1,503

The wastage of process 'A' was 5% and in process 'B' 4%

The wastage of process 'A' was sold at ₹0.25 per unit and that of 'B' at ₹ 0.50 per unit and that of C at ₹ 1.00.

The overhead charges were 160% of direct labour. The final product was sold at ₹10 per unit fetching a profit of 20% on sales. Find out the percentage of wastage in Process 'C'

Solution:

Dr.
Cr.

PROCESS-A- Account

Particulars	Units	₹	Particulars	Units	₹
To, Material introduced A/c	10000	11,000	By Normal Loss A/c (10000 x 5%) x 0.25	500	125
To, Additional Material A/c		1,500	By Transfer to Process-B A/c @ ₹2.64 per unit	9500	25075
To, Direct Labour A/c		4,500			
To, Direct Expenses A/c		1,000			
To, Overheads A/c		7,200			
	10000	25,200		10000	25,200

Dr.

PROCESS-B- Account

Cr.

Particulars	Units	₹	Particulars	Units	₹
To, Transfer from Process-A A/c	9500	25,075	By, Normal Loss A/c (9,500 x 4%) x 0.5	380	190
To, Direct Material A/c		1,500	By, Transfer to Process-C A/c @ ₹ 5.283	9120	48,185
To, Direct Labour A/c		8,000			
To, Direct Expenses A/c		1,000			
To, Overheads A/c		12,800			
	9,500	48,375		9,500	48,375

Dr.

PROCESS-C- Account

Cr.

Particulars	Units	₹	Particulars	Units	₹
To, Transfer from Process-B A/c	9120	48,185	By, Normal Loss A/c (Ref. Working Notes)	696	696
To, Direct Material A/c		1,500	By, Transfer to Finished Stock A/c @ ₹8/- per unit	8424	67,392
To, Direct Labour A/c		6,500			
To, Direct Expenses A/c		1,503			
To, Overheads A/c		10,400			
	9120	68,088		9120	68,088

Working Notes:

- (a) Sale Price per unit 10
 (-) Profit @ 20% 2
 Cost per unit 8

- (b) Let the No. of units of loss in Process 'C' be 'x'

$$\text{Scrap value} = X \times 1 = ₹ X$$

$$68,088 - x = 8(9,120 - x) \text{ units}$$

$$68,088 = 72,960 - 7x$$

$$7x = 4,872$$

$$X = 696 \text{ units}$$

$$\begin{aligned} \text{Percentage of Normal wastage} &= \frac{696}{9120} \times 100 \\ &= 7.63\% \end{aligned}$$

Illustration 27:

	Degree of completion			
Opening stock	1,600	Units	Material	70%
			Labour	60%
			Overhead	60%
Transfer from Process I	10,200	Units		

Transfer to next process	9,200	Units		
Units scrapped	800	Units		
Normal loss 10% of Input				
Closing stock	1,800	Units	Material	60%
			Labour	40%
			Overhead	40%

Prepare a Statement of Equivalent Production.

Solution:

Statement of Equivalent Production

Input	Output	Units	Material		Labour		Overheads	
			%	Units	%	Units	%	Units
1 600	Opening Stock	1 600	30	480	40	640	40	640
10 200	Normal Loss	1 000	-	-	-	-	-	-
	Finished Units	7 600	100	7 600	100	7 600	100	7 600
	Closing Stock	1 800	60	1 080	40	720	40	720
		12 000		9 160		8 960		8 960
	Less: Abnormal Gain	200	100	200	100	200	100	200
11 800		11 800		8 960		8 760		8 760

Illustration 28:

From the following information compute (i) Equivalent production (ii) statement of apportionment of cost, (iii) prepare Process Account.

Work-in-progress (opening) 200 units @ ₹4 per unit	Stage of completion 100% Material 40% Labour & Overheads
Units introduced 1050	
Transfer to next process 1 100 units	
Closing stock 150 units	100% Material 70% Labour and Overhead

Other information:	₹
Material cost	1,050
Labour	2,250
Production Overhead	1,125
	<u>4,425</u>

Solution:

Statement of Equivalent Production

Input	Output	Units	Material	Labour	Overheads

			%	Units	%	Units	%	Units
200	Opening Stock	200	-	-	60	120	60	120
1,050	Finished Stock (1100-200) during this period	900	100	900	100	900	100	900
	Closing Stock	150	100	150	70	105	70	105
1250		1,250		1,050		1,125		1,125

Statement of Cost per unit

Particulars	Cost ₹	Equivalent units	Cost per unit ₹
Material	1,050	1,050	1
Labour	2,250	1,125	2
Production Overhead	1,125	1,125	1

Value of Closing Stock

Element	Units	Cost per unit ₹	Total Cost ₹
Material	150	1	150
Labour	105	2	210
Overhead	105	1	105
			465

Dr.

Process Account
Cr.

Particulars	Units	₹	Particulars	Units	₹
To, Opening Stock A/c	200	800	By, Closing Stock	150	465
To, Material A/c	1050	1,050	By, Transfer to Finished Stock A/c @ ₹ 4.327 per unit	1100	4,760
To, Labour A/c		2,250			
To, Overheads A/c		1,125			
	1,250	5,225		1,250	5,225

Working Note for checking transfer value to the finished stock:

Element	Units	Cost per unit ₹	Total Cost ₹
Material	-	-	800
Labour	120	2	240
Overhead	120	1	120
			1,160
900 x 4			3,600
			4,760

Illustration 29:

From the following information prepare process account.

OPENING STOCK		DEGREE OF COMPLETION
800 Units @ ₹6 per unit	₹ 4,800	Material I - 100% Material II - 60% Labour & Overheads 40%

Transfer from Process NO - I 12,000 units costing	₹16,350	
Transfer to next process	9,700 units	
Normal process loss	10%	
Closing stock	1,800 units	

Degree of Completion: For units scrapped:- Material 100% Labour and Overheads 50%.

For closing stock: Material 60%; Labour and overheads 50%

Scrap realized Re.1.00 per unit

Other information: Material ₹10,500; Labour ₹20,760; Overheads ₹16,670

Solution:

Statement of Equivalent Production

Input	Output	Units	Material-I		Material - II		Labour		Overheads	
			%	Units	%	Units	%	Units	%	Units
800	Opening Stock	800	-	-	40	320	60	480	60	480
12000	Normal Loss (800+12000-1800) x 10%	1100	-	-	-	-	-	-	-	-
	Finished Units (9700-800)	8900	100	8900	100	8900	100	8900	100	8900
	Closing Stock	1800	100	1800	60	1080	50	900	50	900
		12600		10700		10300		10280		10280
	Add: Abnormal Loss	200		200	100	200	50	100	50	100
12800		12800		10900		10500		10380		10380

Statement of Cost per unit

Particulars	Cost (₹)	Equivalent Cost (₹)	Cost per unit (₹)
Material-I	16350	10900	1.5
Material-II	10500	10500	1.0
Labour	20760	10380	2.0
Overhead (16,670-1,100)	15570	10380	1.5

Value of Abnormal Loss

Element	Units	Cost per unit (₹)	Total Cost (₹)
Material-I	200	1.5	300
Material-II	200	1.0	200
Labour	100	2.0	200
Overhead	100	1.5	150
			850

Value of Closing Stock

Element	Units	Cost per unit (₹)	Total Cost (₹)
Material-I	1800	1.5	2,700
Material-II	1080	1.0	1,080
Labour	900	2.0	1,800
Overhead	900	1.5	1,350
			6,930

Dr.

Process Account

Cr.					
Particulars	Units	₹	Particulars	Units	₹
To, Opening Stock A/c	800	4,800	By, Normal Loss A/c	1100	1,100
To, Transfer from Process-I A/c	12000	16,350	By, Closing Stock A/c	1800	6,930
To, Material A/c		10,500	By, Abnormal Loss A/c	200	850
To, Labour A/c		20,760	By, Transfer to Next Process A/c	9700	60,200
			@ ₹ 6.206 per unit		
To, Overheads A/c		16,670			
	12800	69,080		12800	69,080

Illustration 30:

SM Ltd., furnished you the following information relating to process B for the month of October, 2017.

- Opening work-in-progress- NIL
- Units introduced - 10,000 units @ ₹3 per unit
- Expenses debited to the process; Direct materials ₹14,650; Labour ₹21,148; Overheads ₹ 42,000
- Finished output - 9,500 units
- Closing work-in-progress 350 units; Degree of completion : Material 100%; Labour and overheads 50%
- Normal loss in process- one percent of input
- Degree of completion of abnormal loss: Material 100% ; Labour and Overheads 80%
- Units scrapped as normal loss were sold at ₹1 per unit
- All the units of abnormal loss were sold at ₹2.50 per unit.

Prepare:

- Statement of Equivalent Production
- Statement of Cost
- Process - B Account
- Abnormal Loss Account

Solution:**Statement of Equivalent Production**

Input	Output	Units	Material		Labour		Overheads	
			%	Units	%	Units	%	Units
10000	Normal Loss	100	-	-	-	-	-	-
	Finished Units	9500	100	9500	100	9500	100	9500
	Closing Stock	350	100	350	50	175	50	175
	Abnormal Loss	50	100	50	80	40	80	40
10000		10000		9900		9715		9715

Statement of Cost

Particulars	Cost ₹	Equivalent units	Cost per unit ₹
Material (30000+14650)-100	44,550	9,900	4.5000
Labour	21,148	9,715	2.1768

Overhead	42,000	9,715	4.3232

Value of Closing Stock

Element	Units	Cost per unit	Total Cost
Material	350	4.5	1575.00
Labour	175	2.1768	380.94
Overhead	175	4.3232	756.56
			2712.50

Say, ₹ 2713

Value of Abnormal Loss

Element	Units	Cost per unit	Total Cost
Material	50	4.5	225.000
Labour	40	2.1768	87.072
Overhead	40	4.3232	172.928
			485

Dr.			Process Account		Cr.	
Particulars	Units	₹	Particulars	Units	₹	
To, Material Introduced	10000	30000	By, Normal Loss A/c	100	100	
To, Material A/c		14650	By, Abnormal Loss A/c	50	485	
To, Labour A/c		21148	By, Closing Stock A/c	350	2,713	
To, Overheads A/c		42000	By, Transfer to Next Process @ ₹ 11 per unit	9500	1,04,500	
	10000	107798		10000	1,07,798	

Dr. Abnormal Loss Account Cr.

Particulars	Units	₹	Particulars	Units	₹
To, Process A/c	50	485	By, Debtors / Cash	50	125
			By, Costing P & L A/c	-	360
	50	485		50	485

Illustration 31:

AB Ltd. is engaged in process Engineering Industry. During the month of April, 2015, 2,000 units were introduced in Process 'X'. The normal loss was estimated at 5% of input. At the end of the month 1,400 units had been produced and transferred to process Y. 460 units incomplete and 140 units after passing through fully the entire process had to be scrapped. The incomplete units had reached the following stage of completion.

Material	75% completed
Labour	50% completed
Overhead	50% completed

Following are the further information on the Process 'X'

	₹
Cost of the 2,000 units	58,000
Additional Direct Material	14,400

Direct Labour	33,400
Direct Overheads	16,700

Units scrapped realised ₹ 10 each. Prepare Statement of Equivalent Production, Statement of Cost, Statement of Evaluation and the Process X Account.

Solution:

Statement of Equivalent Production

Input	Output	Units	Material		Labour		Overheads	
			%	Units	%	Units	%	Units
2000	Normal Loss	100	-	-	-	-	-	-
	Closing Stock	460	75	345	50	230	50	230
	Finished Units	1,400	100	1,400	100	1,400	100	1,400
	Abnormal Loss	40	100	40	100	40	100	40
2000		2,000		1,785		1,670		1,670

Statement of Cost

Particulars	Cost (₹)	Equivalent Units	Cost per unit (₹)
Material (58000+14400)-1000	71,400	1,785	40
Direct Labour	33,400	1,670	20
Overhead	16,700	1,670	10

Value of Closing Stock

Element	Units	Cost per unit ₹	Total Cost ₹
Material	345	40	13800
Labour	230	20	4600
Overhead	230	10	2300
			20700

Value of Abnormal Loss

Element	Units	Cost per unit ₹	Total Cost ₹
Material	40	40	1600
Labour	40	20	800
Overhead	40	10	400
			2800

Dr.

Process - 'X' Account
Cr.

Particulars	Units	₹	Particulars	Units	₹
To, Material introduced	2000	58,000	By, Normal Loss	100	1,000
To, Additional Material		14,400	By, Abnormal Loss	40	2,800
To, Labour		33,400	By, Closing Stock	460	20,700
To, Overheads		16,700	By, Transfer to Next Process @ ₹ 70 per unit.	1400	98,000
	2000	1,22,500		2000	1,22,500

Illustration 32:

The product of a manufacturing unit passes through two distinct processes. From the past experience the incidence of wastage is ascertained as under:

PROCESS 'A' 2%

PROCESS 'B' 10%

In each case the percentage of wastage is computed on the number of units entering the process concerned. The sales realisation of wastage in Process A and B are ₹ 25 per 100 units and ₹ 50 per 100 units respectively.

The following information is obtained for the month of April, 2015; 40,000 units of crude material were introduced in Process A at a cost of ₹ 16,000.

Particulars	PROCESS A	PROCESS B
	₹	₹
Other Materials	16,000	5,000
Direct Labour	9,000	8,000
Direct Expenses	8,200	1,500
	Units	Units
Output	39,000	36,500
Finished Product Stock:		
April 1	6,000	5,000
April 30	5,000	8,000
Value of stock per unit on April 1st	1.20	1.60

Stocks are valued and transferred to subsequent process at weighted average costs. Prepare respective Process Accounts and Stock Accounts.

Solution:

Dr.

Process A- Account
Cr.

Particular	Units	₹	Particular	Units	₹
To, Material Introduced	40000	16,000	By, Normal Loss A/c (40,000 x 2%) x 25/100	800	200
To, Additional Materials		16,000	By, Abnormal Loss A/c $\frac{49,200-200}{40,000-800} \times 200$	200	250
To, Direct Labour A/c		9,000	By, Transfer to Process-A Finished Stock A/c	39,000	48,750
To, Direct Expenses A/c		8,200			
	40,000	49,200		40,000	49,200

Dr. Process – A Finished Stock Account
Cr.

Particular	Units	₹	Particular	Units	₹
To, Opening Stock A/c	6,000	7,200	By, Closing Stock A/c	5,000	6,217
To, Transfer from Process – A-A/c	39,000	48,750	$\frac{55,950}{45,000} \times 5,000$		
			By, Transfer to Process B A/c @ ₹ 1.243 per unit	40,000	49,733
	45,000	55,950		45,000	55,950

Dr. Process-B- Account
Cr.

Particulars	Units	₹	Particulars	Units	₹
To, Transfer from process – A Finished Stock A/c	40000	49,733	By, Normal Loss A/c	4000	2,000
To, Other Materials		5,000	(40000x 10%) x 50/100		
To, Direct Labour A/c		8,000	By, Transfer to Process-B Finished Stock A/c	36500	63,097
To, Direct Expenses A/c		1,500			
To, Abnormal Gain A/c	500	864			
$\frac{64,233-2,000}{40,000-4,000} \times 500$					
	40,500	65,097		40,500	65,097

Dr. Process – B Finished Stock Account
Cr.

Particulars		₹	Particulars		₹
To, Opening Stock A/c	5000	8,000	By, Closing Stock A/c	8000	13,705
To, Transfer from Process – B A/c	36500	63,097	$\frac{71,097}{41,500} \times 8,000$		
			By, Transfer to Next Process A/c @ ₹ 1.7132 per unit	33500	57,392
	41500	71,097		41500	71,097

Illustration: 33

The following information is obtained in respect of process 3 of the month of August:

Opening Stock Value	1,000 units Direct Material (I) ₹ 390; Direct material (II) ₹ 75; Direct Labour - ₹ 112; Production overhead - ₹ 118.
Process 2 transfer	6,000 units at ₹ 2,360
Process 4 transfer	4,700 units.
Direct material added in process	₹ 520
Direct labour employed	₹ 1,036
Production Over Heads	₹ 1,541
Units scrapped	300
Degree of completion	Direct material 100% Direct labour 80% Production overhead 60%
Closing stock	2,000 units
Degree of completion:	Direct material 60%

Direct labour 50%
Production overhead 40%

Normal loss: 5% of production units scrap realised 0.20 each.

Prepare Process Account on weighted Average method.

Solution:

Statement of Equivalent Production

Input	Particulars	Output Units		Material-II		Labour		Overheads	
			Units	%	Units	%	Units	%	Units
1000	Opening stock	--	--		--		--		--
6000	Normal loss	250	--		--		--		--
	Finished units	4700	4700	100	4700	100	4700	100	4700
	Closing stock	2000	2000	60	1200	50	1000	40	800
	Abnormal Loss *	50	50	100	50	80	40	60	30
7000		7000	6750		5950		5740		5530

Statement of Cost

		Material-I		Material-II		Labour		Overheads
Opening stock	390			75		112		118
Add: during the period	2360			520		1036		1541
	2750							
Less: Scrap value of								
Normal Loss (250 x 0.2)	50	2700		595		1148		1659
Cost per unit (₹)		0.40		0.10		0.20		0.30

Calculation of closing stock:

	₹
Material I 2000 x 0.40	= 800
Material II 1200 x 0.10	= 120
Labour 1000 x 0.20	= 200
Overheads 800 x 0.30	= 240
	= 1360

Value of abnormal loss:

	₹
Material I 50 x 0.40	= 20
Material II 50 x 0.10	= 5
Labour 40 x 0.20	= 8
Overheads 30 x 0.30	= 9
	= 42

Dr.

Process – 3 Account
Cr.

Particulars	Units	Amount ₹	Particulars	Units	Amount ₹
To, Opening Stock A/c	1000	695	By, Normal loss A/c	250	50
To, Transfer from Process 2 A/c	6000	2,360	By, Abnormal loss A/c	50	42
To, Material A/c		520	By, Closing stock A/c	2000	1,360
To, Labour A/c		1,036	By, Transfer to process 4 A/c	4700	4,700
To, Overheads A/c		1,541	@ ₹ 1 per unit		
	7000	6,152		7000	6,152

OPERATING COSTING

OPERATING COSTING OR SERVICE COSTING – TRANSPORT, HOTEL AND HOSPITAL

Operating or Service Costing

Cost Accounting has been traditionally associated with manufacturing companies. However in the modern competitive market, cost accounting has been increasingly applied in service industries like banks, insurance companies, transportation organizations, electricity generating companies, hospitals, passenger transport and railways, hotels, road maintenance, educational institutions, road lighting, canteens, port trusts and several other service organizations. The costing method applied in these industries is known as 'Operating Costing'.

According to CIMA [London] operating costing is, '*that form of operating costing which applies where standardized services are provided either by an undertaking or by a service cost center within an undertaking*'.

Nature of Operating Costing:

The main objective of operating costing is to compute the cost of the services offered by the organization. For doing this, it is necessary to decide the unit of cost in such cases. The cost units vary from industry to industry. For example, in goods transport industry, cost per ton kilometer is to be ascertained while in case of passenger transport, cost per passenger kilometer is to be computed. Cost units used in different service units are explained in detail later in chapter. The next step is to collect and identify various costs under different headings.

The headings used are,

- (a) Fixed or standing charges
- (b) Semi-fixed or maintenance charges
- (c) Variable or running charges.

One of the important features of operating costing is that mostly such costs are fixed in nature. For example, in case of passenger transport organization, most of the costs are fixed while few costs like diesel and oil are variable and dependent on the kilometers run.

Because of the diverse nature of activities carried out in service undertakings, the cost system used is obviously different from that of manufacturing concern. Let us discuss the method of computing costs in various service organisations .

Transport Organisation:

Costing in a transport industry consists of determining the operating cost of each vehicle and applying this cost to find out the cost per unit of service rendered by a vehicle. The cost unit is selected with proper care keeping in view the needs of each concern, the weight, bulk, volume and type of goods carried and distance covered in each trip. Transport undertakings include goods transport organizations as well as passenger transport organizations. The cost unit is either ton kilometer or passenger kilometer. The meaning is cost of carrying one ton over a distance of one kilometer or cost of carrying one passenger for a distance of one kilometer.

Collection of Costs: A log book is maintained for each vehicle to record details of trips made by the vehicle during a specified period of time. Log book is maintained usually on a daily basis. The details shown in the log book

enables the management to make suitable allocation of vehicles, to avoid the duplicate trips, or to avoid idle running capacity. The log book also provides the information relating to the fuel consumed, distance travelled, no of hours travelled, chargeable kilo meters. The log book provide the data for proper allocation of cost and in this respect these may be compared with the production details available in a manufacturing concern

Classification of Costs:

The costs of a transport organisation can be classified and accumulated under the following heads:-

- Fixed or stand-by costs:** These costs which include garage charges, insurance, taxes, license, depreciation, wages of drivers, cleaner's salary, establishment cost of workshop and office. Out of the above some of the costs are directly identifiable for each vehicle such as license fee and some are apportioned such as office expenses
- Maintenance Charges:** These costs are in the nature of semi-variable nature includes expenditure on maintenance, repairs, tyres, tubes and other charges.
- Operating and Running costs:** These costs are variable in nature, includes fuel, lubricating oil, wages of drivers / cleaners (if paid on per trip / kilometer). These costs can be easily identifiable with each of the vehicle.

Significance of Operating or Running Costs:

- Control of operating and running cost and avoidance of waste of fuel and other consumable material.
- Cost of running own vehicles may compared with the hired or other forms of transport.
- Facilitates quotation of hiring rates to outside parties who ask for the transport service.
- If transport service is treated as a separate department or service cost center, the costs to be charged to the requesting department may be easily determined.
- Suitable information is obtained for efficient routing of vehicles.
- Cost of idle vehicles and lost running time is easily obtained.

Illustration 46 :

There are two warehouses for storing finished goods produced in a factory. Warehouse 'A' is at a distance of 10 kms. and Warehouse 'B' is at a distance of 15 kms from the factory. A fleet of 5 tonne lorries is engaged in transporting the finished goods from the factory. The records show that the lorries average a speed of 30 kms. per hour when running and regularly take 40 minutes to load at the factory. At warehouse 'A' unloading takes 30 minutes per load while at warehouse 'B' it takes 20 minutes per load.

Drivers' Wages, depreciation, insurance and taxes amount to ₹18 per hour operated. Fuel oil, tyres, repairs and maintenance cost ₹ 2.40 per kilometer. You are required to draw up a statement showing the cost per tonne kilometer of carrying the finished goods to the two warehouses.

Solution:

Statement showing computation of total cost and cost per tonne kilometer of carrying finished goods to warehouses:

Particulars		A	B
Time for travelling		40 Min	60 Min
Time for loading		40 Min	40 Min
Time for unloading		30 Min	20 Min
		110 Min	120 Min
Cost of Insurance, wages, tax, etc.	$[(110/60) \times 18]$	33.00	
	$[(120/60) \times 18]$		36.00
Fuel & oil etc.	$(20 \times 2.4) (30 \times 2.4)$	48.00	72.00
Total Cost	₹	81.00	108.00
Tonne Kilometers (5 x 10) (5 x 15)	₹	50.00	75.00
Cost per tonne KM	₹	1.62	1.44

Illustration 47 :

A transport service company is running 4 buses between two towns which are 50 miles apart. Seating capacity of each bus is 40 passengers. The following particulars were obtained from their books for April, 2015.

	₹
Wages of Drivers, Conductors and Cleaners	2,400
Salaries of Office and Supervisory Staff	1,000
Diesel and oil and other oil	4,000
Repairs and Maintenance	800
Taxation, Insurance, etc.	1,600
Depreciation	2,600
Interest and Other Charges	<u>2,000</u>
	<u>14,400</u>

Actual passengers carried were 75% of the seating capacity. All the four buses ran on all days of the month. Each bus made one round trip per day. Find out the cost per passenger mile.

Solution:
Computation of Cost per Passenger Mile:

$$\begin{aligned}
 \text{Passenger miles} &= \text{No. of buses} \times \text{Distance} \times \text{Round trip} \times \text{No. of Passengers} \times \text{No. of days in month} \times \text{Capacity} \\
 &= 4 \times 50 \times 2 \times 40 \times 30 \times 75\% \\
 &= 3,60,000 \text{ miles} \\
 \text{Cost per passenger mile} &= 14,400 / 3,60,000 \\
 &= ₹ 0.04
 \end{aligned}$$

Illustration 48:

Mr. Sohan Singh has started transport business with a fleet of 10 taxies. The various expenses incurred by him are given below:

- (i) Cost of each taxi ₹ 75,000
- (ii) Salary of office Staff ₹ 1,500 p.m.
- (iii) Salary of Garage's Supervisor ₹ 2,000 p.m.
- (iv) Rent of Garage ₹ 1,000 p.m
- (v) Drivers Salary (per taxi) ₹ 400 pm.
- (vi) Road Tax and Repairs per taxi ₹ 2,160 p.a.
- (vii) Insurance premium @ 4% of cost p.a.

The life of a taxi is 3,00,000 km. and at the end of which it is estimated to be sold at ₹ 15,000. A taxi runs on an average 4,000 Km. per month of which 20% it runs empty, petrol consumption 9 Km. per litre of petrol costing ₹ 6.30 per litre. Oil and other sundry expenses amount to ₹ 10 per 100 Km.

Calculate the effective cost of running a taxi per kilometre. If the hire charge is ₹ 1.80 per Kilometre, find out the profit that Mr. Shohan may expect to make in the first year of operation.

Solution:
Statement Showing Computation of Effective Cost and Profit for the Year

Particulars	Amount ₹	Amount ₹
Fixed expenses:		
Salary of staff	1,500	
Salary of garage supervisor	2,000	
Rent of garage	1,000	
Driver Salary (10 x 400)	4,000	
Road tax and repairs (2,160 x 10/12)	1,800	
Insurance premium (75,000 x 4 % x 10/12)	2,500	12,800
Fixed cost of 10 taxi's per month		
Cost per taxi = ₹ 12,800/10 = ₹ 1,280		
Cost per km = 1280/4,000 = 0.32		0.32
Running Costs:		
Depreciation [(75,000-15,000) / 3,00,000]		0.20
Petrol (6.3/9)		0.70
Oil & sundry expenses (10/100)		0.10
		1.32
Effective cost per Km = 1.32 x (100/80)		1.65

$$\begin{aligned}\text{Profit for year} &= (1.80 - 1.65) \times 10 \times 3,200 \times 12 \\ &= ₹ 57,600\end{aligned}$$

Illustration 49:

Janata Transport Co. has been given a route 20 km. long for running buses. The company has a fleet of 10 buses each costing ₹ 50,000 and having a life of 5 years without any scrap value.

From the following estimated expenditure and other details calculate the bus fare to be charged from each passenger.

(i) Insurance charges	3 % p.a.
(ii) Annual tax for each bus	₹ 1,000
(iii) Total garage charges	₹ 1,000
(iv) Drivers' salary for each bus	₹ 150 p.m.
(v) conductor's salary for each bus	₹ 100 p.m.
(vi) Annual repairs to each bus	₹ 1,000
(vii) Commission to be shared by the driver and conductor equally: 10% of the takings	
(viii) Cost of stationary	₹ 500 p.m.
(ix) Manager's salary	₹ 2,000 p.m.
(x) Accountant's salary	₹ 1,500 p.m.
(xii) Petrol and oil	₹ 25 per 100 km

Each bus will make 3 round trips carrying on an average 40 passengers on each trip. The bus will run on an average for 25 days in a month. Assuming 15% profit on takings, calculate, the bus fare to be charged from each passenger.

Solution:

Particulars	Amount (₹)

Insurance (50,000 x 3% x 10/12)	1,250
Tax (1,000 x 10/12)	833.33
Garage charges	1,000
Drivers salary (150 x 10)	1,500
Conductor salary (100 x 10)	1,000
Repairs (1,000 x 10/12)	833.33
Cost of stationary	500
Managers salary	2,000
Accountant salary	1,500
Depreciation (50,000 x 10/5 x 1/12)	833.33
Petrol * (30,000/100) x 25	7,500
Commission of conductor & driver 35,000 x (10/100)	3,500
	29,750
(+) Profit @ 15% on takings (35,000 x 15/100)	5,250
	35,000

$$* 10 \times 20 \times 3 \times 2 \times 25 = 30,000$$

Let 'X' be the takings

$$X = 26,250 + (10/100 X) + (15/100 X)$$

$$100 X = 26,25,000 + 25 X$$

$$X = 35,000$$

$$\text{Fare per passenger Km} = 35,000 / (30,000 \times 40)$$

$$= 0.0292 = ₹ 0.03$$

Illustration 50 :

Union Transport Company supplies the following details in respect of a truck of 5 tonne capacity

Cost of truck	₹ 90,000
Estimated life	10 years
Diesel, oil, grease	₹ 15 per trip each way
Repairs and maintenance	₹500 p.m.
Driver's wages	₹ 500 p.m.
Cleaner's wages	₹ 250 p.m.
Insurance	₹ 4,800 per year
Tax	₹2,400 per year
General supervision charges	₹4,800 per year

The truck carries goods to and from the city covering a distance of 50 kms. each way.

On outward trip freight is available to the extent of full capacity and on return 20% of capacity.

Assuming that the truck runs on an average 25 days a month, work out:

- Operating cost tonne-km.
- Rate for tonne per trip that the company should charge if a profit of 50% on freight is to be earned.

Solution:

Particulars	Amount ₹
Repairs & Maintenance	500
Drivers wages	500
Cleaners wages	250
Insurance	400
Tax	200
Supervision charge	400
Depreciation [(90,000/10) x (1/12)]	750
Diesel, oil, grease (15 x 2 x 25)	750
	3,750
(+) 50% profit on freight (100% on cost)	3,750
	7,500

$$\begin{aligned}\text{Tonne Kms} &= 25 [(50 \times 5) + (20/100 \times 50 \times 5)] \\ &= 7,500\end{aligned}$$

$$\text{Cost per tonne km} = 3,750 / 7,500 = 0.50$$

$$(+)\text{ Profit @ 50\% on freight} = 0.50$$

$$= 1.00$$

Illustration 51 :

Manar lodging home is being run in a small hill station with 50 single rooms. The home offers concessional rates during six off- season months in a year. During this period, half of the full room rent is charged. The management's profit margin is targeted at 20% of the room rent. The following are the cost estimates and other details for the year ending on 31st March 2016. [Assume a month to be of 30 days].

- (i) Occupancy during the season is 80% while in the off- season it is 40% only.
- (ii) Expenses:
 - Staff salary [Excluding room attendants] ₹ 2,75,000
 - Repairs to building ₹ 1,30,500
 - Laundry and linen ₹ 40,000
 - Interior and tapestry ₹ 87,500
 - Sundry expenses ₹ 95,400
- (iii) Annual depreciation is to be provided for buildings @ 5% and on furniture and equipments @ 15% on straight-line basis.
- (iv) Room attendants are paid ₹ 5 per room day on the basis of occupancy of the rooms in a month.
- (v) Monthly lighting charges are ₹ 120 per room, except in four months in winter when it is ₹ 30 per room and this cost is on the basis of full occupancy for a month.
- (vi) Total investment in the home is ₹ 100 lakhs of which ₹ 80 lakhs relate to buildings and balance for furniture and equipments.

You are required to work out the room rent chargeable per day both during the season and the off-season months on the basis of the foregoing information.

Solution:

 (i) **Computation of Estimated Cost for the year ending 31st March, 2016**

Particulars	Amount ₹
Salary	2,75,000
Repairs	1,30,500
Laundry and linen	40,000
Interior decoration	87,500
Depreciation: 5% on ₹ 80 lakhs: ₹ 4,00,000 15% on ₹ 20 lakhs: ₹ 3,00,00	7,00,000
Sundry expenses	95,400
Total costs	13,28,400

(ii) Number of room days in a year:

Occupancy during season for 6 months @ 80% $(50 \times 0.80 \times 6 \times 30) = 7,200$

Off-season occupancy for 6 months @ 40% $(50 \times 0.40 \times 6 \times 30) = 3,600$

Total number of room days during a year = 10,800

(iii) Attendant's salary

For 10,800 room days @ ₹ 5 per day = ₹ 54,000

(iv) Light charges for 8 months @ ₹ 120 per month i.e. ₹ 120/30 = ₹ 4 per room day.

Light charges for 4 months @ ₹ 30 per month, i.e. ₹ 30/30 = ₹ 1 per room day

Total lighting charges:

During season @ ₹ 4 for 7200 days = ₹ 28,800

During off season 2 months @ ₹ 4 for 1200 days $(2/6 \times 3600) = ₹ 4,800$

During 4 months of winter @ Re. 1 for 2,400 days $(4/6 \times 3600) = ₹ 2,400$

Note:

It is given in the example that during four months of winter, the lighting is ₹ 30 per room, which is $1/4^{\text{th}}$ of the lighting charges during the remaining period of the year. Hence the rate of room day which is ₹ 4 will also be $1/4^{\text{th}}$ for winter period and so it is taken as Re. 1 per room day.

Statement of Total Estimated Cost

Particulars	Amount ₹
Expenses as shown in I above	13,28,000
Attendant's salary as shown in III above	54,000
Lighting charges as shown in IV above	36,000
Total cost	14,18,400

Computation of total Full Room Days

During season : 7,200

Off-season : 1,800 (Equivalent to 50% rate of 3,600 days)

Total Full Room Days : 9,000

Computation of Room Rent

Cost per room day : ₹ 14,18,400 / 9,000 = ₹ 157.60

Add: Profit margin at 20% of rent or 25%

Of cost = ₹ 39.40

Room Rent = ₹ 197.00

Therefore, during season, room rent of ₹ 197 is to be charged while in the off-season room rent of ₹ 98.50 is to be charged.

9

JOINT PRODUCT AND BY-PRODUCT COSTING

Joint and By-Products

Meaning of Joint Products:

In several industries more than one product emerge from the manufacturing process. These products are sometimes produced intentionally while in some cases they emerge out of the main manufacturing process. Such products are termed as either joint products or by-products. Though sometimes these terms are used interchangeably, there is a major difference between the two and therefore it is necessary to understand clearly the difference between them. Similarly there is a difference between the accounting of the two and hence it is essential to define clearly the concepts of joint products and by-products.

In CIMA Terminology defines joint products as “two or more products separated in the course of processing each having a sufficiently high value to merit recognition as a main product”. Joint products imply that they are produced from the same basic raw material, are comparatively of equal importance, are produced simultaneously by a common process and may require further processing after the point of separation.

Difference Between Joint products and Co-products:

Joint products are frequently confused with co-products. However, there is significant difference between the two, the former being indivisible and the latter divisible. Common costs are allocable among products or services performed because each of the products or services could have been obtained separately. Therefore, any shared cost of obtaining them can be meaningfully allocated on the basis of relative usage of the common facilities. For example, the cost of fuel or power may be allocated to products based on production volumes and metered usage. Co-products do not always arise from the same operation or raw materials and the quantity of co-products is within the control of manufacturer. Thus different quantities of car, jeep and trucks can be produced in car manufacturing industry according to the need of the concern.

Features of Joint Products:

- (a) Joint products are the result of utilization of the same raw material and same processing operations. The processing of a particular raw material may result into the output of two or more products.
- (b) All the products emerging from the manufacturing process are of the same economic importance. In other words, the sales value of those products may be more or less same and none of them can be termed as the major product.
- (c) The products are produced intentionally which implies that the management of the concerned organization has intention to produce all the products.
- (d) Some of joint products may require further processing or may be sold directly after the split off

point.

- (e) The manufacturing process and raw material requirement is common up to a certain stage of manufacturing. After the stage is crossed, further processing becomes different for each product. This stage is known as 'split off' point. The expenditure incurred up to the split off point is called as joint cost and the apportionment of the same to different products is the main objective of the joint product accounting.
- (f) The management has little or no control over the relative quantities of the various products that will result.
- (g) Joint products are commonly produced in industries like, chemicals, oil refining, mining, meatpacking, automobile etc. In oil refining, fuel, oil, petrol, diesel, kerosene, lubricating oil are few examples of the joint products.

Accounting for Joint Product Cost:

Before we proceed to discuss the methods of accounting in case of joint products and by-products, it will be necessary to understand certain terms clearly. These terms are explained below:

- (i) **Split Off Point:** This is a point up to which, input factors are commonly used for production of multiple products, which can be either joint products or by-products. After this point, the joint products or byproducts gain individual identity. In other words, up to a certain stage, the manufacturing process is the same for all the products and a stage comes after which, the individual processing becomes different and distinct. For example, in a dairy, several products like, milk, ghee, butter, milk powder, ice-cream etc. may be produced. The common material is milk. The pasteurization of milk is a common process for all the products and after this process; each product has to be processed separately. This point is of special significance in the accounting of joint product and by-products because the joint cost incurred before this point is to be apportioned appropriately in the joint products.
- (ii) **Joint Costs:** Joint cost is the pre separation cost of commonly used input factors for the production of multiple products. In other words, all costs incurred before or up to the split off point are termed as joint costs or pre separation costs and the apportionment of these costs is the main objective of joint product accounting. Costs incurred after the split off point are post separation costs and can be easily identified with the products.

Accounting Treatment:

In case of joint products, the main objective of accounting of the cost is to apportion the joint costs incurred up to the split off point. As discussed earlier, the manufacturing process is same up to a certain stage and after crossing that stage; each product has distinct manufacturing process. Therefore the main problem is apportionment of the joint cost or the cost incurred up to the split off point. The total cost of production of the joint product will be cost incurred up to the split off point duly apportioned plus the cost incurred after the split off point. There is no problem of charging the cost incurred after the split off point as the cost can be identified easily. The main problem therefore is that of apportionment of the joint cost and the following methods are used for apportioning the same.

- (i) **Physical Quantity Method:** Under this method, cost apportionment is made in proportion to the volume of production. These physical measures may be units, pounds, liters, kilos, tones, gallons etc.
- (ii) **Average Unit Cost Method:** Under this method, the joint cost is apportioned to the joint products by computing the average unit cost of the product units. The average unit cost is computed by dividing the total manufacturing cost by the total number of units produced of all products. This method is useful where all the products produced are uniform with each other in all the respects. This method will not be useful if the production units are not similar with each other.
- (iii) **Weighted Average Method:** Under this method, weights are assigned to each unit based upon size of the units, difference in type of labor employed, material consumption, market share, efforts of labour required and so on. The joint cost is apportioned on the basis of the weights assigned

to each product. This method is highly useful if the weights assigned are on objective basis. If subjective element creeps in, the method may not give accurate results.

- (iv) **Selling Price Method:** Under this method, the joint cost is apportioned on the basis of sales value at the split off point. The logic is that a product should bear the share of the joint cost according to its sale price. If sales price is higher than that of the other products, more share of joint cost should be charged to that product and if it is comparatively less than that of other products, less share of joint cost should be charged to the same. Though logically this method seems to be sound, in practice, charging higher share of joint cost to the product with higher sales value may not be justified due to the fact that lesser efforts are required for manufacturing of the same.

Meaning of By-Products:

The term 'by-products' is sometimes used synonymously with the term 'minor products'. The by-product is a secondary product, which incidentally results from the manufacture of a main product. By-products are also produced from the same raw material and same process operations but they are secondary results of operation. The main difference between the joint product and byproduct is that there is no intention to produce the by-product while the joint products are produced intentionally. The relationship between the by-product and the main product changes with changes in economic or industrial conditions or with advancement of science. The by-product of an industry may become a main product and main product may become a by-product subsequently.

For example, (a) in sugar industry, sugar is a main product and molasses is a by-product (b) in coke ovens, gas and tar are incidentally produced in addition to the main product coke. Gas and tar are, therefore, treated as by-products. These minor secondary products have saleable or usable value and are incidentally produced in addition to the main product.

In CIMA Terminology, By-product is "a product which is recovered incidentally from the material used in the manufacture of recognized main products such as having either a net realizable value or a usable value which is relatively low in comparison with the saleable value of the main products. By products may further be processed to increase their realizable value".

Thus the term 'by-product' is generally used by businessmen and accountants to denote one or more products of relatively small value that are produced simultaneously with a product of greater value.

Classification of By-Products:

By-products can be classified into two groups according to marketable conditions at the split off point:

- (a) Those sold in the same form as originally produced, and
- (b) Those which may undergo further processing before sale.

Accounting treatment:

By-products are jointly produced products of minor importance and do not have separate costs until the split off point. They are not produced intentionally but are emerging out of the manufacturing process of the main products. The following methods are used for accounting of by-products. The methods are broadly divided into Non-Cost Methods and Cost Methods.

(A) **Non-Cost Methods:** The following methods are included in this category.

- (i) **Other income or miscellaneous income method:** Under this method, sales value of by-products is credited to the Profit and Loss Account and no credit is given in the Cost Accounts. The credit to the Profit and Loss Account is treated as other income or miscellaneous income. No effort is made for ascertaining the cost of the product. No valuation of inventory is made and all costs and expenses are charged to the main product. This is the least scientific method and is used where the sales value of the by-product is negligible.
- (ii) **Total sales less total cost:** Under this method, sales value of by-product is added to the sales value of the main product. Further the total cost of the main product including the cost of the by-product is deducted from the sales revenue of the main product and by-product. All costs and expenses are charged to the main product.

- (iii) **Total cost less sales value of by-product:** In this method, the total cost of production is reduced by the sales value of the by-product. This method seems to be more acceptable because like waste and scrap, by-product revenue reduces the cost of major products.
- (iv) **Total cost less sales value of by-products after setting off selling and distribution overheads of by-products:** Sales value of the by-product minus the selling and distribution overheads of byproduct is deducted from the total cost. Selling and distribution overheads are charged against by-products actually sold.
- (v) **Reverse cost method:** This method is based on the view that the sales value of the by-product contains an element of profit. It is agreed that this element of profit should not be credited to the Profit and Loss Account. The cost of by-product is arrived at by working backwards. Selling price of the by-product is deflated by an assumed gross profit margin. Thus under this method, sales value of the by-product is first reduced by, an estimated profit margin, selling and distribution expenses and then the post split off costs and then the cost of the main product is thus reduced by this net figure.

(B) Cost Methods: The following methods are included in this category.

- (i) **Replacement or opportunity cost method:** If the by-products are consumed captively, they are valued at the opportunity cost method or replacement cost method. This means the cost which would have been incurred had the by-product been purchased from outside. For example, bagasse, which is one of the main by-product of sugar industry and which is used for the factory as a fuel in the boiler is valued at the market value, i.e. the price that would have been paid if it would have been purchased from outside.
- (ii) **Standard cost method:** Under this method, the by-product is valued at the standard cost determined for each product. The standard cost may be based on technical assessment. Standard cost of the by-product is credited to the process account of the main product. Accordingly, the cost control of main product can be exercised effectively.
- (iii) **Joint cost proration:** Where the by-product is of some significance, it is appropriate that the joint costs should be apportioned between the main products and by-products on a most suitable and acceptable method. Thus in this method, no distinction is made between the joint product and byproduct. Industries, where the by-products are quite important, use this method. For example, in a petroleum refinery, gas was earlier considered as a by-product. Now it has assumed the importance like petrol, diesel etc. and is being treated as joint product. Accordingly, the joint cost is prorated between the joint product and the by-product.

Difference between Main product & Joint and By-Products:

It is very difficult to make distinction between the joint products, main products and by-products. There are, however, two checks which may be applied to determine if a product is a by-product or a joint product or a main product:

- (i) **Value:** If one of the products is of considerably large value than the others it will usually be considered the main product. Conversely any product which is of considerably less value is likely to be classified as a by-product. If both or some or all the products are more or less of equal value, they are likely to be classified as joint products.
- (ii) **Manufacturing objective:** If the company's objective is to produce A, then B, C and D produced simultaneously will be classified as by-products. This is independent of the comparative values of the various products. If the objective is to produce A and B, they become joint products and C and D become by-products. For example, in coke oven, the objective being production of coke, this is considered as the main product, and gas and tar as by-products.

There are instances when a by-product attains so much importance in terms of sales value and/or the company objective, then it is regarded as a main product. There are also instances when a by-product is more important than the main product, so that they by-product becomes the main product and the main product becomes the by-product.

Illustration 34:

X, Y Ltd. manufactures product A which yields two by-products B and C. The actual joint expenses of manufacturing for a period were ₹ 8,200.

The profits on each product as a percentage of sales are 33-1/3%, 25% and 15% respectively. Subsequent expenses are as follows:

Particulars	Products (₹)		
	'A'	'B'	'C'
Material	100	75	25
Direct	200	125	50
Overheads	150	125	75
	450	325	150
Sales	6,000	4,000	2,500

Apportion the joint expenses

Solution:

Statement Showing Apportionment of Joint Expenses

Particulars	A	B	C	Total
Sales	6,000	4,000	2,500	12,500
(-) Profit	2,000	1,000	375	3,375
Total Cost (Joint & Separate cost)	4,000	3,000	2,125	9,125
Separate Expenses	450	325	150	925
Share of Joint Expenses	3,550	2,675	1,975	8,200

Illustration 35 :

A chemical process yields 60% of the material introduced as main Product - A and by Product B 15% by - Product - C 20% and 5% being the wastage.

The ratio of absorption of Raw material and Labour in the process products is as follows :

- One unit of product C requires half the raw material required for one unit of product - B, one unit of product - A requires 1 ½ time the raw material required for product - B.
- Product A requires double the time needed for the production of one unit of B and one unit of C
- Product C requires half the time required for the production of one unit of product B
- Overheads are to be absorbed in the ratio of 6:1:1
- Cost Data: Input 1,000 units of cost ₹4,600

Direct labour	₹4,100
Overheads	₹6,000

Calculate cost of distribution between the above products.

Solution:

$$\begin{aligned}
 A &= 1,000 \times 60\% &= 600 \text{ units} \\
 B &= 1,000 \times 15\% &= 150 \text{ units} \\
 C &= 1,000 \times 20\% &= 200 \text{ units}
 \end{aligned}$$

Wasteage = 1,000 x 5% = 50 units

Statement showing apportionment of Joint Cost

Element	Basis of Apportionment	Total	Main Product A	By Product B	By Product C
Material	18:3:2	4,600	3,600	600	400
Labour	36:3:2	4,100	3,600	300	200
Overheads	6:1:1	6,000	4,500	750	750
		14,700	11,700	1,650	1,350

Material:

$$\begin{aligned}
 A : B : C &= 3 \times 600 : 2 \times 150 : 1 \times 200 \\
 &= 1800 : 300 : 200 \\
 &= 18 : 3 : 2
 \end{aligned}$$

Labour:

$$\begin{aligned}
 A : B : C &= 6 \times 600 : 2 \times 150 : 1 \times 200 \\
 &= 3600 : 300 : 200 \\
 &= 36 : 3 : 2
 \end{aligned}$$

Illustration 36:

The following data have been extracted from the books of M/s. Southern Coke Co. Ltd.

JOINT PRODUCTS

**YIELD IN LB OF RECOVERED
PRODUCTS PER TONNE OF COAL**

Coke	1,420
Coal tar	120
Benzol	22
Sulphate of Ammonia	26
Gas	<u>412</u>
	<u>2,000</u>

The price of coal is ₹80 per tonne. The direct labour and overhead costs to the point of split-off are ₹40 and ₹60 respectively per tonne of coal. Calculate the material, labour and total cost of each product on the basis of weight.

Solution:

Statement Showing Calculation of Material, Labour and Total Cost of Each Product :

Element	Total	(1420) Coke	(120) Coal tar	(22) Benzol	(26) Sulphate	(412) Gas
	₹	₹	₹	₹	₹	₹

Material	80.00	56.80	4.80	0.88	1.04	16.48
Labour	40.00	28.40	2.40	0.44	0.52	8.24
Overheads	60.00	42.60	3.60	0.66	0.78	12.36
	180.00	127.80	10.80	1.98	2.34	37.08

Illustration 37:

A factory engaged in the production of Chemical X and in the course of manufacture in a by-product-Y is produced which after a separate process has a commercial value. Following are the information for the month of March.

	JOINT EXPENSES	SEPARATE EXPENSES	
		X	Y
Materials (₹)	10,000	2,000	2,800
Labour (₹)	4,000	2,500	2,500
Overheads (₹)	2,500	1,400	1,000

The output for the month was 150 quintals of X and 50 quintals of Y. The selling price of product Y is ₹200 per quintal. The profit on product Y is $33\frac{1}{3}\%$ on cost price. Prepare an Account to show the cost of X per quintal.

Solution:

Joint Expenses Account

Dr.

Cr.

Particulars	Amount ₹	Particulars	Amount ₹
To, Material	10,000	By, Y A/c	1,200
To, Labour	4,000	By, X's A/c	15,300
To, Overheads	2,500		
	16,500		16,500

X's Account

Dr.

Cr.

Particulars	Amount ₹	Particulars	Amount ₹
To, Material	2,000	By, Cost of production A/c	
To, Labour	2,500	@ 141.33 per quintal.	21,200
To, Overheads	1,400		
To, Joint expenses A/c *	15,300		
	21,200		21,200

Y's Account

Dr.

Cr.

Particulars	Amount ₹	Particulars	Amount ₹

To, Material	2,800	By, Cost of production A/c. (150 x 50)	7,500
To, Labour	2,500		
To, Overheads	1,000		
To, Joint expenses A/c	1,200		
	7,500		7,500

Illustration 38:

In manufacturing the main product 'A' a company processes the resulting waste material into two by products B and C. Using reversal cost method of by products, prepare a comparative profit and loss statement of the three products from the following data:

- (i) Total cost upto separation point was ₹ 68,000

	A (₹)	B (₹)	C (₹)
(ii) Sales (all production)	1,64,000	16,000	24,000
(iii) Estimated net profit % to sale value	—	20%	30%
(iv) Estimated Selling expenses as % of sales value	20%	20%	20%
(v) Costs after separation	—	4,800	7,200

Solution:**Apportionment of Joint expenses for the products**

Particulars	B (₹)	C (₹)
Sales	16,000	24,000
(-) Profit	3,200	7,200
Total Cost	12,800	16,800
(-) Selling expenses	3,200	4,800
Manufacturing cost	9,600	12,000
(-) Separate expenses	4,800	7,200
Joint Expenses	4,800	4,800

Joint expenses of A = 68,000 – (4,800 + 4,800) = 58,400.

Profit and Loss Statement:

	Particulars	A ₹	B ₹	C ₹	Total ₹
(i)	Joint cost	58,400	4,800	4,800	68,000
(ii)	Separate cost	--	4,800	7,200	12,000
(iii)	Manufacturing cost (I + II)	58,400	9,600	12,000	80,000
(iv)	Selling expenses	32,800	3,200	4,800	40,800
(v)	Total cost (III + IV)	91,200	12,800	16,800	1,20,800
(vi)	Profit *	72,800	3,200	7,200	83,200
(vii)	Sales	1,64,000	16,000	24,000	2,04,000

Illustration 39:

The progressive manufacturing company manufactures one main product and two by-products. Data for month are shown below:

Particulars	Main Product	By-Product A	By Product B
Sales	1,50,000	12,000	7,000
MANUFACTURING COST:			
(a) Before separation	75,000	—	—
(b) After separation	23,000	2,200	1,800
Administration cost	12,000	1,500	1,000
Ratio of Distribution of			
Selling cost	85%	10%	5%
Net profit in sales	20%	15%	10%

Assuming no beginning and ending inventories, apportion the joint cost among main product and the byproducts.

Solution:

Calculation of Selling Expenses:

Particulars	Amount ₹
Sales of 3 products	1,69,000
(-) Profit (30,000 + 1,800 + 700)	(32,500)
Total Cost	1,36,500
(-) Joint & Separate cost (75,000 + 27,000)	(1,02,000)
	34,500
(-) Administration cost	14,500
Selling Expenses	20,000

Statement showing apportionment of Joint Expenditure:

	Particulars	Main Product	By Product A	By Product B	Total
(i)	Sales	1,50,000	12,000	7,000	1,69,000
(ii)	Profit	30,000	1,800	700	32,500
(iii)	Total cost (i – ii)	1,20,000	10,200	6,300	1,36,500
(iv)	Selling expenses	17,000 (85%)	2,000 (10%)	1,000 (5%)	20,000
(v)	Cost of production	1,03,000	8,200	5,300	1,16,500
(vi)	Administration cost	12,000	1,500	1,000	14,500
(vii)	Manufacturing cost (V-VI)	91,000	6,700	4,300	1,02,000
(viii)	Separate expenses	23,000	2,200	1,800	27,000
(ix)	Share of joint expenses (VII – VIII)	68,000	4,500	2,500	75,000

Illustration 40:

In a factory producing joint products of two varieties, the following data are extracted from the books:

	TOTAL (₹)
Sales of products X and Y	7,50,000
Direct Material	2,25,000

Direct Labour	1,10,000
Variable Overhead (150% on Labour)	1,65,000
Fixed Overhead	2,00,000

The analysis of sales reveals that the percentage of sale of product X is $66\frac{2}{3}\%$.

Management contemplates to process further joint products so that they could be sold at higher rates. Facilities for this are available. The additional expenditure for the further process and total sales anticipated at higher selling prices are given below. Make recommendations presenting the affect of the proposal.

	PRODUCT X	PRODUCT Y	TOTAL
Sales after further processing	6,00,000	3,00,000	9,00,000
Additional material	50,000	20,000	70,000
Additional direct labour	20,000	8,000	28,000

Solution:

	Particulars	X ₹	Y ₹	Total ₹
(i)	Sales after further processing	6,00,000	3,00,000	9,00,000
(ii)	Sales at split off	5,00,000	2,50,000	7,50,000
(iii)	Incremental sales	1,00,000	50,000	1,50,000
(iv)	Incremental/Additional/further processing / Separate cost:			
	Material	50,000	20,000	70,000
	Labour	20,000	8,000	28,000
	Variable Overheads	30,000	12,000	42,000
(v)	Incremental Profit/Loss	--	10,000	10,000

It is recommended to further process Product Y because there is an incremental / additional profit ₹ 10,000 where as product X need not be further processed because there is no additional profit.

Illustration 41:

A vegetable oil refining company obtains four products whose cost details are:

Joint costs of the four products: ₹ 8,29,600

Outputs : A - 5,00,000 litres; B -10,000 litres,C- 5,000 litres and D- 9,000 kgs.

Further processing costs: A ₹ 2,40,000; B ₹ 48,000, C-Nil and D-₹ 8,030.

The products can be sold as intermediates i.e., at split-off point without further processing. The sale prices are:

	As finished Product	As Intermediate
A ₹ Per litre	1.84	1.20
B ₹ Per litre	8.00	4.00
C ₹ per litre	6.40	6.40
D ₹ Per Kg.	26.67	24.00

- Calculate the product-wise profit allocating joint costs on Net Realisable Values (NRV).
- Compare the profitability in selling the products with and without further processing.

Solution:

(a) Statement showing computation of profit after further processing:

	Particulars	A	B	C	D	Total
		₹	₹	₹	₹	₹
(i)	Sales after further processing	9,20,000	80,000	32,000	2,40,030	12,72,030
(ii)	Separate / further costs	2,40,000	48,000	--	8,030	2,96,030
(iii)	Sales at split off (being NRV) (I-II)	6,80,000	32,000	32,000	2,32,000	9,76,000
(iv)	Joint costs (NRV basis)	5,78,000	27,200	27,200	1,97,200	8,29,600
(v)	Profit	1,02,000	4,800	4,800	34,800	1,46,400

Statement Showing Computation of Profit Before Further Processing:

	Particulars	A	B	C	D	Total
		₹	₹	₹	₹	₹
(I)	Sales at split off	6,00,000	40,000	32,000	2,16,000	8,88,000
(II)	Joint costs as apportioned above	5,78,000	27,200	27,200	1,97,200	8,29,600
(III)	Profit (I – II)	22,000	12,800	4,800	18,800	58,400

(b) Statement Showing Computation of Incremental or Additional Profit by Further Process:

	Particulars	A	B	C	D	Total
		₹	₹	₹	₹	₹
(I)	Sales after further processing	9,20,000	80,000	32,000	2,40,030	12,72,030
(II)	Sales before further processing	6,00,000	40,000	32,000	2,16,000	8,88,000
(III)	Incremental or additional sales (I-II)	3,20,000	40,000	-	24,030	3,84,030
(IV)	Incremental cost	2,40,000	48,000	-	8,030	2,96,030
(III)	Additional Profit or Loss (III-IV)	80,000	(8,000)	-	16,000	88,000

Products A&D should be further process, because there is incremental profit and where as products B and C need not be further process.

Alternative Method:

Statement Showing Computation of Profit Before Further Processing (on the basis of sales):

	Particulars	A	B	C	D	Total
		₹	₹	₹	₹	₹
(I)	Sales before further processing / split off	6,00,000	40,000	32,000	2,16,000	8,88,000
(II)	Joint costs 8,29,000 x (6,00,000/8,88,000)	5,60,540	37,369	29,895	2,01,796	8,29,600
(III)	Profit	39,460	2,631	2,105	14,204	58,400

Statement Showing Computation of Profit After Further Processing (on basis of sales)

	Particulars	A	B	C	D	Total
		₹	₹	₹	₹	₹
(I)	Sales at split off	6,80,000	32,000	32,000	2,32,000	9,76,000
(II)	Joint costs as apportioned above.	5,60,540	37,369	29,895	2,01,796	8,29,600
(III)	Profit or Loss	1,19,460	(5,369)	2,105	30,204	1,46,400

Illustration 42:

T Ltd., in the course of refining crude oil obtains four joint products A, B, C and D. The total cost till the split off point was ₹ 97,600. The output and sales in the year 2015 were as follows:

Product	Output (Balance)	Sales (₹)	Separate Costs (₹)
A	5,00,000	1,15,000	30,000
B	10,000	10,000	6,000
C	5,000	4,000	—
D	9,000	30,000	1,000

You are required:

- Calculate the net income for each of the products if the joint costs are apportioned on the basis of sales value of the different products.
- What would be the net income of the company from each product if it decides to sell the products at the split off point itself A@ ₹15 paise, B @ ₹ 50 paise, C @ ₹ 80 paise and D @ ₹ 3 per gallon.
- In case the company expects to operate at the same level of production and sales in the year 2012 could the company increase the net income by altering its processing decisions? If so, what would be the expected overall net income? Which product should be sold at split off? Assume that all costs incurred after the split -off are variable.

Solution:**Statement Showing Computation of Profit After Further Processing:**

	Particulars	A	B	C	D	Total
		₹	₹	₹	₹	₹
(I)	Sales at further processing	1,15,000	10,000	4,000	30,000	1,59,000
(II)	Separate cost	30,000	6,000	--	1,000	37,000
(III)	Sales at Split off (I) - (II)	85,000	4,000	4,000	29,000	1,22,000
(IV)	Joint Costs (On basis of NRV)	68,000	3,200	3,200	23,200	97,600
(V)	Profit (III) - (IV)	17,000	800	800	5,800	24,400

Statement Showing Computation of Profit Before Further Processing:

	Particulars	A	B	C	D	Total
		₹	₹	₹	₹	₹
(I)	Sales at split off	75,000	5,000	4,000	27,000	1,11,000
(II)	Joint Cost (as apportioned above)	68,000	3,200	3,200	23,200	97,600
(III)	Profit (I) - (II)	7,000	1,800	800	3,800	13,400

Statement Showing Computation Of Incremental Profit By Further Processing :

	Particulars	A	B	C	D	Total
		₹	₹	₹	₹	₹
(I)	Sales after further process	1,15,000	10,000	4,000	30,000	1,59,000
(II)	Sales at split off (I) - (II)	75,000	5,000	4,000	27,000	1,11,000
(III)	Incremental sales	40,000	5,000	--	3,000	48,000
(IV)	Incremental/Separate costs	30,000	6,000	--	1,000	37,000
(V)	Incremental Profit (loss) (III) - (IV)	10,000	(1,000)	--	2,000	11,000

Product 'A' and 'D' should be further processed because there is additional profit where as product 'B' and 'C' need not be further processed because there is no additional profit.

Computation of Profit by implementing decision:

	₹
Profit from A	= 17,000
Profit from B	= 1,800
Profit from C	= 800
Profit from D	= <u>5,800</u>
	= <u>25,400</u>

Illustration 43:

Beauty soap, company manufactures four different brands of soaps namely Komal, Lovely, Makeup and Nice. The data on production and sale of these brands during 2015 is reproduced below.

Brand Name	Komal	Lovely	Makeup	Nice
Production & Sales (units)	3,00,000	5,00,000	70,000	40,000
Sale value (₹ Lakhs)	15	31	2.8	1.2

All the above soaps are manufactured jointly up to a particular process. At split off point they are formed into cake-sand packed. The annual cost data were as under.

Direct Material Cost	₹ 30 lakhs
Value added	₹ 20 lakhs
(includes profit at 25% on total cost)	

Out of the above brands, Make up is sold in unpacked condition without further processing while other 3 brands further processed at an additional cost:

Komal	₹1,20,000
Lovely	₹1,30,000 and
Nice	₹ 50,000

You are required to:-

- Work out the profit and cost of each brand of soap after allocating joint cost on the basis of Net Realisable value at split up point. (per unit cost not required).
- Find out revised cost and profit on each brand if the company decides to sell all soaps at split up point at following prices; Komal ₹ 4.50; Lovely ₹6.00; Make up ₹ 4.00 and Nice ₹ 1.50 per unit. Assume that for allocation of joint cost net Realisable value method is used.

- (c) With the working results in (a) and (b) above advise Beauty Soap Company about the processing decision as to which soap to be sold at split of point and which to be processed further so as to maximise profit. Substantiate your decision with suitable costing technique.

Solution:

Computation of Joint Cost

Particulars	Amount (₹)
Direct material	30,00,000
(+) value added	20,00,000
Total Sales	50,00,000
(-) Profit @ 25% on cost (i.e. 20% on sales)	10,00,000
Total Cost	40,00,000
(-) Separate Cost (120 + 130 + 50)	3,00,000
Joint Cost	37,00,000

Statement Showing Computation of Profit After Further Processing:

	Particulars	K	L	M	N	Total
		₹	₹	₹	₹	₹
(I)	Sales after further processing	15,00,000	31,00,000	2,80,000	1,20,000	50,00,000
(II)	Separate cost	1,20,000	1,30,000	-	50,000	3,00,000
(III)	Sales before further processing NRV= (I-II)	13,80,000	29,70,000	2,80,000	70,000	47,00,000
(IV)	Joint Costs (on basis of NRV)	10,86,383	23,38,085	2,20,426	55,106	37,00,000
(V)	Profit or Loss (III-IV)	2,93,617	6,31,915	59,574	14,894	10,00,000

Statement Showing Computation of Profit Before Further Processing:

	Particulars	K	L	M	N	Total
		₹	₹	₹	₹	₹
(I)	Sales at split off	13,50,000	30,00,000	2,80,000	60,000	46,90,000
(II)	Joint Cost (as apportioned above)	10,86,383	23,38,085	2,20,426	55,106	37,00,000
(III)	Profit or Loss	2,63,617	6,61,915	59,574	4,894	9,90,000

Statement Showing Computation of Incremental Profit By Further Processing

	Particulars	K	L	M	N	Total
		₹	₹	₹	₹	₹
(I)	Sales after further process	15,00,000	31,00,000	2,80,000	1,20,000	50,00,000
(II)	Sales before further process	13,50,000	30,00,000	2,80,000	60,000	46,90,000
(III)	Incremental sales (I-II)	1,50,000	1,00,000	-	60,000	3,10,000
(IV)	Separate costs	1,20,000	1,30,000	-	50,000	3,00,000
(V)	Incremental Profit (loss) (III-IV)	30,000	(30,000)	-	10,000	10,000

Products K and N are to be further Process and whereas Products L and M need not to be further process

Illustration 44:

In the course of manufacture of the main product 'P' by products 'A' and 'B' also emerge. The joint expenses of manufacture amount to ₹ 1,19,550. All the three products are processed further after separation and sold as per details given below:

	Main product	By products	
	P	A	B
Sales	90,000	60,000	40,000
Cost incurred after separation	6,000	5,000	4,000
Profit as percentage on sales	25	20	15

Total fixed selling expenses are 10% of total cost of sales which are apportioned to the three products in the ratio of 20 : 40 : 40.

- Prepare a statement showing the apportionment of joint costs to the main product and the two by products.
- If the by-product A is not subjected to further processing and is sold the point of separation for which there is a market, at ₹58,500 without incurring any selling expenses. Would you advise its disposal at this stage. Show the workings.

Solution:

- Statement showing computation of share of joint expenses:**

	Particulars	Main Product P	By Product A	By Product B	Total
		₹	₹	₹	₹
(i)	Sales	90,000	60,000	40,000	1,90,000
(ii)	Profit	22,500	12,000	6,000	40,500
(iii)	Cost of sales (I - II)	67,500	48,000	34,000	1,49,500
(iv)	Selling expenses	2,990	5,980	5,980	14,950
(v)	Manufacturing cost (III - IV)	64,510	42,020	28,020	1,34,550
(vi)	Separate costs	6,000	5,000	4,000	15,000
(vii)	Share of joint expenses (V - VI)	58,510	37,020	24,020	1,19,550

₹

$$\begin{aligned}
 \text{Sales at split off (A)} &= 58,500 \\
 \text{(-) Joint Cost (A)} &= \underline{37,020} \\
 &= \underline{21,480}
 \end{aligned}$$

- It is better to sell By-Product 'A' at split off point because it gives more profit ₹ 21,480 against profit after processing ₹ 12,000.

Illustration 45 :

"If the products are truly joint products the cost of the process can be applied to these products".

- On the basis of the weight or other physical quantity of each product.
- In respect of the marginal cost of the process on the basis of physical quantities and in respect of fixed costs of the process on the basis of the contribution made by the various products.
- On the basis of selling values of the different products

Illustrate the above statement by using the following figures in respect of joint production of A and B for a month.

TOTAL COST:	Direct Material	5,000
	Direct labour	3,000

Variable Overheads	2,000
Fixed Overheads	2,000
Sales ——— A 100 Qtls.	₹ 80 per qtl
Sales ——— B 150 Qtls.	₹ 40 per qtl

Solution:**Computation of Profit by Distributing Joint Costs on the basis of Weight.**

	Particulars	A	B	Total
		₹	₹	₹
(i)	Sales	8,000	6,000	14,000
(ii)	Costs (100 : 150)	4,800	7,200	12,000
(iii)	Profit / (Loss)	3,200	(1,200)	2,000

Computation of Profit by Distributing Variable Cost on the Basis of Weight & Fixed Cost on basis of Contribution:

	Particulars	A	B	Total
		₹	₹	₹
(i)	Sales	8,000	6,000	14,000
(ii)	Variable costs (100 : 150)	4,000	6,000	10,000
(iii)	Contribution	4,000	--	4,000
(iv)	Fixed cost	2,000	--	2,000
(v)	Profit	2,000	--	2,000

Computation of Profit by distribution on the basis of Sales :

	Particulars	A	B	Total
		₹	₹	₹
(i)	Sales	8,000	6,000	14,000
(ii)	Total cost	6,857	5,143	12,000
(iii)	Profit	1,143	857	2,000

10

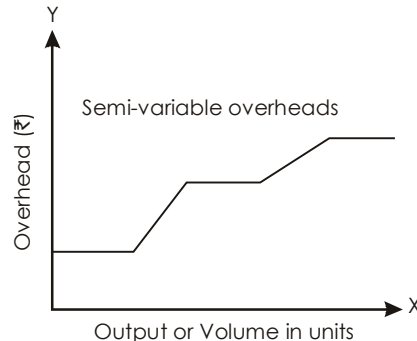
SEPARATION OF VARIABLE AND FIXED ELEMENTS OF SEMI-VARIABLE COSTS

Semi-Variable Overheads:

These are a sort of mixed or hybrid costs, partly fixed and partly variable costs. For example Telephone expenses, include a fixed portion of annual charge plus variable charge according to the calls. Thus total telephone expenses are semi-variable.

Semi-variable overheads are of two types:-

- The expenses which change with the change in volume of output, but the variation cost is less than proportionate to change in output. Examples are power & fuel, lighting, repairs and maintenance of buildings, etc.
- The costs tend to remain constant within certain range of output, then jump up and remain constant for another range and so on.



Semi variable cost need to be classified into fixed and variable due to the following reasons:

- Effective Cost Control:** Fixed costs are in the nature of policy costs or discretionary costs and as such can be controlled by the management. However variable costs can be controlled at lower levels. Separation of two elements facilitate the fixation of responsibility, preparation of overhead budget and exercise effective control.
- Decision Making:** The classification is very useful in management decisions relating to utilization of capacity. If cost information is to be of use in such problems, it is essential that fixed and variable costs which behave differently with changes in volume should be segregated.
- Preparation of Break-even Charts:** Separation of fixed and variable cost is essential for the study of cost volume profit relationship and for the preparation of breakeven charts and profit charts.
- Marginal Costing:** The basic requirement of the technique of Marginal Costing is the separation of fixed and variable costs. While the latter are taken into consideration for the determination of Marginal Cost and contribution, the fixed costs are treated separately.

- (e) **Method of Absorption Costing:** Separate method may be adopted for determination of rates for fixed and variable costs for absorption in production. Further a separate fixed overhead rate also serves as a measure of utilization of the facilities of the undertaking; any under recovery or under absorption denotes the idle or surplus capacity or production efficiency.
- (f) **Flexible Budget:** In a Flexible Budget, the budgeted amounts vary with the levels of activity & fixed cost remains constant. It is the variable cost that varies. Breakup of overhead cost into fixed and variable is therefore necessary for establishment of budget and for the purpose of variance analysis.

Methods of classification of semi variable cost in fixed and variable

- (a) **Graphical Method** – The costs at number of levels are plotted on a graph, x-axis represents the volume and y-axis represents the amount of expenditure. A straight line known as regression line or line of best fit is drawn between the points, plotted in such a manner that there are equal number of points on both the sides of a line and as far as practicable, pairs of points on either side are in equal distance from the line. Points falling far beyond the line are erratic and are not considered. If the regression line is drawn carefully so that most of the plotted points are on the line or not far from it, the scatter chart provides a fairly accurate method for the separation of fixed and variable.
- (b) **Simultaneous Equations** – This uses the straight line equation of $y = m x + c$ where y represents total cost, m is variable cost per unit, x is the level of output and c is fixed costs. The total costs at two different volumes are put into these equations which are solved for the values of m and c.
- (d) **High and Low Method** – The highest and lowest levels of output and costs are taken and the differential is found. This difference arises only due to variable costs. The remaining portion will be fixed costs. Under this method the variable cost per unit will be computed first and then the fixed cost will be derived. Variable cost per unit is computed by dividing the difference in cost at highest level and lowest level with the difference in volume between highest and lowest level.
- (d) **Least Square Method** – This statistical tool uses straight line equation and finds the line of best fit to solve the equations. Also known as Simple Regression Method. Under this method first the mean of volume and mean of costs are computed. The deviations in volume (x) from the mean and deviation in cost (y) from mean are computed.

11

MARGINAL VISA-A-VIS ABSORPTION COSTING

MARGINAL COSTING

Marginal Cost is defined as *"the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit."* Marginal Cost also means *Prime Cost plus Variable Overheads*. Marginal Cost is a constant ratio which may be expressed in terms of an amount per unit of output. On the other hand, fixed cost which is not normally traceable to particular unit denotes a fixed amount of expenditure incurred during an accounting period. Fixed cost is, therefore, also called time cost, period cost, standby cost, capacity cost, or constant cost. Variable cost or marginal cost is also termed as direct cost, activity cost, volume cost or out-of-pocket cost.

From the above definition and analysis of marginal cost, we can understand that is the cost which varies according to the variations in the volumes of output. However, by definition marginal cost is the change in the total cost for addition of one unit. *It is to be noted that for an economist marginal cost and variable cost would be different. But for an accountant both marginal cost and variable cost are same and are interchangeably used.* Therefore, for our study, we use marginal cost and variable cost synonymously.

Marginal Costing:

Marginal costing is *"the ascertainment of marginal costs and of the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs."* Several other terms in use like direct costing, contributory costing, variable costing, comparative costing, differential costing and incremental costing are used more or less synonymously with marginal costing.

It is a process whereby costs are classified into fixed and variable and with such a division so many managerial decisions are taken. The essential feature of marginal costing is division of total costs into fixed and variable, without which this could not have existed. Variable costs vary with volume of production or output, whereas fixed costs remains unchanged irrespective of changes in the volume of output. It is to be understood that unit variable cost remains same at different levels of output and total variable cost changes in direct proportion with the number of units. On the other hand, total fixed cost remains same disregard of changes in units, while there is inverse relationship between the fixed cost per unit and the number of units.

Features of Marginal Costing:

The main features of Marginal Costing may be summed up as follows:

1. Appropriate and accurate division of total cost into fixed and variable by picking out variable portion of semi variable costs also.
2. Valuation of stocks such as finished goods, work-in-progress is valued at variable cost only.
3. The fixed costs are written off soon after they are incurred and do not find place in product cost or inventories.
4. Prices are based on Marginal Cost and Marginal Contribution.

5. It combines the techniques of cost recording and cost reporting.

Advantages or Merits or Applications of Marginal Costing:

1. Marginal costing system is simple to operate than absorption costing because they do not involve the problems of overhead apportionment and recovery.
2. Marginal costing avoids, the difficulties of having to explain the purpose and basis of overhead absorption to management that accompany absorption costing. Fluctuations in profit are easier to explain because they result from cost volume interactions and not from changes in inventory valuation.
3. It is easier to make decisions on the basis of marginal cost presentations, e.g., marginal costing shows which products are making a contribution and which are failing to cover their avoidable (i.e., variable) costs. Under absorption costing the relevant information is difficult to gather, and there is the added danger that management may be misled by reliance on unit costs that contain an element of fixed cost.
4. Marginal costing is essentially useful to management as a technique in cost analysis and cost presentation. It enables the presentation of data in a manner useful to different levels of management for the purpose of controlling costs. Therefore, it is an important technique in cost control.
5. Future profit planning of the business enterprises can well be carried out by marginal costing. The contribution ratio and marginal cost ratios are very useful to ascertain the changes in selling price, variable cost etc. Thus, marginal costing is greatly helpful in profit planning.
6. When a business concern consists of several units and produces several products and evaluation of performance of such components can well be made with the help of marginal costing.
7. It is helpful in forecasting.
8. When there are different products, the determination of number of units of each product, called Optimum Product Mix, is made with the help of marginal costing.
9. Similarly, optimum sales mix i.e., sales of each and every product to get maximum profit can also be determined with the help of marginal costing.
10. Apart from the above, numerous managerial decisions can be taken with the help of marginal costing, some of which, may be as follows:-
 - (a) Make or buy decisions,
 - (b) Exploring foreign markets,
 - (c) Accept an order or not,
 - (d) Determination of selling price in different conditions,
 - (e) Replace one product with some other product,
 - (f) Optimum utilisation of labour or machine hours,
 - (g) Evaluation of alternative choices,
 - (h) Subcontract some of the production processes or not,
 - (i) Expand the business or not,
 - (j) Diversification,
 - (k) Shutdown or continue,

Limitations of Marginal Costing:

- a. The separation of costs into fixed and variable present's technical difficulties and no variable cost is completely variable nor is a fixed cost completely fixed.
- b. Under the marginal cost system, stock of finished goods and work-in-progress are understated. After all, fixed costs are incurred in order to manufacture products and as such, these should

form a part of the cost of the products. It is, therefore, not correct to eliminate fixed costs from finished stock and work-in-progress.

- c. The exclusion of fixed overhead from the inventories affects the Profit and Loss Account and produces an unrealistic and conservative Balance Sheet, unless adjustments are made in the financial accounts at the end of the period.
- d. In marginal costing system, marginal contribution and profits increase or decrease with changes in sales volume. Where sales are seasonal, profits fluctuate from period to period. Monthly operating statements under the marginal costing system will not, therefore, be as realistic or useful as in absorption costing.
- e. During the earlier stages of a period of recession, the low profits or increase in losses, as revealed in a magnified way in the marginal costs statements, may unduly create panic and compel the management to take action that may lead to further depression of the market.
- f. Marginal costing does not give full information. For example, increased production and sales may be due to extensive use of existing equipments (by working overtime or in shifts), or by an expansion of the resources, or by the replacement of labour force by machines. The marginal contribution fails to reveal these.
- g. Though for short-term assessment of profitability marginal costs may be useful, long term profit is correctly determined on full costs basis only.
- h. Although marginal costing eliminates the difficulties involved in the apportionment and under and over-absorption of fixed overhead, the problem still remains so far as the variable overhead is concerned.
- i. With increased automation and technological developments, the impact on fixed costs on products is much more than that of variable costs. A system which ignores fixed costs is therefore, less effective because a major portion of the cost, such as not taken care of.
- j. Marginal costing does not provide any standard for the evaluation of performance. A system of budgetary control and standard costing provides more effective control than that obtained by marginal costing.

Limitations of Absorption Costing:

- 1. Being dependent on levels of output which vary from period to period, costs are vitiated due to the existence of fixed overhead. This renders them useless for purposes of comparison and control. (If, however, overhead recovery rate is based on normal capacity, this situation will not arise).
- 2. Carryover of a portion of fixed costs, i.e., period costs to subsequent accounting periods as part of the cost of inventory is a unsound practice because costs pertaining to a period should not be allowed to be vitiated by the inclusion of costs pertaining to the previous period.
- 3. Profits and losses in the accounts are related not only to sales but also to production, including the production which is unsold. This is contrary to the principle that profits are made not at the stage when products are manufactured but only when they are sold.
- 4. There is no uniformity in the methods of application of overhead in absorption costing. These problems have, no doubt, to be faced in the case of marginal costing also but to a less extent because of the exclusion of fixed costs, as different assumptions made in the matter of application of fixed overhead will not arise in the case of marginal costing.
- 5. Absorption costing is not always suitable for decision making solutions to various types of problems of management decision making, where the absorption cost method would be practically ineffective, such as selection of production volume and optimum capacity utilisation, selection of production mix, whether to buy or manufacture, choice of alternatives and evaluation of performance can be had with the help of marginal cost analysis. Sometimes, the conclusion drawn from absorption cost data in this regard may be misleading and lead to losses.

Differences between Absorption Costing and Marginal Costing:

	Absorption Costing	Marginal Costing
1.	Both fixed and variable costs are considered for product costing and inventory valuation.	Only variable costs are considered for product costing and inventory valuation.
2.	Fixed costs are charged to the cost of production. Each product bears a reasonable share of fixed cost and thus the profitability of a product is influenced by the apportionment of fixed costs.	Fixed costs are regarded as period costs. The profitability of different products is judged by their P/V ratio.
3.	Cost data are presented in conventional pattern. Net profit of each product is determined after subtracting fixed cost along with their variable cost.	Cost data are presented to highlight the total contribution of each product.
4.	The difference in the magnitude of opening stock and closing stock affects the unit cost of production due to the impact of related fixed cost.	The difference in the magnitude of opening stock and closing stock does not affect the unit cost of production.
5.	In case of absorption costing the cost per unit reduces, as the production increases as it is fixed cost which reduces, whereas, the variable cost remains the same per unit.	In case of marginal costing the cost per unit remains the same, irrespective of the production as it is valued at variable cost.

Difference in profit under Marginal and Absorption Costing:

- No opening and closing stock: In this case, profit/loss under absorption and marginal costing will be equal.
- When opening stock is equal to closing stock: In this case, profit/loss under two approaches will be equal provided the fixed cost element in both the stocks is same amount.
- When closing stock is more than opening stock: In other words, when production during a period is more than sales, then profit as per absorption approach will be more than that by marginal approach. The reason behind this difference is that a part of fixed overhead included in closing stock value is carried forward to next accounting period.
- When opening stock is more than the closing stock: In other words when production is less than the sales, profit shown by marginal costing will be more than that shown by absorption costing. This is because a part of fixed cost from the preceding period is added to the current year's cost of goods sold in the form of opening stock.

Differential Cost Analysis

Differential Cost is the change in the costs which results from the adoption of an alternative course of action. The alternative actions may arise due to change in sales volume, price, product mix (by increasing, reducing or stopping the production of certain items), or methods of production, sales, or sales promotion, or they may be due to 'make or buy' or 'take or refuse' decisions. When the change in costs occurs due to change in the activity from one level to another, differential cost is referred to as incremental cost or decremental cost, if a decrease in output is being considered, i.e. total increase in cost divided by the total increase in output. However, accountants generally do not distinguish between differential cost and incremental cost and the two terms are used to mean one and the same thing.

The computation of differential cost provides an useful method of analysis for the management for anticipating the results of any contemplated changes in the level or nature of activity. When policy decisions have to be taken, differential costs worked out on the basis of alternative proposals are of great assistance.

The determination of differential cost is simple. Differential cost represents the algebraic difference

between the relevant costs for the alternatives being considered. Thus, when two levels of activities are being considered, the differential cost is obtained by subtracting the cost at one level from the cost of another level.

The essential features of differential costs are as follows:-

1. The basis data used for differential cost analysis are costs, revenue and the investment factors which are relevant in the problem for which the analysis is undertaken.
2. Total differential costs rather than the costs per unit are considered.
3. Differential cost analysis is made outside the accounting records.
4. As the differences in the costs at two levels are considered, absolute costs at each level are not as relevant as the difference between the two. Thus, items of costs which do not change but are identical for the alternatives under consideration, are ignored.
5. The differentials are measured from a common base point or position.
6. The stage at which the difference between the revenue and the cost is the highest, measured from the common base point, determines the choice from amongst a number of alternative actions.
7. In computing differential costs, historical or standard costs may be used but they should be adjusted to the requirements of future conditions.
8. The elements and items of cost to be considered in differential cost analysis will depend upon the nature of the problem and the alternatives being considered.

Differential Costs Analysis and Marginal Costing:

Although the techniques of differential costs analysis are similar to those of marginal costing, the two should not be confused. The points of similarity and difference between differential costs analysis and marginal costing are summarized below:

Similarity:

- a. Both the techniques of cost analysis and cost presentation.
- b. Both are made use of by the management in decision making and in formulating policies.
- c. The concepts of differential costs and marginal costs mainly arise out of the difference in the behaviour of fixed and variable costs.
- d. Differential costs compare favourably with the economist's definition of marginal cost, viz. that marginal cost is the amount which at any given volume of output is changed if output is increased or decreased by one unit.

Difference:

- a. Differential cost analysis can be made in the case of both absorption costing as well as marginal costing.
- b. While marginal costing excludes the entire fixed costs, some of the fixed costs may be taken into account as being relevant for the purpose of differential cost analysis.
- c. Marginal costs may be embodied in the accounting system whereas differential costs are worked out separately as analysis statements.
- d. In marginal costing, margin of contribution and contribution ratio are the main yardsticks for performance evaluation and for decision making. In differential cost analysis, differential costs are compared with the incremental or decremental revenues, as the case may be.

Practical Application of Differential Costs:

They are useful in managerial decisions, which are enumerated below:

- (i) Determination of most profitable levels of production and price.
- (ii) Acceptance of offer at a lower price or offering a quotation at lower selling price in order to increase capacity.
- (iii) It is used to decide whether it will be more profitable to sell a product as it is or to process it further into a different product to be sold at an increased price.
- (iv) Determining the suitable price at which raw material may be purchased.
- (v) Decision of adding a new product or business segment.
- (vi) Discontinuing a product or business segment in order to avoid or reduce the present loss or increase profit.
- (vii) Changing the product mix.
- (viii) Make or buy decisions.
- (ix) Decision regarding alternative capital investment and plant replacement.
- (x) Decision regarding change in method of production.

Tools and Techniques of Marginal Costing:

1. Contribution:

In common parlance, contribution is the reward for the efforts of the entrepreneur or owner of a business concern. From this, one can get in his mind that contribution means profit. But it is not so. Technically or in Costing terminology, contribution means not only profit but also fixed cost. That is why; it is defined as the amount recovered towards fixed cost and profit.

Contribution can be computed by subtracting variable cost from sales or by adding fixed costs and profit.

Symbolically, $C = S - V \rightarrow (1)$

Where C = Contribution

S = Selling Price

V = Variable Cost

Also $C = F + P \rightarrow (2)$

Where F = Fixed Cost

P = Profit

From (1) and (2) above, we may deduce the following equation called Fundamental Equation of Marginal Costing i.e.

$$S - V = F + P \rightarrow (3)$$

Contribution is helpful in determination of profitability of the products and/or priorities for profitabilities of the products. When there are two or more products, the product having more contribution is more profitable.

For example: The following are the three products with selling price and cost details:

Particulars	A	B	C
Selling price (₹)	100	150	200
Variable cost (₹)	50	70	100
Contribution (₹)	50	80	100

In the above example, one can say that the product 'C' is more profitable because, it has more contribution. This proposition of product having more contribution is more profitable is valid, as long as, there are no limitations on any factor of production. In this context, factors of production

means, the factors that are responsible for producing the products such as material, labour, machine hours, demand for sales etc.,

Limiting Factor (or) Key Factor:

In the above example, we find that product having more contribution is more profitable. However, when there is a limitation on any input factor, the profitability of the product cannot simply be determined by finding out the contribution of the unit, but it can be found out by ascertaining the contribution per unit of that factor of production which is limited in the given situation. Such factor of production which is limited in the question is called key factor or limiting factor.

Continuing the above example, it may be explained as follows:

The three products take same raw material. A takes 1 kg, B requires 2 kgs, C requires 5 kgs and the raw material is not abundant.

Then profitability of the above products is determined as follows:

Profitability =

A	B	C
50 / 1 = ₹ 50	80 / 2 = ₹ 40	100 / 5 = ₹ 20

Now, product A is more profitable because it has more contribution per kg of material.

The key factor can also be called as scarce factor or Governing factor or Limiting factor or Constraining factor etc., whatever may be the name, it indicates the limitation on the particular factor of production.

From the above, it is essentially understandable that contribution is helpful in determination of profitability of the products, priorities for profitability of the products and in particular, profitabilities when there are limitation on any factor.

2. Profit Volume Ratio (P/V Ratio) or Contribution Ratio:

First of all, a ratio is a statistical or mathematical tool with the help of which a relationship can be established between the variables of the same kind. Further, it may be expressed in different forms such as fractional form, quotient, percentage, decimal form, and proportional form.

For example:

Gross profit ratio: It may be expressed as follows:

- Gross profit is $\frac{1}{4}$ th of sales
- Sales is 4 times that of gross profit
- Gross profit ratio is 25%
- Gross profit is 0.25 of sales and lastly
- Gross profit and sales are in the ratio of 1:4

So, P/V ratio or contribution ratio is association of two variables. From this, one may assume that it is the ratio of profit and sales. But it is not so. It is the ratio of Contribution to Sales.

$$\text{Symbolically, P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 \rightarrow (1)$$

$$\text{P/V ratio} = \frac{C}{S} \times 100$$

$$\text{Contribution} = \text{Sales} \times \text{P/V ratio} \rightarrow (2)$$

$$\text{Sales} = \frac{\text{Contribution}}{\frac{P}{V} \text{ Ratio}} \rightarrow (3)$$

When cost accounting data is given for two periods, then:

$$\text{P/V ratio} = \frac{\text{Change in Contribution}}{\text{Change in Sales}} \times 100$$

$$\text{P/V ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$$

It is to be noted that the above two formulas are valid as long as there are no changes in prices, means input prices and selling prices.

Usually, Sales = Cost + Profit

i.e. it can also be written as Sales = Variable Cost + Fixed Cost + Profit and this is called general sales equation.

Since Sales consists of variable costs and contribution, given the variable cost ratio, P/V ratio can be found out. Similarly, given the P/V ratio, variable cost ratio can be found out.

For example, P/V ratio is 40%, then variable cost ratio is 60%, given variable cost ratio is 70%, then P/V ratio is 30%. Such a relationship is called complementary relationship. Thus P/V ratio and variable cost ratios are said to be complements of each other.

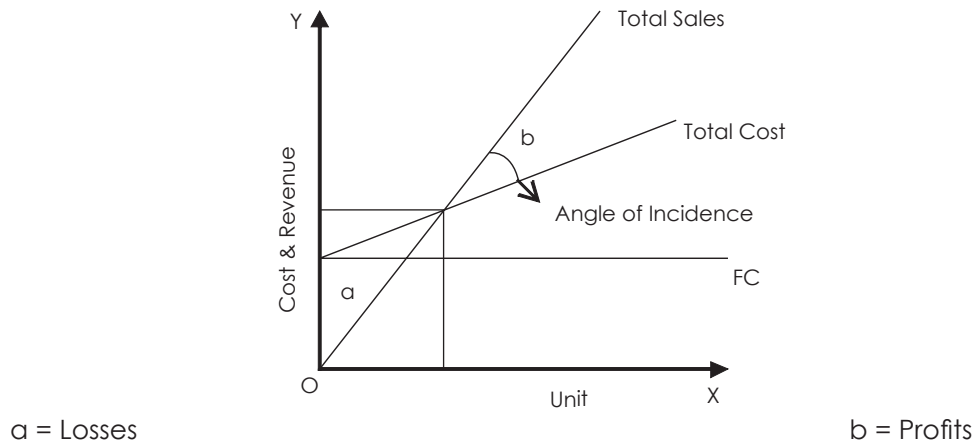
P/V ratio is also useful like contribution for determination of profitabilities of the products as well as the priorities for profitabilities of the products. In particular, it is useful in determination of profitabilities of the products in the following two situations:

- When sales potential in value is limited.
- When there is a greater demand for the products.

Break Even Point:

When someone asks a layman about his business he may reply that it is alright. But a technical man may reply that it is break even. So, Break Even means the volume of production or sales where there is no profit or loss. In other words, Break Even Point is the volume of production or sales where total costs are equal to revenue. It helps in finding out the relationship of costs and revenues to output. In understanding the breakeven point, cost, volume and profit are always used. The break even analysis is used to answer many questions of the management in day to day business.

The formal break even chart is as follows:



When no. of units are expressed on X-axis and costs and revenues are expressed on Y-axis, three lines are drawn i.e., fixed cost line, total cost line and total sales line. In the above graph we find there is an intersection point of the total sales line and total cost line and from that intersection point if a perpendicular is drawn to X-axis, we find break even units. Similarly, from the same intersection point a parallel line is drawn to X-axis so that it cuts Y-axis, where we find Break Even point in terms of value. This is how, the formal pictorial representation of the Break Even chart.

At the intersection point of the total cost line and total sales line, an angle is formed called *Angle of Incidence*, which is explained as follows:

Angle of Incidence:

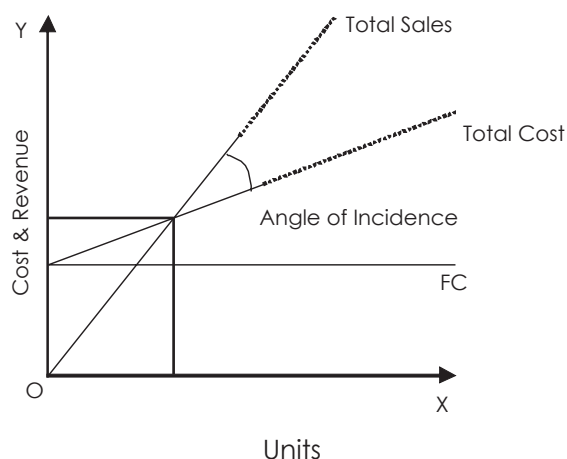
Angle of Incidence is an angle formed at the intersection point of total sales line and total cost line in a formal break even chart. If the angle is larger, the rate of growth of profit is higher and if the angle is lower, the rate of growth of profit is lower. So, growth of profit or profitability rate is depicted by Angle of Incidence.

Break Even Analysis (or) Cost-Volume-Profit Analysis (CVP analysis):

From the breakeven charts breakeven point and profits at a glance can be found out. Besides, management makes profit planning with the help of breakeven charts. It can clearly be understood by way of charts to know the changes in profit due to changes in costs and output. Such profit planning is made with the variables mainly cost, profit and volume, such an analysis is called breakeven analysis. Throughout the charts relationship is established among the cost, volume and profit, it is also called *Cost-Volume-Profit Analysis (CVP analysis)*. That is why it is popularly said by S.C.Kuchal in his book "*Financial Management - An Analytical and Conceptual Approach*", that **Cost-volume-profit analysis, break even analysis and profit graphs are interchangeable words**. The analysis is further explained as follows:

The change in profit can be studied through Break even charts in different situations in the following manner:

(i) Increase in No. of Units

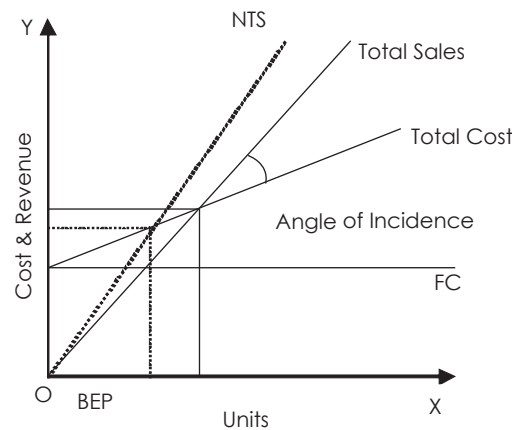


'.....' line indicates increase in total cost and total sales.

In the above chart, if we clearly observe we find that there is no change in BEP even if there is increase or decrease in No. of units.

(ii) Increase in Sales due to increase in selling price.

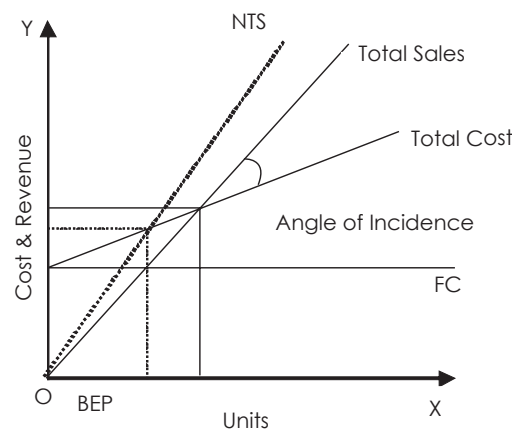
NTS = New Total Sales line



'.....' line indicates changes in break even point and changes in sales.

From the above chart, we observe that profit is increased by increasing the selling price and also, if there is change in selling price, BEP also changes. If selling price is increased then BEP decreases. If selling price is decreased then BEP increases. Thus, we say that there is an inverse relationship between selling price and BEP.

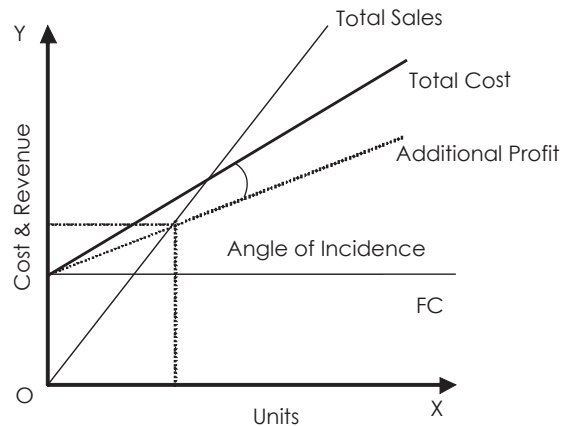
(iii) Decrease in variable cost:



'.....' line indicates decrease in total cost and decrease in B.E.P

From the above chart, we observe that when variable costs are decreased, no doubt, profit is increased. If there is change in variable cost then BEP also changes. If variable cost is decreased then BEP also decreases. If variable cost is increased then BEP also increases. Thus there is direct relationship between variable cost and BEP.

(iv) Change in fixed cost:



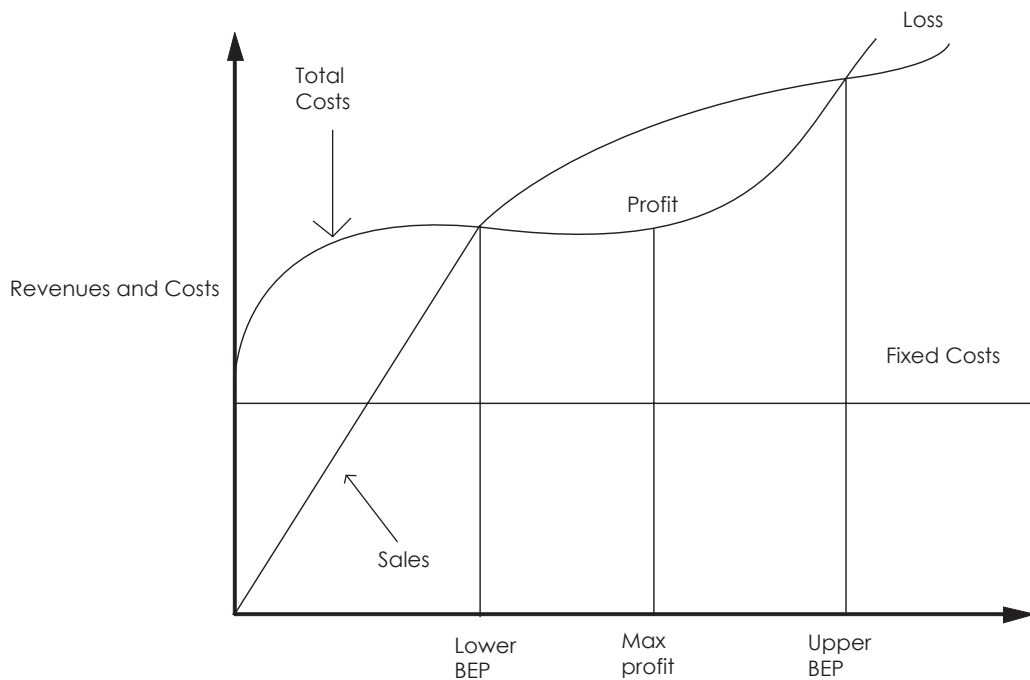
'.....' line indicates decrease in fixed cost and total cost and also decrease in BEP.

NTC = New Total Cost Line

NFC = New Fixed Cost Line

From the above chart also we find that there is increase in profit due to decrease in fixed cost. If fixed cost is increased then BEP also increases. If fixed cost is decreased then BEP also decreases. Thus there is a direct relationship between fixed cost and BEP.

Non linear Break Even Chart:



In some cases on account of non-linear behaviour of cost and sales there may be two or more break even points. In such a case the optimum profit is earned where the difference between the sales and the total costs is the largest. It is obvious that the business should produce only upto this level. This is

being illustrated in the above chart.

Cash Break-Even Point:

When break-even point is calculated only with those fixed costs which are payable in cash, such a break-even point is known as cash break-even point. This means that depreciation and other non-cash fixed costs are excluded from the fixed costs in computing cash break-even point. Its formula is-

Cash break even point = Cash fixed costs / Contribution per unit.

COMPUTATION OF BREAK EVEN POINT:

$$\text{Break Even Point in value} = \frac{F \times S}{S - V} \quad \dots (1)$$

$$= \frac{F \times S}{C} \quad \dots (2)$$

$$= \frac{F \times S}{F + P} \quad \dots (3)$$

$$= \frac{F}{\text{P.V. Ratio}} \quad \dots (4)$$

$$\text{or} = \frac{F}{C/S}$$

$$\text{or} = \frac{F}{\frac{S - V}{S}}$$

$$= \frac{F}{1 - \frac{V}{S}} \quad \dots (5)$$

Break Even Point (in units) = Fixed Cost / Contribution per unit

Proof for basic breakeven:

Let, V be the variable cost per unit

U be the volume of output i.e., No. of units

P be the Profit

F be the Fixed Cost

S be the Selling Price

By substituting the notations in general sales equation:

Sales = Fixed cost + Variable cost + Profit

$$SU = F + VU + P$$

At Break Even, SU = F + VU (Since P = 0)

$$\rightarrow SU - VU = F$$

$$\rightarrow U(S - V) = F$$

$$\rightarrow U = \frac{F}{S - V}$$

OR

$$\text{No. of Units} = \frac{\text{Fixed Cost}}{\text{Contribution per Unit}}$$

Break even sales

$$SU \text{ (Sales)} = \frac{F \times S}{S - V}$$

Uses and applications of Break even Analysis (Or) Profit Charts (Or) Cost Volume Profit Analysis:

The important uses to which cost-volume profit analysis or break-even analysis or profit charts may be put to use are:

- a. Forecasting costs and profits as a result of change in Volume determination of costs, revenue and variable cost per unit at various levels of output.
- b. Fixation of sales Volume level to earn or cover given revenue, return on capital employed, or rate of dividend.
- c. Determination of effect of change in Volume due to plant expansion or acceptance of order, with or without increase in costs or in other words, determination of the quantum of profit to be obtained with increased or decreased volume of sales.
- d. Determination of comparative profitability of each product line, project or profit plan.
- e. Suggestion for shift in sales mix.
- f. Determination of optimum sales volume.
- g. Evaluating the effect of reduction or increase in price, or price differentiation in different markets.
- h. Highlighting the impact of increase or decrease in fixed and variable costs on profit.
- i. Studying the effect of costs having a high proportion of fixed costs and low variable costs and vice-versa.
- j. Inter-firm comparison of profitability.
- k. Determination of sale price which would give a desired profit for break-even.
- l. Determination of the cash requirements as a desired volume of output, with the help of cash break-even charts.
- m. Break-even analysis emphasizes the importance of capacity utilization for achieving economy.
- n. During severe recession, the comparative effects of a shutdown or continued operation at a loss are indicated.
- o. The effect on total cost of a change in the fixed overhead is more clearly demonstrated through break-even charts.

Limitations of Break-even Analysis:

- a. That Costs are either fixed or variable and all costs are clearly segregated into their fixed and variable elements. This cannot possibly be done accurately and the difficulties and complications involved in such segregation make the break-even point inaccurate.
- b. That the behavior of both costs and revenue is not entirely related to changes in volume.
- c. That costs and revenue patterns are linear over levels of output being considered. In practice, this is not always so and the linear relationship is true only within a short run relevant range.
- d. That fixed costs remain constant and variable costs vary in proportion to the volume. Fixed costs are constant only within a limited range and are liable to change at varying levels of activity and also over a long period, particularly when additional plants and equipments are introduced.
- e. That sales mix is constant or only one product is manufactured. A combined analysis taking all the products of the mix does not reflect the correct position regarding individual products.
- f. That production and sales figures are identical or the change in opening and closing stocks of

the finished product is not significant.

- g. That the units of production on the various product range are identical. Otherwise, it is difficult to find a homogeneous factor to represent volume.
- h. That the activities and productivity of the concern remain unchanged during the period of study.
- i. As output is continuously varied within a limited range, the contribution margin remains relatively constant. This is possible mainly where the output is more or less homogeneous as in the case of process industries.

Margin of Safety:

It is the sales point beyond the breakeven point. Margin of safety can be obtained by subtracting break even sales from Total sales. It is useful to determine financial soundness of business enterprise. If margin of safety is high, then the financial position of the enterprise is sound.

Margin of Safety = Total Sales – Break Even Sales → (1)

Total Sales = Break Even Sales + Margin of Safety Sales → (2)

→ Margin of safety can also be computed as follows:

Margin of Safety = Profit / P/V ratio → (3)

A relative measure to the margin of safety is its ratio to total sales.

→ Margin of safety ratio is the ratio of Margin of safety sales to Total sales.

Margin of safety ratio = [Margin of safety / Total sales] x 100 → (4)

→ Margin of safety ratio and Break even sales ratios are complements of each other.

→ If the sales amount, P/V ratio and M/S ratio are given, then profit can be computed as follows:

Profit = Total sales x P/V ratio x M/S ratio → (5)

Apart from the above formulae, various formulae that are used in the chapter to find out different results are as follows:

Profit = (Sales x P/V ratio) – Fixed Cost

Sales value to earn desired profit = $\left(\frac{\text{Fixed Cost} + \text{desired profit}}{\text{P/V ratio}} \right)$ and

Required units to earn desired profit = $\left(\frac{\text{Fixed Cost} + \text{desired profit}}{\text{Contribution per unit}} \right)$

Fixed cost = (Sales x P/V ratio) – Profit

Total sales = Break even sales + Margin of safety sales

Break even sales = Total sales – Margin of safety sales

Margin of safety sales = Total sales – Break even sales

Fixed cost = Break even sales x P/V ratio

Shut down sales = $\left(\frac{\text{Fixed Cost} - \text{Shut down costs}}{\text{P/V ratio}} \right)$

Shut down Units = $\left(\frac{\text{Fixed Cost} - \text{Shut down costs}}{\text{Contribution per unit}} \right)$

The level at which profits are same or the level at which costs are same for two methods or two alternatives

$$\text{i.e., Indifference Point} = \left(\frac{\text{Difference in fixed costs}}{\text{Difference in variable costs per unit}} \right)$$

Practical Problem:

Illustration 1:

The sports material manufacturing company budgeted the following data for the coming year.

	₹
Sales (1,00,000 units)	1,00,000
Variable cost	40,000
Fixed cost	50,000

Find out

- (a) P/V Ratio, B.E.P and Margin of Safety
- (b) Evaluate the effect of
 - (i) 20% increase in physical sales volume
 - (ii) 20% decrease in physical sales volume
 - (iii) 5% increase in variable costs
 - (iv) 5% decrease in variable costs
 - (v) 10% increase in fixed costs
 - (vi) 10% decrease in fixed costs
 - (vii) 10% decreases in selling price and 10% increase in sales volume
 - (viii) 10% increase in selling price and 10% decrease in sales volume
 - (ix) ₹ 5,000 variable cost decrease accompanied by ₹ 15,000 increase in fixed costs.

Solution:

- (a) P/V ratio, B.E.P and Margin of Safety

$$\begin{aligned} \text{Contribution} &= \text{Sales} - \text{Variable cost} \\ &= 1,00,000 - 40,000 \\ &= ₹ 60,000 \end{aligned}$$

$$\begin{aligned} \text{P/V Ratio} &= (\text{Contribution} / \text{Sales}) \times 100 \\ &= (60,000 / 1,00,000) \times 100 \\ &= 60\% \end{aligned}$$

$$\begin{aligned} \text{B.E.P sales} &= \text{Fixed cost} / \text{PV ratio} \\ &= 50,000 / 60\% \\ &= ₹ 83,333 \end{aligned}$$

$$\begin{aligned} \text{Margin of Safety} &= \text{Total sales} - \text{B.E.P sales} \\ &= 1,00,000 - 83,333 \\ &= ₹ 16,667 \end{aligned}$$

(b)

	Contribution ₹	P/V ratio	BE Sales ₹	Margin of safety ₹
(i) Increase in volume by 20%	1,20,000 – 48,000 = 72,000	(72,000 / 1,20,000) x 100 = 60%	(50,000 / 60%) = 83,333	1,20,000 – 83,333 = 36,667
(ii) Decrease in volume by 20%	80,000 – 32,000 = 48,000	(48,000 / 80,000) x 100 = 60%	(50,000 / 60%) = 83,333	80,000 – 83,333 = (3,333)
(iii) 5% increase in variable cost	1,00,000 – 42,000 = 58,000	(58,000 / 1,00,000) x 100 = 58%	(50,000 / 58%) = 86,207	1,00,000 – 86,207 = 13,793
(iv) 5% decrease in variable cost	1,00,000 – 38,000 = 62,000	(62,000 / 1,00,000) x 100 = 62%	(50,000 / 62%) = 80,645	1,00,000 – 80,645 = 19,355
(v) 10% increase in fixed cost	1,00,000 – 40,000 = 60,000	(60,000 / 1,00,000) x 100 = 60%	(55,000 / 60%) = 91,667	1,00,000 – 91,667 = 8,333
(vi) 10% decrease in fixed costs	1,00,000 – 40,000 = 60,000	(60,000 / 1,00,000) x 100 = 60%	(45,000 / 60%) = 75,000	1,00,000 – 75,000 = 25,000
(vii) 10% decreases in selling price and 10% increase in sales volume	99,000 – 44,000 = 55,000	(55,000 / 99,000) x 100 = 55.55%	(50,000 / 55.55%) = 90,009	99,000 – 90,009 = 8,991
(viii) 10% increase in selling price and 10% decrease in sales volume	99,000 – 36,000 = 63,000	(63,000 / 99,000) x 100 = 63.63%	(50,000 / 63.63%) = 78,579	99,000 – 78,579 = 20,421
(ix) ₹ 5,000 variable cost decrease accompanied by ₹ 15,000 increase in fixed costs.	1,00,000 – 35,000 = 65,000	(65,000 / 1,00,000) x 100 = 65%	(65,000 / 65%) = 1,00,000	1,00,000 – 1,00,000 = 0

Illustration 2:

Two businesses AB Ltd and CD Ltd sell the same type of product in the same market. Their budgeted profits and loss accounts for the year ending 30th June, 2016 are as follows:

	AB Ltd (₹)		CD Ltd (₹)	
Sales		1,50,000		1,50,000
Less: Variable costs	1,20,000		1,00,000	
Fixed Cost	15,000	1,35,000	35,000	1,35,000
Profit		15,000		15,000

You are required to calculate the B.E.P of each business and state which business is likely to earn greater profits in conditions.

(a) Heavy demand for the product

(b) Low demand for the product.

Solution:**Statement Showing Computation of P/V ratio, BEP and Determination of Profitability in Different conditions:**

	Particulars	AB Ltd ₹	CD Ltd ₹
I.	Sales	1,50,000	1,50,000
II.	Variable cost	1,20,000	1,00,000
III.	Contribution	30,000	50,000
IV.	P/V ratio $\left[\frac{(30,000/1,50,000) \times 100}{(50,000/1,50,000) \times 100} \right]$	20%	33 1/3%
V.	Fixed cost	15,000	35,000
VI.	Profit	15,000	15,000
VII.	Breakeven sales (V/IV)	75,000	1,05,000

From the above computation, it was found that the product produced by CD Ltd is more profitable in conditions of heavy demand because its P/V ratio is higher. On the other hand, in the condition of low demand, the product produced by AB Ltd is more profitable because its BEP is low.

Illustration 3 :

A factory is currently working to 40% capacity and produces 10,000 units. At 50% the selling price falls by 3%. At 90% capacity the selling price falls by 5% accompanied by similar fall in prices of raw material. Estimate the profit of the company at 50% and 90% capacity production.

The cost at present per unit is:

Material ₹ 10

Labour ₹ 3

Overheads ₹ 5 (60% fixed)

The selling price per unit is ₹ 20/- per unit.

Solution:

Statement Showing Computation of Profit at 50% and 90% Capacity as well as at Current Capacity:

Particulars	40%		50%		90%	
	₹		₹		₹	
	Unit	Total	Unit	Total	Unit	Total
I. Selling price	20.00	2,00,000	19.40	2,42,500	19.00	4,27,500
II. Variable cost						
Material	10.00	1,00,000	10.00	1,25,000	9.50	2,13,750
Labour	3.00	30,000	3.00	37,500	3.00	67,500
Variable OH	2.00	20,000	2.00	25,000	2.00	45,000
	15.00	1,50,000	15.00	1,87,500	14.50	3,26,250
III. Contribution	5.00	50,000	4.40	55,000	4.50	1,01,250
IV. Fixed cost	3.00	30,000		30,000		30,000
V. Profit		20,000		25,000		71,250
VI. B.E. sales $\left(\frac{F \times S}{C} \right)$		1,20,000		1,32,273		1,26,667

Illustration 4 :

The sales turnover and profit during two periods were as follows:

Period	Sales (₹)	Profit (₹)

1	2,00,000	20,000
2	3,00,000	40,000

What would be probable trading results with sales of ₹1,80,000? What amount of sales will yield a profit of ₹ 50,000?

Solution:

$$\begin{aligned} \text{P/V ratio} &= (\text{Change in profit} / \text{Change in sales}) \times 100 \\ &= (20,000 / 1,00,000) \times 100 = 20\% \end{aligned}$$

$$\begin{aligned} \text{Fixed cost} &= (\text{Sales} \times \text{P/V ratio}) - \text{Profit} \\ &= (2,00,000 \times 0.2) - 20,000 = ₹ 20,000 \end{aligned}$$

$$\begin{aligned} \text{Sales required to earn desired profit} &= \frac{\text{Fixed cost} + \text{desired profit}}{\text{P/V ratio}} \\ &= (20,000 + 50,000) / 20\% = ₹ 3,50,000 \end{aligned}$$

Illustration 5 :

The following results of a company for the last two years are as follows:

Year	Sales (₹)	Profit (₹)
2014	1,50,000	20,000
2015	1,70,000	25,000

You are required to calculate:

- P/V Ratio
- B.E.P
- The sales required to earn a profit of ₹ 40,000
- Profit when sales are ₹ 2,50,000
- Margin of safety at a profit of ₹ 50,000 and
- Variable costs of the two periods.

Solution:

$$\begin{aligned} \text{(i) P/V ratio} &= (\text{Change in profit} / \text{Change in sales}) \times 100 \\ &= (5,000 / 20,000) \times 100 = 25\% \end{aligned}$$

$$\begin{aligned} \text{Fixed cost} &= (\text{Sales} \times \text{P/V ratio}) - \text{Profit} \\ &= (1,50,000 \times 25\%) - 20,000 = ₹ 17,500 \end{aligned}$$

$$\begin{aligned} \text{(ii) Break even sales} &= \text{Fixed cost} / \text{PV ratio} \\ &= 17,500 / 25\% = ₹ 70,000 \end{aligned}$$

$$\begin{aligned} \text{(iii) Sales required to earn a profit of ₹ 40,000} &= \frac{\text{Fixed cost} + \text{desired profit}}{\text{P/V ratio}} \\ &= (17,500 + 40,000) / 25\% = ₹ 2,30,000 \end{aligned}$$

$$\begin{aligned} \text{(iv) Profit at sales ₹ 2,50,000} &= (\text{Sales} \times \text{P/V ratio}) - \text{Fixed cost} \\ &= (2,50,000 \times 25\%) - 17,500 = ₹ 45,000 \end{aligned}$$

$$\begin{aligned} \text{(v) Margin of safety at profit of ₹ 50,000} &= \text{Profit} / \text{PV ratio} \\ &= 50,000 / 25\% = ₹ 2,00,000 \end{aligned}$$

(vi) Variable cost for 2011 = $1,50,000 \times 75\% = ₹ 1,12,500$

Variable cost for 2012 = $1,70,000 \times 75\% = ₹ 1,27,500$

Illustration 6:

SV Ltd a multi product company furnishes you the following data relating to the year 2015:

	First Half of the year (₹)	Second Half of the year (₹)
Sales	45,000	50,000
Total cost	40,000	43,000

Assuming that there is no change in prices and variable cost and that the fixed expenses are incurred equally in the two half year period, calculate for the year, 2015

- (i) The P/V Ratio, (iii) Break-even sales
(ii) Fixed Expenses (iv) Percentage of Margin of safety.

Solution:

(i) P/V ratio = $[(7,000 - 5,000) / (50,000 - 45,000)] \times 100$
= 40%

(ii) Fixed expenses for first half year : = (Sales x PV ratio) – Profit
= $(45,000 \times 0.4) - 5,000 = ₹ 13,000$

Fixed expenses for the year = $13,000 + 13,000 = ₹ 26,000$

(iii) Break even sales = $26,000 / 40\% = ₹ 65,000$

(iv) Margin of safety = $(50,000 + 45,000) - 65,000$
= ₹ 30,000

Margin of safety ratio = $[30,000 / (50,000 + 45,000)] \times 100$
= 31.58%

Illustration 7 :

S Ltd. furnishes you the following information relating to the half year ended 30th June, 2015.

Fixed expenses	₹ 45,000
Sales value	₹ 1,50,000
Profit	₹ 30,000

During the second half the year the company has projected a loss of ₹10,000.

Calculate:

- The B.E.P and M/S for six months ending 30th June, 2015.
- Expected sales volume for the second half of the year assuming that the P/V Ratio and Fixed expenses remain constant in the second half year also.
- The B.E.P and M/S for the whole year for 2015.

Solution:

(1) P/V ratio = (Fixed cost + Profit) / Sales

P/V ratio : = $[(45,000 + 30,000) / 1,50,000] \times 100 = 50\%$

BE sales for I half year = $45,000 / 50\% = ₹ 90,000$

Margin of safety for I half year = 1,50,000 – 90,000 = ₹ 60,000

For II half year:

(2) P/V ratio = (Fixed cost + Profit) / Sales

0.5 = [45,000 + (-) 10,000] / Sales

0.5 sales = 35,000

Sales = ₹ 70,000

(3) BE sales for 2015 = (45,000 + 45,000) × 50%
= 1,80,000

Margin of safety for 2015 = (1,50,000 + 70,000) – 1,80,000
= ₹ 40,000

Illustration 8:

The following is the statement of a Radical Co. for the month of June.

	Products		Total (₹)
	L (₹)	M (₹)	
Sales	60,000	60,000	1,20,000
Variable costs	42,000	30,000	72,000
Contribution	18,000	30,000	48,000
Fixed cost			36,000
Net Income			12,000

You are required to compute the P/V ratio for each product and then compute the P/V Ratio, Break-even Point and net profit for the following assumption.

- (i) Sales revenue divided 60% to Product L & 40% to Product M.
- (ii) Sales revenue divided 40% to Product L & 60% to Product M.

Also calculate the profit estimated on sales upto ₹ 1,80,000/- p.m. for each of the sales mix provided above.

Solution:

Computation of P/V ratio

Particulars	L	M	Total
P/V ratio = (C/S) × 100	30%	50%	40%

(i) For Assumption I:

Statement showing computation of P/V ratio, Break even point and profit:

Sr. No.	Particulars	L (₹)	M (₹)	Total (₹)
I.	Sales	72,000	48,000	1,20,000
II.	Variable cost (L - 70%); (M - 50%)	50,400	24,000	74,400
III.	Contribution (L - 30%); (M - 50%)	21,600	24,000	45,600

IV.	Fixed cost			36,000
V.	Profit			9,600
P/V ratio $(45,600 \times 1,20,000) / 100 = 38\%$		30%	50%	38%
Break even sales = $36,000 / 38\% = ₹94,737$				

(ii) For Assumption II:

Statement showing computation of P/V ratio, Break even point and profit:

Sr. No.	Particulars	L (₹)	M (₹)	Total (₹)
I.	Sales	48,000	72,000	1,20,000
II.	Variable cost (L - 70%); (M - 50%)	33,600	36,000	69,600
III.	Contribution (L - 30%); (M - 50%)	14,400	36,000	50,400
IV.	Fixed cost			36,000
V.	Profit			14,400
P/V ratio $(50,400 \times 1,20,000) / 100 = 42\%$		30%	50%	42%
Break even sales = $36,000 / 42\% = ₹85,714$				

Illustration 9 :

Accelerate Co. Ltd., manufactures and sells four types of products under the brand names of A, B, C and D. The sales Mix in value comprises $33\frac{1}{3}\%$, $41\frac{2}{3}\%$, $16\frac{2}{3}\%$ and $8\frac{1}{3}\%$ of products A, B, C & D respectively.

The total budgeted sales (100% are ₹60,000 p.m). Operating costs are:

Variable Costs:

Product A 60% of selling price

Product B 68% of selling price

Product C 80% of selling price

Product D 40% of selling price

Fixed Costs: ₹ 14,700 p.m.

- Calculate the break - even - point for the products on overall basis and
- Also calculate break-even-point, if the sales mix is changed as follows the total sales per month remaining the same. Mix: A - 25% : B - 40% : C - 30% : D - 5%.

Solution:

	Particulars	A (₹)	B (₹)	C (₹)	D (₹)	Total (₹)
I.	Sales	20,000	25,000	10,000	5,000	60,000
II.	Variable cost	12,000	17,000	8,000	2,000	39,000
III.	Contribution	8,000	8,000	2,000	3,000	21,000
IV.	Fixed cost					14,700
V.	Profit					6,300
	P/V ratio = $(C/S) \times 100$	40%	32%	20%	60%	35%

- Break even sales

Break even sales = $14,700 / 35\% = ₹ 42,000$

-

	Particulars	A (₹)	B (₹)	C (₹)	D (₹)	Total (₹)
I.	Sales	15,000	24,000	18,000	3,000	60,000
II.	Variable cost	9,000	16,320	14,400	1,200	40,920

III.	Contribution	6,000	7,680	3,600	1,800	19,080
IV.	Fixed cost					14,700
V.	Profit					4,380
	P/V ratio = (C/S) x 100	40%	32%	20%	60%	31.8 %

Break even sales = $14,700 / 31.8\%$ = ₹ 46,226

Illustration 10 :

Present the following information to show to management:

- The marginal product cost and the contribution p.u.
- The total contribution and profits resulting from each of the following sales mix results.

Particulars	Product	Per unit ₹
Direct Materials	A	10
Direct Materials	B	9
Direct wages	A	3
Direct wages	B	2

Fixed Expenses – ₹ 800

(Variable expenses are allotted to products at 100% Direct Wages)

Sales Price ----- A ₹ 20

Sales Price ----- B ₹ 15

- Sales Mixtures:
- 100 units of Product A and 200 of B.
 - 150 units of Product A and 150 of B.
 - 200 units of Product A and 100 of B.

Solution:**(i) Statement of Marginal Product cost**

Sr. No.	Particulars	A (₹)	B (₹)
I.	Selling price	20.00	15.00
II.	Variable cost		
	Direct material	10.00	9.00
	Direct wages	3.00	2.00
	Variable OHs (100% of direct wages)	3.00	2.00
		16.00	13.00
III.	Contribution (I – II)	4.00	2.00

(ii) Profit at Mix (a):

Sr. No.	Particulars	A (₹)	B (₹)	Total (₹)
I.	No. of units	100	200	
II.	'C' per unit	4	2	
III.	Total contribution (II x I)	400	400	800
IV.	Fixed cost			800
V.	Profit (III - IV)			Nil

Profit at Mix (b):

Sr. No.	Particulars	A (₹)	B (₹)	Total (₹)
I.	No. of units	150	150	
II.	'C' per unit	4	2	
III.	Total contribution (II x I)	600	300	900
IV.	Fixed cost			800
V.	Profit (III - IV)			100

Profit at Mix (c):

Sr. No.	Particulars	A (₹)	B (₹)	Total (₹)
I.	No. of units	200	100	
II.	'C' per unit	4	2	
III.	Total contribution (I x II)	800	200	1000
IV.	Fixed cost			800
V.	Profit (III - IV)			200

here 'C' means 'Contribution'.

Illustration 11:

The following particulars are extracted from the records of a company:

		PER UNIT	
	PRODUCT A		PRODUCT B
Sales (₹)	100		120
Consumption of material	2 Kg		3 Kg
Material cost (₹)	10		15
Direct wages cost (₹)	15		10
Direct expenses (₹)	5		6
Machine hours used	3 Hrs		2 Hrs
Overhead expenses:			
Fixed (₹)	5		10
Variable (₹)	15		20

Direct wages per hour is ₹ 5

- (a) Comment on profitability of each product (both use the same raw material) when :
- 1) Total sales potential in units is limited;
 - 2) Total sales potential in value is limited;
 - 3) Raw material is in short supply;
 - 4) Production capacity (in terms of machine hours) is the limiting factor.
- (b) Assuming raw material as the key factor, availability of which is 10,000 Kgs. and each product cannot be sold more than 3,500 units find out the product mix which will yield the maximum profit.

Solution:

- (a) **Statement showing computation of contribution per unit of different factors of production and determination of profitability**

Sr.No.	Particulars	A (₹)	B (₹)
I.	Sales	100	120

II.	Variable cost		
	Material	10	15
	Labour	15	10
	Direct expenses	5	6
	Variable OH	15	20
		45	51
III.	Contribution (I - II)	55	69
IV.	P/V ratio (III - I)	55%	57.5%
V.	Contribution per kg of material	$55/2$ = 27.5	$69/3$ = 23
VI.	Contribution per machine hour	$55/3$ = 18 1/3	$69/2$ = 34.5

From the above computations, we may comment upon the profitability in the following manner.

1. If total sales potential in units is limited, product B is more profitable, it has more contribution per unit.
2. When total sales in value is limited, product B is more profitable because it has higher P/V ratio.
3. If the raw material is in short supply, Product A is more profitable because it has more contribution per Kg of material.
4. If the production capacity is limited, product B is more profitable, because it has more contribution per machine hour.

(b) Statement showing optimum mix under given conditions and computation of profit at that mix:

Sr.No.	Particulars	A (₹)	B (₹)	Total (₹)
I.	No. of units	3,500	1,000	
II.	Contribution per unit	55	69	
III.	Total contribution	1,92,500	69,000	2,61,500
IV.	Fixed cost (3500 x 5) (3500 x 10)	17,500	*35,000	52,500
V.	Profit			2,09,000

* Fixed cost is taken at maximum capacity (3,500 x 10)

Working Notes:

Kg.

Available material = 10,000

(-) utilized for A (3,500 x 2) = 7,000

= 3,000

Units of B = 3,000 / 3 = 1,000

Illustration 12 :

A company has a capacity of producing 1 lakh units of a certain product in a month. The sales department reports that the following schedule of sales prices is possible.

VOLUME OF PRODUCTION

SELLING PRICE PER UNIT

%

₹

60

0.90

70

0.80

80	0.75
90	0.67
100	0.61

The variable cost of manufacture between these levels is 15 paise per unit and fixed cost ₹ 40,000. Prepare a statement showing incremental revenue and differential cost at each stage. At which volume of production will the profit be maximum?

Solution:

Statement showing computation of differential cost, incremental revenue and determination of capacity at which profit is maximum:

Capacity %	Units	Sales (₹)	V. Cost @ (₹) 0.15	Fixed cost (₹)	Total Cost (₹)	Differential Cost (₹)	Incremental Revenue (₹)
60%	60,000	54,000	9,000	40,000	49,000	--	--
70%	70,000	56,000	10,500	40,000	50,500	1,500	2,000
80%	80,000	60,000	12,000	40,000	52,000	1,500	4,000
90%	90,000	60,300	13,500	40,000	53,500	1,500	300
100%	1,00,000	61,000	15,000	40,000	55,000	1,500	700

From the above computation, it was found that the incremental revenue is more than the differential cost up to 80% capacity, the profit is maximum at that capacity.

Illustration 13:

A company is at present working at 90 per cent of its capacity and producing 13,500 units per annum. It operates a flexible budgetary control system. The following figures are obtained from its budget.

	90% ₹	100% ₹
Sales	15,00,000	16,00,000
Fixed expenses	3,00,500	3,00,600
Semi-fixed expenses	97,500	1,00,500
Variable expenses	1,45,000	1,49,500
Units made	13,500	15,000

Labour and material costs per unit are constant under present conditions. Profit margin is 10 per cent.

- You are required to determine the differential cost of producing 1,500 units by increasing capacity to 100%
- What would you recommend for an export price for these 1,500 units taking into account that overseas prices are much lower than indigenous prices?

Solution:

Computation of material and labour cost:

Particulars	₹	₹
Sales at present		15,00,000
(-) Profit @ 10%		1,50,000
Total cost		13,50,000

(-) All costs other than material & labour		
Fixed expenses	3,00,500	5,43,000
Semi fixed expenses	97,500	
Variable expenses	1,45,000	
Material & Labour cost		8,07,000

(a) Statement showing differential cost of 1500 units:

Particulars	₹
Material & Labour (8,07,000 x 1500/13500)	89,667
Fixed expenses (3,00,600 – 3,00,500)	100
Semi fixed expenses (1,00,500 – 97,500)	3,000
Variable expenses (1,49,500 – 1,45,000)	4,500
Differential cost	97,267

(b) Differential cost per unit = $97,267 / 1,500 = ₹ 64.84$

The minimum price for these 1,500 units should not be less than ₹ 64.84

Illustration 14 :

The operating statement of a company is as follows:

	(₹)
Sales (80,000 @ ₹15 each)	12,00,000
Costs:	
Variable:	(₹)
Material	2,40,000
Labour	3,20,000
Overheads	<u>1,60,000</u>
	7,20,000
Fixed Cost	<u>3,20,000</u>
	10,40,000
PROFIT	<u>1,60,000</u>

The capacity of the plant is 1 lakh units. A customer from U.S.A. is desirous of buying 20,000 units at a net price of ₹10 per unit. Advise the producer whether or not offer should be accepted. Will your advice be different, if the customer is local one.

Solution:**Statement showing computation of profit before and after accepting the order:**

Sr. No.	Particulars	Present Position (Before accepting) 80,000	Order Value (20,000)	Total (After accepting) 1,00,000
		₹	₹	₹
I.	Sales	12,00,000	2,00,000	14,00,000

II.	Variable Cost			
	Material	2,40,000	60,000	3,00,000
	Labour	3,20,000	80,000	4,00,000
	Variable OH	1,60,000	40,000	2,00,000
		7,20,000	1,80,000	9,00,000
III.	Contribution (I - II)	4,80,000	20,000	5,00,000
IV.	Fixed cost	3,20,000	--	3,20,000
V.	Profit (III - IV)	1,60,000	20,000	1,80,000

As the profit is increased by ₹ 20,000 by accepting the order, it is advised to accept the same. If the order is from local one, it should not be accepted because it will adversely affect the present market.

Illustration 15 :

A company manufactures scooters and sells it at ₹3,000 each. An increase of 17% in cost of materials and of 20% of labour cost is anticipated. The increased cost in relation to the present sales price would cause at 25% decrease in the amount of the present gross profit per unit.

At present, material cost is 50%, wages 20% and overhead is 30% of cost of sales.

You are required to :

- Prepare a statement of profit and loss per unit at present and;
- Compute the new selling price to produce the same percentage of profit to cost of sales as before.

Solution:

Let X and Y be the cost and profit respectively.

$$X + Y = 3,000 \quad (1)$$

$$\text{Material} = X \times 50/100 = 0.5X$$

$$\text{Labour} = X \times 20/100 = 0.2X$$

$$\text{Overheads} = X \times 30/100 = 0.3X$$

After increase of cost:

$$\text{Material} = 0.5 X \times 117/100 = 0.585 X$$

$$\text{Labour} = 0.2X \times 120/100 = 0.240 X$$

$$\text{Overheads} = 0.300 X$$

$$= 1.125 X$$

$$\text{Profit} = Y \times 75/100 = 0.75Y$$

$$\text{New Equation } 1.125X + 0.75Y = 3,000 \rightarrow (2)$$

$$\text{Multiplying Eq. (1) by 0.75 } 0.75X + 0.75Y = 2,250$$

$$0.375X = 750$$

$$X = 750/0.375 = ₹ 2,000$$

$$Y = 3,000 - 2,000 = ₹ 1,000$$

Statement of cost & profit per unit at present:

₹

Material = 2,000 x 50%	= 1,000
Labour = 2,000 x 20%	= 400
Overheads = 2,000 x 30%	= <u>600</u>
	= 2,000
(+) profit @ 50% of cost	= <u>1,000</u>
	= <u>3,000</u>

Computation of new selling price to get same percentage of profit:

	₹
Material = 1,000 x 117/100	= 1,170
Labour = 400 x 120/100	= 480
Overheads	= <u>600</u>
Cost	= 2,250
(+) Profit @ 50%	= <u>1,125</u>
New selling price	= <u>3,375</u>

Illustration 16 :

An umbrella manufacturer marks an average net profit of ₹ 2.50 per piece on a selling price of ₹14.30 by producing and selling 6,000 pieces or 60% of the capacity. His cost of sales is

	₹
Direct material	3.50
Direct wages	1.25
Works overheads (50% fixed)	6.25
Sales overheads (25% variable)	0.80

During the current year, he intends to produce the same number but anticipates that fixed charges will go up by 10% which direct labour rate and material will increase by 8% and 6% respectively but he has no option of increasing the selling price. Under this situation, he obtains an offer for further 20% of the capacity. What minimum price you will recommend for acceptance to ensure the manufacturer an overall profit of ₹16,730.

Solution:**Computation of profit at present after increase in cost:**

	Particulars	₹
I.	Selling price	14.30
II.	Variable cost	
	Material (3.5 x 106/100)	3.710
	Labour (1.25 x 108/100)	1.350
	Works overhead	3.125
	Sales overhead	0.200

	Total	8.385
III.	Contribution per unit (I-II)	5.915
IV.	Total contribution (6,000 x 5.915)	35,490
V.	Fixed cost Works OH 3.125 Sales OH 0.600 3.725 x 6,000 = 22,350 x 110/100	24,585
VI.	Profit (iv - v)	10,905

Computation of selling price of the order: (₹)

Variable cost of order (2,000 x 8.385) = 16,770

(+) required profit (16,730 – 10,905) = 5,825

Sales required = 22,595

Selling price of order = 22,595/2,000 = 11.2975 (or) ₹ 11.30

Illustration 17 :

The Dynamic company has three divisions. Each of which makes a different product. The budgeted data for the coming year are as follows:

	A (₹)	B (₹)	C (₹)
Sales	<u>1,12,000</u>	<u>56,000</u>	<u>84,000</u>
Direct Material	14,000	7,000	14,000
Direct Labour	5,600	7,000	22,400
Direct Expenses	14,000	7,000	28,000
Fixed Cost	<u>28,000</u>	<u>14,000</u>	<u>28,000</u>
	61,600	35,000	92,400

The Management is considering to close down the division C'. There is no possibility of reducing fixed cost. Advise whether or not division C' should be closed down.

Solution:

Statement showing computation of profit before closing down of division C:

Sr. No.	Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
I.	Sales	1,12,000	56,000	84,000	2,52,000
II.	Variable cost				
	Direct Material	14,000	7,000	14,000	35,000
	Direct Labour	5,600	7,000	22,400	35,000
	Direct expenses	14,000	7,000	28,000	49,000
III.	Total Variable Cost	33,600	21,000	64,400	1,19,000

IV.	Contribution (i - iii)	78,400	35,000	19,600	1,33,000
V.	Fixed cost				70,000
VI.	Profit (iv - v)				63,000

Statement showing computation of profit after closing 'C':

Sr. No.	Particulars	A (₹)	B (₹)	Total (₹)
I.	Sales	1,12,000	56,000	1,68,000
II.	Variable cost			
	Direct Material	14,000	7,000	21,000
	Direct Labour	5,600	7,000	12,600
	Direct expenses	14,000	7,000	21,000
III.	Total Variable Cost	33,600	21,000	54,600
IV.	Contribution (i - iii)	78,400	35,000	1,13,400
V.	Fixed cost			70,000
VI.	Profit (iv - v)			43,400

From the above computations, it was found that profit is decreased by (₹63,000 - ₹43,400) ₹ 19,600 by closing down division 'C', it should not be closed down. In other words, as long as if there is a contribution of ₹ 1, from division 'C', it should not be closed down.

Illustration 18 :

Mr. Young has ₹ 1,50,000 investment in a business. He wants a 15% profit on his money. From an analysis of recent cost figures he finds that his variable cost of operating is 60% of sales; his fixed costs are ₹75,000 per year. Show supporting computations for each answer.

- What sales volume must be obtained to break-even?
- What sales volume must be obtained to his 15% return on investment?
- Mr. Young estimates that even if he closed the doors of his business he would incur ₹25,000 expenses per year. At what sales would be better off by locking his sales up?

Solution:

$$\text{P/V ratio (V. cost ratio 60\%)} = 40\%$$

$$(a) \text{ Break even sales} = 75,000 / 40\% = ₹ 1,87,500$$

$$(b) \text{ Required sales to get desired income} = (75,000 + 22,500) / 40\% = ₹ 2,43,750$$

$$= ₹ 2,43,750$$

$$(c) \text{ Shut down sales} = \frac{\text{Fixed cost} - \text{shut down cost}}{\text{P/V Ratio}}$$

$$= (75,000 - 25,000) / 40\%$$

$$= ₹ 1,25,000$$

Illustration 19 :

The manager of a Co. provides you with the following information:

	₹
Sales	: 4,00,000
Costs: Variable (60% of sales)	
Fixed cost	: 80,000
Profit before tax	: 80,000
Income-tax (60%)	
Net profit	: 32,000

The company is thinking of expanding the plant. The increased fixed cost with plant expansion will be ₹40,000. It is estimated that the maximum production in new plant will be worth ₹2,40,000. The company also wants to earn additional income ₹3,200 on investment. On the basis of computations give your opinion on plant expansion.

Solution:

Statement showing computation of profit before and after plant expansion:

Sr. No.	Particulars	Present (Before expansion) (₹)	Expansion value (₹)	Total (After expansion) (₹)
I.	Sales	4,00,000	2,40,000	6,40,000
II.	Variable cost (60%)	2,40,000	1,44,000	3,84,000
III.	Contribution (i - ii)	1,60,000	96,000	2,56,000
IV.	Fixed cost	80,000	40,000	1,20,000
V.	Profit before tax (iii - iv)	80,000	56,000	1,36,000
VI.	Profit after tax (V x 0.40)	32,000	22,400	54,400

From the above computations, it was found that the profit is increased by ₹ 22,400 by expanding the plant, which is much higher than the expected income of ₹ 3,200, one's opinion should be in favour of plant expansion.

12

STANDARD COSTING AND VARIANCE ANALYSIS

STANDARD COSTING & VARIANCE ANALYSIS

Standard Cost:

Standard Cost is defined as *"the predetermined cost that is calculated at the management's standards of efficient operations and the relevant necessary expenditure"*.

From this we understand that it is the cost calculated when all the people working in the organisation to their utmost, the expenditure incurred for producing the product can be taken as standard cost. The optimum efficiency can not at all time exists. Therefore, optimum efficiency is assumed and that is why standard cost is called assumed cost. Further, all the inputs of cost scientifically analysed using so many industrial engineering techniques such as work measurement, method study, time and motion study, merit rating, job evaluation and other scientific techniques, it can also be called as Scientific Cost.

Standard Costs and Estimated Costs:

The distinction between Standard Costs and Estimated Costs should be clearly understood. While both Standard Costs and Estimated Costs are predetermined costs, their objectives are different. The main differences between the two types of costs are:

1. Estimated Costs are intended to determine what the costs 'will' be. Standard Costs aim at what costs 'should' be.
2. Estimated Costs are based on average of past actual figures adjusted for anticipated changes in future. Anticipated wastes, spoilage and inefficiencies, all of which tend to increase costs are included in estimated costs. Standard Costs are planned costs determined on a scientific basis and they are based upon certain assumed conditions of efficiency and other factors.
3. In Estimated Costing Systems, stress is not so much on cost control, but costs are used for other purposes such as fixation of prices to be quoted in advance. Standard Costs serve as effective tools for cost control.

Setting of Standard Costs:

While setting production costs standards, the following preliminaries should be considered:

- a. Study of the technical and operational aspects of the concern, such as methods of manufacture and the processes involved, management of organisation and line of assignment of responsibilities, division of the organisation into cost centres, units of measurement of input and output, anticipation of wastes, rejections and losses, expected efficiency, and capacity likely to be utilized.
- b. Review of the existing costing system and the cost records and forms in use.

- c. The type of standard to be used, i.e., whether current, basic, or normal standard costs are to be set. The choice of a particular type of standard will depend upon two factors, viz. which type would be most effective for cost control in the organization, and whether the standards will be merged in the accounting system or kept outside the accounts as statistical data.
- d. Proper classification of the accounts so that variances may be determined in the manner desired.
- e. Fixation of responsibility for setting standards. As definite responsibility for variances from standards is ultimately to be laid on individuals or departments, it is but natural that all those individuals or departments should be associated with the setting of standards.

Stock Valuation:

The function of a Balance Sheet is to give a true and fair view of the state of affairs of a company on a particular date. A true and fair view also implies the consistent application of generally accepted principles. Stocks valued at standard costs are required to be adjusted at actual costs in the following circumstances:

- (a) As per Accounting Standards – 2, closing stock to be valued either at cost price or at net realisable value (NRV) whichever is less.
- (b) The standard costing system introduced is still in an experimental stage and the variances merely represent deviations from poorly set standards.
- (c) Occurrence of certain variances which are beyond the control of the management. (Unless the stocks are adjusted for uncontrollable factors, the values are not correctly stated).

Maintenance of Raw Material Stock at Standard Cost:

In the single plan, the inventory in the stores ledger may be carried either at standard costs or at actual. Although both the methods are in use, the consensus is in favour of standard costs. The advantages of adopting standard costs for inventory valuation are as follows:

- a. Stores ledger may be maintained in quantities only and the standard price noted at the top in the ledger sheets. This economises the use of forms as well as reduces clerical costs as no columns for rates need be maintained.
- b. Pricing of materials requisitions is simplified as only one standard price for each item of material is required to be used.
- c. Price variance is promptly revealed at the time of purchase of material.

The disadvantages are:

- a. The stores ledger does not reveal the current prices.
- b. If the material stock is shown in the Balance Sheet at standard costs, the variances have the effect of distorting the profit or loss. Standard cost of the closing inventory is required to be adjusted to actual cost based on price variance to comply with the statutory requirement of the Companies Act, 2013.
- c. A revision of the standard necessitates revision of the cost of the inventory.

Difference between Standard Costing and Budgetary Control:

Like Budgetary Control, Standard Costing assumes that costs are controllable along definite lines of supervision and responsibility and it aims at managerial control by comparison of actual performances with suitable predetermined yardsticks. The basic principles of cost control, viz., setting up of targets or standards, measurement of performance, comparison of actual with the targets and analysis and reporting of variances are common to both standard costing and budgetary control systems. Both techniques are of importance in their respective fields and are complementary to each other. Thus, conceptually there is not much of a difference between standard costs and budgeted and the terms budgeted performance and standard performance mean, for many concerns one and the same thing.

Budgets are usually based on past costs adjusted for anticipated future changes but standard costs

are of help in the preparation of production costs budgets. In fact, standards are often indispensable in the establishment of budgets. On the other hand, while setting standard overhead rates of standard costing purposes, the budgets framed for the overhead costs may be made use of with modifications, if necessary. Thus, standard costs and budgets are interrelated but not inter-dependent.

Despite the similarity in the basic principles of Standard Costing and Budgetary Control, the two systems vary in scope and in the matter of detailed techniques. The difference may be summarized as follows:

1. A system of Budgetary Control may be operated even if no Standard Costing system is in use in the concern.
2. While standard is an unit concept, budget is a total concept.
3. Budgets are the ceilings or limits of expenses above which the actual expenditure should not normally rise; if it does, the planned profits will be reduced. Standards are minimum targets to be attained by actual performance at specified efficiency.
4. Budgets are complete in as much as they are framed for all the activities and functions of a concern such as production, purchase, selling and distribution, research and development, capital utilisation, etc. Standard Costing relates mainly to the function of production and the related manufacturing costs.
5. A more searching analysis of the variances from standards is necessary than in the case of variations from the budget.
6. Budgets are indices, adherence to which keeps a business out of difficulties. Standards are pointers to further possible improvements.

Advantages of Standard Costing:

The advantages derived from a system of standard costing are tabulated below:

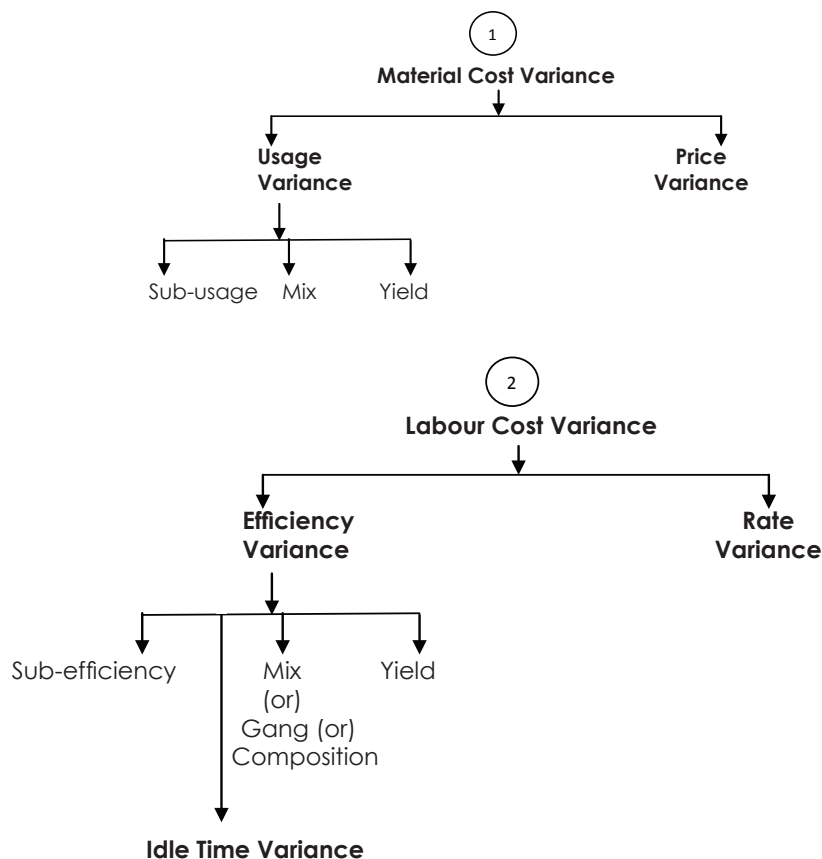
1. Standard Costing system establishes yard-sticks against which the efficiency of actual performances is measured.
2. The standards provide incentive and motivation to work with greater effort and vigilance for achieving the standard. This increase efficiency and productivity all round.
3. At the very stage of setting the standards, simplification and standardisation of products, methods, and operations are effected and waste of time and materials is eliminated. This assists in managerial planning for efficient operation and benefits all the divisions of the concern.
4. Costing procedure is simplified. There is a reduction in paper work in accounting and less number of forms and records are required.
5. Cost are available with promptitude for various purposes like fixation of selling prices, pricing of inter-departmental transfers, ascertaining the value of costing stocks of work-in-progress and finished stock and determining idle capacity.
6. Standard Costing is an exercise in planning - it can be very easily fitted into and used for budgetary planning.
7. Standard Costing system facilities delegation of authority and fixation of responsibility for each department or individual. This also tones up the general organisation of the concern.
8. Variance analysis and reporting is based on the principles of management by exception. The top management may not be interested in details of actual performance but only in the variances from the standards, so that corrective measures may be taken in time.
9. When constantly reviewed, the standards provide means for achieving cost reduction.
10. Standard costs assist in performance analysis by providing ready means for preparation of information.
11. Production and pricing policies may be formulated in advance before production starts. This

helps in prompt decision-making.

12. Standard costing facilitates the integration of accounts so that reconciliation between cost accounts and financial accounts may be eliminated.
13. Standard Costing optimizes the use of plant capacities, current assets and working capital.

Limitations of standard costing:

1. Establishment of standard costs is difficult in practice.
2. In course of time, sometimes even in a short period the standards become rigid.
3. Inaccurate, unreliable and out of date standards do more harm than benefit.
4. Sometimes, standards create adverse psychological effects. If the standard is set at high level, its non achievement would result in frustration and build-up of resistance.
5. Due to the play of random factors, variances cannot sometimes be properly explained, and it is difficult to distinguish between controllable and non-controllable expenses.
6. Standard costing may not sometimes be suitable for some small concerns. Where production cannot be carefully scheduled, frequent changes in production conditions result in variances. Detailed analysis of all of which would be meaningless, superfluous and costly.
7. Standard costing may not, sometimes, be suitable and costly in the case of industries dealing with non-standardized products and for repair jobs which keep on changing in accordance with customer's specifications.
8. Lack of interest in standard costing on the part of the management makes the system practically ineffective. This limitation, of course, applies equally in the case of any other system which the management does not accept wholeheartedly.



Direct Materials Cost Variance: Direct materials cost variance is the difference between the actual direct material cost incurred and the standard direct material cost specified for the production achieved.

1. **Direct Materials Price Variance:** The difference between the actual and standard price per unit of the material applied to the actual quantity of material purchased or used.

$$\begin{aligned}\text{Direct materials price variance} &= (\text{Standard Price} \text{ minus } \text{Actual Price}) \times \text{Actual Quantity, or} \\ &= (\text{SP} - \text{AP}) \text{ AQ} \\ &= (\text{Standard Price} \times \text{Actual Quantity}) \text{ minus } (\text{Actual Price} \times \text{Actual Quantity}) \\ &= (\text{AQSP} - \text{AQAP})\end{aligned}$$

Causes of Material Price Variance:

- a. Change in basic purchase price of material.
- b. Change in quantity of purchase or uneconomical size of purchase order.
- c. Rush order to meet shortage of supply, or purchase in less or more favourable market.
- d. Failure to take advantage of off-season price, or failure to purchase when price is cheaper.
- e. Failure to obtain (or availability of) cash and trade discounts or change in the discount rates.
- f. Weak purchase organisation.
- g. Payment of excess or less freight.
- h. Transit losses and discrepancies, if purchase price is inflated to include the loss.
- i. Change in quality or specification of material purchased.
- j. Use of substitute material having a higher or lower unit price.
- k. Change in materials purchase, upkeep, and store-keeping cost. (This is applicable only when such changes are allocated to direct material costs on a predetermined or standard cost basis.)
- l. Change in the pattern or amounts of taxes and duties.

2. **Direct Materials Usage Variance:** The difference between the actual quantity used and the amount which should have been used, valued at standard price.

$$\begin{aligned}\text{Direct materials usage variance} &= (\text{Standard Quantity for actual output} \times \text{Standard Price}) \text{ minus} \\ &\quad (\text{Standard Price} \times \text{Actual Quantity}) \\ &= \text{SQSP} - \text{AQSP} \text{ or} \\ &= \text{Standard Price} \times (\text{Standard Quantity for actual output} \text{ minus } \text{Actual Quantity}) \\ &= \text{SP} (\text{SQ} - \text{AQ})\end{aligned}$$

Causes of Materials Usage Variance:

- a. Variation in usage of materials due to inefficient or careless use, or economic use of materials.
- b. Change in specification or design of product.
- c. Inefficient and inadequate inspection of raw materials.
- d. Purchase of inferior materials or change in quality of materials
- e. Rigid technical specifications and strict inspection leading to more rejections which require more materials for rectification.
- f. Inefficiency in production resulting in wastages
- g. Use of substitute materials.
- h. Theft or pilferage of materials.

- i. Inefficient labour force leading to excessive utilisation of materials.
- j. Defective machines, tools, and equipments, and bad or improper maintenance leading to breakdowns and more usage of materials.
- k. Yield from materials in excess of or less than that provided as the standard yield.
- l. Faulty materials processing. Timber, for example, if not properly seasoned may be wasted while being used in subsequent processes.
- m. Accounting errors, e.g. when materials returned from shop or transferred from one job to another are not properly accounted for.
- n. Inaccurate standards
- o. Change in composition of a mixture of materials for a specified output.

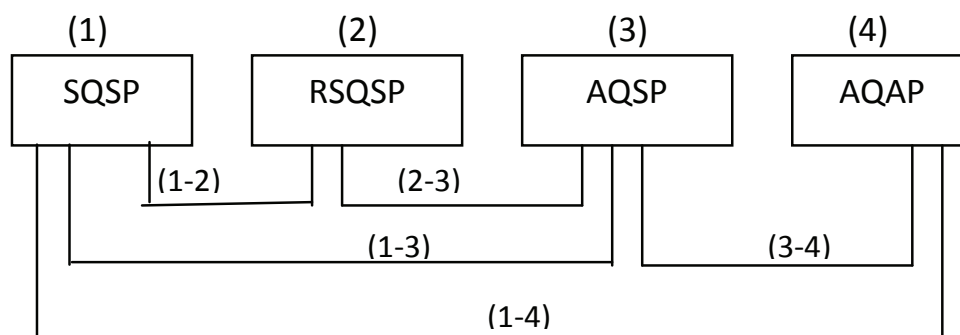
(i) Direct Materials Mix Variance: One of the reasons for materials usage variance is the change in the composition of the materials mix. The difference between the actual quantity of material used and the standard proportion, priced at standard price.

$$\begin{aligned}\text{Mix variance} &= (\text{Revised Standard Quantity} \text{ minus } \text{Actual Quantity}) \times \text{Standard Price.} \\ &= \text{RSQSP} - \text{AQSP}\end{aligned}$$

(ii) Direct Materials Yield Variance: Yield variance is the difference between the standard cost of production achieved and the actual total quantity of materials used, multiplied by the standard weighted average price per unit.

$$\text{Material yield variance} = (\text{Standard Yield for Actual Mix} \text{ minus } \text{Actual Yield}) \times \text{Standard Yield Price}$$

(Standard yield price is obtained by dividing the total cost of the standard units by the total cost of the standard mixture by the total quantity (number of physical units)).



Where

SQ = Standard Quantity for Actual Production or Output

SP = Standard Price

AQ = Actual Quantity of Materials Consumed

AP = Actual Price

RSQ = Revised Standard Quantity

1. SQSP = Standard Cost of Standard Material

2. RSQSP = Revised Standard Cost of Standard Material

3. AQSP = Standard cost of Actual Material

4. AQAP = Actual Cost of Actual Material

(a) Material Sub-Usage or Yield Variance = 1-2

- (b) Material Mix Variance = 2-3
- (c) Material Usage Variance = 1-3
- (d) Material Price Variance = 3-4
- (e) Material Cost Variance = 1-4

II. Direct Labour Cost Variance: Direct Labour Cost Variance (also termed Direct Wage Variance) is the difference between the actual direct wages incurred and the standard direct wages specified for the activity achieved.

1. Direct Labour Rate Variance (Wage Rate Variance): The difference between the actual and standard wage rate per hour applied to the total hours worked.

Wages rate variance = (Standard Rate *minus* Actual Rate) x Actual Hours

$$= (SR-AR) \times AH$$

$$= SRAH-ARAH$$

Causes of Direct Labour Rate Variances:

- a. Change in basic wage structure or change in piece-work rate. These will give rise to a variance till such time the standards are not revised.
- b. Employment of workers of grades and rates of pay different from those specified, due to shortage of labour of the proper category, or through mistake, or due to retention of surplus labour.
- c. Payment of guaranteed wages to workers who are unable to earn their normal wages if such guaranteed wages form part of direct labour cost.
- d. Use of a different method of payment, e.g. payment at day-rates while standards are based on piece-work method of remuneration.
- e. Higher or lower rates paid to casual and temporary workers employed to meet seasonal demands, or urgent or special work.
- f. New workers not being allowed full normal wage rates.
- g. Overtime and night shift work in excess of or less than the standard, or where no provision has been made in the standard. This will be applicable only if overtime and shift differential payments form part of the direct labour cost.
- h. The composition of a gang as regards the skill and rates of wages being different from that laid down in the standard.

2. Direct Labour Efficiency Variance (also termed Labour Time Variance): The difference between the standard hours which should have been worked and the hours actually worked, valued at the standard wage rate.

Direct Labour Efficiency Variance = (Standard Hours for Actual Production *minus* Actual Hours) x Standard Rate

$$= (SH-AH) \times SR$$

$$= SRSH-SRAH$$

Causes for Labour Efficiency Variance:

- a. Lack of proper supervision or strict supervision than specified.
- b. Poor working conditions.
- c. Delays due to waiting for materials, tools, instructions, etc. if not treated as idle time.
- d. Defective machines, tools and other equipments.
- e. Machine break-down, if not booked to idle time.

- f. Work on new machines requiring less time than provided for, till such time standard is not revised.
- g. Basic inefficiency of workers due to low morale, insufficient training, faulty instructions, incorrect scheduling of jobs, etc.
- h. Use of non-standard material requiring more or less operation time.
- i. Carrying out operations not provided for a booking them as direct wages.
- j. Incorrect standards
- k. Wrong selection of workers, i.e., not employing the right type of man for doing a job.
- l. Increase in labour turnover.
- m. Incorrect recording of performances, i.e., time or output.

i. Direct Labour Composition or Mix or Gang Variance: This is a sub-variance of labour efficiency variance. This variance arises due to change in the composition of a standard gang, or, combination of labour force

Mix or Gang or Composition Variance = (Actual Hours at Standard Rate of Standard Gang) *minus* (Actual Hours at Standard Rate of Actual Gang)

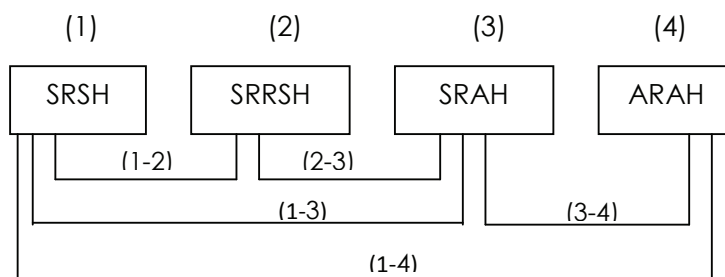
ii. Direct Labour Yield Variance: Just as material yield variance is calculated, similarly labour yield variance can also be known. It is the variation in labour cost on account of increase or decrease in yield or output as composed to the relative standard. The formula is –

$$\text{Direct Labour Yield Variance} = \text{Standard Cost Per Unit} \times \left[\frac{\text{Standard Output for Actual Mix} - \text{Actual Output}}{\text{Standard Output for Actual Mix}} \right]$$

3. Idle time variance: This variance which forms a portion of wages efficiency variance, is represented by the standard cost of the actual hours for which the workers remain idle due to abnormal circumstances.

Idle time variance = (Standard rate x Actual hours paid for) *minus* (Standard rate x Actual hours worked) or

= Standard Rate x Idle Hours



SR = Standard Rate of Labour Per Hour

SH = Standard Hours for Actual Production or Output

RSH = Revised Standard Hours

AH = Actual Hours

AR = Actual Rate of Labour per Hour

1. SRRSH = Standard Cost of Standard Labour

2. SRRSH = Revised Standard Cost of Labour
3. SRAH = Standard Cost of Actual Labour
4. ARAH = Actual Cost of Labour
 - a. Labour Sub-Efficiency or Yield Variance = 1-2
 - b. Labour Mix or Gang or Composition Variance = 2-3
 - c. Labour Efficiency Variance = 1-3
 - d. Labour Rate Variance = 3-4
 - e. Labour Cost Variance = 1-4

Idle Time Variance = Idle Time Hours x Standard Rate per Hour.

It is to be noted that this is the part and parcel of efficiency ratio and always it is adverse.

Illustration 1:

Product A required 10 kg of material at a rate of ₹4 per kg. The actual consumption of material for the manufacturing product A comes to 12 kg of material at the rate of ₹4.50 per kg.

- Calculate:
- (a) Material Cost Variance
 - (b) Material Usage Variance
 - (c) Material Price Variance.

Solution:

Computation of Required Values

- Let
- (1) SQSP = Standard Cost of Standard Material
 - (2) AQSP = Standard Cost of Actual Material
 - (3) AQAP = Actual Cost of Material

Given Values:

SQ = Standard Quantity of Material = 10 kg

AQ = Actual Quantity of Material = 12 kg

SP = Standard Price = ₹ 4 per kg

AP = Actual Price = ₹ 4.50 per kg.

$$(1) \text{ SQSP} = (10 \times 4) = ₹ 40$$

$$(2) \text{ AQSP} = (12 \times 4) = ₹ 48$$

$$(3) \text{ AQAP} = (12 \times 4.50) = ₹ 54$$

Computation of Required Material Variances

- a. Material Usage Variance = (1) – (2) = 40-48 = ₹8 (A)
- b. Material Price Variance = (2) – (3) = 48-54 = ₹6 (A)
- c. Material Cost Variance = (1) – (3) = 40-54 = ₹14 (A)

Illustration 2:

The standard quantity and standard price of raw material required for one unit of product A are given as follows

	Quantity (kg.)	S.P. (₹)
Material X	2	3
Material Y	4	2

The actual production and relevant data are as follows:

Material X 1,100 kgs. @ ₹ 3,410

Material Y 1,800 kgs. @ ₹ 3,960

Calculate Variances. Actual production was 500 units.

Solution:

Analysis of Given Data

Material	Standard Data			Actual Data		
	Quantity (Kg.)	Price (₹)	Value (₹)	Quantity (Kg.)	Price (₹)	Value (₹)
A	1000 (500 x 2)	3.00	3,000	1,100	3.10	3,410
B	2000 (500 x 4)	2.00	4,000	1,800	2.20	3,960
	3000		7,000	2,900		7,370

Material	SQSP (₹)	RSQSP (₹)	AQSP (₹)	AQAP (₹)
X		966.67 x 3 = 2,900	1,100 x 3	
Y		1933.33 x 2 = 3,867	1,800 x 2	
Total	7,000	6,767	6,900	7,370

Where (1) SQSP = Standard Cost of Standard Material = ₹ 7,000

(2) RSQSP = Revised Standard Cost of Material = ₹ 6,767

(3) AQSP = Standard Cost of Actual Material = ₹ 6,900

(4) AQAP = Actual Cost of Material = ₹ 7,370

Computation of Variances

(a) Material Sub-usage variance = (1) – (2) = 7,000 – 6,767 = ₹ 233 (F)

(b) Material Mix variance = (2) – (3) = 6,767 – 6,900 = ₹ 133 (A)

(c) Material Usage variance = (1) – (3) = 7,000 – 6,900 = ₹100 (F)

(d) Material price variance = (3) – (4) = 6,900 – 7,370 = ₹ 470 (A)

(e) Material cost variance = (1) – (4) = 7,000 – 7,370 = ₹ 370 (A)

Illustration 3:

From the following you are required to calculate

(a) Material Usage Variance

(b) Material Price Variance

(c) Material Cost Variance

Quantity of material purchased 3,000 units

Value of material purchased ₹ 9,000

Standard quantity of material required
for one tonne of finished product 25 units

Standard rate of material ₹ 2 per unit

Opening stock of material NIL

Closing stock of material 500 units

Finished production during the period 80 tonnes

Solution:**Given Values:****SQ** = Standard Quantity for Actual Production = $25 \times 80 = 2,000$ units.**AQ** = Actual Quantity = 2,500 units (3,000 units – 500 units)**SP** = Standard Price = ₹ 2**AP** = Actual Price = ₹ 3**(1) SQSP** = Standard Cost of Standard Material = $2,000 \times 2 = ₹ 4,000$ **(2) AQSP** = Standard Cost of Actual Material = $2,500 \times 2 = ₹ 5,000$ **(3) AQAP** = Actual Cost of Material = ₹ 7,500 (2,500 units × ₹ 3 per unit)**Computation Of Material Variances:**a. Material usage variance = $(1) - (2) = ₹ (4,000 - 5,000) = ₹ 1,000$ (A)b. Material price variance = $(2) - (3) = ₹ (5,000 - 7,500) = ₹ 2,500$ (A)c. Material cost variance = $(1) - (3) = ₹ (4,000 - 7,500) = ₹ 3,500$ (A)**Illustration 4:**

From the following information, compute (a) Mix, Price and Usage Variances.

	Quantity (Kg.)	Unit Rate (₹)	Total (₹)
Standard:			
Material A	10	2	20
Material B	20	3	60
Material C	20	6	120
	50		200
Actual:			
Material A	5	3	15
Material B	10	6	60
Material C	15	5	75
	30		150

Solution:**Computation of Required Values**

Materials	(1) SQSP (₹)	(2) RSQSP (₹)	(3) AQSP (₹)	(4) AQAP (₹)

A	$10 \times 2 = 20$	$6 \times 2 = 12$	$5 \times 2 = 10$	$5 \times 3 = 15$
B	$20 \times 3 = 60$	$12 \times 3 = 36$	$10 \times 3 = 30$	$10 \times 6 = 60$
C	$20 \times 6 = 120$	$12 \times 6 = 72$	$15 \times 6 = 90$	$15 \times 5 = 75$
	<u>200</u>	<u>120</u>	<u>130</u>	<u>150</u>

RSQ For A = $10/50 \times 30 = 6$ units

RSQ For B = $20/50 \times 30 = 12$ units

RSQ For C = $20/50 \times 30 = 12$ units

Where (1) **SQSP** = Standard Cost of Standard Material = ₹ 200

(2) **RSQSP** = Revised Standard Cost of Material = ₹ 120

(3) **AQSP** = Standard Cost of Actual Material = ₹ 130

(4) **AQAP** = Actual Cost of Material = ₹ 150

Computation of Required Variances:

(a) Material Sub-Usage Variance = (1) – (2) = ₹ 200 – ₹ 120 = ₹80 (F)

(b) Material Mix Variance = (2) – (3) = ₹ 120 – ₹ 130 = ₹10 (A)

(c) Material Usage Variance = (1) – (3) = ₹ 200 – ₹130 = ₹70 (F)

(d) Material Price Variance = (3) – (4) = ₹130 – ₹150 = ₹20 (A)

(e) Material Cost Variance = (1) – (4) = ₹ 200 – ₹ 150 = ₹50 (F)

Illustration 5:

From the data given below, calculate the Material Price Variance, Material Usage Variance and Material Mix Variance:

Raw Material	Standard	Actual
A	40 units @ ₹50 per unit	50 units @ ₹50 per unit
B	60 units @ ₹40 per unit	60 units @ ₹45 per unit

Solution:

Material	Q	P (₹)	Value (₹)	Q	P (₹)	Value (₹)
A	40	50	2,000	50	50	2,500
B	60	40	2,400	60	45	2,700
	100		4,400	110		5,200

Computation of Required Values

Material	(1) SQSP (₹)	(2) RSQSP (₹)	(3) AQSP (₹)	(4) AQAP (₹)
A	$40 \times 50 = 2,000$	$44 \times 50 = 2,200$	$50 \times 50 = 2,500$	$50 \times 50 = 2,500$
B	$60 \times 40 = 2,400$	$66 \times 40 = 2,640$	$60 \times 40 = 2,400$	$60 \times 45 = 2,700$
	4,400	4,840	4,900	5,200

RSQ For A = $40/100 \times 110 = 44$ units

RSQ For B = $60/100 \times 110 = 66$ units

Where (1) **SQSP** = Standard Cost of Standard Material = ₹ 4,400

(2) **RSQSP** = Revised Standard Cost of Material = ₹ 4,840

(3) AQSP = standard Cost of Actual Material = ₹ 4,900

(4) AQAP = Actual Cost of Material = ₹ 5,200

Computation of Required Variances:

- (a) Material Sub-Usage Variance = (1) – (2) = ₹ 440 (A) [₹ 4,400 – ₹ 4,840]
 (b) Material Mix Variance = (2) – (3) = ₹ 60 (A) [₹ 4,840 – ₹ 49,00]
 (c) Material Usage Variance = (1) – (3) = ₹ 500 (A) [₹ 4,400 – ₹ 4,900]
 (d) Material Price Variance = (3) – (4) = ₹ 300 (A) [₹ 4,900 – ₹ 5,200]
 (e) Material Cost Variance = (1) – (4) = ₹ 800 (A) [₹ 4,400 – ₹ 5,200]

Illustration 6:

The standard material cost for 100 kg of chemical D is made up :

Chemical A 30 kg. @ ₹ 4 per kg

Chemical B 40 kg. @ ₹ 5 per kg

Chemical C 80 kg. @ ₹ 6 per kg

In a batch 500 kg. of chemical D were produced from a mix of

Chemical A 140 kg. @ ₹ 588

Chemical B 220 kg. @ ₹ 1,056

Chemical C 440 kg. @ ₹ 2,860

How do you yield mix and price of factors contribute to the variance in the actual cost per 100 kg. of chemical D over the standard cost ?

Solution:

Analysis of Given Data

Chemical	Standard Data			Actual Data		
	Quantity	Price (₹)	Value (₹)	Quantity	Price (₹)	Value (₹)
A	30	4	120	28		117.60
B	40	5	200	44		211.20
C	80	6	480	88		572.00
	150		800	160		900.80
Less: Loss	50		-	60		-
	100		800	100		900.80

Computation of Required Values

Chemical	(1) SQSP (₹)	(2) RSQSP (₹)	(3) AQSP (₹)	(4) AQAP (₹)
A	30 × 4 = 120	32.00 × 4 = 128.00	28 × 4 = 112.00	117.60
B	40 × 5 = 200	42.67 × 5 = 213.35	44 × 5 = 220.00	211.20

C	80×6 = 480	85.33×6 = 512.00	88×6 = 528.00	572.20
	800.00	853.35	860.00	900.80

Computation of RSQ:

$$RSQ = \left(\frac{SQ \text{ for that product}}{SQ \text{ for all product}} \right) \times AQ \text{ for that product}$$

$$\text{For A} = \left(\frac{30}{150} \right) \times 160 = 32.00 \text{ units.}$$

$$\text{For B} = \left(\frac{40}{150} \right) \times 160 = 42.67 \text{ units.}$$

$$\text{For C} = \left(\frac{80}{150} \right) \times 160 = 85.33 \text{ units.}$$

- Where (1) SQSP = Standard cost for Standard material = ₹800
 (2) RSQSP = Revised standard cost of material = ₹ 853.35
 (3) AQSP = Standard cost of actual material = ₹ 860.00
 (4) AQAP = Actual cost of material = ₹ 900.80

Computation of Required Variances

- (a) Material Yield variance = (1) – (2) = ₹53.35 (A) [₹800 – ₹853.35]
 (b) Material Mix variance = (2) – (3) = ₹6.65 (A) [₹853.35 – ₹860]
 (c) Material usage variance = (1) – (3) = ₹60 (A) [₹800 – ₹860]
 (d) Material price variance = (3) – (4) = ₹40.80 (A) [₹860 – ₹900.80]
 (e) Material cost variance = (1) – (4) = ₹100.80 (A) [₹800 – ₹900.80]

Illustration 7:

Material	Standard Quantity	Price	Total
	(Kg.)	(₹)	(₹)
A	500	6.00	3,000
B	400	3.75	1,500
C	300	3	900
	1,200		5,400
Less: 10% Normal loss	120		
	1,080		5,400

Material	Actual Quantity	Price	Total
A	400	6.00	2,400
B	500	3.60	1,800
C	400	2.80	1,120
	1,300		5,320
Less: Actual loss	220		
	1,080		5,320

Calculate:

- Material Cost Variance
- Material Price Variance
- Material Mix Variance
- Material Yield Variance
- Material Usage Variance

Solution:

Computation of Required Values

	SQSP (1) (₹)	RSQSP (2) (₹)	AQSP (3) (₹)	AQAP (4) (₹)
A	3,000	$541.67 \times 6 = 3,250$	$400 \times 6 = 2,400$	2,400
B	1,500	$433.33 \times 3.75 = 1,625$	$500 \times 3.75 = 1,875$	1,800
C	900	$325 \times 3 = 975$	$400 \times 3 = 1,200$	1,120
	5400	5,850	5,475	5,320

Computation of RSQ:

$$\text{For A} = \left(\frac{500}{1,200} \right) \times 1,300 = 541.67 \text{ units.}$$

$$\text{For B} = \left(\frac{400}{1,200} \right) \times 1,300 = 433.33 \text{ units.}$$

$$\text{For C} = \left(\frac{300}{1,200} \right) \times 1,300 = 325.00 \text{ units.}$$

Where

- SQSP** = Standard Cost for Standard Material = ₹ 5,400
- RSQSP** = Revised Standard Cost of Material = ₹ 5,850
- AQSP** = Standard Cost of Actual Material = ₹ 5,475
- AQAP** = Actual Cost of Material = ₹ 5,320

Computation of Required Variances

- Material Yield Variance = (1) – (2) = ₹ 450 (A) [₹(5,400 – 5,850)]
- Material Mix Variance = (2) – (3) = ₹ 375 (F) [₹(5,850 – 5,475)]
- Material usage variance = (1) – (3) = ₹75 (A) [₹(5,400 – 5,475)]
- Material price variance = (3) – (4) = ₹155 (F) [₹(5,475 – 5,320)]
- Material cost variance = (1) – (4) = ₹80 (F) [₹(5,400 – 5,320)]

Illustration 8:

A manufacturing concern which has adopted standard costing furnishes the following information.

Standard

Material for 70 Kg of finished product of 100 Kg

Price of materials Re.1 per kg

Actual

Output 2,10,000 kg.

Material used 2,80,000 kg.
Cost of materials ₹ 2,52,000

Calculate:

- Material Usage Variance
- Material Price Variance
- Material cost Variance

Solution:

Computation of Required Values

(1) SQSP (₹)	(2) AQSP (₹)	(3) AQAP (₹)
$[2,10,000 \times 100/70] \times 1$	$2,80,000 \times 1$	
3,00,000	2,80,000	2,52,000

Computation of Required Variances:

- Material Usage Variance = (1) – (2) = ₹ 20,000 (F)
- Material Price Variance = (2) – (3) = ₹ 28,000(F)
- Material Cost Variance = (1) – (3) = ₹ 48,000(F)

Illustration 9:

The standard set for material consumption was 100kg. @ ₹ 2.25 per kg.

In a cost period:

Opening stock was 100 kg. @ ₹ 2.25 per kg.

Purchases made 500 kg. @ ₹ 2.15 per kg.

Consumption 110 kg.

Calculate: a) Usage b) Price variance

- When variance is calculated at point of purchase
- When variance is calculated at point of issue on FIFO basis
- When variance is calculated at point of issue on LIFO basis

Solution:

a) Computation of Material Usage Variance

$$\begin{aligned}
 \text{Material Usage Variance} &= \text{SQSP} - \text{AQSP} \\
 &= \text{SP} (\text{SQ} - \text{AQ}) \\
 &= 2.25(100-110) \\
 &= 22.50 \text{ (A)}
 \end{aligned}$$

b) Computation of Price variance:

- When Variance is calculated at the point of purchase:

$$\begin{aligned}
 \text{Price variance} &= \text{AQSP} - \text{AQAP} \\
 &= (110 \times 2.25) - (110 \times 2.15) \\
 &= 11 \text{ (F)}
 \end{aligned}$$

2) When variance is calculated at the point of issue on FIFO basis

$$\begin{aligned}
 \text{Price variance} &= \text{AQSP} - \text{AQAP} \\
 &= (110 \times 2.25) - ([100 \times 2.25] + [10 \times 2.15]) \\
 &= 1 \text{ (F)}
 \end{aligned}$$

3) When variance is calculated at the point of issue on LIFO basis

$$\begin{aligned}
 \text{Price variance} &= \text{AQSP} - \text{AQAP} \\
 &= (110 \times 2.25) - (110 \times 2.15) \\
 &= 247.50 - 236.50 \\
 &= 11 \text{ (F)}
 \end{aligned}$$

Illustration 10:

Using the following information calculate each of three labour variance for each department.

	Dept X	Dept Y
Gross wages direct (₹)	28,080	19,370
Standard hours produced	8,640	6,015
Standard rate per hour (₹)	3	3.40
Actual hours worked	8,200	6,395

Solution:

Dept. X : Computation of Required Values

SRSH (1)	SRAH (2)	ARAH (3)
3 x 8640	3 x 8200	
₹ 25,920	₹ 24,600	₹ 28080

1. SRSH = Standard Cost of Standard Labour
2. SRAH = Standard Cost of Actual Labour
3. ARAH = Actual Cost of Labour
- a. Labour Efficiency Variance = (1) – (2) = ₹ 1,320 (F) [₹ (25,920 – 24,600)]
- b. Labour Rate Variance = (2) – (3) = ₹ 3,480 (A) [₹ (24,600 – 28,080)]
- c. Labour Cost Variance = (1) – (3) = ₹ 2,160 (A) [₹ (25,920 – 28,080)]

Dept. Y Computation of Required Values

SRSH (1) (₹)	SRAH (2) (₹)	ARAH (3) (₹)
3.4 x 6,015	3.4 x 6,395	
₹ 20,451	₹ 21,743	₹ 19,370

- a. Labour efficiency variance = (1) – (2) = ₹ 1,292 (A)

- b. Labour rate variance = (2) – (3) = ₹ 2,373 (F)
c. Labour Cost Variance = (1) – (3) = ₹ 1,081 (F)

Illustration 11:

Calculate variances from the following:

STANDARD				ACTUAL			
INPUT	MATERIAL	(₹)/KG	TOTAL	INPUT	MATERIAL	(₹)/KG	TOTAL
400	A	@ 50	20,000	420	A	@ 45	18,900
200	B	@20	4,000	240	B	@ 25	6,000
100	C	@15	1,500	90	C	@15	1,350
700			25,500	750			26,250
LABOUR HOURS				LABOUR HOURS			
	100 @ ₹2 per hour	200			120 @ ₹2.50 per hour	300	
	200 woman @ ₹ 1.50	300	500		240 woman @ ₹ 1.60	384	684
25	Normal Loss			75	Actual Loss		
675			26000	675			26,934

Solution:

Calculation of Material Variances:

	(1)	(2)	(3)	(4)
	SQSP (₹)	RSQSP (₹)	AQSP (₹)	AQAP (₹)
A		428.57 x 50	420 x 50	
B		214.29 x 20	240 x 20	
C		107.14 x 15	90 x 15	
A	20,000	21,429	21,000	18,900
B	4,000	4,289	4,800	6,000
C	1,500	1,607	1,350	1,350
	₹ 25,500	₹ 27,325	₹ 27,150	₹ 26,250

RSQ for

$$A = 400/700 \times 750 = 428.67 \text{ units}$$

$$B = 200/700 \times 750 = 214.29 \text{ units}$$

$$C = 100/700 \times 750 = 107.14 \text{ units}$$

1. SQSP = Standard Cost of Standard Material = ₹ 25,500
2. RSQSP= Revised Standard Cost of Material = ₹ 27,325
3. AQSP= Standard Cost of Actual Material = ₹ 27,150
4. AQAP = Actual Cost of Material = ₹ 26,250
 - a. Material Yield Variance (1-2) = ₹ 1,825 (A)
 - b. Material Mix Variance (2-3) = ₹ 175 (F)

- c. Material Usage Variance (1-3) = ₹ 1,650 (A)
- d. Material Price Variance (3-4) = ₹ 900 (F)
- e. Material Cost Variance (1-4) = ₹ 750 (A)

Calculation of Labour Variances:

	(1)	(2)	(3)	(4)
	SRSH (₹)	SRRSH (₹)	SRAH (₹)	ARAH (₹)
Men		2 x 107.14	2 x 120	
Women		1.50 x 214.28	1.50 x 240	
Men	200	214.28	240	300
Women	300	321.42	360	384
	₹ 500	₹ 536	₹ 600	₹ 684

RSH for

Men = $100/700 \times 750 = 107.14$ units.

Women = $200/700 \times 750 = 214.28$ units.

1. SRSH = Standard Cost of Standard Labour = ₹ 500
2. SRRSH = Revised Standard Cost of Labour = ₹ 536
3. SRAH = Standard Cost of Actual Labour = ₹ 600
4. ARAH = Actual Cost of Labour = ₹ 684
 - a. Labour Yield Variance (1-2) = ₹ 36 (A)
 - b. Labour Mix Variance (2-3) = ₹ 64 (A)
 - c. Labour Efficiency Variance (1-3) = ₹ 100 (A)
 - d. Labour Rate Variance (3-4) = ₹ 84 (A)
 - e. Labour Cost Variance (1-4) = ₹ 184 (A)

Illustration 12:

The standard labour complement and the actual labour complement engaged in a week for a job are as under:

	Skilled workers	Semi-skilled workers	Unskilled workers
a) Standard no. of workers in the gang	32	12	6
b) Standard wage rate per hour (₹)	3	2	1
c) Actual no. of workers employed in the gang during the week	28	18	4
d) Actual wage rate per hour (₹)	4	3	2

During the 40 hour working week the gang produced 1,800 standard labour hours of work. Calculate

- 1) Labour Efficiency Variance
- 2) Mix Variance
- 3) Rate of Wages Variance
- 4) Labour Cost Variance

Solution:

Analysis of Given Data

	Standard Data			Actual Data		
	Hours	Rate (₹)	Value (₹)	Hours	Rate (₹)	Value (₹)
Skilled	32 × 40 = 1,280	3	3,840	28 × 40 = 1,120	4	4,480
Semi skilled	12 × 40 = 480	2	960	18 × 40 = 720	3	2,160
Unskilled	6 × 40 = 240	1	240	4 × 40 = 160	2	320
	2,000		5,040	2,000		6,960

Computation of Required Values

	SRSH (1) (₹)	SRRSH (2) (₹)	SRAH (3) (₹)	ARAH (4) (₹)
Men	3 × 1,152 = 3,456	3,840	3 × 1,120 = 3,360	4,480
Women	2 × 432 = 864	960	2 × 720 = 1,440	2,160
Boys	1 × 216 = 216	240	1 × 160 = 160	320
	4,536	5,040	4,960	6,960

Computation of SH

$$SH = \left(\frac{\text{SH for that worker}}{\text{SH for all the worker}} \right) \times AQ \text{ for that worker}$$

$$\text{For Skilled worker} = \left(\frac{1,280}{2,000} \right) \times 1,800 = 1,152$$

$$\text{For Semiskilled worker} = \left(\frac{480}{2,000} \right) \times 1,800 = 432$$

$$\text{For Unskilled worker} = \left(\frac{240}{2,000} \right) \times 1,800 = 216$$

Where (1) SRSH = Standard Cost of Standard Labour = ₹ 4,536

(2) SRRSH = Revised Standard Cost of Labour = ₹ 5,040

(3) SRAH = Standard Cost of Actual Labour = ₹ 4,960

(4) ARAH = Actual Cost of Labour = ₹ 6,960

Computation of Labour Variances:

- Labour Sub-Efficiency Variance = (1) – (2) = ₹ 504 (A) [₹(4,536 – 5,040)]
- Labour Mix or Gang Variance = (2) – (3) = ₹80 (F) [₹(5,040 – 4,960)]
- Labour Efficiency Variance = (1) – (3) = ₹424 (A) [₹(4,536 – 4,960)]
- Labour Rate Variance = (3) – (4) = ₹2,000 (A) [₹(4,960 – 6,960)]
- Labour Cost Variance = (1) – (4) = ₹2,424 (A) [₹(4,536 – 6,960)]

Illustration 13:

A chemical company gives you the following standard and actual data of its Chemical No.1456. You

are required to calculate variances (material).

Standard Data

450	kg. of Material A @ ₹20 per kg.	9,000
360	kg. of Material B @ ₹10 per kg.	3,600
810		12,600
	2,400 Skilled hours @ ₹2	4,800
	1,200 Unskilled hours @ ₹1	1,200
		6,000
90	Normal loss	
720		18,600

Actual Data

450	kg. of Material A @ ₹19 per kg.	8,550
360	kg. of Material B @ ₹11 per kg.	3,960
810		12,510
	2,400 Skilled hours @ ₹2.25	5,400
	1,200 Unskilled hours @ ₹1.25	1,500
		6,900
50	Normal loss	
760		19,410

Solution:

Computation of Required Values

Material	SQSP (1)	RSQSP (2)	AQSP (3)	AQAP (4)
A	475 x 20 = 9,500	9,000	450 x 20 = 9,000	
B	380 x 10 = 3,800	3,600	360 x 10 = 3,600	
	13,300	12,600	12,600	12,510

Computation of Sq:

$$SQ = \left(\frac{SQ \text{ for that material}}{SQ \text{ for all material}} \right) \times AQ \text{ for that material}$$

$$\text{For A} = \left(\frac{450}{720} \right) \times 760 = 475 \text{ units.}$$

$$\text{For B} = \left(\frac{360}{720} \right) \times 760 = 380 \text{ units.}$$

- Where
- (1) SQSP = Standard Cost of standard Material = ₹ 13,300
 - (2) RSQSP = Revised Standard Cost of Material = ₹ 12,600
 - (3) AQSP = Standard Cost of Actual Material = ₹ 12,600
 - (4) AQAP = Actual Cost of Material = ₹ 12,510.

Computation of Required Variances:

- a. Material Yield Variance = (1) – (2) = ₹700 (F) [₹(13,300 – 12,600)]
- b. Material Mix Variance = (2) – (3) = Nil [₹(12,600 – 12,600)]
- c. Material Usage Variance = (1) – (3) = ₹700 (F) [₹(13,300 – 12,600)]
- d. Material Price Variance = (3) – (4) = ₹90 (F) [₹(12,600 – 12,510)]
- e. Material Cost Variance = (1) – (4) = ₹790 (F) [₹(13,300 – 12,510)]

14

ACTIVELY BASED COSTING

14.1 ACTIVITY BASED COST MANAGEMENT

Introduction

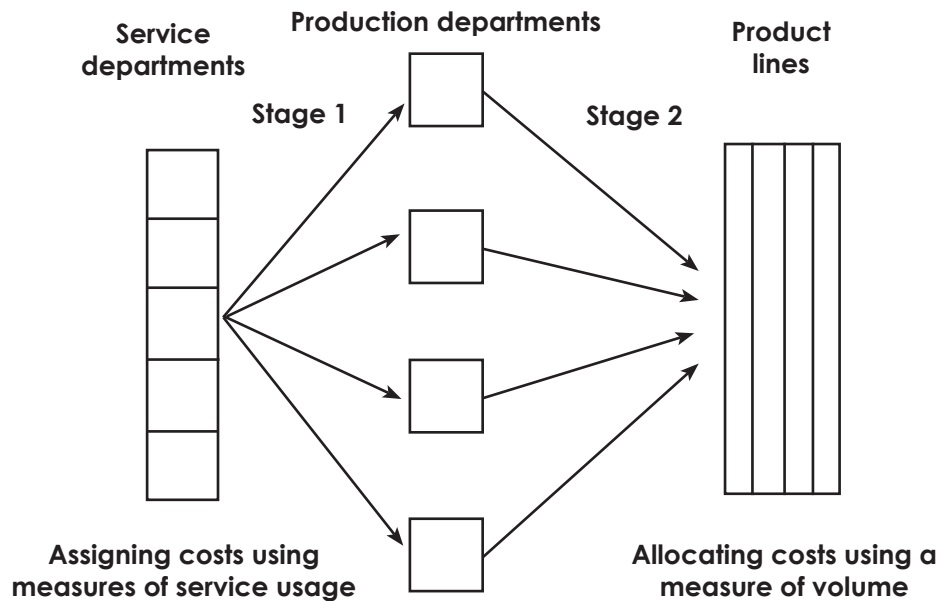
A powerful tool for measuring performance, Activity-Based Costing (ABC) is used to identify, describe, assign costs to, and report on agency operations. A more accurate cost management system than traditional cost accounting; ABC identifies opportunities to improve business process effectiveness and efficiency by determining the "true" cost of a product or service. Activity Based Costing is a method for developing cost estimates in which the project is subdivided into discrete, quantifiable activities or a work unit. ABC systems calculate the costs of individual activities and assign costs to cost objects such as products and services on the basis of the activities undertaken to produce each product or services. It accurately identifies sources of profit and loss.

Limitations of Traditional Costing System

The cost of product arrived in traditional accounting system is not so accurate due to following reasons:

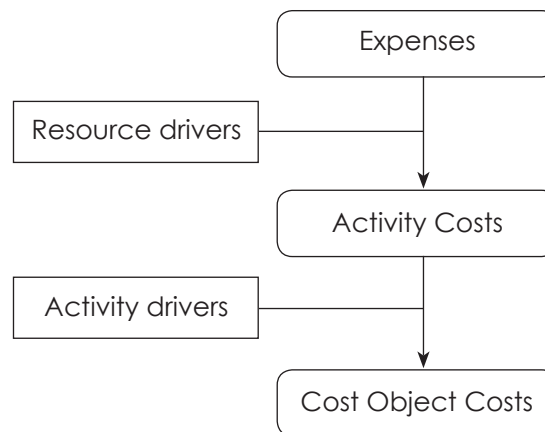
- (i) The present Costing system has developed convenient overhead recovery basis and blanket overhead recovery are acceptable when valuing stocks for financial reporting, but they are inappropriate when used for decision making and typical product strategy decisions. Such decisions have implications over 3-5 years and over this period many fixed costs become variable.
- (ii) The traditional fixed verses variable cost split is often unrealistic since, as business grows they often become more complex.
- (iii) In case of companies manufacturing and selling multiple products usually make decisions on pricing, product-mix, process technology etc., based on distorted cost information due to difficulties in traditional costing system in collection, classification, allocation and recovery of overheads to individual products.
- (iv) The cost structure is changing especially when making direct labour component to small proportion.
- (v) Traditional accounting was confined merely to furnishing information at product level. The new manufacturing technology demands the feed back of performance while production is still in progress rather than history.
- (v) There is also an urgent need to integrate the activity measurement and financial measurement.

Therefore, in order to overcome the inadequacies of traditional methods of overhead absorption and short-term biasing of marginal costing, Activity Based Costing (ABC) has been researched.



Activity-Based Costing

The concepts of ABC were developed in the manufacturing sector of the United States during the 1970s and 1980s. It is a practice in which activities are identified and all related costs of performing them are calculated, providing actual costs chargeable. The focus of activity based costing is activities. Thus identifying activities is a logical first step in designing an activity based costing. An activity is an event, task or unit of work with a specified purpose. For example; designing products, setting up machines, operating machines and distributing products.



The CIMA terminology defines ABC as a cost attribution to cost units on the basis of benefit received from indirect activities. Peter B. B. Turney defines ABC as "a method of measuring the cost and performance of activities and cost objects. Assigns cost to activities based on their use of resources and assigns cost to cost objects based on their use of activities. ABC recognizes the causal relationship of cost drivers to activities." ABC can be defined by the following equation:

$$C/A = HD + M + E + S$$

Where C/A = Estimated cost per activity

H = Number of labor hours required to perform the activity one time

D = Wages per labor hour

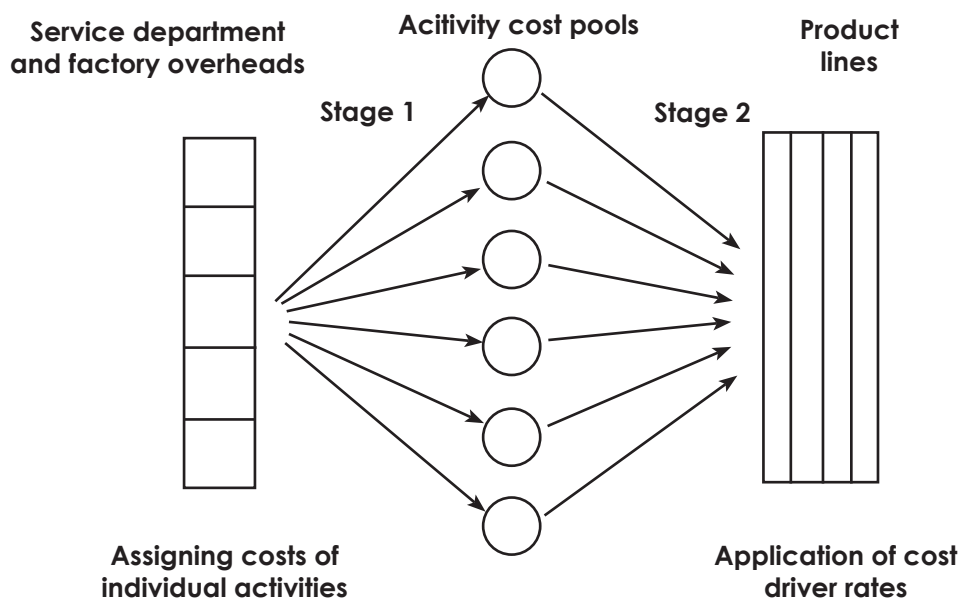
M = Material costs required to perform the activity one time

E = Equipment costs to perform the activity one time

S = Subcontracting costs to perform the activity one time

The total cost for performing the activity will be based on the number of times the activity is performed during a specific time frame. An activity based costing system first traces costs to activities and then to products and other cost objects. The following figure diagrammatically explains the basic flow of Activity-Based Costing.

Activity-based Costing



Important Terms in Activity Based Costing

The operation of the ABC system involves the use of the following terms:

Activity: An activity means an aggregate of closely related tasks having some specific functions which are used for completion of goal or objectives. For example, customer order processing is an activity. It includes receiving order from customers, interacting with production department regarding capacity to produce and giving commitment to the customer regarding delivery time. Other activities may be assembling, packaging, advertising etc.

Resource : Resources are elements that are used for performing the activities or factors helping in the activities. For example, order receiver, telephone, computers etc. are resources in customer order processing activity. It may include material, labour, equipment, office supplies etc.

Cost : Cost is amount paid for resource consumed by the activity. For example, salaries, printing stationary, telephone bill etc. are cost of customer order processing activity. It is also known as activity cost pool.

Cost object: It refers to an item for which cost measurement is required. e.g. a product, a service, or a customer.

Cost pool: A cost pool is a term used to indicate grouping of costs incurred on a particular activity which drives them.

Cost driver: Any element that would cause a change in the cost of activity is cost driver. Actually cost drivers are basis of charging cost of activity to cost object. Cost drivers are used to trace cost to product by using a measure of resources consumed by each activity. For example, frequency of order, number of order etc. may

be cost driver of customer order processing activity. Cost driver may be involved two parts:

1. Resource cost driver
2. Activity cost driver

A resource cost driver is a measure of the quantity of resources consumed by an activity. An activity cost driver is a measure of the frequency and intensity of demand, placed on activities by cost objects.

For example

Activities	Resources	Cost pools	Cost driver
Consulting	Consultant, computer	Employee cost, maintenance cost	Level of consultant, time spent
Laser printing	Printing staff, printer	Colour cost, maintenance cost, printing stationary	No. of pages printed, font
Accounting administration	Administration staff	Salaries	No. of times account produced
Customer service	Telephone, staff	Telephone bill, salaries	Frequency of order, no. of order, time spent in servicing, no. of service calls
Research development	Staff, equipment, material	Salaries, maintenance cost, material cost	No. of research projects, time spent on a project, technical complexities of project

The cost drivers for various functions i.e., production, marketing, research, and developments are given below.

Production	Number of units Number of set-ups
Marketing	Number of sales personnel Number of sales orders
Research & development	Number of research projects Personnel hours spend on projects Technical complexities of the projects
Customer service	Number of service calls Number of products serviced Hours spend on servicing products

Let's illustrate the concept of activity based costing by looking at two common manufacturing activities: (1) the setting up of a production machine for running batches of products, and (2) the actual production of the units of product.

We will assume that a company has annual manufacturing overhead costs of ₹2,000,000—of which ₹200,000 is directly involved in setting up the production machines. During the year the company expects to perform 400 machine setups. Let's also assume that the **batch sizes** vary considerably, but the setup efforts for each machine are similar.

The cost per setup is calculated to be ₹500 (₹200,000 of cost per year divided by 400 setups per year). Under activity based costing, ₹200,000 of the overhead will be viewed as a **batch-level cost**. This means that ₹200,000 will first be allocated to batches of products to be manufactured (referred to as a **Stage 1 allocation**), and then be assigned to the units of product in each batch (referred to as **Stage 2 allocation**). For example, if Batch X consists of 5,000 units of product, the setup cost per unit is ₹0.10 (₹500 divided by 5,000 units). If Batch Y is 50,000 units, the cost per unit for setup will be ₹0.01 (₹500 divided by 50,000 units). For simplicity, let's assume that the remaining ₹1,800,000 of manufacturing overhead is caused by the production activities that correlate with the company's 100,000 machine hours.

For our simple two-activity example, let's see how the rates for allocating the manufacturing overhead would look with activity based costing and without activity based costing:

	With ABC	Without ABC
Mfg overhead costs assigned to setups	₹200,000	₹-0-
Number of setups	400	Not applicable
Mfg overhead cost per setup	₹500	₹-0-
Total manufacturing overhead costs	₹2,000,000	₹2,000,000
Less: Cost traced to machine setups	200,000	-0-
Mfg O/H costs allocated on machine hours	₹1,800,000	₹2,000,000
Machine hours (MH)	100,000	100,000
Mfg overhead costs per MH	₹18	₹20
Mfg Overhead Cost Allocations	₹500 setup cost per batch + ₹18 per MH	₹20 per MH

Next, let's see what impact these different allocation techniques and overhead rates would have on the per unit cost of a specific unit of output. Assume that a company manufactures a batch of **5,000** units and it produces 50 units per machine hour, here is how the cost assigned to the units with activity based costing and without activity based costing compares:

	With ABC	Without ABC
Mfg overhead for setting up machine	₹500	₹-0-
No. of units in batch	5,000	Not applicable
Mfg O/H caused by Setup – Per Unit	₹0.10	Not applicable
Mfg overhead costs per machine hour	₹18	₹20
No. of units produced per machine hour	50	50
Mfg O/H caused by Production – Per Unit	₹0.36	₹0.40
Total Mfg O/H Allocated – Per Unit	₹0.46	₹0.40

Stages of Activity Based Costing

The different steps or stages in ABC system can be given as follows:

1. Identify the chosen cost objects

The cost objects of any organization are the products or services and the goal is to first calculate the total cost of manufacturing and distributing these products and their unit cost.

2. Identify the different activities within the organization

After the identification of cost objects, the main activities, which are being performed in the organization, have to be identified. Usually the number of activities over cost centers in ABC will be much more as compared to traditional overhead system. The exact number will depend on how the management subdivides the organizations activities.

3. Identifying the direct cost of products

The direct cost of products or objects may comprise direct material cost, direct labor cost and direct expenses. Classification of as many of the total costs as direct costs as is economically feasible should be

made. It reduces the amount of costs classified as indirect.

4. Relating the overhead to the activities

After identifying the organizations activities, the various items of overhead are related to activities both support and primary, that caused them. As a result of relating the items of overhead to various activities, cost pool or cost buckets are created.

5. Spreading the support activities across the primary activities

The spreading of support activities (i.e., activities which support or assist manufacturing) across the primary activities (correlated to the number of units produced) is done on some suitable base which reflects the use of support activity. The base is the cost driver and is measured of how the support activities are used.

6. Determining the activity cost drivers

The determination of the activity cost drivers is done in order to relate the overhead collected in cost pools to the cost objects of products. It is done on the basis of the factor that drives the consumption of the activities.

7. Calculating the activity cost driver rates

The activity cost rates for each activity are calculated in the way in which overhead absorption rates would be calculated under the traditional system. It can be presented as follows:

Activity cost driver rate = $\frac{\text{Total cost of activity}}{\text{Activity driver}}$

These activity cost driver rates are to be used for ascertaining the amount of overhead chargeable to various cost objects or products.

8. Computing the total cost of products or cost objects

The total costs of the products shall be computed by adding all direct and indirect costs assigned to them. The amount of overhead chargeable to a product or cost object shall be calculated by multiplying the activity cost drivers rates by different amounts of each activity that each product or other cost object consumes.

Significance of Activity Based Costing

The following list reflects the results of several surveys of practice in the United States, the United Kingdom, and Canada to determine why companies choose ABC.

- Cost Reduction: ABC measures how much activities that are costly and then take steps to reduce their costs by changing the productions process or outsourcing those activities.
- Product pricing and decisions of whether to continue producing a product or keeping a particular customer. ABC implementers generally believe that ABC provides more accurate cost information than conventional costing does. Management can use this information to negotiate price increases with customers or to drop unprofitable products.
- Budgeting and performance measurement: Management can use more accurate cost information to improve budgets and measures of department and division performance.

Advantages of Activity Based Costing

- (i) It provides more accurate product costing information by reducing arbitrary cost allocations.
- (ii) It improves the quality of information available for decision making by answering the questions such as what activities and events are driving cost and where efforts should be made to control cost ?
- (iii) It is easiest way to allocate overhead in the product.
- (iv) It helps to identify the activities that can be eliminated.

- (v) It links up cause and effect relationship.
- (vi) ABC helps to identify the value added activities (that increase the customer's satisfaction) and non-value added activities (that creates the problems in customer's satisfaction)
- (vii) ABC translates cost in to a language that people can understand and that can be linked up to business activities.

Limitations of Activity Based Costing

- (i) More time consuming to collect data
- (ii) Cost of buying, implementing and maintaining activity based system
- (iii) In some cases, the establishment of cause and effect relationship between cost driver and costs not be a simple affair.
- (iv) ABC does not conform to generally accepted accounting principles in some areas.

Conclusion

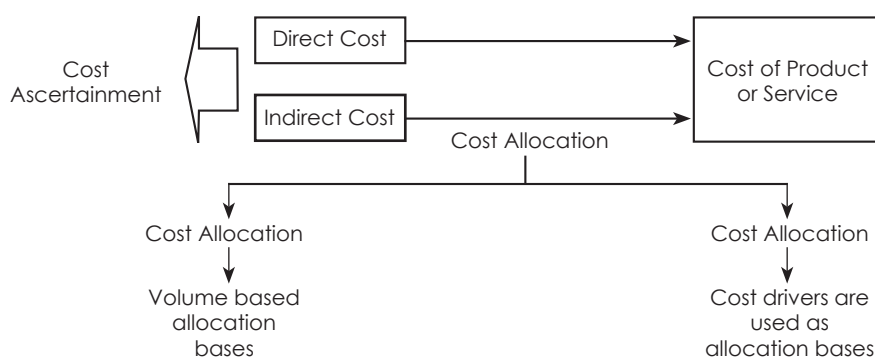
Activity based costing has revolutionized product costing, planning, and forecasting in the last decade. It is based on a philosophy of estimation that: "it is better to be approximately right, than precisely wrong." In summary, activity-based costing is a management decision-making tool. It provides financial support data structured in a fashion fundamentally different from accounting data provided in the general ledger. By associating cost to the activity, a clear relationship can be established between sources of activity demand and the related costs. This association can benefit the distributor in determining where costs are being incurred, what is initiating the costs and where to apply efforts to curb inflationary costs. This can be of particular value in tracking new products or customers.

Traditional vs. Activity Based Costing

Activity-Based Costing (ABC) is a system that focuses on activities as the fundamental cost objects and uses the cost of these activities for computing the costs of products. There are several reasons why managers are preferring ABC to traditional system.

- (i) In the traditional system cost analysis is done by product. In ABC managers focus attention on activities rather than products because activities in various departments may be combined and costs of similar activities ascertained, e.g. quality control, handling of materials, repairs to machines etc. If detailed costs are kept by activities, the total company costs for each activity can be obtained, analysed, planned and controlled.
- (ii) Managers manage activities and not products. Changes in activities lead to changes in costs. Therefore, if the activities are managed well, costs will fall and resulting products will be more competitive.
- (iii) Allocating overhead cost to production based on a single cost driver (allocation base, such as unit basis, percentage of material, percentage of prime cost, labour hour rate, machine hour rate etc.) can result in an unrealistic product cost because the traditional system fails to capture cause-and-effect relationships. To manage activities better and to make wiser economic decisions, managers need to identify the relationships of causes (activities) and effects (costs) in a more detailed and accurate manner.
- (iv) ABC highlights problem areas that deserve management's attention and more detailed analysis. Many actions are possible, on pricing, on process technology, on product design, on operational movements and on product mix.

Traditional costing can lead to undercosting or overcosting of products or services. Over or under costing of products distorts cost information. A poor quality of cost information causes management to make poor decisions for pricing, product emphasis, make or buy etc. ABC differs from the traditional system only in respect of allocations of overheads or indirect costs. Direct costs are identified with, or assigned to, the cost object, in the same manner as is done in case of traditional costing system. Overhead costs are linked to the cost objects based on activities. This is shown in the following figure:



The following figure explains the entire process of cost allocation under ABC.



Illustration 1.

The budgeted overheads and cost driver volumes of XYZ are as follows.

Cost Pool	Budgeted Overheads (₹)	Cost Driver	Budgeted Volume
Material procurement	5,80,000	No. of orders	1,100
Material handling	2,50,000	No. of movements	680
Set-up	4,15,000	No. of set ups	520
Maintenance	9,70,000	Maintenance hours	8,400
Quality control	1,76,000	No. of inspection	900
Machinery	7,20,000	No. of machine hours	24,000

The company has produced a batch of 2,600 components of AX-15, its material cost was ₹ 1,30,000 and labor cost ₹ 2,45,000. The usage activities of the said batch are as follows.

Material orders – 26, maintenance hours – 690, material movements – 18, inspection – 28, set ups – 25, machine hours – 1,800

Calculate – cost driver rates that are used for tracing appropriate amount of overheads to the said batch and ascertain the cost of batch of components using activity Based Costing.

Solution:

Computation of Cost Driver Rates

	Particulars		Amount (₹)
1.	Material procurement	580000/1100	527
2.	Material handling	250000/680	368
3.	Set-up	415000/520	798
4.	Maintenance	970000/8400	115
5.	Quality control		196
6.	Machinery	720000/24000	30

Computation of Batch Cost of 2600 units of AX-15

		₹
Material cost		1,30,000
Labour Cost		2,45,000
Prime Cost		3,75,000
Add: Overheads		

Material orders 26 x 527	13,702	
Material handling 18 x 368	6,624	
Set-up 25 x 798	19,950	
Maintenance 690 x 115	79,350	
Quality Control 28 x 196	5,488	
Machinery 1800 x 30	54,000	1,79,114
Total Cost		5,54,114

Illustration 2.

A company produces four products, viz. P, Q, R and S. The data relating to production activity are as under

Product	Quantity of production	Material cost/unit ₹	Direct labour hours/unit	Machine hours/unit	Direct Labour cost/unit ₹
P	1,000	10	1	0.50	6
Q	10,000	10	1	0.50	6
R	1,200	32	4	2.00	24
S	14,000	34	3	3.00	18

Production overheads are as under:

₹

(i) Overheads applicable to machine oriented activity:	1,49,700
(ii) Overheads relating to ordering materials	7,680
(iii) Set up costs	17,400
(iv) Administration overheads for spare parts	34,380
(v) Material handling costs	30,294

The following further information have been compiled:

Product	No. of set up	No. of materials orders	No. of times materials handled	No. of spare parts
P	3	3	6	6
Q	18	12	30	15
R	5	3	9	3
S	24	12	36	12

Required:

- Select a suitable cost driver for each item of overhead expense and calculate the cost per unit of cost driver.
- Using the concept of activity based costing, compute the factory cost per unit of each product.

Solution:**Computation of Cost Driver Rates**

- Overheads relating to Machinery oriented activity

Cost Driver → Machine Hour Rate

$$(1000 \times 0.5) + (1000 \times 0.5) + (1200 \times 2) + (14000 \times 3)$$

$$1,49,700/49,900 = ₹ 3 \text{ per hour}$$

- Overheads relating to ordering materials

Cost driver → No. of Material orders

$$7680/30 = ₹ 256 \text{ per order}$$

3) Set up costs

Cost driver → No. of set ups

$$17400/50 = ₹ 348 \text{ per set up}$$

4) Administrative Overheads for spare parts

Cost driver → No. of spare parts

$$34380/36 = ₹ 955 \text{ per spare part.}$$

5) Material Handling costs

Cost driver → No. of times materials handled

$$30294/81 = ₹ 374 \text{ per material handling}$$

Computation of factory cost for each product

	P		Q		R		S	
Materials		10.00		10.00		32.00		34.00
Labour		6.00		6.00		24.00		18.00
Overheads								
Machine oriented activity	1.500		1.50		6.00		9.00	
Ordering of Materials	0.768		0.31		0.64		0.22	
Set up costs	1.044		0.63		1.45		0.60	
Administrative Spare Parts	5.730		1.43		2.39		0.82	
Material handling	2.244	11.29	1.12	4.99	2.81	13.29	0.96	11.60
Factory Cost (₹)		27.29		20.99		69.29		63.60

Illustration 3.

Precision Auto comp Ltd. Manufactures and sells two automobile components A and B. Both are identical with slight variation in design. Although the market for both the products is the same, the market share of the company for product A is very high and that of product B very low. The company's accountant has prepared the following profitability statement for the two products Cost of production: (same for both the products)

Direct Material	₹	125
Direct Labour	₹	24
Direct Expenses (sub-contract charges)	₹	36
Overheads (400% of direct labour)	₹	96
Total Cost	₹	281

		Product A	Product B	Total
Quantity sold	No.	1,24,000	23,150	1,47,150
Unit sale price	₹	300	290	
Total sales realisation	₹			4,39,13,500
Cost of sales as above	₹			4,13,49,150
Margin	₹			25,64,350

The company's marketing manager, after attending a workshop on activity-based costing challenges the accountant's figures. The nearest competitor's prices for the two products are ₹ 330 and ₹ 275 per unit respectively and, if the company can match the competitor's prices, it can sell 75,000 nos. each of the two products. The

Production Manager confirms that he can produce this product mix with the existing facilities. The management engages you as consultant, and the following facts have been identified by you:

- product A undergoes 5 operations and product B undergoes two operations by sub-contractors, although the total subcontract charges are the same for both the products, and
- 75% of the overheads is accounted for by three major heads relating to sub-contracting operations, viz., ordering, inspection and movement of components, to and from the sub-contractor's works.

Prepare a revised profitability statement to find out if the marketing manager's proposal is viable.

Solution:

Total overheads = $1,47,150 \times 96$ = ₹ 1,41,26,400

Operations overhead = $1,41,26,400 \times 75/100$ = ₹ 1,05,94,800

Balance 25% assumed to be fixed i.e. ₹ 35,31,600

Allocation of Variable Overheads under ABC

A = $1,05,94,800 \times 5/7$ = ₹ 75,67,714

B = $1,05,94,800 \times 2/7$ = ₹ 30,27,086

Statement showing computation profit under Activity Based Costing as per Manager's suggestion:

No. of units		A		B		Total
		Units	75000	Units	75000	
Materials	₹	125	93,75,000	125	93,75,000	1,87,50,000
Labour	₹	24	18,00,000	24	18,00,000	36,00,000
Direct expenses	₹	36	27,00,000	36	27,00,000	54,00,000
Prime Cost	₹	185	1,38,75,000	185	1,38,75,000	2,77,50,000
Variable Overheads	₹	101	75,67,714	41	30,27,086	1,05,94,800
Fixed Overheads	₹	24	17,65,800	24	17,65,800	35,31,600
Total Cost	₹	310	2,32,08,514	250	1,86,67,886	4,18,76,400
Profit	₹	30	15,41,486	25	19,57,114	34,98,600
Sales	₹	330	2,47,50,000	275	2,06,25,000	4,53,75,000

As the profit is more at the Marketing Manager's proposal by ₹ 9,34,250 and hence this proposal may be accepted.

Illustration 4.

Relevant data relating to a company are:

	Products			
	P	Q	R	Total
Production and sales (units)	60,000	40,000	16,000	

Raw material usage in units		10	10	22	
Raw material costs	₹	50	40	22	24,76,000
Direct labour hours		2.5	4	2	3,42,000
Machine hours		2.5	2	4	2,94,000
Direct labour costs	₹	16	24	12	
No. of production runs		6	14	40	60
No. of deliveries		18	6	40	64
No. of receipts		60	140	880	1,080
No. of production orders		30	20	50	100

Overheads:

₹

Setup	60,000
Machines	15,20,000
Receiving	8,70,000
Packing	5,00,000
Engineering	7,46,000

The company operates a JIT inventory policy and receives each component once per production run.

Required:

- Compute the product cost based on direct labour-hour recovery rate of overheads.
- Compute the product cost using activity based costing.

Solution:
(i)

Traditional Method of absorption of overhead i.e. on the basis of Direct Labour Hours

$$\text{Total overheads} = \frac{36,96,000}{\text{Hours } (60000 \times 2.5) + (400000 \times 4) + (160000 \times 3)}$$

$$= \frac{36,96,000}{3,42,000} = ₹ 10.81 \text{ per labour hour}$$

Calculation of Factory cost of the products

	P	Q	R
	₹	₹	₹
Raw Material	50=000	40=00	22=00
Direct Labour	16=000	24=00	12=00
Overheads (2.5 x 10.81)	27=025	43=24	21=62
Factory cost	93=000	107=24	55=62

(ii) Under Activity Based Costing System

Computation of Cost Drivers Rates.

- Set up cost : Cost driver → No. of Production run
 $60000/60 = ₹ 1000/\text{per run}$
- Machines : Cost driver → Machine hour rate
 $15,20,000/2,94,000 = ₹ 5.17 \text{ per Machine hour rate}$

- 3) Receiving cost: Cost driver → No. of Receipts
 $8,70,000/1080 = ₹ 805.56$
- 4) Packing : Cost driver → No. of deliveries
 $5,00,000/64 = ₹ 7812.5$ per delivery
- 5) Engineering: Cost driver → No. of Production order
 $7,46,000/100 = ₹ 7,460$ per order

Calculation of Factory Cost per unit of Production

	P		Q		R	
	₹	₹	₹	₹	₹	₹
Materials		50.00		40.00		22.00
Direct Labour		16.00		24.00		12.00
Overheads						
Setup cost	0.10		0.35		2.50	
Machines	12.93		10.34		20.68	
Receiving cost	0.81		2.82		44.31	
Packing	2.34		1.17		19.53	
Engineering	3.73	19.91	3.73	18.41	23.31	110.33
Factory Cost		85.91		82.41		144.33

Illustration 5.

Trimake Limited makes three main products, using broadly the same production methods and equipment for each. A conventional product costing system is used at present, although an Activity Based Costing (ABC) system is being considered. Details of the three products, for typical period are:

	Labour Hours per unit	Machine Hours per unit	Material Per unit	Volumes Units
Product X	½	1 ½	₹ 20	750
Product Y	1 ½	1	12	1,250
Product Z	1	3	25	7,000

Direct labour costs ₹ 6 per hour and production overheads are absorbed on a machine hour basis. The rate for the period is ₹ 28 per machine hour.

You are required:

- (a) to calculate the cost per unit for each product using conventional methods.

Further analysis shows that the total of production overheads can be divided as follows

	%
Costs relating to set-ups	35
Costs relating to machinery	20
Costs relating to materials handling	15
Costs relating to inspection	30
Total production overhead	100%

The following activity volumes are associated with the product line for the period as a whole.

Total activities for the period

	Number of Set-ups	Number of movements of materials	Number of Inspections
Product X	75	12	150
Product Y	115	21	180
Product Z	480	87	670
	670	120	1,000

You are required:

- (b) To calculate the cost per unit for each product using ABC principles; c) to comment on the reasons for any differences in the costs in your answers to (a) and (b)

Solution:

(a) Computation of cost per unit using Conventional Methods:

Total overheads	₹
X = 750 x 1.5 x 28 =	31,500
Y = 1250 x 1 x 28 =	35,000
Z = 7000 x 3 x 28 =	5,88,000
	<u>6,54,500</u>

Computation of Cost

	X	Y	Z
	₹	₹	₹
Materials	20	12	25
Labour	3	9	6
Overheads	42	28	84
Factory Cost	65	49	115

(b) Under ABC Costing

		Setup Cost	Machine Cost	Machine Handling Cost	Inspection Expenses	Total
Costs	₹	2,29,075	1,30,900	98,175	1,96,350	6,54,500
Cost Driver		No. of setups	Machine hours	No. of Moment of Materials	No. of Inspections	
Cost driver rates	₹	341.90 (229075/670)	5.6 (130900/23375)	818.125 (98,175/120)	196.35 (196350/1000)	

Cost per unit under ABC costing

	X		Y		Z	
	₹	₹	₹	₹	₹	₹
Materials		20.00		12.00		25.00
Labour		3.00		9.00		6.00
Overheads						
Setup Cost	34.19		31.45		23.44	
Machine cost	8.40		5.60		16.80	
Machine Handling Cost	13.09		13.74		10.17	
Inspection Cost	39.27	94.95	28.27	79.06	18.79	69.20
Total Cost		117.95		100.06		100.20

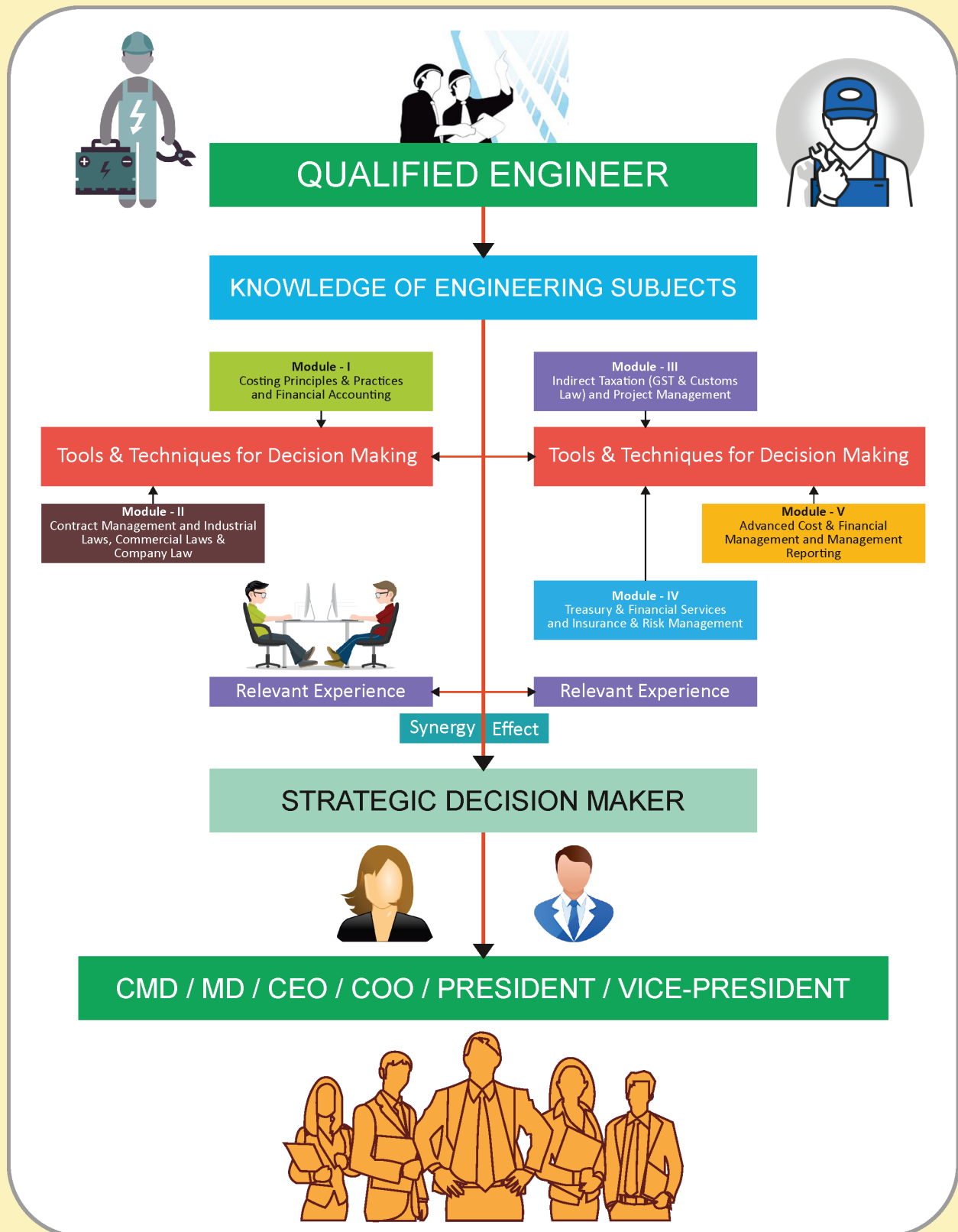
Part-B

FINANCIAL ACCOUNTING





THE INSTITUTE OF COST ACCOUNTANTS OF INDIA
EXECUTIVE DIPLOMA IN
COST & MANAGEMENT ACCOUNTING FOR ENGINEERS



CAREER PATH FOR ENGINEERS TO BECOME STRATEGIC DECISION MAKERS

1

FUNDAMENTALS OF ACCOUNTING

- Accounting - Definition & Meaning
- Principles of Financial Accounting
- Types of Accounting
- Financial / Cost and Management Accounting
- Capital & Revenue Transaction
- Mercantile and Cash basis of Accounting

1.1 BASICS

Business is an economic activity undertaken with the motive of earning profits and to maximize the wealth for the owners. Business cannot run in isolation. Largely, the business activity is carried out by people coming together with a purpose to serve a common cause. This team is often referred to as an organization, which could be in different forms such as sole proprietorship, partnership, body corporate etc. The rules of business are based on general principles of trade, social values, and statutory framework encompassing national or international boundaries. While these variables could be different for different businesses, different countries etc., the basic purpose is to add value to a product or service to satisfy customer demand.

The business activities require resources (which are limited & have multiple uses) primarily in terms of material, labour, machineries, factories and other services. The success of business depends on how efficiently and effectively these resources are managed. Therefore, there is a need to ensure that the businessman tracks the use of these resources. The resources are not free and thus one must be careful to keep an eye on cost of acquiring them as well.

As the basic purpose of business is to make profit, one must keep an ongoing track of the activities undertaken in course of business. Two basic questions would have to be answered:

- (a) What is the result of business operations? This will be answered by finding out whether it has made profit or loss.
- (b) What is the position of the resources acquired and used for business purpose? How are these resources financed? Where the funds come from?

The answers to these questions are to be found continuously and the best way to find them is to record all the business activities. Recording of business activities has to be done in a scientific manner so that they reveal correct outcome. The science of book-keeping and accounting provides an effective solution. It is a branch of social science. This study material aims at giving a platform to the students to understand basic principles and concepts, which can be applied to accurately measure performance of business. After studying the various chapters included herein, the student should be able to apply the principles, rules, conventions and practices to different business situations like trading, manufacturing or service.

Over years, the art and science of accounting has evolved together with progress of trade and commerce at national and global levels. Professional accounting bodies have been doing intensive research to come up with accounting rules that will be applicable. Modern business is certainly more complex and continuous updating

of these rules is required. Every stakeholder of the business is interested in a particular facet of information about the business. The art and science of accounting helps to put together these requirements of information as per universally accepted principles and also to interpret the results. It is interesting to note that each one of us has an accountant hidden in us. We do see our parents keep track of monthly expenses. We make a distinction between payment done for monthly grocery and that for buying a house or a car. We understand that while grocery is a monthly expense and buying a house is like creating a resource that has indefinite future use. The most common accounting record that each one of us knows is our bank passbook or a bank statement, which the bank maintains for us. It tracks each rupee that we deposit or withdraw from our account. When we go to supermarket to buy something, the cashier at the counter will record things we buy and give us a 'bill' or 'cash memo'. These are source documents prepared for the transaction between the supermarket and us. While these are simple examples, there could be more complex business activities. A good working knowledge of keeping records is therefore necessary. Professional accounting bodies all over the world have been functioning with the objective of providing this body of knowledge. These institutions are engaged in imparting training in the field of accounting. Let us start with some basic definitions, concepts, conventions and practices used in development of this art as well as science.

Definitions

In order to understand the subject matter with clarity, let us study some of the definitions which depict the scope, content and purpose of Accounting. The field of accounting is generally sub-divided into:

- (a) Book-keeping
- (b) Financial Accounting
- (c) Cost Accounting and
- (d) Management Accounting

Let us understand each of these concepts.

(a) Book-keeping

The most common definition of book-keeping as given by J. R. Batliboi is "Book-keeping is an art of recording business transactions in a set of books."

As can be seen, it is basically a record keeping function. One must understand that not all dealings are, however, recorded. Only transactions expressed in terms of money will find place in books of accounts. These are the transactions which will ultimately result in transfer of economic value from one person to the other. Book-keeping is a continuous activity, the records being maintained as transactions are entered into. This being a routine and repetitive work, in today's world, it is taken over by the computer systems. Many accounting packages are available to suit different business organizations.

It is also referred to as a set of primary records. These records form the basis for accounting. It is an art because, the record is to be kept in such a manner that it will facilitate further processing and reporting of financial information which will be useful to all stakeholders of the business.

(b) Financial Accounting

It is commonly termed as Accounting. The American Institute of Certified Public Accountants defines Accounting as "an art of recoding, classifying and summarizing in a significant manner and in terms of money, transactions and events which are in part at least of a financial character, and interpreting the results thereof."

The first step in the cycle of accounting is to identify transactions that will find place in books of accounts. Transactions having financial impact only are to be recorded. E.g. if a businessman negotiates with the customer regarding supply of products, this will not be recorded. The negotiation is a deal which will potentially create a transaction and will have exchange of money or money's worth. But unless this transaction is finally entered into, it will not be recorded in the books of accounts.

Secondly, the recording of the business transactions is done based on the Golden Rules of accounting (which are explained later) in a systematic manner. Transaction of similar nature are grouped together and recorded accordingly. e.g. Sales Transactions, Purchase Transactions, Cash Transactions etc. One has to interpret the transaction and then apply the relevant Golden Rule to make a correct entry thereof.

Thirdly, as the transactions increase in number, it will be difficult to understand the combined effect of the same by referring to individual records. Hence, the art of accounting also involves the step of summarizing them. With the aid of computers, this task is simplified in today's accounting world. The summarization will help users of the

business information to understand and interpret business results.

Lastly, the accounting process provides the users with statements which will describe what has happened to the business. Remember the two basic questions we talked about, one to know whether business has made profit or loss and the other to know the position of resources that are used by the business.

It can be noted that although accounting is often referred to as an art, it is a science also. This is because it is based on a universally applicable set of rules. However, it is not a pure science as there is a possibility of different interpretation.

(c) Cost Accounting

According to the Chartered Institute of Management Accountants (CIMA), Cost Accountancy is defined as "application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability as well as the presentation of information for the purpose of managerial decision-making."

It is a branch of accounting dealing with the classification, recording, allocation, summarization and reporting of current and prospective costs and analyzing their behaviours. Cost Accounting is frequently used to facilitate internal decision making and provides tools with which management can appraise performance and control costs of doing business. It primarily involves relating the costs to the different products produced and sold or services rendered by the business. While Financial Accounting deals with business transactions at a broader level, Cost Accounting aims at further breaking it up to the last possible level to identify costs with products and services. It uses the same Financial Accounting documents and records. Modern computerized accounting packages like ERP systems provide for processing Financial as well as Cost Accounting records simultaneously.

This branch of accounting deals with the process of ascertainment of costs. The concept of cost is always applied with reference to a context. Knowledge of cost concepts and their application provide a very sound platform for decision making. Cost Accounting aims at equipping management with information that can be used for control on business activities.

(d) Management Accounting

Management Accounting is concerned with the use of Financial and Cost Accounting information to managers within organizations, to provide them with the basis in making informed business decisions that would allow them to be better equipped in their management and control functions. Unlike Financial Accounting information (which, for public companies, is public information), Management Accounting information is used within an organization (typically for decision-making) and is usually confidential and its access available only to a selected few.

According to the Chartered Institute of Management Accountants (CIMA), Management Accounting is "the process of identification, measurement, accumulation, analysis, preparation, interpretation and communication of information used by management to plan, evaluate and control within an entity and to assure appropriate use of and accountability for its resources. Management Accounting also comprises the preparation of financial reports for non management groups such as shareholders, creditors, regulatory authorities and tax authorities".

Basically, Management Accounting aims to facilitate management in formulating strategies, planning and constructing business activities, making decisions, optimal use of resources, and safeguarding assets of business.

These branches of accounting have evolved over years of research and are basically synchronized with the requirements of business organizations and all entities associated with them. We will now see what are they and how accounting satisfies various needs of different stakeholders.

Difference between Book-keeping and Accountancy:

The Significant difference between Book-keeping and Accountancy are:

Sl No.	Points of difference	Book Keeping	Accountancy
1.	Meaning	Book-keeping is considered as end.	Accountancy is considered as beginning.

2.	Functions	The primary stage of accounting function is called Book-keeping.	The overall accounting functions are guided by accountancy.
3	Depends	Book-keeping can provide the base of Accounting.	Accountancy depends on Book-keeping for its complete functions.
4.	Data	The necessary data about financial performances and financial positions are taken from Book-keeping.	Accountancy can take its decisions, prepare reports and statements from the data taken from Book-keeping.
5.	Recording of Transactions	Financial transactions are recorded on the basis of accounting principles, concepts and conventions.	Accountancy does not take any principles, concepts and conventions from Book-keeping.

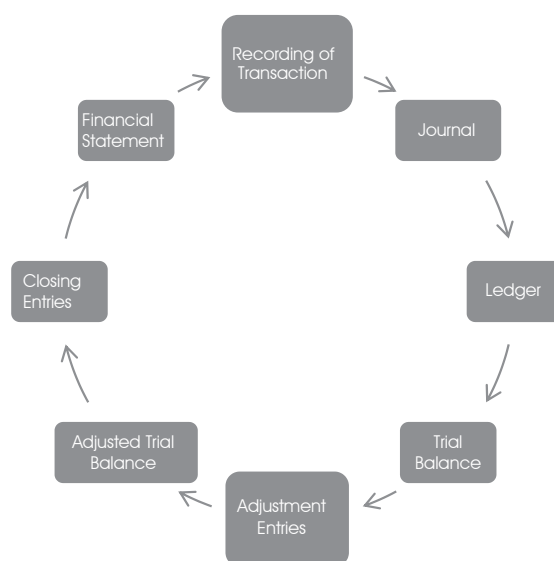
Difference between Management Accounting and Financial Accounting:

The significant difference between Management Accounting and Financial Accounting are:

Management Accounting	Financial Accounting
1. Management Accounting is primarily based on the data available from Financial Accounting.	1. Financial Accounting is based on the monetary transactions of the enterprise.
2. It provides necessary information to the management to assist them in the process of planning, controlling, performance evaluation and decision making.	2. Its main focus is on recording and classifying monetary transactions in the books of accounts and preparation of financial statements at the end of every accounting period.
3. Reports prepared in Management Accounting are meant for management and as per management requirement.	3. Reports as per Financial Accounting are meant for the management as well as for shareholders and creditors of the concern.
4. Reports may contain both subjective and objective figures.	4. Reports should always be supported by relevant figures and it emphasizes on the objectivity of data.
5. Reports are not subject to statutory audit.	5. Reports are always subject to statutory audit.
6. It evaluates the sectional as well as the entire performance of the business.	6. It ascertains, evaluates and exhibits the financial strength of the whole business.

Accounting Cycle

When complete sequence of accounting procedure is done which happens frequently and repeated in same directions during an accounting period, the same is called an accounting cycle.



Accounting Cycle

Steps/Phases of Accounting Cycle

The steps or phases of accounting cycle can be developed as under:

- Recording of Transaction:** As soon as a transaction happens it is at first recorded in subsidiary book.
- Journal:** The transactions are recorded in Journal chronologically.
- Ledger:** All journals are posted into ledger chronologically and in a classified manner.
- Trial Balance:** After taking all the ledger account's closing balances, a Trial Balance is prepared at the end of the period for the preparations of financial statements.
- Adjustment Entries:** All the adjustments entries are to be recorded properly and adjusted accordingly before preparing financial statements.
- Adjusted Trial Balance:** An adjusted Trail Balance may also be prepared.
- Closing Entries:** All the nominal accounts are to be closed by the transferring to Trading Account and Profit and Loss Account.

Financial Statements: Financial statement can now be easily prepared which will exhibit the true financial position and operating results.

Objectives of Accounting

The main objective of Accounting is to provide financial information to stakeholders. This financial information is normally given via financial statements, which are prepared on the basis of Generally Accepted Accounting Principles (GAAP). There are various accounting standards developed by professional accounting bodies all over the world. In India, these are governed by The Institute of Chartered Accountants of India, (ICAI). In the US, the American Institute of Certified Public Accountants (AICPA) is responsible to lay down the standards. The Financial Accounting Standards Board (FASB) is the body that sets up the International Accounting Standards. These standards basically deal with accounting treatment of business transactions and disclosing the same in financial statements.

The following objectives of accounting will explain the width of the application of this knowledge stream:

- To ascertain the amount of profit or loss made by the business i.e. to compare the income earned versus the expenses incurred and the net result thereof.
- To know the financial position of the business i.e. to assess what the business owns and what it owes.
- To provide a record for compliance with statutes and laws applicable.
- To enable the readers to assess progress made by the business over a period of time.
- To disclose information needed by different stakeholders.

Let us now see which are different stakeholders of the business and what do they seek from the accounting information. This is shown in the following table.

Stakeholder	Interest in business	Accounting Information
Owners / Investors / existing and potential	Profits or losses	Financial statements, Cost Accounting records, Management Accounting reports
Lenders	Assessment of capability of the business to pay interest and principal of money lent. Basically, they monitor the solvency of business	Financial statement and analysis thereof, reports forming part of accounts, valuation of assets given as security
Customers and suppliers	Stability and growth of the business	Financial and Cash flow statements to assess ability of the business to offer better business terms and ability to supply the products and services
Government	Whether the business is complying with various legal requirements	Accounting documents such as vouchers, extracts of books, information of purchase, sales, employee obligations etc. and financial statements

Employees and trade unions	Growth and profitability	Financial statements for negotiating pay packages
Competitors	Performance and possible tie-ups in the era of mergers and acquisitions	Accounting information to find out possible synergies

Users of Accounting Information

Accounting provides information both to internal users and the external users. The internal users are all the organizational participants at all levels of management (i.e. top, middle and lower). Generally top level management requires information for planning, middle level management which requires information for controlling the operations. For internal use, the information is usually provided in the form of reports, for instance Cash Budget Reports, Production Reports, Idle Time Reports, Feedback Reports, whether to retain or replace an equipment decision reports, project appraisal report, and the like.

There are also the external users (e.g. Banks, Creditors). They do not have direct access to all the records of an enterprise, they have to rely on financial statements as the source of information. External users are basically, interested in the solvency and profitability of an enterprise.

Types of Accounting Information

Accounting information may be categorized in number of ways on the basis of purpose of accounting information, on the basis of measurement criteria and so on. The various types of accounting information are given below:

I. Accounting information relating to financial transactions and events.

(a) Financial Position- Information about financial position is primarily provided in a Balance Sheet. The financial position of an enterprise is affected by different factors, like -

- (i) Information about the economic resources controlled by the enterprise and its capacity in the past to alter these resources is useful in predicting the ability of the enterprise to generate cash and cash equivalents in the future.
- (ii) Information about financial structure is useful in predicting future borrowing needs and how future profits and cash flows will be distributed among those with an interest in the enterprise; it is also useful in predicting how successful the enterprise is likely to be in raising further finance.
- (iii) Information about liquidity and solvency is useful in predicting the ability of the enterprise to meet its financial commitments as they fall due. Liquidity refers to the availability of cash in the near future to meet financial commitments over this period. Solvency refers to the availability of cash over the longer term to meet financial commitments as they fall due.

(b) Financial Performance- Information about financial performance is primarily provided in a Statement of Profit and Loss which is also known as Income Statement.

Information about the performance of an enterprise and its profitability, is required in order to assess potential changes taking place in the economic resources that it is likely to control in the future. Information about variability of performance is also important in this regard. Information about performance is necessary in predicting the capacity to generate cash flows from its available resource. It is an important input in forming judgments about the effectiveness of an enterprise to utilize resources.

(c) Cash Flows—Information about cash flows is provided in the financial statements by means of a cash flow statement.

Information concerning cash flows is useful in providing the users with a basis to assess the ability of the enterprise to generate cash and cash equivalents and the needs of the enterprise to utilise those cash and cash equivalent.

These information may be classified as follows:

- (i) on the basis of Historical Cost,
- (ii) on the basis of Current Cost,
- (iii) on the basis of Realizable Value,

- (iv) on the basis of Present Value

II. Accounting information relating to cost of a product, operation or function.

III. Accounting information relating to planning and controlling the activities of an enterprise for internal reporting.

This information may further be classified as follows:

- (i) Information relating to Finance Area
- (ii) Information relating to Production Area
- (iii) Information relating to Marketing Area
- (iv) Information relating to Personnel Area
- (v) Information relating to Other Areas (such as Research & Development).

IV. Accounting information relating to Social Effects of business decisions.

V. Accounting information relating to Environment and Ecology.

VI. Accounting information relating to Human Resources.

Basic Accounting Terms

In order to understand the subject matter clearly, one must grasp the following common expressions always used in business accounting. The aim here is to enable the student to understand with these often used concepts before we embark on accounting procedures and rules. You may note that these terms can be applied to any business activity with the same connotation.

- (i) **Transaction:** It means an event or a business activity which involves exchange of money or money's worth between parties. The event can be measured in terms of money and changes the financial position of a person e.g. purchase of goods would involve receiving material and making payment or creating an obligation to pay to the supplier at a future date. Transaction could be a cash transaction or credit transaction. When the parties settle the transaction immediately by making payment in cash or by cheque, it is called a cash transaction. In credit transaction, the payment is settled at a future date as per agreement between the parties.
- (ii) **Goods/Services :** These are tangible article or commodity in which a business deals. These articles or commodities are either bought and sold or produced and sold. At times, what may be classified as 'goods' to one business firm may not be 'goods' to the other firm. e.g. for a machine manufacturing company, the machines are 'goods' as they are frequently made and sold. But for the buying firm, it is not 'goods' as the intention is to use it as a long term resource and not sell it. Services are intangible in nature which are rendered with or without the object of earning profits.
- (iii) **Profit:** The excess of Revenue Income over expense is called profit. It could be calculated for each transaction or for business as a whole.
- (iv) **Loss:** The excess of expense over income is called loss. It could be calculated for each transaction or for business as a whole.
- (v) **Asset:** Asset is a resource owned by the business with the purpose of using it for generating future profits. Assets can be Tangible and Intangible. Tangible Assets are the Capital assets which have some physical existence. They can, therefore, be seen, touched and felt, e.g. Plant and Machinery, Furniture and Fittings, Land and Buildings, Books, Computers, Vehicles, etc. The capital assets which have no physical existence and whose value is limited by the rights and anticipated benefits that possession confers upon the owner are known as Intangible Assets. They cannot be seen or felt although they help to generate revenue in future, e.g. Goodwill, Patents, Trade-marks, Copyrights, Brand Equity, Designs, Intellectual Property, etc.

Assets can also be classified into Current Assets and Non-Current Assets.

Current Assets – An asset shall be classified as Current when it satisfies any of the following :

- (a) It is expected to be realised in, or is intended for sale or consumption in the Company's normal Operating Cycle,
- (b) It is held primarily for the purpose of being traded ,

- (c) It is due to be realised within 12 months after the Reporting Date, or
- (d) It is Cash or Cash Equivalent unless it is restricted from being exchanged or used to settle a Liability for at least 12 months after the Reporting Date.

Non-Current Assets – All other Assets shall be classified as Non-Current Assets. e.g. Machinery held for long term etc.

- (vi) **Liability:** It is an obligation of financial nature to be settled at a future date. It represents amount of money that the business owes to the other parties. E.g. when goods are bought on credit, the firm will create an obligation to pay to the supplier the price of goods on an agreed future date or when a loan is taken from bank, an obligation to pay interest and principal amount is created. Depending upon the period of holding, these obligations could be further classified into Long Term on non-current liabilities and Short Term or current liabilities.

Current Liabilities – A liability shall be classified as Current when it satisfies any of the following :

- (a) It is expected to be settled in the Company's normal Operating Cycle,
- (b) It is held primarily for the purpose of being traded,
- (c) It is due to be settled within 12 months after the Reporting Date, or
- (d) The Company does not have an unconditional right to defer settlement of the liability for at least 12 months after the reporting date (Terms of a Liability that could, at the option of the counterparty, result in its settlement by the issue of Equity Instruments do not affect its classification)

Non-Current Liabilities – All other Liabilities shall be classified as Non-Current Liabilities. E.g. Loan taken for 5 years, Debentures issued etc.

- (vii) **Internal Liability :** These represent proprietor's equity, i.e. all those amount which are entitled to the proprietor, e.g., Capital, Reserves, Undistributed Profits, etc.

- (viii) **Working Capital :** In order to maintain flows of revenue from operation, every firm needs certain amount of current assets. For example, cash is required either to pay for expenses or to meet obligation for service received or goods purchased, etc. by a firm. On identical reason, inventories are required to provide the link between production and sale. Similarly, Accounts Receivable generate when goods are sold on credit. Cash, Bank, Debtors, Bills Receivable, Closing Stock, Prepayments etc. represent current assets of firm. The whole of these current assets form the working capital of a firm which is termed as Gross Working Capital.

Gross Working Capital = Total Current Assets

= Long term internal liabilities plus long term debts plus the current liabilities minus the amount blocked in the fixed assets.

There is another concept of working capital. Working capital is the excess of current assets over current liabilities. That is the amount of current assets that remain in a firm if all its current liabilities are paid. This concept of working capital is known as Net Working Capital which is a more realistic concept.

Working Capital (Net) = Current Assets – Currents Liabilities.

- (ix) **Contingent Liability :** It represents a potential obligation that could be created depending on the outcome of an event. E.g. if supplier of the business files a legal suit, it will not be treated as a liability because no obligation is created immediately. If the verdict of the case is given in favour of the supplier then only the obligation is created. Till that it is treated as a contingent liability. Please note that contingent liability is not recorded in books of account, but disclosed by way of a note to the financial statements.
- (x) **Capital :** It is amount invested in the business by its owners. It may be in the form of cash, goods, or any other asset which the proprietor or partners of business invest in the business activity. From business point of view, capital of owners is a liability which is to be settled only in the event of closure or transfer of the business. Hence, it is not classified as a normal liability. For corporate bodies, capital is normally represented as share capital.
- (xi) **Drawings :** It represents an amount of cash, goods or any other assets which the owner withdraws from business for his or her personal use. e.g. if the life insurance premium of proprietor or a partner of business is paid from the business cash, it is called drawings. Drawings will result in reduction in the owners' capital. The concept of drawing is not applicable to the corporate bodies like limited companies.

- (xii) **Net worth** : It represents excess of total assets over total liabilities of the business. Technically, this amount is available to be distributed to owners in the event of closure of the business after payment of all liabilities. That is why it is also termed as Owner's Equity. A profit making business will result in increase in the owner's equity whereas losses will reduce it.
- (xiii) **Non-current Investments** : Non-current Investments are investments which are held beyond the current period as to sale or disposal. e. g. Fixed Deposit for 5 years.
- (xiv) **Current Investments** : Current investments are investments that are by their nature readily realizable and are intended to be held for not more than one year from the date on which such investment is made. e. g. 11 months Commercial Paper.
- (xv) **Debtor** : The sum total or aggregate of the amounts which the customer owe to the business for purchasing goods on credit or services rendered or in respect of other contractual obligations, is known as Sundry Debtors or Trade Debtors, or Trade Receivable, or Book-Debts or Debtors. In other words, Debtors are those persons from whom a business has to recover money on account of goods sold or service rendered on credit. These debtors may again be classified as under:
- (i) Good debts : The debts which are sure to be realized are called good debts.
 - (ii) Doubtful Debts : The debts which may or may not be realized are called doubtful debts.
 - (iii) Bad debts : The debts which cannot be realized at all are called bad debts.
- It must be remembered that while ascertaining the debtors balance at the end of the period certain adjustments may have to be made e.g. Bad Debts, Discount Allowed, Returns Inwards, etc.
- (xvi) **Creditor** : A creditor is a person to whom the business owes money or money's worth. e.g. money payable to supplier of goods or provider of service. Creditors are generally classified as Current Liabilities.
- (xvii) **Capital Expenditure**: This represents expenditure incurred for the purpose of acquiring a fixed asset which is intended to be used over long term for earning profits there from. e. g. amount paid to buy a computer for office use is a capital expenditure. At times expenditure may be incurred for enhancing the production capacity of the machine. This also will be a capital expenditure. Capital expenditure forms part of the Balance Sheet.
- (xviii) **Revenue expenditure**: This represents expenditure incurred to earn revenue of the current period. The benefits of revenue expenses get exhausted in the year of the incurrence. e.g. repairs, insurance, salary & wages to employees, travel etc. The revenue expenditure results in reduction in profit or surplus. It forms part of the Income Statement.
- (xix) **Balance Sheet**: It is the statement of financial position of the business entity on a particular date. It lists all assets, liabilities and capital. It is important to note that this statement exhibits the state of affairs of the business as on a particular date only. It describes what the business owns and what the business owes to outsiders (this denotes liabilities) and to the owners (this denotes capital). It is prepared after incorporating the resulting profit/losses of Income Statement.
- (xx) **Profit and Loss Account or Income Statement**: This account shows the revenue earned by the business and the expenses incurred by the business to earn that revenue. This is prepared usually for a particular accounting period, which could be a month, quarter, a half year or a year. The net result of the Profit and Loss Account will show profit earned or loss suffered by the business entity.
- (xxi) **Trade Discount**: It is the discount usually allowed by the wholesaler to the retailer computed on the list price or invoice price. e.g. the list price of a TV set could be ₹ 15000. The wholesaler may allow 20% discount thereof to the retailer. This means the retailer will get it for ₹ 12000 and is expected to sale it to final customer at the list price. Thus the trade discount enables the retailer to make profit by selling at the list price. Trade discount is not recorded in the books of accounts. The transactions are recorded at net values only. In above example, the transaction will be recorded at ₹ 12000 only.
- (xxii) **Cash Discount**: This is allowed to encourage prompt payment by the debtor. This has to be recorded in the books of accounts. This is calculated after deducting the trade discount. e.g. if list price is ₹ 15000 on which a trade discount of 20% and cash discount of 2% apply, then first trade discount of ₹ 3000 (20% of ₹ 15000) will be deducted and the cash discount of 2% will be calculated on ₹ 12000 (₹15000 – ₹ 3000). Hence the cash discount will be ₹ 240/- (2% of ₹ 12000) and net payment will be ₹ 11,760 (₹12,000 - ₹ 240)

Let us see if we can apply these in the following illustrations.

Illustration 1.

Fill in the blanks:

- (a) The cash discount is allowed by _____ to the _____.
- (b) Profit means excess of _____ over _____.
- (c) Debtor is a person who _____ to others.
- (d) In a credit transaction, the buyer is given a _____ facility.
- (e) The fixed asset is generally held for _____.
- (f) The current liabilities are obligations to be settled in _____ period.
- (g) The withdrawal of money by the owner of business is called _____.
- (h) The amount invested by owners into business is called _____.
- (i) Transaction means exchange of money or money's worth for _____.
- (j) The net result of an income statement is _____ or _____.
- (k) The _____ shows financial position of the business as on a particular date.
- (l) The _____ discount is never entered in the books of accounts.
- (m) Vehicles represent _____ expenditure while repairs to vehicle would mean _____ expenditure.
- (n) Net worth is excess of _____ over _____.

Solution:

- (a) creditor, debtor
- (b) income, expenditure
- (c) Owes
- (d) Credit
- (e) Longer period
- (f) Short
- (g) Drawings
- (h) Capital
- (i) Value
- (j) Profit, loss
- (k) Balance sheet
- (l) Trade
- (m) Capital, revenue
- (n) Total assets, total liabilities

Illustration 2.

Give one word or a term used to describe the following:-

- (a) An exchange of benefit for value
- (b) A transaction without immediate cash settlement.
- (c) Commodities in which a business deals.
- (d) Excess of expenditure over income.

- (e) Things of value owned by business to earn future profits.
- (f) Amount owed by business to others.
- (g) An obligation which may or may not materialise.
- (h) An allowance by a creditor to debtor for prompt payment.
- (i) Assets like brand value, copy rights, goodwill.

Solution:

(a) Transaction, (b) Credit transaction, (c) Goods, (d) Loss, (e) Assets, (f) Liability, (g) Contingent Liability, (h) Cash Discount, (i) Intangible Asset.

1.2 GENERALLY ACCEPTED ACCOUNTING PRINCIPLES

A widely accepted set of rules, conventions, standards, and procedures for reporting financial information, as established by the Financial Accounting Standards Board are called Generally Accepted Accounting Principles (GAAP). These are the common set of accounting principles, standards and procedures that companies use to compile their financial statements. GAAP are a combination of standards (set by policy boards) and simply the commonly accepted ways of recording and reporting accounting information.

GAAP is to be followed by companies so that investors have a optimum level of consistency in the financial statements they use when analyzing companies for investment purposes. GAAP cover such aspects like revenue recognition, balance sheet item classification and outstanding share measurements.

1.3 ACCOUNTING CONCEPTS AND CONVENTIONS

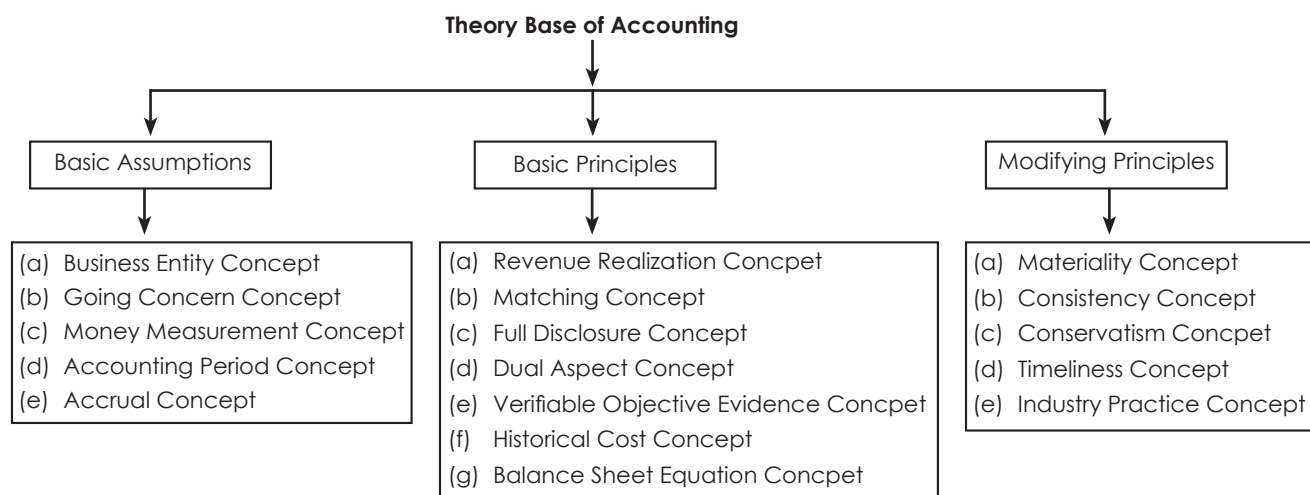
As seen earlier, the accounting information is published in the form of financial statements. The three basic financial statements are

- (i) The Profit & Loss Account that shows net business result i.e. profit or loss for a certain periods.
- (ii) The Balance Sheet that exhibits the financial strength of the business as on a particular dates.
- (iii) The Cash Flow Statement that describes the movement of cash from one date to the other.

As these statements are meant to be used by different stakeholders, it is necessary that the information contained therein is based on definite principles, concrete concepts and well accepted convention.

Accounting principles are basic guidelines that provide standards for scientific accounting practices and procedures. They guide as to how the transactions are to be recorded and reported. They assure uniformity and understandability. Accounting concepts lay down the foundation for accounting principles. They are ideas essentially at mental level and are self-evident. These concepts ensure recording of financial facts on sound bases and logical considerations. Accounting conventions are methods or procedures that are widely accepted. When transactions are recorded or interpreted, they follow the conventions. Many times, however, the terms-principles, concepts and conventions are used interchangeably.

Professional Accounting Bodies have published statements of these concepts. Over years, many of these concepts are being challenged as outdated. Yet, no major deviations have been made as yet. Path breaking ideas have emerged and the accounting standards of modern days do require companies to record and report transactions which may not be necessarily based on concepts that are in vogue for long. It is essential to study accounting from the basic levels and understand these concepts in entirety.



A. BASIC ASSUMPTIONS

(a) Business Entity Concept

As per this concept, the business is treated as distinct and separate from the individuals who own or manage it. When recording business transactions, the important question is how will it affect the business entity? How they affect the persons who own it or run it or otherwise associated with it is irrelevant. Application of this concept enables recording of transactions of the business entity with its owners or managers or other stakeholders. For example, if the owner pays his personal expenses from business cash, this transaction can be recorded in the books of business entity. This transaction will take the cash out of business and also reduce the obligation of the business towards the owner.

At times it is difficult to separate owners from the business. Consider an individual, who runs a small retail outlet. In the eyes of law, there is no distinction made between financial affairs of the outlet with that of the individual. The creditors of the retail outlet can sue the individual and collect his claim from personal resources of the individual. However, in accounting, the records are kept as distinct for the retail outlet and the individual respectively. For certain forms of business entities, such as limited companies this distinction is easier. The limited companies are separate legal persons in the eyes of law as well.

The entity concept requires that all the transactions are to be viewed, interpreted and recorded from 'business entity' point of view. An accountant steps into the shoes of the business entity and decides to account for the transactions. The owner's capital is the obligation of business and it has to be paid back to the owner in the event of business closure. Also, the profit earned by the business will belong to the owner and hence is treated as owner's equity.

(b) Going Concern Concept

The basic principles of this concept is that business is assumed to exist for an indefinite period and is not established with the objective of closing it down. So unless there is good evidence to the contrary, the accountant assumes that a business entity is a 'going concern' - that it will continue to operate as usual for a longer period of time. It will keep getting money from its customers, pay its creditors, buy and sell goods, use assets to earn profits in future. If this assumption is not considered, one will have to constantly value the worth of the assets and resource. This is not practicable. This concept enables the accountant to carry forward the values of assets and liabilities from one accounting period to the other without asking the question about usefulness and worth of the assets and recoverability of the receivables.

The going concern concept forms a sound basis for preparation of a Balance Sheet.

(c) Money Measurement Concept

A business transaction will always be recorded if it can be expressed in terms of money. The advantage of this concept is that different types of transactions could be recorded as homogenous entries with money as common denominator. A business may own ₹ 3 Lacs cash, 1500 kg of raw material, 10 vehicles, 3 computers etc. Unless each of these is expressed in terms of money, we cannot find out the assets owned by the business. When expressed in the common measure of money, transactions could be added or subtracted to find out the combined effect. In the above example, we could add values of different assets to find the total assets owned.

The application of this concept has a limitation. When transactions are recorded in terms of money, we only consider the absolute value of the money. The real value of the money may fluctuate from time to time due to inflation, exchange rate changes, etc. This fact is not considered when recording the transaction.

(d) The Accounting Period Concept

We have seen that as per the going-concern concept the business entity is assumed to have an indefinite life. Now if we were to assess whether the business has made profit or loss, should we wait until this indefinite period is over? Would it mean that we will not be able to assess the business performance on an ongoing basis? Does it deprive all stakeholders the right to the accounting information? Would it mean that the business will not pay income tax as no income will be computed?

To circumvent this problem, the business entity is supposed to be paused after a certain time interval. This time interval is called an accounting period. This period is usually one year, which could be a calendar year i.e. 1st January to 31st December or it could be a fiscal year in India as 1st April to 31st March. The business organizations have the freedom to choose their own accounting year. For certain organizations, reporting of financial information in public domain are compulsory. In India, listed companies must report their quarterly unaudited financial results and yearly audited financial statements. For internal control purpose, many organizations prepare monthly financial statements. The modern computerized accounting systems enable the companies to prepare real-time online financials at the click of button.

Businesses are living, continuous organisms. The splitting of the continuous stream of business events into time periods is thus somewhat arbitrary. There is no significant change just because one accounting period ends and a new one begins. This results into the most difficult problem of accounting of how to measure the net income for an accounting period. One has to be careful in recognizing revenue and expenses for a particular accounting period. Subsequent section on accounting procedures will explain how one goes about it in practice.

(e) The Accrual Concept

The accrual concept is based on recognition of both cash and credit transactions. In case of a cash transaction, owner's equity is instantly affected as cash either is received or paid. In a credit transaction, however, a mere obligation towards or by the business is created. When credit transactions exist (which is generally the case), revenues are not the same as cash receipts and expenses are not same as cash paid during the period.

When goods are sold on credit as per normally accepted trade practices, the business gets the legal right to claim the money from the customer. Acquiring such right to claim the consideration for sale of goods or services is called accrual of revenue. The actual collection of money from customer could be at a later date.

Similarly, when the business procures goods or services with the agreement that the payment will be made at a future date, it does not mean that the expense effect should not be recognized. Because an obligation to pay for goods or services is created upon the procurement thereof, the expense effect also must be recognized.

Today's accounting systems based on accrual concept are called as Accrual System or Mercantile System of Accounting.

B. BASIC PRINCIPLES

(a) The Revenue Realisation Concept

While the conservatism concept states whether or not revenue should be recognized, the concept of realisation talks about what revenue should be recognized. It says amount should be recognized only to the tune of which it is certainly realizable. Thus, mere getting an order from the customer won't make it eligible to recognize as revenue. The reasonable certainty of realizing the money will come only when the goods ordered are actually supplied to the customer and he is billed. This concept ensures that income unearned or unrealized will not be considered as revenue and the firms will not inflate profits.

Consider that a store sales goods for ₹ 25 lacs during a month on credit. The experience and past data shows that generally 2% of the amount is not realized. The revenue to be recognized will be ₹ 24.50 lacs. Although conceptually the revenue to be recognized at this value, in practice the doubtful amount of ₹ 50 thousand (2% of ₹ 25 lacs) is often considered as expense.

(b) The Matching Concept

As we have seen the sale of goods has two effects: (i) a revenue effect, which results in increase in owner's

equity by the sales value of the transaction and (ii) an expense effect, which reduces owner's equity by the cost of goods sold, as the goods go out of the business. The net effect of these two effects will reflect either profit or loss. In order to correctly arrive at the net result, both these aspects must be recognized during the same accounting period. One cannot recognize only the revenue effect thereby inflating the profit or only the expense effect which will deflate the profit. Both the effects must be recognized in the same accounting period. This is the principle of matching concept.

To generalize, when a given event has two effects – one on revenue and the other on expense, both must be recognized in the same accounting period.

(c) Full Disclosure Concept

As per this concept, all significant information must be disclosed. Accounting data should properly be clarified, summarized, aggregated and explained for the purpose of presenting the financial statements which are useful for the users of accounting information. Practically, this principle emphasizes on the materiality, objectivity and consistency of accounting data which should disclose the true and fair view of the state of affairs of a firm. This principle is going to be popular day by day as per Companies Act, 1956 major provisions for disclosure of essential information about accounting data and as such, concealment of material information, at present, is not very easy. Thus, full disclosure must be made for such material information which are useful to the users of accounting information.

(d) Dual Aspect Concept

The assets represent economic resources of the business, whereas the claims of various parties on business are called obligations. The obligations could be towards owners (called as owner's equity) and towards parties other than the owners (called as liabilities).

When a business transaction happens, it will involve use of one or the other resource of the business to create or settle one or more obligations. e.g. consider Mr. Suresh starts a business with the investment of ₹ 25 lacs. Here, the business has got a resource of cash worth ₹ 25 lacs (which is its asset), but at the same time it has created an obligation of business towards Mr. Suresh that in the event of business closure, the money will be paid back to him. This could be shown as:

$$\text{Assets} = \text{Liabilities} + \text{Capital}$$

In other words,

Cash brought in by Mr. Suresh (₹ 25 lacs) = Liability of business towards Mr. Suresh (₹ 25 lacs)

We know that liability of the business could be towards owners and parties other than owners, this equation could be re-written as:

$$\text{Assets} = \text{Liabilities} + \text{Owner's equity}$$

$$\text{Cash ₹ 25,00,000} = \text{Liabilities ₹ nil} + \text{Mr. Suresh's equity ₹ 25,00,000}$$

This is the fundamental accounting equation shown as formal expression of the dual aspect concept. This powerful concept recognizes that every business transaction has dual impact on the financial position. Accounting systems are set up to simultaneously record both these aspects of every transaction; that is why it is called as Double-entry system of accounting. In its present form the double entry system of accounting owes its existence to an Italian expert Mr. Luca Pacioli in the year 1495.

Continuing with our example of Mr. Suresh, now let us consider he borrows ₹ 15 lacs from bank. The dual aspect of this transaction on one hand the business cash will increase by ₹ 15 lacs and a liability towards the bank will be created for ₹ 15 lacs.

$$\text{Assets} = \text{Liabilities} + \text{Owner's equity}$$

$$\text{Cash ₹ 40,00,000} = \text{Liabilities ₹ 15,00,000} + \text{Mr. Suresh's equity ₹ 25,00,000}$$

The student must note that the dual aspect concept entails recognition of the two effects of each transaction. These effects are of equal amount and reverse in nature. How to decide these two aspects?

The golden rules of accounting are used to arrive at this decision. After recording both aspects of the

transaction, the basic accounting equation will always balance or be equal.

The above concepts find the application in preparation of the Balance Sheet which is the statement of assets and liabilities as on a particular date. We will now see some more concepts that are important for preparation of Profit and Loss Account or Income Statement.

(e) Verifiable Objective Evidence Concept

Under this principle, accounting data must be verified. In other words, documentary evidence of transactions must be made which are capable of verification by an independent respect. In the absence of such verification, the data which will be available will neither be reliable nor be dependable, i.e., these should be biased data. Verifiability and objectivity express dependability, reliability and trustworthiness that are very useful for the purpose of displaying the accounting data and information to the users.

(f) Historical Cost Concept

Business transactions are always recorded at the actual cost at which they are actually undertaken. The basic advantage is that it avoids an arbitrary value being attached to the transactions. Whenever an asset is bought, it is recorded at its actual cost and the same is used as the basis for all subsequent accounting purposes such as charging depreciation on the use of asset, e.g. if a production equipment is bought for ₹ 1.50 crores, the asset will be shown at the same value in all future periods when disclosing the original cost. It will obviously be reduced by the amount of depreciation, which will be calculated with reference to the actual cost. The actual value of the equipment may rise or fall subsequent to the purchase, but that is considered irrelevant for accounting purpose as per the historical cost concept.

The limitation of this concept is that the Balance Sheet does not show the market value of the assets owned by the business and accordingly the owner's equity will not reflect the real value. However, on an ongoing basis, the assets are shown at their historical costs as reduced by depreciation.

(g) Balance Sheet Equation Concept

Under this principle, all which has been received by us must be equal to that has been given by us and needless to say that receipts are clarified as debits and giving is clarified as credits. The basic equation, appears as :-

$$\text{Debit} = \text{Credit}$$

Naturally every debit must have a corresponding credit and vice-e-versa. So, we can write the above in the following form –

$$\text{Expenses} + \text{Losses} + \text{Assets} = \text{Revenues} + \text{Gains} + \text{Liabilities}$$

And if expenses and losses, and incomes and gains are set off, the equation takes the following form –

$$\text{Asset} = \text{Liabilities}$$

or, Asset = Equity + External Liabilities

i.e., the Accounting Equation.

C. MODIFYING PRINCIPLES

(a) The Concept of Materiality

This is more of a convention than a concept. It proposes that while accounting for various transactions, only those which may have material effect on profitability or financial status of the business should have special consideration for reporting. This does not mean that the accountant should exclude some transactions from recording. e.g. even ₹ 20 worth conveyance paid must be recorded as expense. What this convention claims is to attach importance to material details and insignificant details should be ignored while deciding certain accounting treatment. The concept of materiality is subjective and an accountant will have to decide on merit of each case. Generally, the effect is said to be material, if the knowledge of an event would influence the decision of an informed stakeholder.

The materiality could be related to information, amount, procedure and nature. Error in description of an asset or wrong classification between capital and revenue would lead to materiality of information. Say, If postal stamps of ₹ 500 remain unused at the end of accounting period, the same may not be considered for recognizing as inventory on account of materiality of amount. Certain accounting treatments depend upon procedures laid down by accounting standards. Some transactions are by nature material irrespective

of the amount involved. e.g. audit fees, loan to directors.

(b) The Concept of Consistency

This concept advocates that once an organization decides to adopt a particular method of revenue or expense recognition in line with the other concepts, the same should be consistently applied year after year, unless there is a valid reason for change in the method. Lack of consistency would result in the financial information becoming non-comparable between the different accounting periods. The insistence of this concept would result in avoidance of window dressing the results by choosing the accounting method by convenience and thereby either inflating or understating net income.

Consider an example. An asset of ₹ 10 lacs is purchased by a business. It is estimated to have useful life of 5 years. It will follow that the asset will be depreciated over a period of 5 years at the rate of ₹ 2 lacs every year. The estimate of useful life and the rate of depreciation cannot be changed from one period to the other without a valid reason. Suppose the firm applies the same depreciation rate for the first three years and due to change in technology the asset becomes obsolete, the whole of the remaining amount could be expensed out in the fourth year.

However, it may be difficult to be consistent if the business entities have two factories in different countries which have different statutory requirement for accounting treatment.

(c) The Prudence Concept

Accountants who prepare financial statements of the business, like other human being, would like to give a favourable report on how well the business has performed during an accounting period. However, prudent reporting based on skepticism builds confidence in the results and in the long run best serves all the divergent interests of users of financial statements. This philosophy of prudence leads to the conservatism concept.

The concept underlines the prudence of under-stating than over-stating the net income of an entity for a period and the net assets as on a particular date. This is because business is done in situations of uncertainty. For years, this concept was meant to "anticipate no profits but recognize all losses". This can be stated as

- (i) Delay in recognizing income unless one is reasonably sure
- (ii) Immediately recognize expenses when reasonably sure

This, of course, does not mean to overdo and create window dressing in reporting. e.g. if the business has sold ₹ 20 Lacs worth goods on the last day of accounting period and also received a cheque for the same, one cannot argue that the revenue should not be recognized as it is not certain whether the cheque will be cleared by the bank. One cannot stretch the conservatism concept too much. But at the same time, if the business has to receive ₹ 5 lacs from a customer to whom goods were sold quite some time ago and no payments are forthcoming, then while determining the net income for the period, the accountant must judge the likelihood of the recoverability of this money and the prudence will prevail to make a provision for this amount as doubtful debtors.

Let us take another example. A business had purchased goods for ₹ 10 lacs before the end of an accounting period. If sold at the usual selling price, the goods would fetch the price of ₹ 12.50 lacs. Due to innovative product introduced by the competition, the goods are likely to be sold for ₹ 9 lacs only. At what value should the goods be shown in the balance sheet? Would it be at ₹ 10 lacs being the actual cost of buying? Or would it be at ₹ 9 lacs? Here, the conservatism principle will come in play. The stock of goods will be valued at ₹ 9 lacs, being the lower of cost or net realisable value, as per AS-2.

(d) Timeliness Concept

Under this principle, every transaction must be recorded in proper time. Normally, when the transaction is made, the same must be recorded in the proper books of accounts. In short, transaction should be recorded date-wise in the books. Delay in recording such transaction may lead to manipulation, misplacement of vouchers, misappropriation etc. of cash and goods. This principle is followed particularly while verifying day to day cash balance. Principle of timeliness is also followed by banks, i.e. every bank verifies the cash balance with their cash book and within the day, the same must be completed.

(e) Industry Practice

As there are different types of industries, each industry has its own characteristics and features. There may

be seasonal industries also. Every industry follows the principles and assumption of accounting to perform their own activities. Some of them follow the principles, concepts and conventions in a modified way. The accounting practice which has always prevailed in the industry is followed by it. e.g Electric supply companies, Insurance companies maintain their accounts in a specific manner. Insurance companies prepare Revenue Account just to ascertain the profit/loss of the company and not Profit and Loss Account. Similarly, non trading organizations prepare Income and Expenditure Account to find out Surplus or Deficit.

Conclusion

The above paragraphs bring out essentially broad concepts and conventions that lay down principles to be followed for accounting of business transaction. While going through the different topics, students are advised to keep track of concepts applicable for various accounting treatment. One would have by now understood the importance of these concepts in preparation of basic financial statements. More clarity will emerge as one explores the ocean of different business transactions arising out of complex business situations. The legal and professional requirements also have their say in deciding the accounting treatment. Let us see if you can apply these concepts in the following illustrations.

Exercise:

Recognise the accounting concept in the following:

- (1) The business will run for an indefinite period.
- (2) The business is distinct and separate from its owners.
- (3) The transactions are recorded at their original cost.
- (4) The transactions recorded are those that can be expressed in money terms.
- (5) Revenues will be recognized only if there is reasonable certainty that it will be paid for.
- (6) Accounting treatment once decided should be followed period after period.
- (7) Every transaction has two effects to be recorded in books of accounts.
- (8) Transactions are recorded even if an obligation is created and actual cash is not involved.
- (9) Stock of goods is valued at lower of its cost and realizable value.
- (10) Effects of an event must be recognized in the same accounting period.

Events and Transactions:

Event is a transaction or change recognized on the financial statements of an accounting entity. Accounting events can be either external or internal. An external event would occur with an outside party, such as the purchase or sales of a good. An internal event would involve changes in the accounting entity's records, such as adjusting an account on the financial statements.

An accounting event is any financial event that would impact the account balances of a company's financial statements. Every time the company uses or receives cash, or adjusts an entry in its accounting records, an accounting event has occurred.

Transactions vs. Events

Transaction is exchange of an asset with consideration of money value while event is anything in general purpose which occur at specific time and particular place. All transactions are events but all events are not transactions. This is because in order events to be called transaction an event must involve exchange of values.

Voucher:

It is a written instrument that serves to confirm or witness (vouch) for some fact such as a transaction. Commonly, a voucher is a document that shows goods have bought or services have been rendered, authorizes payment, and indicates the ledger account(s) in which these transactions have to be recorded.

Types of Voucher - Normally the following types of vouchers are used. i.e.:

- (i) Receipt Voucher

- (ii) Payment Voucher
- (iii) Non-Cash or Transfer Voucher
- (iv) Supporting Voucher

(i) Receipt Voucher

Receipt voucher is used to record cash or bank receipt. Receipt vouchers are of two types. i.e.

- (a) Cash receipt voucher – it denotes receipt of cash
- (b) Bank receipt voucher – it indicates receipt of cheque or demand draft

(ii) Payment Voucher

Payment voucher is used to record a payment of cash or cheque. Payment vouchers are of two types. i.e.

- (a) Cash Payment voucher – it denotes payment of cash
- (b) Bank Payment voucher – it indicates payment by cheque or demand draft.

(iii) Non Cash Or Transfer Voucher

These vouchers are used for non-cash transactions as documentary evidence. e.g., Goods sent on credit.

(iv) Supporting Vouchers

These vouchers are the documentary evidence of transactions that have happened.

Source Documents

Vouchers are the documentary evidence of the transactions so happened. Source documents are the basis on which transactions are recorded in subsidiary books i.e. source documents are the evidence and proof of transactions.

Name of the Book	Source document
(a) Cash Book	Cash Memos, Cash Receipts and issue vouchers
(b) Purchase Books	Inward invoice received from the creditors of goods
(c) Sales Book	Outward Invoice issued to Debtors
(d) Return Inward Book	Credit Note issued to Debtors and Debit Notes received from Debtors
(e) Returns Outward Book	Debit Note issued to creditors and Credit Note received from creditors.

The Concept of “Account”, “Debit” and “Credit”:

One must get conversant with these terms before embarking to learn actual record-keeping based on the rules.

An ‘Account’ is defined as a summarised record of transactions related to a person or a thing. e.g. when the business deals with customers and suppliers, each of the customers and supplier will be a separate account. We must know that each one of us is identified as a separate account by the bank when we open an account with them. The account is also related to things – both tangible and intangible.

e.g. land, building, equipment, brand value, trademarks etc. are some of the things. When a business transaction happens, one has to identify the ‘account’ that will be affected by it and then apply the rules to decide the accounting treatment.

Typically, an account is expressed as a statement in form of English letter ‘T’. It has two sides. The left hand side is called as “Debit” side and the right hand side is called as “Credit” side. The debit is connoted as ‘Dr’ and the credit by ‘Cr’. The convention is to write the Dr and Cr labels on both sides as shown below. Please see the following example:

Dr.	Cash Account	Cr.
Debit side		Credit side

Each side of the account will show effects, so that one can easily take totals of both sides and find out the difference between the two. Such difference in the two sides of an account is called ‘balance’. If the total of

debit side is more than the credit side, the balance is called as 'debit balance' and if the total of credit side is more than the debit side, the balance is called as 'credit balance'. If the debit and credit side are equal, the account will show 'nil balance'.

The balances are to be computed at the end of an accounting period. These balances are then considered for preparation of income statement and balance sheet. Let us see the example:

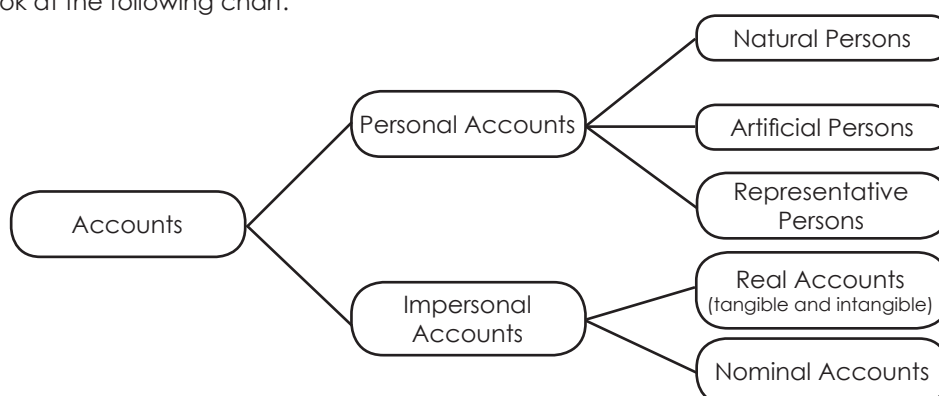
Dr.		Cash Account		Cr.	
Particulars	Amount ₹	Particulars	Amount ₹		
Cash brought into business	1,00,000	Paid for goods purchased	50,000		
Received for goods sold	25,000	Paid for rent	15,000		
		Balance at the end	60,000		
	1,25,000		1,25,000		

It can be seen from the above example that the debit side of cash account shows the receipt of cash into the business and the credit side reflects the cash that has gone out of the business. What is the meaning of the balance at the end? Well, it shows that cash balance available in the business.

Types of Accounts:

We have seen that an account may be related to a person or a thing – tangible or intangible. While doing business transactions (that may be large in number and complex in nature), one may come across numerous accounts that are affected. How does one decide about accounting treatment for each of them? If common rules are to be applied to similar type of accounts, there must be a way to classify the account on the basis of their common characteristics.

Please take look at the following chart.



Let us see what each type of account means.

(1) Personal Account : As the name suggests these are accounts related to persons.

- These persons could be natural persons like Suresh's A/c, Anil's A/c, Rani's A/c etc.
- The persons could also be artificial persons like companies, bodies corporate or association of persons or partnerships etc. Accordingly, we could have Videocon Industries A/c, Infosys Technologies A/c, Charitable Trust A/c, Ali and Sons trading A/c, ABC Bank A/c, etc.
- There could be representative personal accounts as well. Although the individual identity of persons related to these is known, the convention is to reflect them as collective accounts. e.g. when salary is payable to employees, we know how much is payable to each of them, but collectively the account is called as 'Salary Payable A/c'. Similar examples are rent payable, Insurance prepaid, commission pre-received etc. The students should be careful to have clarity on this type and the chances of error are more here.

(2) Real Accounts : These are accounts related to assets or properties or possessions. Depending on their physical existence or otherwise, they are further classified as follows:

- Tangible Real Account – Assets that have physical existence and can be seen, and touched. e.g. Machinery A/c, Stock A/c, Cash A/c, Vehicle A/c, and the like.

(b) **Intangible Real Account** – These represent possession of properties that have no physical existence but can be measured in terms of money and have value attached to them. e.g. Goodwill A/c, Trade mark A/c, Patents & Copy Rights A/c, Intellectual Property Rights A/c and the like.

(3) **Nominal Account** : These accounts are related to expenses or losses and incomes or gains e.g. Salary and Wages A/c, Rent of Rates A/c, Travelling Expenses A/c, Commission received A/c, Loss by fire A/c etc.

The Accounting Process:

There are two approaches for deciding when to write on the debit side of an account and when to write on the credit side of an account:

A. American Approach/ Modern Approach

B. British Approach/ Traditional Approach/Double Entry System

A. American approach : In order to understand the rules of debit and credit according to this approach transactions are divided into five categories.

For Assets	Increase in Assets	Dr.
	Decrease in Assets	Cr.
For Liabilities	Decrease in Liabilities	Dr.
	Increase in Liabilities	Cr.
For Capital	Decrease in Capital	Dr.
	Increase in Capital	Cr.
For Incomes	Decrease in Income	Dr.
	Increase in Income	Cr.
For Expense	Increase in Expense	Dr.
	Decrease in Expense	Cr.

Illustration 4.

Ascertain the debit and credit from the following particulars under Modern Approach.

- (i) Started business with capital.
- (ii) Bought goods for cash.
- (iii) Sold goods for cash.
- (iv) Paid salary.
- (v) Received Interest on Investment.
- (vi) Bought goods on credit from Mr. Y
- (vii) Paid Rent out of Personal cash

Solution:

	Effect of Transaction	Account	To be debited/Credited
(a)	Increase in Cash	Cash A/c	Debit
	Increase in Capital	Capital A/c	Credit
(b)	Increase in Stock	Purchase A/c	Debit
	Decrease in Cash	Cash A/c	Credit
(c)	Increase in Cash	Cash A/c	Debit
	Decrease in Stock	Sale A/c	Credit

(d)	Increase in Expense	Salary A/c	Debit
	Decrease in Cash	Cash A/c	Credit
(e)	Increase in Cash	Cash A/c	Debit
	Increase in Income	Interest A/c	Credit
(f)	Increase in Stock	Purchase A/c	Debit
	Increase in Liability	Y A/c	Credit
(g)	Increase in Expense	Rent A/c	Debit
	Increase in Capital	Capital A/c	Credit

B. British Approach or Double Entry System :

When one identifies the account that is getting affected by a transaction and type of that account, the next step is to apply the rules to decide whether the accounting treatment is to debit or credit that account. The Golden Rules will guide us whether the account is to be debited or credited.

There is one rule for each basic type of account i.e. personal, real and nominal. These rules are shown in the following chart.

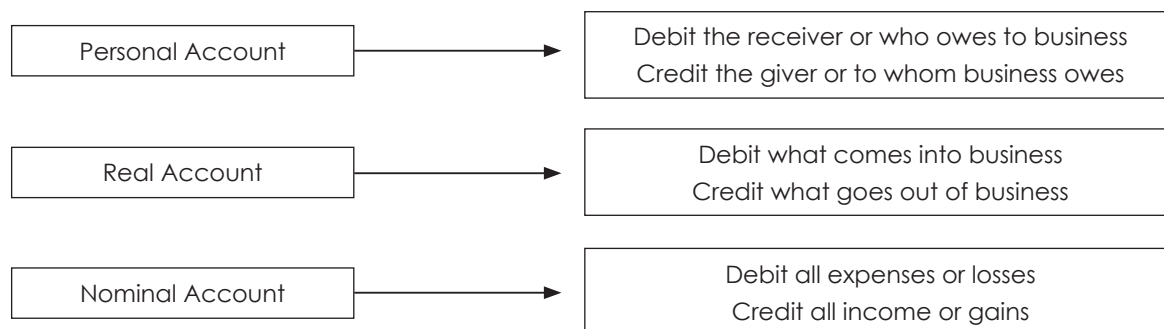


Illustration 5.

Ascertain the Debit Credit under British Approach or Double Entry System. Take Previous illustration

Solution:

	Step-I	Step-II	Step-III	Step-IV
(a)	Cash A/c Capital A/c	Real Personal	Comes in Giver	Debit Credit
(b)	Purchase A/c Cash A/c	Nominal Real	Expenses Goes out	Debit Credit
(c)	Cash A/c Sales A/c	Real Nominal	Comes in Incomes	Debit Credit
(d)	Salary A/c Cash A/c	Nominal Real	Expenses Goes out	Debit Credit
(e)	Cash A/c Interest A/c	Real Nominal	Comes in Incomes	Debit Credit
(f)	Purchase A/c Y' A/c	Nominal Personal	Expenses Giver	Debit Credit
(g)	Rent A/c Capital A/c	Nominal Personal	Expenses Giver	Debit Credit

Accounting Equations:

The whole Financial Accounting depends on Accounting Equation which is also known as Balance Sheet Equation. The basic Accounting Equation is:

$$\text{Assets} = \text{Liabilities} + \text{Owner's equity}$$

$$\left. \begin{array}{l} \text{or } A = L + P \\ \text{or } P = A - L \\ \text{or } L = A - P \end{array} \right\} \text{Where } A = \text{Assets, } L = \text{Liabilities, } P = \text{Capital}$$

While trying to do this correlation, please note that incomes or gains will increase owner's equity and expenses or losses will reduce it.

Students are advised to go through the following illustration to understand this equation properly.

Illustration 6.

Prepare an Accounting Equation from the following transactions in the books of Mr. X for January, 2013:

- 1 Invested Capital in the firm ₹ 20,000
- 2 Purchased goods on credit from Das & Co. for ₹ 2,000
- 4 Bought plant for cash ₹ 8,000
- 8 Purchased goods for cash ₹ 4,000
- 12 Sold goods for cash (cost ₹ 4,000 + Profit ₹ 2,000) ₹ 6,000.
- 18 Paid to Das & Co. in cash ₹ 1,000
- 22 Received from B. Banerjee ₹ 300 (being a debtor)
- 25 Paid salary ₹ 6,000
- 30 Received interest ₹ 5,000
- 31 Paid wages ₹ 3,000

Solution:

Effect of transaction on Assets, Liabilities and Capital

Date	Transaction	Assets =	Liabilities +	Capital
January, 2013 1	Invested Capital in the firm, ₹ 20,000	20,000	-	20,000
2	Purchased goods on credit from Das & Co. ₹ 2,000	+2,000	+2,000	-
	Revised Equation	22,000 =	2,000 +	20,000
4	Bought Plant for cash ₹ 8,000	+8,000 -8,000	-	-
	Revised Equation	22,000 =	2,000 +	20,000
8	Purchased goods for cash ₹ 4,000	+4,000 -4,000	- -	- -
	Revised Equation	22,000 =	2,000 +	20,000

Date	Transaction	Assets =	Liabilities +	Capital
12	Sold Goods for cash (Cost ₹ 4,000 + Profit ₹ 2,000)	+6,000 -4,000		+2,000
	Revised Equation	24,000	2,000 +	22,000
18	Paid to Das & Co. for ₹ 1,000	-1,000	-1,000	
	Revised Equation	23,000 =	1,000 +	22,000
22	Received from B.Banerjee for ₹ 300	+300 -300		
	Revised Equation	23,000 =	1,000 +	22,000
25	Paid salary for ₹ 6,000	- 6,000		-6,000
	Revised Equation	17,000 =	1,000 +	16,000
30	Received Interest for ₹ 5,000	+5,000		+5,000
	Revised Equation	22,000 =	1,000 +	21,000
31	Paid Wages for ₹3,000	-3,000		-3,000
	Revised Equation	19,000 =	1,000 +	18,000

Accrual Basis and Cash Basis of Accounting

(i) Accrual Basis of Accounting

Accrual Basis of Accounting is a method of recording transactions by which revenue, costs, assets and liabilities are reflected in the accounts for the period in which they accrue. This basis includes consideration relating to deferrals, allocations, depreciation and amortization. This basis is also referred to as mercantile basis of accounting. Under the Companies Act 1956, all companies are required to maintain the books of accounts according to accrual basis of accounting

(ii) Cash Basis of Accounting

Cash Basis of Accounting is a method of recording transactions by which revenues, costs, assets and liabilities are reflected in the accounts for the period in which actual receipts or actual payments are made.

Distinction between Accrual Basis of Accounting and Cash Basis of Accounting

Accrual basis of accounting differs from Cash basis of accounting in the following respects:

Basis of Distinction	Accrual Basis of Accounting	Cash Basis of Accounting
1. Prepaid/Outstanding Expenses/ accrued/unaccrued Income in Balance Sheet.	Under this, there may be prepaid/ outstanding expenses and accrued/unaccrued incomes in the Balance Sheet.	Under this, there is no prepaid/outstanding expenses or accrued/ unaccrued incomes.
2. Higher/lower Income in case of prepaid expenses and accrued income	Income Statement will show a relatively higher income	Income Statement will show lower income.
3. Higher/lower income incase of outstanding expenses and unaccrued income	Income Statement will show a relatively lower income.	Income Statement will show higher income.
4. Recognition under the Companies Act. 1956.	This basis is recognized under the Companies Act, 1956.	This basis is not recognized under the Companies Act, 1956.

5. Availability of options to an accountant to manipulate the accounts by way of choosing the most suitable method out of several alternative methods of accounting e.g. FIFO/LIFO/SLM/ WDV	Under this, an accountant has options.	Under this an accountant has no option to make a choice as such.

Hybrid or Mixed Basis

Is the combination of both the basis i.e. Cash as well as Accrual basis. Incomes are recorded on Cash basis but expenses are recorded on Accrual basis.

This is not a system of accounting on its own. It is a combination of the Cash Basis Accounting and Accrual Basis Accounting. This system is based on the concept of conservatism.

Under the hybrid system of accounting, incomes are recognised as in Cash Basis Accounting i.e. when they are received in cash and expenses are recognised on accrual basis i.e. during the accounting period in which they arise irrespective of when they are paid.

Illustration 7.

Mr. Anil Roy, a junior lawyer, provides the following particulars for the year ended 31st December, 2012:

	₹
Fees received in cash in 2013	60,000
Salary paid to Staff in 2013	8,000
Rent of office in 2013	14,000
Magazine and Journal for 2013	1,000
Travelling and Conveyance paid in 2013	3,000
Membership Fees paid in 2013	1,600
Office Expenses paid in 2013	10,000

Additional Information:-

Fees include ₹ 3,000 in respect of 2012 and fees not yet received is ₹ 7,000. Office rent includes ₹ 4,000 for previous year and rent of ₹ 2,000 not yet paid. Membership fees is paid for 2 years.

Compute his net income for the year 2013, under – (a) Cash Basis, (b) Accrual Basis and (c) Mixed or Hybrid Basis.

Solution:

Statement of Income (Cash Basis) For the year ended 31st December, 2013

Particulars	Amount (₹)	Amount (₹)
Fees received		60,000
Less :		
Salary	8,000	
Office Rent	14,000	
Magazine & Journal	1,000	
Travelling & Conveyance	3,000	
Membership Fees	1,600	

Office Expenses	10,000	37,600
Net Income		22,400

(ii)

Mr. Anil Roy

Statement of Income (Accrual Basis)

For the year ended 31st December, 2013

Particulars		Amount (₹)	Amount (₹)
Fees received		60,000	64,000
Add: Accrued fees for 2012		7,000	
		67,000	
Less: Fees for 2011 received in 2012		3,000	
Less :			
Salary		8,000	34,800
Office Rent	14,000		
Add: Outstanding rent	2,000		
	16,000		
Less: Rent for 2011 paid in 2012	4,000	12,000	
Magazine & Journal		1,000	
Travelling & Conveyance		3,000	
Membership Fees	1,600		
Less: Advance fee paid for 2013 ($\frac{1}{2} \times 1600$)	800	800	
Office Expenses		10,000	
Net Income			29,200

Mr. Anil Roy

Statement of Income (Mixed or Hybrid Basis)

For the year ended 31st December, 2013

Particulars	Amount (₹)	Amount (₹)	Amount (₹)
Fees received			60,000
Less :			
Salary		8,000	
Office Rent	14,000		
Add: Outstanding rent	2,000		
	16,000		
Less: Fees for 2011	4,000	12,000	
Magazine & Journal		1,000	
Travelling & Conveyance		3,000	
Membership Fees	1,600		
Less: Advance	800	800	
Office Expenses		10,000	34,800
Net Income			25,200

1.4 CAPITAL & REVENUE TRANSACTIONS

The concepts of capital and revenue are of fundamental importance to the correct determination of accounting profit for a period and recognition of business assets at the end of that period. The distinction affects the measurement of profit in a number of accounting periods.

Capital has been defined by economists as those assets which are used in the production of goods and rendering of services for further production of assets. In accounting, on the other hand, the capital of a business is increased by that portion of the periodic income which has not been consumed by the owner.

The relationship between capital and revenue is that of between a tree and its fruits. It is the tree which produces the fruits, and it is the fruit that can be consumed. If the tree is tendered with care, it will produce more fruits, conversely, if the tree is destroyed, there will be no more fruits. Likewise, revenue comes out of capital and capital is the source of revenue. Capital is invested by a person in the business so that it may produce revenue. Moreover, as a fruit may give birth to another new tree, different revenues may also produce further new capital.

Capital can be brought in by a person into the business in different forms-cash or kind. When capital is brought in the form of cash, it is spent away on various items of assets that make the business a running concern. Capital of the firm is thus, represented by its inventory of assets.

Capital of a business can be increased in a two fold way:

1. When the owner brings in more capital to the business; and/or
2. When the owner does not consume the entire periodic income.

When the owner brings in further capital to his business, the amount is credited to the Capital Account. Likewise, the net income for a period is credited to the Capital Account, and if his drawings are less than that income, the capital is increased by the difference. Example, Capital ₹ 500, Profit ₹ 300, drawings ₹ 350. So the revised capital will be ₹ 450 ($₹ 500 + ₹ 300 - ₹ 350$)

The difference between the two terms 'revenue' and 'receipt' should be carefully distinguished. A receipt is the inflow of money into business, whereas revenue is the aggregate exchange value received for goods and services provided to the customers.

Capital and Revenue Expenditures

Capital expenditure is the outflow of funds to acquire an asset that will benefit the business for more than one accounting period. A capital expenditure takes place when an asset or service is acquired or improvement of a fixed asset is effected. These assets are expected to provide benefits to the business in more than one accounting period and are not intended for resale in the ordinary course of business. In short, it is an expenditure on assets which is not written off completely against income in the accounting period in which it is acquired.

Revenue expenditure is the outflow of funds to meet the running expenses of a business and it will be of benefit for the current period only. A revenue expenditure is incurred to carry on the normal course of business or maintain the capital assets in a good condition.

It may be pointed out here that an expenditure need not necessarily be a payment made to somebody in cash - it may be made by the exchange of another asset, or by assuming a liability. Expenditure incurrence and expenditure recognition are distinct phenomena. Expenditure incurrence refers to the receipt of goods and services, whereas expenditure recognition is a matter to be decided whether the expenditure is of capital or revenue nature. For example, the buying of an asset is a capital expenditure but charging depreciation against profit is a revenue expenditure, over the entire life of that asset. On the application of periodicity, accrual and matching concepts, accountants identify all revenue expenditures for a given period for ascertaining profit. An expenditure which cannot be identified to a particular accounting period is considered of capital nature.

The accounting treatment of capital and revenue expenditure are as under:

Revenue expenditures are charged as an expense against profit in the year they are incurred or recognised. Capital Expenditures are capitalised-added to an Asset Account.

The following are the points of distinction between Capital Expenditure and Revenue Expenditure:

Sl. No.	Capital Expenditure	Sl. No.	Revenue Expenditure
1.	The economic benefits of Capital Expenditures are enjoyed for more than one accounting period.	1.	The economic benefits of Revenue Expenditures are enjoyed within a particular accounting period.
2.	Capital Expenditures are of non-recurring in nature.	2.	Revenue Expenditures are of recurring in nature.
3.	All Capital Expenditures eventually become Revenue Expenditures like depreciation	3.	Revenue Expenditures are not generally capital expenditures.
4.	Capital Expenditures are not matched with Capital Receipts.	4.	All Revenue Expenditures are matched with Revenue Receipts.

Rules for Determining Capital Expenditure

An expenditure can be recognised as capital if it is incurred for the following purposes:

An expenditure incurred for the purpose of acquiring long term assets (useful life is at least more than one accounting period) for use in business to earn profits and not meant for resale, will be treated as a capital expenditure. For example, if a second hand motor car dealer buys a piece of furniture with a view to use it in business; it will be a capital expenditure. But if he buys second hand motor cars, for re-sale, then it will be a revenue expenditure because he deals in second hand motor cars.

When an expenditure is incurred to improve the present condition of a machine or putting an old asset into working condition, it is recognised as a capital expenditure. The expenditure is capitalised and added to the cost of the asset. Likewise, any expenditure incurred to put an asset into working condition is also a capital expenditure.

For example, if one buys a machine for ₹ 5,00,000 and pays ₹ 20,000 as transportation charges and ₹40,000 as installation charges, the total cost of the machine comes upto ₹ 5,60,000. Similarly, if a building is purchased for ₹1,00,000 and ₹ 5,000 is spent on registration and stamp duty, the capital expenditure on the building stands at ₹1,05,000.

If an expenditure is incurred, to increase earning capacity of a business that will be considered as of capital nature. For example, expenditure incurred for shifting the factory for easy supply of raw materials. Here, the cost of such shifting will be a capital expenditure.

Preliminary expenses incurred before the commencement of business is considered capital expenditure. For example, legal charges paid for drafting the memorandum and articles of association of a company or brokerage paid to brokers, or commission paid to underwriters for raising capital.

Thus, one useful way of recognising an expenditure as capital is to see that the business will own something which qualifies as an asset at the end of the accounting period.

Some examples of Revenue Expenditure

- (i) Salaries and wages paid to the employees;
- (ii) Rent and rates for the factory or office premises;
- (iii) Depreciation on plant and machinery;
- (iv) Consumable stores;
- (v) Inventory of raw materials, work-in-progress and finished goods;
- (vi) Insurance premium;
- (vii) Taxes and legal expenses; and
- (viii) Miscellaneous expenses.

Replacement of Fixed Assets

The above rules of capital and revenue expenditure do not hold good when an existing asset is replaced

for another. If an asset is replaced with a similar kind of asset, the expenditure incurred is treated as Revenue Expenditure. For example, if a set of weighing machines in a shop becomes defective and is replaced with a similar set, the cost of replacement should be treated as revenue expenditure and it should be charged to the Profit and Loss Account. However, if an asset is replaced with an asset which is superior than the previous one, the expense is partly capital and partly revenue. For example, if a manual typewriter costing ₹ 5,000 is replaced with an electronic typewriter costing ₹ 15,000, then ₹ 5,000 will be revenue expenditure and the excess value of the new typewriter over the old one, ₹ 10,000 will be capital expenditure.

Deferred Revenue Expenditures

Deferred revenue expenditures represent certain types of assets whose usefulness does not expire in the year of their occurrence but generally expires in the near future. These type of expenditures are carried forward and are written off in future accounting periods. Sometimes, we make some revenue expenditure but it eventually becomes a capital asset (generally of an intangible nature). If one undertake substantial repairs to the existing building, the deterioration of the premises may be avoided. We may engage our own employees to do that work and pay them at prevailing wage-rate, which is of a revenue nature. If this expenditure is treated as a revenue expenditure and the current year's-profit is charged with these expenses, we are making the current year to absorb the entire expenses, though the benefit of which will be enjoyed for a number of accounting years. To overcome this difficulty, the entire expenditure is capitalised and is added to the asset account. Another example is an insurance policy. A business can pay insurance premium in advance, say, for a 3 year period. The right does not expire in the accounting period in which it is paid but will expire within a fairly short period of time (3 years). Only a portion of the total premium paid should be treated as a revenue expenditure (portion pertaining to the current period) and the balance should be carried forward as an asset to be written off in subsequent years.

Now, Preliminary Expenses are not shown in the balance Sheet as per para 56 of AS-26, it is a part of other expenses which is shown in the **Profit and Loss A/c** (Part II of Schedule III in case of a Company). It is a part of **revenue expenditure**, e.g., expenditure incurred on Scientific Research is recognized as an expense when it is incurred". In short, the whole amount of expenditure is treated as expense for the current year only and will not proportionately be transferred as deferred charge.

Capital and Revenue Receipts

A receipt of money may be of a capital or revenue nature. A clear distinction, therefore, should be made between capital receipts and revenue receipts.

A receipt of money is considered as capital receipt when a contribution is made by the proprietor towards the capital of the business or a contribution of capital to the business by someone outside the business. Capital receipts do not have any effect on the profits earned or losses incurred during the course of a year.

Additional capital introduced by the proprietor; by partners, in case of partnership firm, by issuing fresh shares, in case of a company; and, by selling assets, previously not intended for resale.

A receipt of money is considered as revenue receipt when it is received from customers for goods supplied or fees received for services rendered in the ordinary course of business, which is a result of the firm's activity in the current period. Receipts of money in the revenue nature increase the profits or decrease the losses of a business and must be set against the revenue expenses in order to ascertain the profit for the period.

The following are the points of difference between capital receipts and revenue receipts:

Sl. No.	Revenue Receipt	Sl. No.	Capital Receipt
1.	It has short-term effect. The benefit is enjoyed within one accounting period.	1.	It has long-term effect. The benefit is enjoyed for many years in future.
2.	It occurs repeatedly. It is recurring and regular.	2.	It does not occur again and again. It is non-recurring and irregular.
3.	It is shown in profit and loss account on the credit side, as an income for the year	3.	It is shown in the Balance Sheet on the liability side.
4.	It does not produce capital receipt.	4.	Capital receipt, when invested, produces revenue receipt e.g. when capital is invested by the owner, business gets revenue receipt (i.e. sale proceeds of goods etc.).

5.	This does not increase or decrease the value of asset or liability.	5.	The capital receipt decreases the value of asset or increases the value of liability e.g. sale of a fixed asset, loan from bank etc.
6.	Sometimes, expenses of capital nature are to be incurred for revenue receipt, e.g. purchase of shares of a company is capital expenditure but dividend received on shares is a revenue receipt.	6.	Sometimes expenses of revenue nature are to be incurred for such receipt e.g. on obtaining loan (a capital receipt) interest is paid until its repayment.

Capital and Revenue Profits

While ascertaining the trading profit of a business for a particular period, a proper distinction is to be made between capital and revenue profits. If profit arises out of an ordinary nature, being the outcome of the ordinary function and object of the business, it is termed as 'Revenue Profit'. But, when a profit arises out of a casual and non-recurring transaction, it is termed as Capital Profit. Revenue profit arises out of the sale of the merchandise that the business deals in.

Capital Profit arises from:

- Profit prior to incorporation;
- Premium received on issue of shares;
- Profit made on re-issue of forfeited shares;
- Redemption of Debenture at a discount;
- Profit made on sale or revaluation of a Fixed Asset.

Generally, capital profits arise out of the sale of assets other than inventory at a price more than its book value or in connection with the raising of capital or at the time of purchasing an existing business. For example, if an asset, whose book value is ₹ 5,000 on the date of sale, is sold for ₹ 6,000 then ₹ 1,000 will be considered as capital profit. Likewise, issue of shares at a premium is also a capital profit. Revenue profits are distributed to the owners of the business or transferred to General Reserve Account, being shown in the balance sheet as a retained earning. Capital profits are generally capitalised-transferred to a capital reserve account which can only be utilised for setting off capital losses in future. Capital profits of a small amount (arising out of selling of one asset) is taken to the Profit and Loss Account and added with the revenue profit-applying the concept of materiality.

Capital and Revenue Losses

While ascertaining losses, revenue losses are differentiated from capital losses, just as revenue profits are distinguished from capital profits. Revenue losses arise from the normal course of business by selling the merchantable at a price less than its purchase price or cost of goods sold or where there is a declining in the current value of inventories. Capital losses may result from the sale of assets, other than inventory for less than written down value or the diminution or elimination of assets other than as the result of use or sale (flood, fire, etc.) or in connection with raising capital of the business (issue of shares at a discount) or on the settlement of liabilities for a consideration more than its book value (debenture issued at par but redeemed at a premium). Treatment of capital losses are same as that of capital profits. Capital losses arising out of sale of fixed assets generally appear in the Profit and Loss Account (being deducted from the net profit). But other capital losses are adjusted against the capital profits. Where the capital losses are substantial, the treatment is different. These losses are generally shown on the balance sheet as fictitious assets and the common practice is to spread that over a number of accounting years as a charge against revenue profits till the amount is fully exhausted.

Illustration 9.

State whether the following are capital, revenue or deferred revenue expenditure.

- Carriage of ₹ 7,500 spent on machinery purchased and installed.
- Heavy advertising costs of ₹ 20,000 spent on the launching of a company's new product.
- ₹ 200 paid for servicing the company vehicle, including ₹ 50 paid for changing the oil.
- Construction of basement costing ₹ 1,95,000 at the factory premises.

Solution:

- Carriage of ₹ 7,500 paid for machinery purchased and installed should be treated as a Capital Expenditure.

- (ii) Advertising expenses for launching a new product of the company should be treated as a Revenue Expenditure. (As per AS-26)
- (iii) ₹ 200 paid for servicing and oil change should be treated as a Revenue Expenditure.
- (iv) Construction cost of basement should be treated as a Capital Expenditure.

Illustration 10.

Classify the following items as capital or revenue expenditure :

- (i) An extension of railway tracks in the factory area;
- (ii) Wages paid to machine operators;
- (iii) Installation costs of new production machine;
- (iv) Materials for extension to foremen's offices in the factory;
- (v) Rent paid for the factory;
- (vi) Payment for computer time to operate a new stores control system,
- (vii) Wages paid to own employees for building the foremen's offices. Give reasons for your classification.

Solution :

- (i) Expenses incurred for extension of railway tracks in the factory area should be treated as a Capital Expenditure because it will yield benefit for more than one accounting period.
- (ii) Wages paid to machine operators should be treated as a Revenue Expenditure as it will yield benefit for the current period only.
- (iii) Installation costs of new production machine should be treated as a Capital Expenditure because it will benefit the business for more than one accounting period.
- (iv) Materials for extension to foremen's offices in the factory should be treated as a Capital Expenditure because it will benefit the business for more than one accounting period.
- (v) Rent paid for the factory should be treated as a Revenue Expenditure because it will benefit only the current period.
- (vi) Payment for computer time to operate a new stores control system should be treated as Revenue Expenditure because it has been incurred to carry on the normal business.
- (vii) Wages paid for building foremen's offices should be treated as a Capital Expenditure because it will benefit the business for more than one accounting period.

Illustration 11.

State with reasons whether the following are Capital Expenditure or Revenue Expenditure:

- (i) Expenses incurred in connection with obtaining a licence for starting the factory were ₹ 10,000.
- (ii) ₹ 1,000 paid for removal of stock to a new site.
- (iii) Rings and Pistons of an engine were changed at a cost of ₹ 5,000 to get full efficiency.
- (iv) ₹ 2,000 spent as lawyer's fee to defend a suit claiming that the firm's factory site belonged to the Plaintiff. The suit was not successful.
- (v) ₹ 10,000 were spent on advertising the introduction of a new product in the market, the benefit of which will be effective during four years.
- (vi) A factory shed was constructed at a cost of ₹ 1,00,000. A sum of ₹ 5,000 had been incurred for the construction of the temporary huts for storing building materials.

Solution :

- (i) ₹ 10,000 incurred in connection with obtaining a license for starting the factory is a Capital Expenditure. It is incurred for acquiring a right to carry on business for a long period.
- (ii) ₹ 1,000 incurred for removal of stock to a new site is treated as a Revenue Expenditure because it is not enhancing the value of the asset and it is also required for starting the business on the new site.

- (iii) ₹ 5,000 incurred for changing Rings and Pistons of an engine is a Revenue Expenditure because, the change of rings and piston will restore the efficiency of the engine only and it will not add anything to the capacity of the engine.
- (iv) ₹ 2,000 incurred for defending the title to the firm's assets is a Revenue Expenditure.
- (v) ₹ 10,000 incurred on advertising is to be treated as a Revenue Expenditure. [As per As-26]
- (vi) Cost of construction of Factory shed of ₹ 1,00,000 is a Capital Expenditure, similarly cost of construction of small huts for storing building materials is also a Capital Expenditure.

Illustration 12.

State clearly how you would deal with the following in the books of a Company :

- (i) The redecoration expenses ₹ 6,000.
- (ii) The installation of a new Coffee-making Machine for ₹ 10,000.
- (iii) The building of an extension of the club dressing room for ₹ 15,000.
- (iv) The purchase of snacks & food stuff ₹ 2,000.
- (v) The purchase of V.C.R. and T.V. for the use in the club lounge for ₹ 15,000.

Solution :

- (i) The redecoration expenses of ₹ 6,000 shall be treated as a Revenue Expenditure.
- (ii) The installation of a new Coffee - Making Machine is a Capital Expenditure because it is the acquisition of an asset.
- (iii) ₹ 15,000 spent for the extension of club dressing room is a Capital Expenditure because it creates an asset of a permanent nature.
- (iv) The purchase of snacks & food stuff of ₹ 2,000 is a Revenue Expenditure.
- (v) The purchase of V.C.R. and T.V. for ₹ 15,000 is a Capital Expenditure, because it is the acquisition of assets.

2

DOUBLE ENTRY SYSTEM

Double Entry System -

Books of Prime Entry

A journal is often referred to as Book of Prime Entry or the book of original entry. In this book transactions are recorded in their chronological order. The process of recording transaction in a journal is called as 'Journalisation'. The entry made in this book is called a 'journal entry'.

Functions of Journal

- Analytical Function: Each transaction is analysed into the debit aspect and the credit aspect. This helps to find out how each transaction will financially affect the business.
- Recording Function: Accountancy is a business language which helps to record the transactions based on the principles. Each such recording entry is supported by a narration, which explain, the transaction in simple language. Narration means to narrate – i.e. to explain. It starts with the word – Being ...
- Historical Function: It contains a chronological record of the transactions for future references.

Advantages of Journal

The following are the advantages of a journal :

- Chronological Record : It records transactions as and when it happens. So it is possible to get a detailed day-to-day information.
- Minimising the possibility of errors : The nature of transaction and its effect on the financial position of the business is determined by recording and analyzing into debit and credit aspect.
- Narration : It means explanation of the recorded transactions.
- Helps to finalise the accounts : Journal is the basis of ledger posting and the ultimate Trial Balance.
- The Trial balance helps to prepare the final accounts.
- The specimen of a journal book is shown below.

Date	Particulars	Voucher number	Ledger folio	Debit amount (₹)	Credit amount (₹)
dd-mm-yy	Name of A/c to be debited Name of A/c to be credited (narration describing the transaction)	-----	Reference of page number of the A/c in ledger	-----	-----

Explanation of Journal

- Date Column: This column contains the date of the transaction.
- Particulars: This column contains which account is to be debited and which account is to be credited. It is

also supported by an explanation called narration.

- (iii) Voucher Number: This Column contains the number written on the voucher of the respective transaction.
- (iv) Ledger Folio (L.F.): This column contains the folio (i.e. page no.) of the ledger, where the transaction is posted.
- (v) Dr. Amount and Cr. Amount: This column shows the financial value of each transaction. The amount is recorded in both the columns, since for every debit there is a corresponding and equal credit.

All the columns are filled in at the time of entering the transaction except for the column of ledger folio. This is filled at the time of posting of the transaction to 'ledger'. This process is explained later in this chapter.

Example:

As per voucher no. 31 of Roy Brothers, on 10.05.2013 goods of ₹ 50000 were purchased. Cash was paid immediately. Ledger Folios of the Purchase A/c and Cash A/c are 5 and 17 respectively. Journal entry of the above transaction is given below:

In the books of Roy Brothers

Journal Entries

Date	Particulars	Voucher No.	Ledger Folio	Dr.	Cr.
				Amount (₹)	Amount (₹)
10.05.2013	Purchase A/c Dr. To, Cash A/c (Being goods purchased for Cash)	31	5 17	50,000	50,000

Illustration 13.

Let us illustrate the journal entries for the following transactions: 2012

April

- 1 Mr. Vikas and Mrs. Vaibhavi who are husband and wife start consulting business by bringing in their personal cash of ₹ 5,00,000 and ₹ 2,50,000 respectively.
- 10 Bought office furniture of ₹ 25,000 for cash. Bill No. - 2013/F/3
- 11 Opened a current account with Punjab National Bank by depositing ₹ 1,00,000
- 15 Paid office rent of ₹ 15,000 for the month by cheque to M/s Realtors Properties. Voucher No. 3
- 20 Bought a motor car worth ₹ 4,50,000 from Millennium Motors by making a down payment of ₹ 50,000 by cheque and the balance by taking a loan from HDFC Bank. Voucher No. M/13/7
- 25 Vikas and Vaibhavi carried out a consulting assignment for Avon Pharmaceuticals and raised a bill for ₹ 10,00,000 as consultancy fees. Bill No. B13/4/1 raised. Avon Pharmaceuticals have immediately settled ₹ 2,50,000 by way of cheque and the balance will be paid after 30 days. The cheque received is deposited into Bank.
- 30 Salary of one receptionist @ ₹ 5,000 per month and one officer @ ₹ 10,000 per month. The salary for the current month is payable to them.

Solution:

The entries for these transactions in a journal will look like:

In the Books of Vikash & Vaibhavi

Journal Entries

Journal Folio-1

Date	Particulars	Voucher number	L.F	Dr.	Cr.
				Amount (₹)	Amount (₹)

01-04-2013	Cash A/c Dr. To Vikas's Capital A/c To Vaibhavi's Capital A/c (Being capital brought in by the partners)		1 2 3	7,50,000	5,00,000 2,50,000
10-04-2013	Furniture A/c Dr. To Cash A/c (Being furniture purchased in cash)	2013/F/3	4 1	25,000	25,000
11-04-2013	Punjab National Bank A/c Dr. To Cash A/c (Being current account opened with Punjab National Bank by depositing cash)		5 1	1,00,000	1,00,000
15-04-2013	Rent A/c Dr. To Punjab National Bank A/c (being rent paid to Realtors Properties for the month)	3	6 5	15,000	15,000
20-04-2013	Motor Car A/c Dr. To Punjab National Bank A/c To Loan from HDFC Bank A/c (Being car purchased from Millennium Motors by paying down payment and loan arrangement)	M/13/7	7 5 8	4,50,000	50,000 4,00,000
25-04-2013	Punjab National Bank A/c Dr. Avon Pharmaceuticals A/c Dr. To Consultancy Fees A/c (Being amount received and revenue recognized for fees charged)	B13/4/1	5 9 10	2,50,000 7,50,000	10,00,000
30-04-2013	Salary A/c Dr. To Salary payable A/c (Being the entry to record salary obligation for the month)		11 12	15,000	15,000

Subsidiary Books

Although once understood, the entries are easy to be written, but if transactions are too many, it may become difficult to manage them and retrieve. Imagine there are 25 purchase transactions in a day. Because the journal will record all transaction chronologically, it may be possible that the purchase transactions could be scattered i.e. they may not all come together one after the other. Now, at the end of the day if the owner wants to know the total purchases made during the day, the accountant will spend time first to retrieve all purchase transactions from journal and then take total. This involve time.

This being the greatest limitation of journal, it is generally sub-divided into more than one journal. On what logic is such a sub-division made? It is done on the basis of similar transactions which are clubbed in a single book e.g. purchase transactions, sales transaction etc. The sub-division of journal is done as follows:

Transaction	Subsidiary Book
All cash and bank transactions	Cash Book - has columns for cash, bank and cash discount
All credit purchase of goods – only those Goods that are purchased for resale are covered here.	Purchase Day Book or Purchase register
All credit sale of goods	Sales Day Book or sales register
All purchase returns – i.e. return of goods back to suppliers due to defects	Purchase Return Book or Return Outward Book

Transaction	Subsidiary Book
All sales returns – i.e. return of goods back from customers	Sales Return Book or Return Inward Book
All bill receivables – these are bills accepted by customers to be honoured at an agreed date. This is dealt with in depth later in the study note	Bills Receivable Book
All bills payable - these are bills accepted by the business to be honoured by paying to suppliers at an agreed date.	Bills Payable Book
For all other transactions not covered in any of the above categories – i.e. purchase or sale of assets, expense accruals, rectification entries, adjusting entries, opening entries and closing entries.	Journal Proper

Let us see the formats for each of these and examples as illustration.

Recording of Cash and Bank Transactions

Cash Book

A Cash Book is a special journal which is used for recording all cash receipts and all cash payments. Cash Book is a book of original entry since transactions are recorded for the first time from the source documents. The Cash Book is larger in the sense that it is designed in the form of a Cash Account and records cash receipts on the debit side and cash payments on the credit side. Thus, the Cash Book is both a journal and a ledger.

Cash Book as the only Book of Original Entry

This Cash Book records all types of transactions even if there are some credit transactions i.e. all transactions are recorded and not like the ordinary Cash Book where only cash transactions are recorded. For non cash transactions, that will be two entries in the cash Book, ultimately that will be no effect in Cash Balance. For example, if goods are sold to Mr. X on credit for ₹ 5,000, the entries will be

			Dr.	Cr.
(1)	Cash A/c	Dr	5,000	
	To Sales A/c			5,000
(2)	X A/c	Dr	5,000	
	To Cash A/c			5,000

Although the original entry is

X A/c	Dr	5,000	
To Sales A/c			5,000

Types of Cash Book

There are different types of Cash Book as follows:

- Single Column Cash Book-** Single Column Cash Book has one amount column on each side. All cash receipts are recorded on the debit side and all cash payments on the payment side, this book is nothing but a Cash Account and there is no need to open separate cash account in the ledger.
- Double Column Cash Book-** Cash Book with Discount Column has two amount columns, one for cash and other for Discount on each side. All cash receipts and cash discount allowed are recorded on the debit side and all cash payments and discount received are recorded on the credit side.

Triple Column Cash Book- Triple Column Cash Book has three amount columns, one for cash, one for Bank and one for discount, on each side. All cash receipts, deposits into bank and discount allowed are recorded on debit side and all cash payments, withdrawals from bank and discount received are recorded on the credit

side. In fact, a triple-column cash book serves the purpose of Cash Account and Bank Account both. Thus, there is no need to create these two accounts in the ledger.

Dr. Specimen of Single Column Cash Book
Cr.

Receipts				Payments			
Date	Particulars	L.F.	Cash	Date	Particulars	L.F.	Cash

Dr. Specimen of Double Column Cash Book
Cr.

Receipts					Payments				
Date	Particulars	L.F.	Cash	Disc. Allowed	Date	Particulars	L.F.	Cash	Disc. Received

Double Column Cash Book containing contra transaction and cheque transaction

The double column Cash book has columns on both the sides of the Cash book. This cash book can have two columns on both the sides as under :

- (a) Cash and Discount Columns,
- (b) Cash and Bank columns,
- (c) Bank and Discount columns.

(I) Contra Transactions

Transactions which relates to allowing discount or receiving discount in cash after the settlement of the dues are known as Contra Transactions.

Example:

1. Cash deposited in to Bank
 Bank A/c Dr.
 To Cash A/c
2. Cash withdrawn from Bank
 Cash A/c Dr.
 To Bank A/c

(II) Cheque Transactions

When a cheque is received and no any other information at a later date about the same is given, it will be assumed that the said cheque has already been deposited into bank on the same day when it was received. Then the entry should be as under:

Bank A/c Dr.
 To Debtors/Party A/c

But if it is found that the said cheque has been deposited into the bank at a later date, then the entry will be:

- (i) When the cheque is received
 Cash A/c Dr.
 To Debtors/Party A/c
- (ii) When the same was deposited into bank at a later date
 Bank A/c Dr.
 To Cash A/c
- (iii) When the said cheque is dishonoured by the bank
 Debtors/Party A/c Dr.
 To Bank A/c

Let us see an illustration for the following cash and bank transactions in the books of Mr. Abhishek

January 1 Opening cash balance was ₹ 3,800 and bank balance was ₹ 27,500

January 4 Wages paid in cash ₹ 1,500

January 5 received cheque of ₹ 19,800 from KBK enterprises after allowing discount of ₹ 200

January 7 Paid consultancy charges by cheque for ₹ 7,500

January 10 Cash of ₹ 2,500 withdrawn from bank

January 12 Received a cheque for ₹ 4,500 in full settlement of the account of Mr. X at a discount of 10% and deposited the same into the Bank.

January 15 X's cheque returned dishonoured by the Bank

In the Books of Mr. Abhishek

Dr. Cash Book
 Cr.

Receipts						Payments					
Date	Particulars	L.F.	Cash (₹)	Bank (₹)	Discount Allowed (₹)	Date	Particulars	L.F.	Cash (₹)	Bank (₹)	Discount received (₹)
1-Jan	Opening Balance		3,800	27,500		4-Jan	Wages paid		1,500		
5-Jan	Recd from KBK			19,800	200	7-Jan	Consultancy fees			7,500	
10-Jan	Cash withdrawn		2,500			10-Jan	Cash withdrawn			2,500	
12-Jan	Mr. X			4,500	500	15-Jan	Mr. X			4,500	500
							Closing balance		4,800	37,300	
			6,300	51,800	700				6,300	51,800	500

Please note that the balance of discount columns is not taken and these are posted directly to the respective ledger account separately. The balance of cash and bank columns are posted into cash and bank accounts periodically. The posting into ledger is explained later in this chapter.

Purchase Day Book

The purchase day book records the transactions related to credit purchase of goods only. It follows that any cash purchase or purchase of things other than goods is not recorded in the purchase day book. Periodically, the totals of Purchase Day Book are posted to Purchase Account in the ledger. The specimen Purchase Day Book is given below:

In the Books of

Purchase Day Book

Date	Name of the Suppliers and details of Goods purchased	Invoice reference	L. F.	Amount (₹)	Remarks

The format for Purchase Return is exactly the same; hence separate illustration is not given.

Let us see an illustration for following transactions for a furniture shop:

1. Bought 20 tables @ ₹ 500 per table from Majestic Appliances on credit @ 12% trade discount as per invoice number 22334 on 2nd March.
2. Purchased three dozen chairs @ ₹ 250 each from Metro chairs as per invoice number 1112 on 4th March.
3. Second hand furniture bought from Modern Furnitures on credit as per invoice number 375 for ₹ 1200 on 7th March.
4. Purchased seven book racks from Mayur Furnitures for ₹ 4900 paid for in cash on 6th March.
5. Purchased Machinery for ₹ 30000 from Kirloskar Ltd on 9th March as per invoice number 37.

In the Books of Furniture Shop

Purchase Day Book

Date	Name of the Suppliers and Details of goods purchased	Invoice reference	L. F.	Amount (₹)
2nd March	Majestic Appliances 20 tables @ ₹ 500 and 12% trade discount [(20 × ₹ 500) = ₹ 10000 less 12% discount i.e., ₹ 1,200]	22334		8,800
4th March	Metro Chairs 3 dozen chairs @ 250 per chair	1112		9,000
7th March	Modern Furnitures	375		1,200
	Total			19,000

Please note that the transaction for purchase of book rack will not be entered in the purchase book as it is not purchased on credit. (Where will it go then? It will go to the cash book!). Similarly purchase of machinery will not form part of purchase book. It will be entered in Journal Proper.

Sales Day Book

The sales day book records transaction of credit sale of goods to customers. Sale of other things, even on credit, will not be entered in the sales day book but will be entered in Journal Proper. If goods are sold for cash, it will be entered in cash book. Total of sales day book is periodically posted to sales account in the ledger. The specimen of a sales day book is given below.

In the books of

Sales Day Book

Date	Particulars	Invoice reference	L. F.	Amount	Remarks

The format of sales return book is exactly the same as in the case of Purchase Day Book.

Let us see how will be the following transaction recorded in the books of a Cloth Merchant.

- 1st July Sold Tip Top clothing 50 suits of ₹ 2,200 each on two months credit on invoice number -2
- 11th July Sold to New India Woolen 100 sweaters @ ₹ 250 each on invoice number 55
- 13th July Received an order from Modern clothing for 100 trousers @ ₹ 500 at trade discount of 10%
- 17th July Sold 50 sarees to Lunkad brothers @ ₹ 750 each
- 25th July Sold T-shirts at exhibition hall for cash for ₹ 7,500

**In the books of Cloth Merchant
Sales Day Book**

Date	Particulars	Invoice reference	L. F.	Amount
1st July	Tip Top Clothing 50 suits @ ₹ 2,200	2		1,10,000
11th July	New India Woolen 100 sweaters @ ₹ 250	55		25,000
17th July	Lunkad brother 50 sarees @ ₹ 750			37,500
	Total			1,72,500

Here again, cash sales at exhibition hall are not recorded. Also, merely getting an order for goods is not a transaction to be entered in sales book.

Other Subsidiary Books – Returns Inward, Return Outward, Bills Receivable, Bills Payable.

(i) Return Inward Book- The transactions relating to goods which are returned by the customers for various reasons, such as not according to sample, or not up to the mark etc contain in this book. It is also known as Sales Return Book.

Generally when a customer returns good to suppliers he issues a Debit Note for the value of the goods returned by him. Similarly the supplier who receives those goods issues a Credit Note.

Returns Inward Day Book

Date	Particulars	Outward Invoice	L.F.	Details	Totals	Remarks

(ii) Return Outward Book- This book contains the transactions relating to goods that are returned by us to our creditors e.g. goods broken in transit, not according to the sample etc. It's also known as Purchase Return Book.

Return Outward Day Book

Date	Particulars	Debit Note	L.F.	Details	Totals	Remarks

(iii) Bills Receivable Book- It is such a book where all bills received are recorded and therefrom posted directly to the credit of the respective customer's account. The total amounts of the bills so received during the period (either at the end of the week or month) is to be posted in one sum to the debit of Bills Receivable A/c.

Bills Receivable Day Book

No. of Bills	Date of Receipt of Bill	From whom	Name of the Receiver	Name of Drawer	Name of Acceptor	Date of Bill	Due Date	L.F.	Amount of Bill	How disposed off

(iv) Bills Payable Book- Here all the particulars relating to bills accepted are recorded and therefrom posted directly to the debit of the respective creditor's account. The total amounts of the bills so accepted during the period (either at the end of the week or month) is to be posted in one sum to the credit of Bills Payable A/c.

Bills Payable Day Book

No. of Bills	Date of Acceptance	To whom given	Name of Drawer	Name of the Payee	Where Payable	Date of Bill	Term	Due Date	L.F.	Amount of Bill	How disposed off

Journal Proper

We know that usual transactions are recorded in primary books of accounts. If any transaction is not recorded in the primary books the same is recorded in Journal Proper. It includes Credit Purchase and Credit Sales of Assets;

Transfer Entries; Opening Entries; Closing Entries; Adjusting Entries and Rectification of Errors.

However, these are explained in subsequent Para.

Ledger Accounts

Ledger is the main book or principal book of account. The entries into ledger accounts travel through the route of journal and subsidiary books. The ledger book contain all accounts viz. assets, liabilities, incomes or gains, expenses or losses, owner's capital and owner's equity. The ledger is the book of final entry and hence is a permanent record. There is a systematic way in which transactions are posted into a ledger account. Once the transactions are posted for an accounting period, the ledger accounts are balanced (i.e. the difference between debit side and credit side is calculated). These balances are used to ultimately prepare the financial statement like Profit and Loss A/c and Balance Sheet. The ledger may also be divided as General ledger and Sub-ledgers. While the General Ledger will have all ledger accounts, the sub-ledgers will have individual accounts of customers and suppliers. If there are 10 customers, the general ledger will not have 10 individual accounts for each customer. Instead, these 10 customer account will exist in what is called as 'Receivables or Debtors Ledger' and the general ledger will have only one account that represents the customers. This is named as Debtors Control Account. Similar is the case of supplier accounts. Such sub-ledgers are necessary for better control over individual accounts. Also, this will avoid the general ledger from becoming too big, especially when number of customers and suppliers is large.

The specimen of a typical ledger account is given below.

Dr.				Ledger-Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)				

Ledger Posting

As and when the transaction takes place, it is recorded in the journal in the form of journal entry. This entry is posted again in the respective ledger accounts under double entry principle from the journal. This is called ledger posting.

The rules for writing up accounts of various types are as follows:

Assets	:	Increases on the left hand side or the debit side and decreases on the credit side or the right hand side.
Liabilities	:	Increases on the credit side and decreases on the debit side.
Capitals	:	The same as liabilities.
Expenses	:	Increases on the debit side and decreases on the credit side.
Incomes or gain	:	Increases on the credit side and decrease on the debit side.

To summarise

Dr.	Assets	Cr.	Dr.	Liabilities & Capital	Cr.
Increase		Decrease	Decrease		Increase
Dr.	Expenses or Loses	Cr.	Dr.	Income or Gains	Cr.
Increase		Decrease	Decrease		Increase

The student should clearly understand the nature of debit and credit.

A debit denotes:

- In the case of a person that he has received some benefit against which he has already rendered some service or will render service in future. When a person becomes liable to do something in favour of the firm, the fact is recorded by debiting that person's account : (relating to Personal Account)
- In case of goods or properties, that the value and the stock of such goods or properties has increased, (relating to Real Accounts)

- (c) In case of other accounts like losses or expenses, that the firm has incurred certain expenses or has lost money. (relating to Nominal Account)

A credit denotes:

- (a) In case of a person, that some benefit has been received from him, entitling him to claim from the firm a return benefit in the form of cash or goods or service. When a person becomes entitled to money or money's worth for any reason. The fact is recorded by crediting him (relating to Personal Account)
- (b) In the case of goods or properties, that the stock and value of such goods or properties has decreased. (relating to Real Accounts)
- (c) In case of other accounts like interest or dividend or commission received, or discount received, that the firm has made a gain (relating to Nominal Account)

At a glance:

Dr. (Debit side)	Cr. (Credit side)
DESTINATION Where the economic benefit reaches / is received.	SOURCE of each economic benefits
Receiver	Giver
What comes in	What goes out
All expense and losses	All income and gains

Let us now understand the mechanism of posting transaction into the ledger account. Consider the transaction: Rent paid in cash for ₹ 10,000. The journal entry for this transaction would be:

Jan 15	Rent A/c	Dr.	10,000	
	To, Cash A/c			10,000

We will open two ledger accounts namely Rent A/c and Cash A/c. Let us see how the posting is made

Rent Account

Dr.				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
Jan 15	To, Cash A/c		10,000				

Cash Account

Dr.				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
				Jan 15	By Rent A/c		10,000

Please observe the following conventions while posting a transaction into ledger accounts. Note that both the effects of an entry must be recorded in the ledger accounts simultaneously.

- (1) The posting in the account which is debited, is done on the debit side by writing the name of the account or accounts that are credited with the prefix 'To'.
- (2) The posting in the account which is credited, is done on the credit side by writing the name of the account or accounts that are debited with the prefix 'By'.

Let us now see how we can create ledger account for the seven journal entries that we passed for Illustration 18.

Folio No. 1

Dr.	Cash Account	Cr.

Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
1.4.2013	To Vikas's capital A/c	1	500,000	10.4.2013	By Furniture A/c	1	25,000
1.4.2013	To Vaibhavi's capital A/c	1	250,000	11.4.2013	By Punjab National Bank A/c	1	1,00,000
				30.4.2013	By Balance c/d		6,25,000
			750,000				7,50,000
1.5.2013	To Balance b/d		625,000				

Folio No. 2

Dr. Mr. Vikas's Capital Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
30.4.2013	To Balance c/d		5,00,000	1.4.2013	By Cash A/c	1	5,00,000
			5,00,000				5,00,000
				1.5.2013	By Balance b/d		5,00,000

Folio No. 3

Dr. Mrs. Vaibhavi's Capital Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
				1.4.2013	By Cash A/c	1	2,50,000

Folio No. 4

Dr. Furniture Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
10.04.2013	To Cash		25,000				

Folio No. 5

Dr. Punjab National Bank Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
11.4.2013	To Cash A/c	1	1,00,000	15.4.2013	By Rent A/c	1	15,000
25.4.2013	To Consultancy Fees A/c	1	2,50,000	20.4.2013	By Motor Car A/c	1	50,000

Folio No. 6

Dr. Rent Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
15.4.2013	To Punjab National Bank A/c	1	15,000				

Folio No. 7

Dr. Motor Car Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
20.4.2013	To Punjab National Bank A/c	1	50,000				
"	To Loan from HDFC Bank A/c	1	4,00,000				

Folio No. 8

Dr. Loan from HDFC Bank Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
				20.4.2013	By Motor Car A/c	1	4,00,000

Folio No. 9

Dr. Avon Pharmaceuticals Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
25.4.2013	To Consultancy Fees A/c	1	7,50,000				

Folio No. 10

Dr. Consultancy Fees Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
				25.4.2013	By Punjab National Bank A/c	1	2,50,000
				25.4.2013	By Avon Pharmaceuticals A/c	1	7,50,000

Folio No. 11

Dr. Salary Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
30.4.2013	To Salary payable A/c	1	15,000				

Folio No. 12

Dr. Salary Payable Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
				30.4.2013	By Salary A/c	1	15,000

Please carefully observe the posting of journal entries into various ledger accounts. Do you see some further calculation in the cash A/c and Mr. Vikas's Capital A/c? What is done is that after posting all transactions to these accounts, the difference between the debit and credit sides is calculated. This difference is put on the side with smaller amount in order to tally grand totals of both sides. The convention is to write "To Balance c/d" or "By Balance c /d" as the case may be. This procedure is normally done at the end of an accounting period. This process is called as "balancing of ledger accounts".

Once the ledgers are balanced for one accounting period, the balance needs to be carried forward to the next accounting period as a running balance. This is done by writing "To Balance b/d" or "By balance b/d" as the case may be after the grand totals. This is also shown in the Cash A/c and Mr. Vikas's Capital Account.

Could you now attempt to balance the other ledger accounts and carry the balances to the next accounting period?

Important note : Please remember that the balances of personal and real accounts only are carried down to the next accounting period as they represent resources and obligations of the business which will continue to be used and settled respectively in future. Balances of nominal accounts (which represent incomes or gains and expenses or losses) are not carried down to the next period. These balances are taken to the Profit and Loss Account (or Income statement) prepared for the period. The net result of the P & L Account will show either net income or net loss which will increase or decrease the owner's equity.

In the above example, please note that the balances of Rent A/c, Consultancy Fees Account and Salary Account will not be carried down to the next period, but to the P & L Account of that period.

Posting to Ledger Accounts from Subsidiary books

In the above section, we explained posting to ledger accounts directly on the basis of journal entries. In practice, however, we know that use of subsidiary books is in vogue. Let us see how the posting to ledger accounts is done based on these records.

For each of the subsidiary books, there is a ledger account e.g. for purchase book, there is Purchase Account, for sales book there's Sales A/c, for cash book there will be Cash A/c as well as Bank A/c and so on.

Let us continue with illustration seen in the section 1.17.3.1.3 above and post the totals into respective ledger accounts. It is considered that there was a Purchase of ₹ 19,000 and Sales of ₹ 1,72,500.

Dr. Cash Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
1st Jan	To Balance b/d		3,800		By Wages A/c		1,500
	To Bank A/c		2,500		By Balance c/d		4,800
			6,300				6,300

Dr. Purchases Account				Cr.			

Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
	To Sundries as per purchase book		19,000		By Transfer to P & L A/c		19,000

Dr. Sales Account				Cr.			
Date	Particulars	J. F.	Amount (₹)	Date	Particulars	J. F.	Amount (₹)
	To Transfer to P & L A/c		1,72,500		By Sundries as per sales book		1,72,500

Typical Ledger Account Balances

We have seen how to balance various ledger accounts. It can be seen that while some accounts will show debit balance, while the other will show credit balance. Is there any relationship between the type of account (whether it is the account of asset, liability, capital, owner's equity, incomes or gain, expenses or losses) and the kind of balance (debit or credit) it should show?

The answer is generally 'Yes'. You may test to find the following are typical relationships.

Type of Account	Type of balance
All asset accounts	Debit balance
All liability accounts	Credit balance
Capital & Owner's equity account	Credit balance
Expenses or loss accounts	Debit balance
Incomes or gain accounts	Credit balance

Let us test these possibilities for confirmation. How does one go about testing this? Consider 'Cash A/c'. Whenever business receives cash we debit it, and whenever it is paid we credit it. Is it possible to see a situation that credits to cash are more than debits? In other words could we have negative cash in hand? No. Cash account will therefore always show a debit balance. So is true for all real asset accounts. After solving problems, if the contrary is observed, there is every chance that an error has been made while passing the accounting entries.

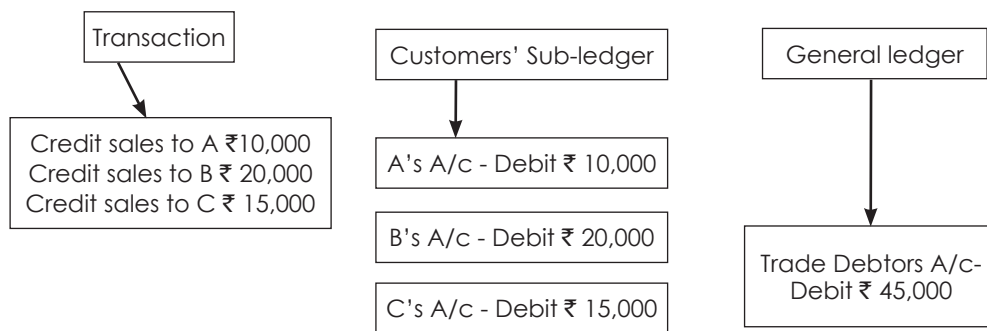
The Structure of Ledger

In practice, for the sake of convenience and ease of operations, the ledger is subdivided as follows:

- General Ledger: This contains all main ledger accounts excepting individual accounts of customers, vendors and employees. For these categories there will be only one representative account in the general ledger e.g. for customers – Trade Debtors A/c (or Trade Receivables Control A/c), for suppliers – Trade Creditors A/c (or Trade Payables A/c) etc.
- Sub-Ledgers: These are primarily, Customers' Ledger, Suppliers Ledger, Employees ledger etc. The customer ledger will have all individual accounts of all customers. Suppliers' ledger will have all individual accounts of all suppliers. Employee ledger will have individual accounts of all employees.

The balances of all individual accounts must tally with the balance reflected in the representative A/c in the general ledger. For this a periodical reconciliation is a must.

For example, if business has 3 customers A, B, and C; then an A/c for each of them is opened in the sub-ledger called Customers Ledger and General Ledger will have only one A/c by the name of Trade Debtors A/c. All transactions with each of them will be recorded in the individual accounts as well as the control ledger. See the following:



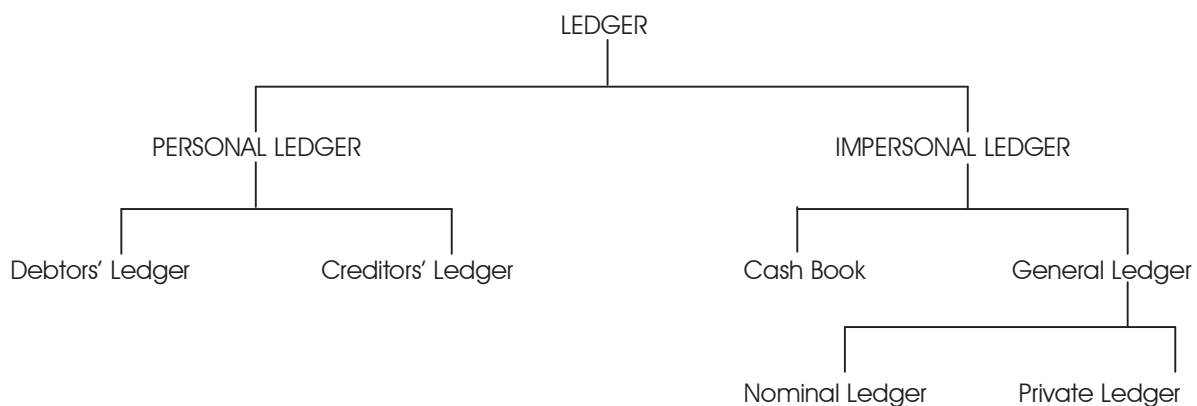
Such separation is made for better control. A person in charge of customer accounting is given responsibility of all individual customer accounting in the Customers sub-ledger, whereas another person be given responsibility for Suppliers' sub-ledger. In bigger organizations this division of labour is an absolute necessity. The person looking after General ledger is different.

Simultaneous posting of transactions into sub-ledgers A/cs and representative A/cs in general ledger may be quite tedious in manual accounting. But computerised accounting automates this process as well.

Subdivisions of Ledger

Practically, the Ledger may be divided into two groups -

(a) Personal Ledger & (b) Impersonal Ledger. They are again sub-divided as :



Personal Ledger: The ledger where the details of all transactions about the persons who are related to the accounting unit, are recorded, is called the Personal Ledger.

Impersonal Ledger: The Ledger where details of all transactions about assets, incomes & expenses etc. are recorded, is called Impersonal Ledger.

Again, Personal Ledger may be divided into two groups:

Viz. (a) Debtors' Ledger, & (b) Creditors' Ledger.

(a) **Debtors' Ledger:** The ledger where the details of transactions about the persons to whom goods are sold, cash is received, etc. are recorded, is called Debtors' Ledger.

(b) **Creditors' Ledger:** The ledger where the details of transactions about the persons from whom goods are purchased on credit, pay to them etc. are recorded, is called Creditors' Ledger.

Impersonal Ledger may, again be divided into two group, viz, (a) Cash Book; and (b) General Ledger.

(a) **Cash Book:** The Book where all cash & bank transactions are recorded, is called Cash Book.

(b) **General Ledger:** The ledger where all transactions relating to real accounts, nominal accounts, details of

Debtors' Ledger and Creditors' Ledger are recorded, is called General Ledger.

General Ledger may, again, be divided into two groups. Viz, Nominal Ledger; & Private Ledger.

- (a) **Nominal Ledger:** The ledger where all transactions relating to incomes and expenses are recorded, is called Nominal Ledger.
- (b) **Private Ledger:** The Ledger where all transactions relating to assets and liabilities are recorded, is called Private Ledger.

Advantages of sub-division of Ledger.

The advantages of sub-division of ledger are:

- (a) **Easy to Divide work :** As a result of sub-division, the division of work is possible and records can be maintained efficiently by the concerned employee.
- (b) **Easy to handle :** As a result of sub-division, the size and volume of ledger is reduced.
- (c) **Easy to collect information:** From the different classes of Ledger a particular type of transactions can easily be found out.
- (d) **Minimizations of mistakes:** As a result of sub-division, chances of mistakes are minimized.
- (e) **Easy to compute:** As a result of sub-division, the accounting work may be computed quickly which is very helpful to the management.
- (f) **Fixation of responsibility:** Due to sub-division, allotment of different types of work to different employees is done for which concerned employee will be responsible.

Trial Balance

After the transactions are posted to various ledger accounts (either from journal or from subsidiary books) and they are balanced, the next stage is to draw up the list of all balances. We know that some ledger accounts will show 'debit balance' (debit side greater than the credit side), while the other will reflect a 'credit balance' (credit side being higher than debit side). All account balances are listed to ensure that the total of all debit balances equals the total of all credit balances. Why does this happen? Remember the dual aspect concept studied earlier in this study note?. According to this concept, every debit has equal corresponding credit. This list of balances is called Trial Balance.

According to the Dictionary for Accountants by Eric. L. Kohler, Trial Balance is defined as "a list or abstract of the balances or of total debits and total credits of the accounts in a ledger, the purpose being to determine the equality of posted debits and credits and to establish a basic summary for financial statements". According to Rolland, "The final list of balances, totaled and combined, is called Trial Balance".

As this is merely a listing of balances, this will always be as on a particular date. Further it must be understood that Trial Balance does not form part of books of account, but it is a report prepared by extracting balances of accounts maintained in the books of accounts.

When this list with tallied debit and credit balances is drawn up, the arithmetical accuracy of basic entries, ledger posting and balancing is ensured. However, it does not guarantee that the entries are correct in all respect. This will be explained later in this chapter.

Although it is supposed to be prepared at the end of accounting period, computerized accounting packages are capable of providing instant Trial Balance reports even on daily basis, as the transactions are recorded almost on line.

Let us prepare the trial balance for the ledger accounts from the illustration 18.

Trial Balance as on...

Account name	Debit (₹)	Credit (₹)
Cash A/c	6,25,000	
Vikas's capital A/c		5,00,000
Vaibhavi's capital A/c		2,50,000
Furniture A/c	25,000	
Punjab National Bank A/c	2,85,000	
Rent A/c	15,000	
Motor Car	4,50,000	

Account name	Debit (₹)	Credit (₹)
Loan from HDFC A/c		4,00,000
Avon Pharmaceuticals	7,50,000	
Consultancy fees A/c		10,00,000
Salary A/c	15,000	
Salary payable A/c		15,000
Total	21,65,000	21,65,000

It can be seen that the totals of debit and credit balances is exactly matching. This is the result of double entry book-keeping wherein every debit has equal corresponding credit.

Feature's of a Trial Balance

1. It is a list of debit and credit balances which are extracted from various ledger accounts.
2. It is a statement of debit and credit balances.
3. The purpose is to establish arithmetical accuracy of the transactions recorded in the Books of Accounts.
4. It does not prove arithmetical accuracy which can be determined by audit.
5. It is not an account. It is only a statement of account.
6. It is not a part of the final statements.
7. It is usually prepared at the end of the accounting year but it can also be prepared anytime as and when required like weekly, monthly, quarterly or half-yearly.
8. It is a link between books of accounts and the Profit and Loss Account and Balance Sheet.

Preparation of Trial Balance:

1. It may be prepared on a loose sheet of paper.
2. The ledger accounts are balanced at first. They will have either "debit-balance" or "credit balance" or "nil-balance".
3. The accounts having debit-balance is written on the debit column and those having credit-balance are written on the credit column.

The sum total of both the balances must be equal, for "Every debit has its corresponding and equal credit".

Purpose of a Trial Balance

It serves the following purposes :

1. To check the arithmetical accuracy of the recorded transactions.
2. To ascertain the balance of any Ledger Account.
3. To serve as an evidence of fact that the double entry has been completed in respect of every transaction.
4. To facilitate the preparation of final accounts promptly.

Is Trial Balance indispensable?

It is a mere statement prepared by the accountants for his own convenience and if it agrees, it is assumed that at least arithmetical accuracy has been done although there may be a lot of errors.

Trial Balance is not a process of accounts, but its preparation helps us to finalise the accounts. Since it is prepared on a particular date, as at / as on is stated.

Trial Balance – Utility and Interpretation

The utility of Trial balance could be found in the following:

- (1) It forms the basis for preparation of Financial Statements i.e. Profit and Loss Account and Balance Sheet.
- (2) A tallied trial balance ensures the arithmetical accuracy of the entries made. If the trial balance does not tally, the errors can be found out, rectified and then financial statements can be prepared.
- (3) It acts as a quick reference. One can easily find out the balance in any ledger account without actually referring to the ledger.
- (4) If the listing of ledger accounts is systematically done in the trial balance, one can do quick time analysis.

Hence, listing is usually done in the sequence of Asset accounts, Liability accounts, Capital accounts, Owner's equity accounts, Income or gain accounts and Expenses or losses accounts in that order.

One can draw some quick inferences from trial balance by interpreting the same. If one plots monthly trial balances side by side, one can analyse the movement of balances in various accounts e.g. one can see how expenses are increasing or decreasing or showing a trend of movements. By comparing the owner's equity balances as on two dates, one can interpret the business result e.g. if the equity has gone up, one can interpret that business has earned net profit and vice versa.

Trial Balance and Errors

We have seen that a tallied Trial Balance (T. B.) ensures arithmetical accuracy. What does it mean? It means entries have been passed as per double entry, that every debit has equal corresponding credit. If the T.B. does not tally, there could be errors in transaction entry. Such errors are called 'Errors affecting trial balance'. These can be:

- Only one effect of a transaction is posted to ledger e.g. for rent paid in cash, if entry is posted to cash but not to rent account, then obviously the T.B. will not match.
- Posting of wrong amount in one of the ledger accounts e.g. rent of ₹ 1,000 is paid in cash. The posting to Rent A/c is done for ₹ 1,000, Cash A/c is recorded at ₹ 10,000. The T.B. will not tally.
- If one of the posting is entered twice, T.B. will not match.
- If the balance in a ledger is not correctly taken to the T.B. e.g. the Rent A/c has a balance of ₹1,000, but while taking it to the T.B. it is taken as ₹ 100, the T.B. will through up difference.
- Taking balance to the wrong side in the T.B. e.g. a debit balance of ₹ 5,00,000 in Debtors A/c is taken as credit balance in the TB, then there will be a mismatch.
- Wrong carry forwards also will result in the T.B. mismatch.

No financial statements can be prepared if the T.B. does not tally. Hence, the errors will have to be rectified before proceeding further. The accountants therefore endeavour to minimize errors by being more careful and by doing periodical scrutiny of the entries.

Errors which are not disclosed by a Trial Balance

The following errors cannot be detected by a Trial Balance :

- Errors of Omission:** When the transaction is not at all recorded in the books of accounts, i.e. neither in the debit side nor in the credit side of the account – trial balance will agree.
- Errors of Commission:** Where there is any variation in figure/amount, e.g. instead of ₹ 800 either ₹80 or ₹ 8,000 is recorded, in both sides of ledger accounts – trial balance will agree.
- Errors of Principal:** When accounts are prepared not according to double entry principle e.g. Purchase of a Plant wrongly debited to Purchase Account – Trial balance will agree.
- Errors of Misposting:** When wrong posting is made to a wrong account instead of a correct one although amount is correctly recorded, e.g., sold goods to B but wrongly debited to D's Account – trial balance will agree.
- Compensating Errors:** When one error is compensated by another error e.g. Discount Allowed ₹100 not debited to Discount Allowed Account, whereas interest received ₹100, but not credit to Interest Account – trial balance will agree.

Procedure to locate Errors:

If the Trial Balance does not agree, the following procedure should carefully be followed:

- At first, check all ledger account balance one by one.
- Addition of both the columns (Debit and Credit) should be checked.
- If any difference comes divide the same by 2 and see whether the said figure appear on the correct side or not.
- Additions of the subsidiary books, and ledger accounts to be checked up.
- Posting from subsidiary books to the ledger to be checked up.
- Opening balance of all account whether brought forward correctly or not to be checked up.
- Even if the trial balance does not agree upto this level checking should be started again from the journal

and book of original entry using tick mark.

Illustration 14.

From the following ledger account balances, prepare a Trial Balance of Mr. Sen for the year ended 31st March, 2013.

Capital ₹ 80,000 ; Sales ₹ 10,00,000; Adjusted Purchase ₹ 8,00,000; Current A/c (Cr) ₹ 10,000; Petty Cash ₹ 10,000; Sales Ledger Balance ₹ 1,20,000; Purchase Ledger Balance ₹ 60,000; Salaries ₹ 24,000; Carriage Inwards ₹ 4,000; Carriage Outward ₹ 6,000; Discount Allowed ₹ 10,000; Building ₹ 80,000; Outstanding Expenses ₹ 10,000; Prepaid Insurance ₹ 2,000 ; Depreciation ₹ 4,000 ; Cash at Bank ₹ 80,000 ; Loan A/c (Cr) ₹ 66,000; Profit & Loss A/c (Cr) ₹ 20,000; Bad Debts Recovered ₹ 2,000 ; Stock at 31.03.2013 ₹ 1,20,000; Interest Received ₹ 10,000; Accrued Interest ₹ 4,000; Investment ₹ 20,000; Provision for Bad Debts (01.04.2012) ₹ 6,000 ; General Reserve ₹ 20,000.

Solution:

Trial Balance of Mr. Sen as on 31st March, 2013

Dr.
Cr.

Heads of Accounts	Amount (₹)	Heads of Accounts	Amount (₹)
Adjusted Purchase	8,00,000	Capital	80,000
Petty Cash	10,000	Sales	10,00,000
Sales Ledger Balance	1,20,000	Current A/c	10,000
Salaries	24,000	Purchase Ledger Balance	60,000
Carriage Inward	4,000	Outstanding Expenses	10,000
Discount Allowed	10,000	Loan A/c	66,000
Building	80,000	Profit & Loss A/c (cr)	20,000
Prepaid Insurance	2,000	Bad Debts Recovered	2,000
Depreciation	4,000	Interest Received	10,000
Cash at Bank	80,000	Provision for Bad debts	6,000
Stock (31.03.2013)	1,20,000	General Reserve	20,000
Accrued Interest	4,000		
Investment	20,000		
Carriage outward	6,000		
	12,84,000		12,84,000

Note: Closing Stock will appear in Trial Balance since there is adjusted purchase.

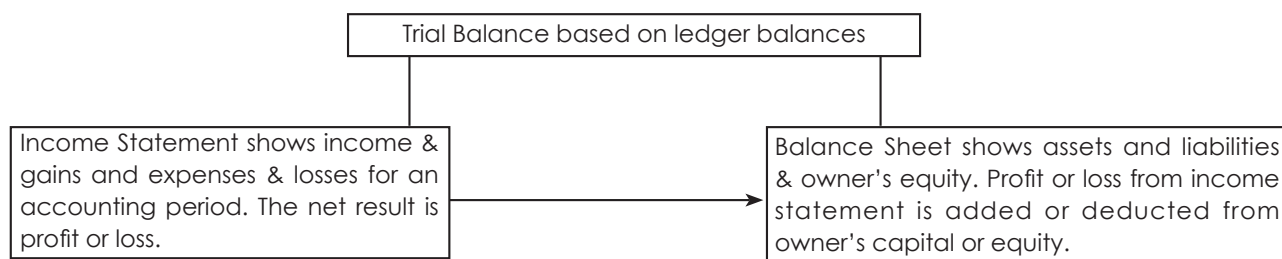
Adjusted purchase = Opening Stock + Purchase - Closing Stock.

It may be noted that if only adjusted purchase is considered then the matching concept is affected. Hence, to satisfy the matching concept, closing stock is also considered in Trial Balance.

Measurement, Valuation and Accounting Estimates

At the end of the last section, it was stated that Trial Balance forms the basis for preparing financial statements. However, there are certain other tasks that have to be completed before these final accounts are prepared. You know that accounting entries are made on the basis of actual transactions carried out during an accounting period. These are all included in the trial balance. However, there could be certain other business realities which are to be recognized as either asset, liability, income, gain, expense, loss or a combination thereof. As we know the matching concept necessitates the consideration of all aspects which may affect the financial result of the business. Technically these are called as adjustments for which entries need to be passed, without which the financial statements will not give a true and fair view of business activity. We discuss some of these entries and adjustments in the following sections.

Before discussing these, let us understand the meaning of Income Statement and Balance Sheet.



Depending on the nature of business, the income statement is prepared in different forms like:

- (a) In case of manufacturing concern, a Manufacturing, Trading and P & L A/c is prepared.
- (b) In case of a trading or service organization, a Trading and P & L A/c is prepared.

The Manufacturing or Trading Accounts show Gross margins (or gross losses) and the P & L A/c shows Net Profit or Net Loss.

The Balance Sheet exhibits the list of assets (which indicate resources owned) and the liabilities & owners' capital and equity (which shows how the resources are funded).

For company type of organizations, standard formats for P & L and Balance Sheet are given in the Companies Act that is to be adhered to. The accounting should be as per the prescribed Accounting Standards.

Closing Stock

We know when goods are purchased for resale we include them in Purchases A/c, while goods sold are shown in Sales A/c. At the end of accounting period, some of these goods may remain unsold. If we show the entire cost of purchases in income statement, it will not be as per the matching concept. We should only show the cost of those goods that are sold during the period. The balance cost should be carried forward to the next accounting period through the balance sheet. How should the closing stock be valued? According to the conservative principle, the stock is valued at lower of cost or market price. If cost of stock is ₹125000 and its realizable market price is only ₹115000, then the value considered is ₹115000 only. What it means is the difference of ₹10000 is charged off to the current periods profits.

Students are advised to refer to Accounting Standard 2 - 'Valuation of Inventories' to get thorough knowledge.

Please remember the closing stock figure does not appear in the trial balance, but is valued and directly taken to the P & L A/c. The entry passed for this is:

Closing Stock A/c Dr.
 To Trading and P & L A/c

In solving the examination problem, this entry is not actually passed, but the effect of its outcome is given. Here, one effect is "show closing stock as asset in Balance Sheet" and second effect is "show it on the credit side of Trading A/c".

Note : But, if the closing stock appears in the debit side of Trial Balance, it means it has already been adjusted against purchases. In that case, the closing stock will appear only in the asset side of the Balance Sheet.

Depreciation

When the business uses its assets to earn income, there is wear and tear of the asset life. Assets will have limited life and as we go on using it, the value diminishes. Again the question to be asked is – at what value should the asset be shown in the balance sheet? Consider a machine was bought on 1st April 2012 for ₹2,00,000. It's used for production activity throughout the year. When the final accounts are being prepared, at what value should it be shown in Balance Sheet as on 31st March 2013?

Well, according to cost principle initial entry for purchase of machine is shown at cost paid for it e.g. ₹2,00,000 in this case. But the fact that the machine is used must be recognized in financials. Hence the value in the Balance sheet must be brought down to the extent of its use. This is called as Depreciation. How is it calculated? While there are different methods of calculating depreciation (explained in subsequently), the simple idea is to spread it over the useful life of the asset, so that at the end of its life the value is zero. In our example, if useful life of the machine is taken as 10 years, the depreciation will be simply ₹2,00,000 ÷ 10 i.e. ₹20,000 every year. So a

depreciation of ₹ 20,000 will be charged to the profit of every year and value of asset will be brought down by the same value.

Students are advised to refer to Accounting Standard 6 issued by ICAI to get thorough knowledge on Depreciation accounting.

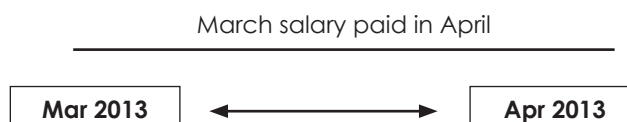
The entry passed for this is:

Depreciation A/c Dr.
 To Fixed Asset A/c

The effect given is one – include in the P & L A/c as expense for the period and two – reduce from asset value in the Balance Sheet.

Accrued Expenses or Outstanding Expenses

There may be expenses incurred for the current accounting period, but not actually paid for. The matching concept, however, necessitates that this expense must be recognized as expense for the current year and should not be deferred till its actual payment. Typically, we know salary for the month is normally paid in the 1st week of the next month. Imagine the accounting period close on 31st March. The salary for the month of March is not paid till 31st March. But as it is related to this month, it must be booked as expense for the current month and also as a liability payable in the next month (which is in next accounting period). This can be shown as follows:



The entry for this is:

Expense A/c Dr.
 To Outstanding Expense A/c or Expense payable A/c

The two effects when preparing the final accounts are:

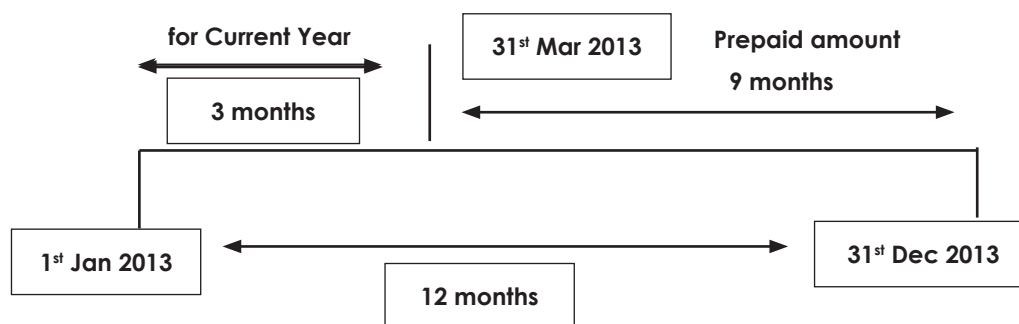
One – add in respective expense in P & L A/c and two – show as a liability in the Balance Sheet.

Prepaid Expenses

At times we may pay for certain expenses which are period related. For example, the business has taken an insurance policy against fire on which the annual premium payable is ₹ 75,000. The policy is taken on 1st January 2013 valid till 31st December 2013. But the company's accounting period ends on 31st March 2013. When considering the insurance expense for the accounting year, what amount should be considered? See the following.

As can be seen, out of the total premium period of 12 months, only 3 months are related to the current accounting period and the remaining 9 months' premium is related to the next accounting period. Hence only 3 months' premium is to be considered as expense for the current year i.e. ₹ 18750 (75000 ÷ 4).

The entry for this is:



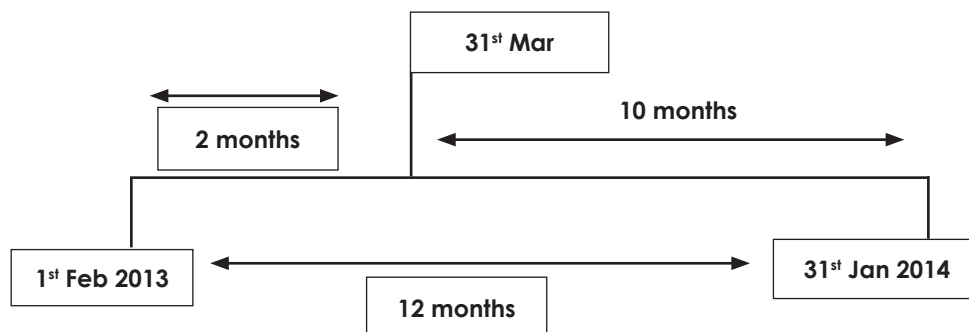
Prepaid Insurance A/c Dr.
 To Insurance A/c

The two effects while preparing final accounts are:

One – Reduce from respective expense in P & L A/c and two – show as an asset in the Balance Sheet.

Accrued Incomes

Just as expenses accrue, there are instances of income getting accrued at the end of accounting period. The extent to which it accrues, it must be booked as income for the current accounting period. Consider, the business has put a One year fixed deposit of ₹ 1,00,000 with Citi Bank at a fixed interest of 9 % p.a. on 1st February 2013 and the interest is credited by the bank on a semi-annual basis. Also, consider that the accounting period ends on 31st March 2013. The Citi bank will credit the 1st semi-annual interest on 31st July 2013 and the next on 31st January 2014. Now, consider the following:



It can be noticed that interest for the 2 months will be considered as accrued as on 31st of March 2013 and must be taken as income for the current accounting year.

The entry for this is:

Accrued Interest A/c Dr.
 To Interest A/c

The two effects while preparing final accounts are:

One – Show as income in the P & L A/c and two – show as an asset in the Balance Sheet.

Income Received in Advance

If an income is received which is not related to the current accounting period, it cannot be included in the current year's P & L A/c. So, if it's already included as income it must be reduced. The entry for this is:

Respective Income A/c Dr.
 To Income received in advance A/c

The effects while preparing final account are:

One – Reduce from respective income and two – show it as liability in Balance Sheet.

Illustration 15.

Journalize the following transactions in the books of Gaurav, post them into ledger and prepare trial balance for June 2013 :

- June 1: Gaurav started business with ₹ 10,00,000 of which 25% amount was borrowed from wife.
 June 4: Purchased goods from Aniket worth ₹ 40,000 at 20% TD and 1/5th amount paid in cash.
 June 7: Cash purchases ₹ 25,000.
 June 10: Sold goods to Vishakha ₹ 30,000 at 30% TD and received 30% amount in cash.
 June 12: Deposited cash into bank ₹ 20,000.
 June 15: Uninsured goods destroyed by fire ₹ 5,500.
 June 19: Received commission ₹ 3,500.
 June 22: Paid to Aniket ₹ 25,500 in full settlement of A/c.
 June 25: Cash stolen from cash box ₹ 1,000.
 June 27: Received from Vishakha ₹ 14,500 and discount allowed ₹ 200.
 June 30: Interest received ₹ 2,400 directly added in our bank account.

Solution:

In the books of Gaurav Journal Entries

Date	Particulars	L.F.	Dr.	Cr.
			Amount (₹)	Amount (₹)
2013 1-Jun	Cash A/c Dr. To Capital A/c To Loan from Wife A/c (Being capital brought into business)		10,00,000	7,50,000 2,50,000
4-Jun	Purchases A/c Dr. To Cash A/c To Aniket's A/c (Being goods purchased at 20% TD & 1/5th amount paid in cash)		32,000	6,400 25,600
7-Jun	Purchases A/c Dr. To Cash A/c (Being cash purchases)		25,000	25,000
10-Jun	Cash A/c Dr. Vishakha's A/c Dr. To Sales A/c (Being goods sold at 30% TD & 30% amount received in cash)		6,300 14,700	21,000
12-Jun	Bank A/c Dr. To Cash A/c (Being cash deposited in bank)		20,000	20,000
15-Jun	Loss by Fire A/c Dr. To Purchases A/c (Being uninsured goods lost by fire)		5,500	5,500
19-Jun	Cash A/c Dr. To Commission A/c		3,500	3,500

	(Being commission received)			
22-Jun	Aniket's A/c To Cash A/c To Discount A/c (Being paid to Aniket in full settlement & discount received)	Dr.	25,600	25,500 100
25-Jun	Loss by Theft A/c To Cash A/c (Being cash stolen)	Dr.	1,000	1,000
27-Jun	Cash A/c Discount A/c To Vishakha's A/c (Being amount received from Vishakha & discount allowed)	Dr.	14,500 200	14,700
30-Jun	Bank A/c To Interest A/c (Being interest received directly added into bank account)		2,400	2,400
			1,150,700	1,150,700

Dr. Cash Account				Cr.			
Date	Particulars	J.F.	Amount (₹)	Date	Particulars	J.F.	Amount (₹)
1/6/13	To Capital A/c		7,50,000	4/6/13	By Purchases A/c		6,400
1/6/13	To Loan from Wife A/c		2,50,000	7/6/13	By Purchases A/c		25,000
10/6/13	To Sales A/c		6,300	12/6/13	By Bank A/c		20,000
19/6/13	To Commission A/c		3,500	22/6/13	By Aniket's A/c		25,500
27/6/13	To Vishakha's A/c		14,500	25/6/13	By Loss by Theft A/c		1,000
				30/6/13	By Balance c/d		9,46,400
			10,24,300				10,24,300
1/7/13	To Balance b/d		9,46,400				

Dr. Capital Account				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)
30/6/13	To Balance c/d		7,50,000	1/6/13	By Cash A/c		7,50,000
			7,50,000				7,50,000
				1/7/13	By Balance b/d		7,50,000

Dr. Loan from Wife Account				Cr.			
Date	Particulars	J.F.	Amount (₹)	Date	Particulars	J.F.	Amt. (₹)
30/6/13	To Balance c/d		2,50,000	1/6/13	By Cash A/c		2,50,000
			2,50,000				2,50,000
				1/7/13	By Balance b/d		2,50,000

Dr. Purchases Account				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)

4/6/13	To Cash A/c		6,400	15/6/13	By Loss by fire		5,500
4/6/13	To Aniket's A/c		25,600	30/6/13	By Balance c/d		51,500
7/6/13	To Cash A/c		25,000				
			57,000				57,000
1/7/13	To Balance b/d		51,500				

Aniket's Account							
Dr.				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)
22/6/13	To Cash A/c		25,500	4/6/13	By Purchases A/c		25,600
22/6/13	To Discount A/c		100				
			25,600				25,600

Vishakha's Account							
Dr.				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)
10/6/13	To Sales A/c		14,700	27/6/13	By Cash A/c		14,500
				27/6/13	By Discount A/c		200
			14,700				14,700

Sales Account							
Dr.				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)
30/6/13	To Balance c/d		21,000	10/6/13	By Cash A/c		6,300
				10/6/13	By Vishakha's A/c		14,700
			21,000				21,000
				1/7/13	By Balance b/d		21,000

Bank Account							
Dr.				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)
12/6/13	To Cash A/c		20,000	30/6/13	By Balance c/d		22,400
30/6/13	To Interest A/c		2,400				
			22,400				22,400
1/7/13	To Balance b/d		22,400				

Loss by Fire Account							
Dr.				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)
15/6/13	To Purchases A/c		5,500	30/6/13	By Balance c/d		5,500
			5,500				5,500
1/7/13	To Balance b/d		5,500				

Commission Account							
Dr.				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)
30/6/13	To Balance c/d		3,500	19/6/13	By Cash A/c		3,500

			3,500			3,500
				1/7/13	By Balance b/d	3,500

Dr. Discount Account				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)
27/6/13	To Vishakha's A/c		200	22/6/13	By Aniket's A/c		100
				30/6/13	By Balance c/d		100
			200				200
1/7/13	To Balance b/d		100				

Dr. Loss by Theft Account				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)
25/6/13	To Cash A/c		1,000	30/6/13	By Balance c/d		1,000
			1,000				1,000
1/7/13	To Balance b/d		1,000				

Dr. Interest Account				Cr.			
Date	Particulars	J.F.	Amt. (₹)	Date	Particulars	J.F.	Amt. (₹)
30/6/13	To Balance c/d		2,400	30/6/13	By Bank A/c		2,400
			2,400				2,400
				1/7/13	By Balance b/d		2,400

Trial Balance as on 30.6.13

Name of Account	Dr. (₹)	Cr. (₹)
Cash A/c	9,46,400	-----
Capital A/c	-----	7,50,000
Loan from Wife A/c	-----	2,50,000
Purchases A/c	51,500	-----
Aniket's A/c	-----	-----
Vishakha's A/c	-----	-----
Sales A/c	-----	21000
Bank A/c	22,400	-----
Loss by Fire A/c	5,500	-----
Commission A/c	-----	3500
Discount A/c	100	-----
Loss by Theft A/c	1,000	-----
Interest A/c	-----	2,400
Total	10,26,900	10,26,900

3

DEPRECIATION

2.1 ACCOUNTING FOR DEPRECIATION

A business or concern holds fixed assets for regular use and not for resale. The capability of a fixed asset to render service cannot be unlimited. Except land, all other fixed assets have a limited useful life. The benefit of a fixed asset is received throughout its useful life. So its cost is the price paid for the 'Series of Services' to be received or enjoyed from it over a number of years and it should be spread over such years.

Depreciation means gradual decrease in the value of an asset due to normal wear and tear, obsolescence etc. In short, depreciation means the gradual diminution, loss or shrinkage in the utility value of an asset due to wear and tear in use, effluxion of time or introduction of technology in the market. A certain percentage of total cost of fixed assets which has expired and as such turned into expense during the process of its use in a particular accounting period.

Accounting Standard (AS-10) states that, Depreciation is allocated so as to charge a fair proportion of the depreciable amount in each accounting period during the expected useful life of the asset.

"Depreciation accounting is a system of accounting which aims to distribute the cost or other basic value of tangible capital assets, less salvage (if any), over the estimated useful life of the unit (which may be a group of assets) in a systematic and rational manner. It is a process of allocation, not of valuation. Depreciation for the year is the portion of the total charge under such a system that is allocated to the year. Although the allocation may properly take into account occurrences during the year, it is not intended to be the measurement of the effect of all such occurrences."

The above definition may be criticized as under:

- (i) It does not classify properly what is meant by systematic and rational manner. The word 'rational' may mean that it should reasonably be related to the expected benefits in any case.
- (ii) Historical cost and any other kind of cost should be allocated or not does not defined by this definition.
- (iii) Some Accountants are in a belief that depreciation is nothing but an arbitrary allocation of cost. According to them, all the conventional methods say allocation of historical cost over a number of years is arbitrary.

Certain Useful Terms

Amortization - Intangible assets such as goodwill, trademarks and patents are written off over a number of accounting periods covering their estimated useful lives. This periodic write off is known as *Amortization* and that is quite similar to depreciation of tangible assets. The term amortization is also used for writing off leasehold premises. Amortization is normally recorded as a credit to the asset account directly or to a distinct provision for depreciation account. Though the write off of intangibles that have no limited life is not approved by some Accountants, some concerns do amortize such assets on the ground of conservatism.

Depletion - This method is specially suited to mines, oil wells, quarries, sandpits and similar assets of a wasting character. In this method, the cost of the asset is divided by the total workable deposits of the mine etc. And by following the above manner rate of depreciation can be ascertained. Depletion can be distinguishable

from depreciation in physical shrinkage or lessening of an estimated available quantity and the latter implying a reduction in the service capacity of an asset.

Obsolescence – The term 'Obsolescence' refers to loss of usefulness arising from such factors as technological changes, improvement in production methods, change in market demand for the product output of the asset or service or legal or medical or other restrictions. It is different from depreciation or exhaustion, wear and tear and deterioration in that these terms refer to functional loss arising out of a change in physical condition.

Dilapidation - In one sentence Dilapidation means a state of deterioration due to old age or long use. This term refers to damage done to a building or other property during tenancy.

Nature of Depreciation

Depreciation is a term applicable in case of plant, building, equipment, machinery, furniture, fixtures, vehicles, tools etc. These long-term or fixed assets have a limited useful life, i.e. they will provide service to the entity (in the form of helping in the generation of revenue) over a limited number of future accounting periods. Depreciation implies gradual decrease in the value of an asset due to normal wear and tear, obsolescence etc. In short, depreciation means the gradual diminution, loss or shrinkage in the utility value of an asset due to wear and tear in use, effluxion of time or introduction of technology in the market. It makes a part of the cost of assets chargeable as an expense in profit and loss account of the accounting periods in which the assets helped in earning revenue.

Thus, **International Accounting Standard (IAS)-4** provides that "Depreciation is the allocation of the depreciable amount of an asset over its estimated useful life."

In Accounting Research Bulletin No. 22, **AICPA** observed that "Depreciation for the year is the portion of the total charge under such a system that is allocated to the year. Although the allocation may properly take into account occurrences during the year, it is not intended to be the measurement of the effect of all such occurrences."

Causes of Depreciation

A. Internal Causes

- (i) **Wear and tear** : Plant & machinery, furniture, motor vehicles etc. suffer from loss of utility due to vibration, chemical reaction, negligent handling, rusting etc.
- (ii) **Depletion (or exhaustion)** : The utility or resources of wasting assets (like mines etc.) decreases with regular extractions.

B. External or Economic Causes

- (i) **Obsolescence** : Innovation of better substitutes, change in market demand, imposition of legal restrictions may result into discarding an asset.
- (ii) **Inadequacy** : Changes in the scale of production or volume of activities may lead to discarding an asset.

C. Time element : With the passage of time some intangible fixed assets like lease, patents, copy-rights etc., lose their value or effectiveness, whether used or not. The word "amortization" is a better term to speak for the gradual fall in their values.

D. Abnormal occurrences : An accident, fire or natural calamity can damage the service potential of an asset partly or fully. As a result the effectiveness of the asset is affected and reduced.

Characteristics of Depreciation

The Characteristics of Depreciation are:

- (i) It is a **charge against profit**.
- (ii) It indicates **diminution in service potential**.
- (iii) It is an **estimated loss** of the value of an asset. It is not an **actual loss**.
- (iv) It depends upon different **assumptions**, like effective life and residual value of an asset.
- (v) It is a process of allocation and not of valuation.
- (vi) It arises mainly from an **internal cause** like wear and tear or depletion of an asset. But it is treated as any

expense charged against profit like rent, salary, etc., which arise due to an **external transaction**.

- (vii) Depreciation on any particular asset is **restricted** to the working life of the asset.
- (viii) It is charged on **tangible fixed assets**. It is not charged on any current asset. For allocating the costs of intangible fixed assets like goodwill, etc., a certain amount of their total costs may be charged against periodic revenues. This is known as **amortization**.

Objective and Necessity for Providing Depreciation

Eric Kohler defined depreciation as "the lost usefulness, expired utility, the diminution in service yield." Its measurement and charging are necessary for cost recovery. It is treated as a part of the expired cost for an asset. For determination of revenue, that part or cost should be matched against revenue. The objects or necessities of charging depreciation are:

- (i) **Correct calculation of cost of production:** Depreciation is an allocated cost of a fixed asset. It is to be calculated and charged correctly against the revenue of an accounting period. It must be correctly included within the cost of production.
- (ii) **Correct calculation of profits:** Costs incurred for earning revenues must be charged properly for correct calculation of profits. The consumed cost of assets (depreciation) has to be provided for correct matching of revenues with expenses.
- (iii) **Correct disclosure of fixed assets at reasonable value:** Unless depreciation is charged, the depreciable asset cannot be correctly valued and presented in the Balance Sheet. Depreciation is charged so that the Balance Sheet exhibits a true and fair view of the affairs of the business.
- (iv) **Provision of replacement cost:** Depreciation is a non-cash expense. But net profit is calculated after charging it. Through annual depreciation cash resources are saved and accumulated to provide replacement cost at the end of the useful life of an asset.
- (v) **Maintenance of capital:** A significant portion of capital has to be invested for purchasing fixed assets. The values of such assets are gradually reduced due to their regular use and passage of time. Depreciation on the assets is treated as an expired cost and it is matched against revenue. It is charged against profits. If it is not charged the profits will remain inflated. This will cause capital erosion.
- (vi) **Compliance with technical and legal requirements:** Depreciation has to be charged to comply with the relevant provisions of the Companies Act and Income Tax Act.

Note: As per Companies Act 1956, a company have to provide for depreciation on fixed assets before declaration of dividends.

Methods of Charging Depreciation

There are different concepts about the nature of depreciation. Moreover, the nature of all fixed assets cannot be the same. As a result, different methods are found to exist for charging depreciation. A broad classification of the methods may be summarized as follows:

Capital/Source of Fund

- (i) Sinking Fund Method
- (ii) Annuity Method
- (iii) Insurance Policy Method

Time Base

- (i) Fixed Installment Method
- (ii) Reducing Balance Method
- (iii) Sum of Years' Digit Method
- (iv) Double Declining Method

Use Base

- (i) Working Hours Method
- (ii) Mileage Method

(iii) Depletion Service Hours Method

(iv) Unit method

Price Base

(i) Revaluation Method

(ii) Repairs Provision Method

Some important Methods of Charging Depreciation are discussed as below :

I. Fixed/Equal Instalment OR Straight Line Method

Features:

(i) A fixed portion of the cost of a fixed asset is allocated and charged as periodic depreciation.

(ii) Such depreciation becomes an equal amount in each period.

(iii) The formula for calculation of depreciation is : $\text{Depreciation} = (V-S)/n$

Where,

V = Cost of the asset

S = Residual value or the expected scrap value of the asset n = Estimated life of the asset

Illustration: 16

Machine No.	Cost of Machine (₹)	Expenses incurred at the time of purchase to be capitalized (₹)	Estimated Residual Value (₹)	Expected Useful Life in years
1	90,000	10,000	20,000	8
2	24,000	7,000	3,100	6
3	1,05,000	20,000	12,500	3
4	2,50,000	30,000	56,000	5

Solution:

Machine No	Cost of Machine (₹)	Expenses incurred at the time of purchase to be capitalize (₹)	Total Cost of Asset = (b+c) (₹)	Estimated Residual Value (₹)	Expected Useful Life in years	Depreciation = (d-e)/f (₹)	Rate of Depreciation under SLM = (g/d)×100
a	b	c	d	e	f	g	h
1	90,000	10,000	1,00,000	20,000	8	10,000	10%
2	24,000	7,000	31,000	3,100	6	4,650	15%
3	1,05,000	20,000	1,25,000	12,500	5	22,500	18%
4	2,50,000	30,000	2,80,000	56,000	10	22,400	8%

Illustration 17.

A machine is purchased for ₹ 7,00,000. Expenses incurred on its cartage and installation ₹ 3,00,000. Calculate the amount of depreciation @ 20% p.a. according to Straight Line Method for the first year ending on 31st March, 2014 if this machine is purchased on:

(a) 1st April, 2013

(b) 1st July, 2013

(c) 1st October, 2013

(d) 1st January, 2014

Solution:

Here, Total Cost of Asset = Purchased Price + Cost of Cartage and Installation
 = ₹ 7,00,000 + ₹ 3,00,000 = ₹ 10,00,000

Amount of Depreciation:

= Total Cost of Asset × Rate of Depreciation × $\frac{\text{Period from the date of purchase to date of closing accounts}}{12}$

(a) The machine was purchased on 1st April, 2013:

$$\text{Amount of Depreciation} = ₹ 10,00,000 \times 20\% \times \frac{12}{12} = ₹ 2,00,000$$

(b) 1st July, 2013

$$\text{Amount of Depreciation} = ₹ 10,00,000 \times 20\% \times \frac{9}{12} = ₹ 1,50,000$$

(c) 1st October, 2013

$$\text{Amount of Depreciation} = ₹ 10,00,000 \times 20\% \times \frac{6}{12} = ₹ 1,00,000$$

(d) 1st January, 2014

$$\text{Amount of Depreciation} = ₹ 10,00,000 \times 20\% \times \frac{3}{12} = ₹ 50,000$$

II. Reducing / Diminishing Balance Method or Written Down Value Method

Features:

- Depreciation is calculated at a fixed percentage on the original cost in the first year. But in subsequent years it is calculated at the same percentage on the written down values gradually reducing during the expected working life of the asset.
- The rate of allocation is constant (usually a fixed percentage) but the amount allocated for every year gradually decreases.

Illustration 18.

On 1.1.2011 a machine was purchased for ₹ 1,00,000 and ₹ 50,000 was paid for installation. Assuming that the rate of depreciation was 10% on Reducing Balance Method, calculate amount of depreciation upto 31.12.2013.

Solution:

Year	Opening Book Value (₹)	Rate	Depreciation (₹)	Closing Book Value (₹)
2011	1,50,000	10%	15,000	1,35,000
2012	1,35,000	10%	13,500	1,21,500
2013	1,21,500	10%	12,150	1,09,350

Note: Cost of the machine (i.e. Opening Book Value for the year 2011)

= Cost of Purchase + Cost of Installation

= ₹ 1,00,000 + ₹ 50,000 = ₹ 1,50,000

Illustration 19.

On 1.1.11 machinery was purchased for ₹ 80,000. On 1.7.12 additions were made to the amount of ₹ 40,000. On 31.3.2013, machinery purchased on 1.7.2012, costing ₹ 12,000 was sold for ₹ 11,000 and on 30.06.2013 machinery purchased on 1.1.2014 costing ₹ 32,000 was sold for ₹ 26,700. On 1.10.2013, additions were made to the amount of ₹ 20,000. Depreciation was provided at 10% p.a. on the Diminishing Balance Method.

Show the Machinery Accounts for three years from 2011-2013. (year ended 31st December)

Solution:**Statement of Depreciation**

Date	Particulars	Machines – I Cost = ₹ 80,000		Machines – II Cost = ₹ 40,000		Machines – III Cost = ₹ 20,000	Total Depre- ciation
		₹	₹	₹	₹	₹	₹
01.01.2011	Book Value	48,000	32,000				
31.12.2011	Depreciation	4,800	3,200				8,000
01.01.2012	W.D.V.	43,200	28,800				
01.07.2012	Purchase			28,000	12,000		
31.12.2012	Depreciation	4,320	2,880	1,400	600		9,200
01.01.2013	W.D.V.	38,880	25,920	26,600	11,400		
31.03.2013	Depreciation				285		285
	W.D.V.				11,115		
	Sold For				11,000		
	Loss on sale				115		
30.06.2013	Depreciation		1,296				1,296
	W.D.V.		24,624				
	Sold For		26,700				
	Profit on Sale		2,076				
01.10.2013	Purchase					20,000	
31.12.2013	Depreciation	3,888		2,660		500	7,048
01.01.2014	W.D.V.	34,992		23,940		19,500	

Dr.

Machinery Account

Cr.

Date	Particulars	Amount (₹)	Date	Particulars	Amount (₹)
01.01.11	To, Bank A/c	80,000	31.12.11	By, Depreciation A/c	8,000
		80,000		„ Balance c/d	72,000
					80,000
01.01.12	To, Balance b/d	72,000	31.12.12	By, Depreciation A/c	9,200
01.07.12	„ Bank A/c	40,000		„ Balance c/d	1,02,800
		1,12,000			1,12,000
01.01.13	To, Balance b/d	1,02,800	31.3.13	By, Bank (Sale) A/c	11,000
30.06.13	„ P & L A/c (Profit on Sale)	2,076		„ Depreciation A/c	285
	„ Bank A/c	20,000	30.6.13	„ P & L A/c (Loss on Sale)	115
				„ Bank A/c (Sale)	26,700
			31.12.13	„ Depreciation A/c	1,296
				„ Depreciation A/c	7,048
				„ Balance c/d	78,432
		1,24,876			1,24,876

Provision for Depreciation Account

Provision of depreciation is the collected value of all depreciation. Provision of depreciation account is the account of provision of depreciation. With making of this account we are not credited depreciation in asset account, but transfer every year depreciation to provision of depreciation account. Every year we adopt this procedure and when assets are sold we will transfer sold asset's 'total depreciation' to credit side of asset account, for calculating correct profit or loss on fixed asset. This provision uses with any method of calculating depreciation.

There are following features of provision for depreciation account:

- Fixed asset is made on its original cost and every year depreciation is not transfer to fixed asset account.

- Provision of depreciation account is Conglomerated value of all old depreciation.
- This system can be used both in straight line and diminishing method of providing depreciation.

The journal entries will be :

- (i) For purchase of asset

Asset's A/c	Dr.
To Cash/Bank A/c	
- (ii) For providing depreciation at end of year

Depreciation A/c	Dr.
To Provision for depreciation A/c	
- (iii) For sale of assets

Cash/Bank A/c	Dr.
To Asset Sales A/c	
- (iv) Cost of assets sold transferred from Assets Account to Sale of Assets Account.

Assets Sales A/c	Dr.
To Asset's A/c.	
- (v) Total depreciation on asset sold transferred from provision for depreciation account.

Provision for depreciation A/c	Dr.
To Asset Sales A/c	
- (vi) Profit or loss on sale of assets will be transferred from asset sale account to Profit or Loss Account.

Disposal of an Asset

When an asset is sold because of obsolescence or inadequacy or any other reason, the cost of the asset is transferred to a separate account called "Asset Disposal Account". The following entries are to be made:

- (i) When the cost of the asset is transferred:

Asset Disposal A/c	Dr.
To, Asset A/c (original cost)	
- (ii) When depreciation provided on the asset is transferred:

Provision for Depreciation A/c	Dr.
To, Asset Disposal A/c	
- (iii) For charging depreciation for the year of sale:

Depreciation A/c	Dr.
To, Asset Disposal A/c	
- (iv) When cash received on sale of asset:

Bank/Cash A/c	Dr.
To, Asset Disposal A/c	
- (v) When loss on disposal is transferred to Profit & Loss A/c:

Profit & Loss A/c	Dr.
To, Asset Disposal A/c	
- (vi) When profit on disposal is transferred to Profit & Loss A/c:

Asset Disposal A/c	Dr.
To, Profit & Loss A/c	

Illustration 20.

S & Co. purchased a machine for ₹ 1,00,000 on 1.1.2011. Another machine costing ₹ 1,50,000 was purchased on 1.7.2012. On 31.12.2013, the machine purchased on 1.1.2011 was sold for ₹ 50,000. The company provides depreciation at 15% on Straight Line Method. The company closes its accounts on 31st December every year. Prepare – (i) Machinery A/c, (ii) Machinery Disposal A/c and (iii) Provision for Depreciation A/c.

Solution:

S & Co.

Dr.			Machinery Account			Cr.		
Date	Particulars	Amount (₹)	Date	Particulars	Amount (₹)			
1.1.2011	To, Bank A/c	1,00,000	31.12.2011	By, Balance c/d	1,00,000			
		1,00,000			1,00,000			
1.1.2012	To, Balance b/d	1,00,000	31.12.2012	By, Balance c/d	2,50,000			
1.7.2012	To, Bank A/c	1,50,000						
		2,50,000						
1.1.2013	To, Balance b/d	2,50,000	31.12.2013	By, Machinery Disposal A/c	1,00,000			
		2,50,000			31.12.2013	By, Balance c/d	1,50,000	
1.1.2014	To, Balance b/d	1,50,000			2,50,000			

Dr.			Provision for Depreciation Account			Cr.		
Date	Particulars	Amount (₹)	Date	Particulars	Amount (₹)			
31.12.2011	To, Balance c/d	15,000	31.12.2011	By, Depreciation A/c	15,000			
		15,000			15,000			
31.12.2012	To, Balance c/d	41,250	1.1.2012	By, Balance b/d	15,000			
		41,250	31.12.2012	By, Depreciation A/c (₹ 15,000 + ₹ 11,250)	26,250			
31.12.2013	To, Machinery Disposal A/c	30,000	1.1.2013	By, Balance b/d	41,250			
		33,750			31.12.2013	By, Depreciation A/c	22,500	
31.12.2013	To, Balance c/d	63,750	1.1.2014	By, Balance b/d	63,750			
					33,750			

Dr.			Machinery Disposal Account			Cr.		
Date	Particulars	Amount (₹)	Date	Particulars	Amount (₹)			
31.12.2013	To, Machinery A/c	1,00,000	31.12.2013	By, Provision for Depreciation A/c	30,000			
				By, Depreciation A/c	15,000			
				By, Bank A/c	50,000			
				By, Profit & Loss A/c(Loss on Sale)	5,000			
		1,00,000			1,00,000			

Working Notes

- Depreciation for the machine purchased on 1.7.2012
 For the year 2012 (used for 6 months) = ₹ 1,50,000 × 15% × 6/12 = ₹ 11,250
 For the year 2013 (used for full year) = ₹ 1,50,000 × 15% = ₹ 22,500

2. Depreciation for the machine purchased on 1.1.2011

$$\text{Depreciation} = ₹ 1,00,000 \times 15\% = ₹ 15,000$$

$$\text{So, Depreciation for 2 years} = ₹ 15,000 \times 2 = ₹ 30,000$$

Profit or Loss on Sale of Assets – Method of Depreciation Calculation

Sometimes an asset is sold before the completion of its useful life for some unavoidable circumstances (due to obsolescence etc.) including a part of the asset which is no longer required in future. If the sale price is less than the WDV, there will be loss, and vice versa. The profit & loss on sale of asset is adjusted in the year of Sale in Profit & Loss Account.

Accounting Treatment

a. Where no provision for depreciation account is maintained:

WDV of the amount sold will be transferred to 'Assets Disposal Account'. The entries will be as follows:

(i) WDV of asset has been transferred to Asset Disposal A/c

Asset Disposal A/c	Dr.
To Asset A/c	

(ii) In case of Sale of an Asset

Cash/Bank A/c	Dr.
To Asset Disposal A/c	

(iii) For depreciation (if any)

Depreciation (P & L A/c)	Dr.
To Asset Disposal A/c	

(iv) In case of Profit on Sale of Asset

Asset Disposal A/c	Dr.
To Profit & Loss A/c	

(v) In case of Loss on Sale of Asset

Profit & Loss A/c	Dr.
To Asset Disposal A/c	

b. Alternative Approach

In this situations, all adjustments are to be prepared through the assets account. The entries are as follows:

(i) In case of Assets sold

Cash/Bank A/c	Dr.
To Assets A/c	

(ii) In case of Depreciation

Depreciation (Profit & Loss) A/c	Dr.
To Assets A/c	

(iii) In case of Profit on Sale

Assets A/c	Dr.
To Profit & Loss	

(iv) In case of Loss on Sale

Profit & Loss A/c

Dr.

To Assets A/c

Illustration 21.

On 1st April, 2011, Som Ltd. purchased a machine for ₹66,000 and spent ₹5,000 on shipping and forwarding charges, ₹7,000 as import duty, ₹1,000 for carriage and installation, ₹500 as brokerage and ₹500 for an iron pad. It was estimated that the machine will have a scrap value of ₹ 5,000 at the end of its useful life which is 15 years. On 1st January, 2012 repairs and renewals of ₹ 3,000 were carried out. On 1st October, 2013 this machine was sold for ₹ 50,000. Prepare Machinery Account for the 3 years.

Solution:

In the books of Som Ltd.					
Dr.			Cr.		
Date	Particulars	Amount (₹)	Date	Particulars	Amount (₹)
01.04.2011	To, Bank A/c	66,000	31.03.2012	By, Depreciation A/c	5,000
	To, Bank A/c	14,000		By, Balance c/d	75,000
		80,000			80,000
01.04.2012	To, Balance b/d	75,000	31.03.2013	By, Depreciation A/c	5,000
		75,000		By, Balance c/d	70,000
					75,000
01.04.2013	To, Balance b/d	70,000	01.10.2013	By, Depreciation A/c	2,500
				By, Bank A/c (sale)	50,000
				By, Profit & Loss A/c (Loss)	17,500
		70,000			70,000

Working Note :

$$1. \quad \text{Total Cost} = ₹ 66,000 + ₹ 5,000 + ₹ 7,000 + ₹ 1,000 + ₹ 500 + ₹ 500 = ₹ 80,000$$

$$\text{Depreciation} = \frac{\text{Total Cost} - \text{Scrap Value}}{\text{Expected life}} = \frac{80,000 - 5,000}{15} = ₹ 5,000$$

The amount spent on repairs and renewals on 1st January, 2012 is of revenue nature and hence, does not form part of the cost of asset.

Change of Method

As per AS-6, the depreciation method selected should be applied consistently from period to period. Change in depreciation method should be made only in the following situations:

- For compliance of statute.
- For compliance of accounting standards.
- For more appropriate presentation of the financial statement.

Procedure to be followed in this case:

- Depreciation should be recalculated applying the new method from the date of its acquisition/ installation till the date of change of method.
- Difference between the total depreciation under the new method and the accumulated depreciation under previous method till the date of change may be surplus/ deficiency.
- The said surplus is credited to Profit & Loss Account under the head "depreciation written Back".

(iv) Deficiency is charged to Profit & Loss Account.

(v) The journal entries will be :

(a) If old value is less

Profit and Loss A/c.

Dr.

To, Assets A/c.

(b) If old value is more

Asset A/c.

Dr.

To, Profit and Loss A/c.

(vi) The above change of depreciation method should be treated as change in accounting policy and its post effect should be disclosed and quantified.

Illustration 22.

Ram Ltd. which depreciates its machinery at 10% p.a. on Diminishing Balance Method, had on 1st January, 2013 ₹ 9,72,000 on the debit side of Machinery Account.

During the year 2013 machinery purchased on 1st January, 2011 for ₹ 80,000 was sold for ₹ 45,000 on 1st July, 2013 and a new machinery at a cost of ₹ 1,50,000 was purchased and installed on the same date, installation charges being ₹ 8,000.

The company wanted to change the method of depreciation from Diminishing Balance Method to Straight Line Method with effect from 1st January, 2010. Difference of depreciation up to 31st December, 2013 to be adjusted. The rate of depreciation remains the same as before. Show Machinery Account.

Solution:

In the books of Ram Ltd.

Dr.

Machinery Account

Cr.

Date	Particulars	Amount (₹)	Date	Particulars	Amount (₹)
01.01.13	To, Balance b/d (9,07,200+64,800)	9,72,000	01.07.13	By, Depreciation A/c [W.N.3]	3,240
				By, Bank A/c - Sale	45,000
01.07.13	To, Bank A/c (1,50,000 + 8,000)	1,58,000		By, Loss on sale of Machine A/c [W.N.4]	16,560
			31.12.13	By, Depreciation A/c:	
				- For the year 2012	1,12,000
				- For ½ year [1,58,000×10%×½]	7,900
				By, Profit & Loss A/c : Adjustment	11,200
				By, Balance c/d :	
				- M ₁ (9,07,200 – 1,12,000 – 11,200)	7,84,000
				- M ₂	Nil
				- M ₃ (1,58,000 – 7,900)	1,50,100
		11,30,000			11,30,000

Working Notes :

(1) At 10% depreciation on Diminishing Balance Method :

	₹
If balance of machinery in the beginning of the year is	10
Depreciation for the year is	1

Balance of Machinery at the end of the year	2

By using the formula, balance of asset on 1st January 2010 will be calculated as follows:

	₹
Balance as on 1 st January, 2013	9,72,000
Balance as on 1 st January, 2012 is $9,72,000 \times 10/9 =$	10,80,000
Balance as on 1 st January, 2011 is $10,80,000 \times 10/9 =$	12,00,000

This balance, ₹ 12,00,000 is composed of 2 machines, one of ₹ 11,20,000 and another of ₹ 80,000.

	₹
Depreciation at 10% p.a. on Straight Line Method on ₹ 11,20,000	1,12,000
Total Depreciation for 2011 and 2012 (₹ 1,12,000 x 2)	2,24,000
Total Depreciation charged for 2011 and 2012 on Diminishing Balance Method (1,12,000 + 1,00,800)	2,12,800
Balance to be charged in 2013 to change from Diminishing Balance Method to Straight Line Method	11,200

- (2) Machine purchased on 1st January, 2011 for ₹ 80,000 shows the balance of ₹ 64,800 on 1st January 2013 as follows :

	₹
Purchase price	80,000
Less : Depreciation for 2011	8,000
	72,000
Less : Depreciation for 2012	7,200
Balance as on Jan. 1, 2013	64,800

- (3) On second machine (original purchase price ₹ 80,000), depreciation at 10% p.a. on ₹ 64,800 for 6 months, viz., ₹ 3,240 has been charged to the machine on July 1 2013 i.e., on date of sale.

- (4) Loss on sale of (ii) machine has been computed as under:

	₹
Balance of the machine as on 1.1.2013	64,800
Less : Depreciation for 6 months up to date of sale	3,240
Balance on date of sale	61,560
Less : Sale proceeds	45,000
Loss on sale	16,560

Illustration 23.

M/s. Hot and Cold commenced business on 01.07.2008. When they purchased a new machinery at a cost of ₹ 8,00,000. On 01.01.2010 they purchased another machinery for ₹ 6,00,000 and again on 01.10.2012 machinery costing ₹ 15,00,000 was purchased. They adopted a method of charging depreciation @ 20% p.a. on diminishing balance basis.

On 01.07.2012, they changed the method of providing depreciation and adopted the method of writing off the Machinery Account at 15% p.a. under straight line method with retrospective effect from 01.07.2008, the adjustment being made in the accounts for the year ended 30.06.2013.

The depreciation has been charged on time basis. You are required to calculate the difference in depreciation to be adjusted in the Machinery on 01.07.2012, and show the Machinery Account for the year ended 30.06.2013.

Solution:

In the books of M/s Hot and Cold

Dr. Machinery Account			Cr.		
Date	Particulars	Amount ₹	Date	Particulars	Amount ₹
01.07.12	To, Balance b/d	6,73,280	30.6.13	By Depreciation A/c	3,78,750
	To, Profit and Loss A/c (Depreciation Overcharged)	21,720		By Balance c/d	18,16,250
01.10.12	To, Bank A/c (Purchase)	15,00,000			
		21,95,000			21,95,000

Workings:**1. Statement of Depreciation:**

Date	Particulars	Machine – I ₹	Machine – II ₹	Total Depreciation ₹
01.07.2008	Book Value	8,00,000		
30.06.2009	Depreciation @ 20%	1,60,000		1,60,000
01.07.2009	W.D.V.	6,40,000		
01.01.2010	Bank (Purchase)		6,00,000	
30.06.2010	Depreciation @ 20%	1,28,000	60,000	1,88,000
01.07.2010	W.D.V.	5,12,000	5,40,000	
30.06.2011	Depreciation @ 20%	1,02,400	1,08,000	2,10,400
01.07.2011	W.D.V.	4,09,600	4,32,000	
30.06.2012	Depreciation @ 20%	81,920	86,400	1,68,320
01.07.2012	W.D.V.	3,27,680	3,45,600	
		6,73,280		7,26,720

2. Depreciation Overcharged:

Now depreciation under Straight Line Method

On ₹ 8,00,000 @ 15% = ₹ 1,20,000 × 4 years (from 01.07.2008 to 30.06.2012)	₹ 4,80,000
On ₹ 6,00,000 @ 15% = ₹ 90,000 × 2.5 years (from 01.01.2010 to 30.06.2012)	₹ 2,25,000
	₹ 7,05,000

Depreciation overcharged = Reducing Balance Basis – Straight Line Basis
= ₹ (7,26,720 – 7,05,000)
= ₹ 21,720

3. Depreciation for the year:

On ₹ 14,00,000 @ 15% for the year	₹ 2,10,000
On ₹ 15,00,000 @ 15% for the 9 months	₹ 1,68,750
	₹ 3,78,750

4

FINAL ACCOUNTS

3.1 INTRODUCTION

Preparation of final accounts is the final destination of the accounting process. As discussed earlier these final accounts include two statements – Income statement which reflects the outcome of business activities during an accounting period (i.e. profit or loss) and the balance sheet which show the position of the business at the end of the accounting period (i.e. resources owned as assets and sources of funds as liabilities plus capital). The objective of financial statements is to provide information about the financial strength, performance and changes in financial position of an enterprise that is useful to a wide range of users in making economic decisions. Financial statements should be understandable, relevant, reliable and comparable. Reported assets, liabilities and equity are directly related to an organization's financial position. Reported income and expenses are directly related to an organization's financial performance.

Financial statements are intended to be understandable by readers who have “a reasonable knowledge of business and economic activities and accounting and who are willing to study the information diligently”.

In this chapter, we will see how conceptually these statements are prepared and what each of them contains.

3.2 PREPARATION OF FINANCIAL STATEMENTS

Profitability Statement – This statement is related to a complete accounting period. It shows the outcome of business activities during that period in a summarized form. The activities of any business will include purchase, manufacture, and sell.

Balance Sheet – Business needs some resources which have longer life (say more than a year).

Such resources are, therefore, not related to any particular accounting period, but are to be used over the useful life thereof. The resources do not come free. One requires finance to acquire them. This funding is provided by owners through their investment, bank & other through loans, suppliers by way of credit terms. The Balance Sheet shows the list of resources and the funding of the resources i.e. assets and liabilities (towards owners and outsiders). It is also referred as sources of funds (i.e. liabilities & capital) and application of funds (i.e. assets). Let us discuss these statements in depth.

Trading Account: It is an account which is prepared by a merchandising concern which purchases goods and sells the same during a particular period. The purpose of it to find out the gross profit or gross loss which is an important indicator of business efficiency.

The following items will appear in the debit side of the Trading Account:

- (i) **Opening Stock:** In case of trading concern, the opening stock means the finished goods only. The amount of opening stock should be taken from Trial Balance.
- (ii) **Purchases:** The amount of purchases made during the year. Purchases include cash as well as credit purchase. The deductions can be made from purchases, such as, purchase return, goods withdrawn by the proprietor, goods distributed as free sample etc.

(iii) **Direct expenses:** It means all those expenses which are incurred from the time of purchases to making the goods in suitable condition. This expenses includes freight inward, octroi, wages etc.

(iv) **Gross profit:** If the credit side of trading A/c is greater than debit side of trading A/c gross profit will arise.

The following items will appear in the credit side of Trading Account:

- (i) **Sales Revenue:** The sales revenue denotes income earned from the main business activity or activities. The income is earned when goods or services are sold to customers. If there is any return, it should be deducted from the sales value. As per the accrual concept, income should be recognized as soon as it is accrued and not necessarily only when the cash is paid for. The Accounting standard 7 (in case of contracting business) and Accounting standard 9 (in other cases) define the guidelines for revenue recognition. The essence of the provisions of both standards is that revenue should be recognized only when significant risks and rewards (vaguely referred to as ownership in goods) are transferred to the customer. For example, if an invoice is made for sale of goods and the term of sale is door delivery; then sale can be recognized only on getting the proof of delivery of goods at the door of customer. If such proof is pending at the end of accounting period, then this transaction cannot be taken as sales, but will be treated as unearned income.
- (ii) **Closing Stocks:** In case of trading business, there will be closing stocks of finished goods only. According to convention of conservatism, stock is valued at cost or net realizable value whichever is lower.
- (iii) **Gross Loss:** When debit side of trading account is greater than credit side of trading account, gross loss will appear.

Dr		Trading Account for the year ended		Cr	
Particulars	Amount	Particulars	Amount		
Opening stock:		Sales			
Finished goods		less sales returns			
Purchases		Closing stock			
Less: purchase returns		Finished goods			
Gross Profit		Gross Loss			
(transferred to P & L A/c)		(transferred to P & L A/c)			
Total		Total			

Preparation of Trading Account

Illustration 1.

Following are the ledger balances presented by M/s. P. Sen as on 31st March 2013.

Particulars	Amount (₹)	Particulars	Amount (₹)
Stock (1.4.2012)	10,000	Sales	3,00,000
Purchase	1,60,000	Return Inward	16,000
Carriage Inwards	10,000	Return Outward	10,000
Wages	30,000	Royalty on Production	6,000
Freight	8,000	Gas and Fuel	2,000

Additional Information:

- (1) Stock on 31.3.2013: (i) Market Price ₹ 24,000; (ii) Cost Price ₹ 20,000;
- (2) Stock valued ₹ 10,000 were destroyed by fire and insurance company admitted the claim to the extent of ₹ 6,000.
- (3) Goods purchased for ₹ 6,000 on 29th March, 2013, but still lying in-transit, not at all recorded in the books.
- (4) Goods taken for the proprietor for his own use for ₹ 3,000.
- (5) Outstanding wages amounted to ₹ 4,000.
- (6) Freight was paid in advance for ₹ 1,000.

Solution:

**In the books of M/s. P. Sen
Trading Account
For the year ended 31st March, 2013.**

Dr.

Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To Opening Stock		10,000	By, Sales	3,00,000	
To Purchase	1,60,000		Less: Return Inward	16,000	2,84,000
Less: Return Outward	10,000				
	1,50,000		By, Closing Stock	20,000	
Less: Goods taken by Proprietor	3,000		Add: Stock Destroyed	10,000	
	1,47,000			30,000	
Add: Goods-in-transit	6,000	1,53,000	Add: Goods-in-Transit	6,000	36,000
To Wages	30,000				
Add: Outstanding	4,000	34,000			
To, Carriage Inwards		10,000			
To, Freight	8,000				
Less: Prepaid	1,000	7,000			
To, Royalty on production		6,000			
To, Gas & fuel		2,000			
To, Profit & Loss A/c.		98,000			
- Gross profit transferred					
		3,20,000			3,20,000

Note: (a) Stock should be valued as per cost price or market price whichever is lower.

(b) The claim which was admitted by insurance company and the loss of stock, will not appear in Trading Account.

Profit and Loss Account:

The following items will appear in the debit side of the Profit & Loss A/c:

- (i) **Cost of Sales:** This term refers to the cost of goods sold. The goods could be manufactured and sold or can be directly identified with goods.
- (ii) **Other Expenses:** All expenses which are not directly related to main business activity will be reflected in the P & L component. These are mainly the Administrative, Selling and distribution expenses. Examples are salary to office staff, salesmen commission, insurance, legal charges, audit fees, advertising, free samples, bad debts etc. It will also include items like loss on sale of fixed assets, interest and provisions. Students should be careful to include accrued expenses as well.
- (iii) **Abnormal Losses:** All abnormal losses are charged against Profit & Loss Account. It includes stock destroyed by fire, goods lost in transit etc.

The following items will appear in the credit side of Profit & Loss A/c:

- (i) **Revenue Incomes:** These incomes arise in the ordinary course of business, which includes commission received, discount received etc.
- (ii) **Other Incomes:** The business will generate incomes other than from its main activity. These are purely incidental. It will include items like interest received, dividend received, etc. The end result of one component of the P & L A/c is transferred over to the next component and the net result will be transferred to the balance sheet as addition in owners' equity. The profits actually belong to owners of business. In case of company organizations, where ownership is widely distributed, the profit figure is separately shown in balance sheet.

Dr

Profit and Loss Account for the year ended

Cr

Particulars	Amount	Particulars	Amount
Gross Loss		Gross Profit	
(transferred from Trading A/c)		(transferred from Trading A/c)	
Administrative expenses		Other Income	
Office salaries		Interest received	
Communication		Commission received	
Travel & Conveyance		Profit on sale of assets	
Office rent		Rent received	
Depreciation of office assets		Net loss	
Audit fees			
Insurance			
Repairs & maintenance			
Selling & Distribution expenses			
Advertising			
Salesmen commission			
Delivery van expenses/Depreciation on delivery vans/Bad debts			
Financial expenses			
Bank charges			
Interest on loans			
Loss on sale of assets			
Net profit			
Total		Total	

Preparations of Profit & Loss Account

Illustration 2.

From the following particulars presented by Sri Tirlhankar for the year ended 31st March 2013, Prepare Profit and Loss Account.

Gross Profit ₹ 1,00,000, Rent ₹ 22,000; Salaries, ₹ 10,000; Commission (Cr.) ₹ 12,000; Insurance ₹ 8,000; Interest (Cr.) ₹ 6,000; Bad Debts ₹ 2,000; Provision for Bad Debts (1.4.2012) ₹ 4,000; Sundry Debtors ₹40,000; Discount Received ₹2,000; Plant & Machinery ₹ 80,000.

Adjustments:

- Outstanding salaries amounted to ₹ 4,000;
- Rent paid for 11 months;
- Interest due but not received amounted to ₹ 2,000
- Prepaid Insurance amounted to ₹ 2,000;
- Depreciate Plant and Machinery by 10% p.a.
- Further Bad Debts amounted to ₹ 2,000 and make a provision for Bad Debts @5% on Sundry Debtors.
- Commissions received in advance amounted to ₹ 2,000.

Solution

In the Books of Sri Tirlhankar

**Profit and Loss Account
for the year ended 31st March 2013**

Dr.

Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To Rent	22,000		By Trading A/c.		1,00,000
Add: Outstanding	2,000	24,000	-Gross Profit		
" Salaries	10,000		" Commission	12,000	
Add: Outstanding	4,000	14,000	Less: Received in advance	2,000	10,000
" Insurance	8,000		" Interest	6,000	
Less: Prepaid	2,000	6,000	Add: Accrued Interest	2,000	8,000
" Bad Debts	2,000				
Add: further Bad Debts	2,000	4,000	" Discount received		2,000
" Depreciation on Plant & Machinery @10% on ₹ 80,000		8,000	" Provisions for Bad Debts	4,000	
" Capital A/c. (Net Profit Transferred)		66,100	Less: New Provision @ 5% on (₹ 40,000 – ₹ 2,000)	1,900	2,100
		1,22,100			1,22,100

Profit and Loss Appropriation Account

We know that the net profit or loss is added to or deducted from owner's equity. The net profit may be used by the business to distribute dividends, to create reserves etc. In order to show these adjustments, a P & L Appropriation A/c is maintained. Distribution of profits is only appropriation and does not mean expenses. After passing such distribution entries, the remaining surplus is added in owner's equity.

The format of P & L Appropriation A/c is given below

Dr.

Profit and Loss Appropriation Account for the year ended _____

Cr.

Particulars	Amount	Particulars	Amount
To Proposed dividend		By Net profit transferred from P & L A/c	
To Transfer to General Reserve			
To Surplus carried to Capital A/c			
Total		Total	

Illustration 3.

X,Y and Z are three Partners sharing profit and Losses equally. Their capital as on 01.04.2012 were: X ₹ 80,000 ; Y ₹ 60,000 and Z ₹ 50,000.

They mutually agreed on the following points (as per partnership deed)

(a) Interest on capital to be allowed @ 5% P.a. (b) X to be received a salary @ ₹ 500 p.m. (c) Y to be received a commission @ 4% on net profit after charging such commission. (d) After charging all other items 10% of the net profit to be transferred General Reserve.

Profit from Profit and Loss Account amounted to ₹ 66,720. Prepare a Profit and Loss Appropriation Account for the year ended 31st March, 2013.

Solution:

**In the books of X,Y and Z
Profit and Loss Appropriation Account**

Dr.

For the year ended 31st March, 2013

Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To, Interest on Capital:			By, Profit and Loss A/c		66,720
X	4,000				
Y	3,000				
Z	2,500	9,500			
“ Salaries					
X : (₹500 x 12)		6,000			
“ Commission					
Y		1,970 ¹			
“ General Reserve		4,925 ²			
“ Net Divisible Profit					
X	14,775				
Y	14,775				
Z	14,775	44,325			
		66,720			66,720

Workings:

1. **Net Profit before charging Y's Commission** = ₹ (66,720 – 15,500) = ₹ 51,220
 Less: Y's Commission @ 4% i.e.- $\left(\frac{4}{104} \times ₹ 51,220\right)$ = ₹ 1,970
49,250

2. **Transfer to General Reserve** = ₹ 49,250 x 10% = ₹ 4,925

Balance Sheet: Horizontal format of Balance Sheet is also used by the business other than company

A. Liabilities

(a) Capital: This indicates the initial amount the owner or owners of the business contributed. This contribution could be at the time of starting business or even at a later stage to satisfy requirements of funds for expansion, diversification etc. As per business entity concept, owners and business are distinct entities, and thus, any contribution by owners by way of capital is liability.

(b) Reserves and Surplus: The business is a going concern and will keep making profit or loss year by year. The accumulation of these profit or loss figures (called as surpluses) will keep on increasing or decreasing owners' equity. In case of non-corporate forms of business, the profits or losses are added to the capital A/c and not shown separately in the balance sheet of the business.

(c) Long Term or Non-Current Liabilities: These are obligations which are to be settled over a longer period of time say 5-10 years. These funds are raised by way of loans from banks and financial institutions. Such borrowed funds are to be repaid in installments during the tenure of the loan as agreed. Such funds are usually raised to meet financial requirements to procure fixed assets. These funds should not be generally used for day-to-day business activities. Such loan are normally given on the basis of some security from the business e.g. against a charge on the fixed assets. So, long term loan are called as "Secured Loan" also.

(d) Short Term or Current Liabilities: A liability shall be classified as Current when it satisfies any of the following :

- It is expected to be settled in the organisation's normal Operating Cycle,
- It is held primarily for the purpose of being traded,
- It is due to be settled within 12 months after the Reporting Date, or
- The organization does not have an unconditional right to defer settlement of the liability for at least 12 months after the reporting date (Terms of a Liability that could, at the option of the counterparty, result in its settlement by the issue of Equity Instruments do not affect its classification)

Current liabilities comprise of :

- (i) Sundry Creditors** - Amounts payable to suppliers against purchase of goods. This is usually settled within 30-180 days.

- (ii) **Advances from customers** – At times customer may pay advance i.e. before they get delivery of goods. Till the business supplies goods to them, it has an obligation to pay back the advance in case of failure to supply. Hence, such advances are treated as liability till the time they get converted to sales.
- (iii) **Outstanding Expenses:** These represent services procured but not paid for. These are usually settled within 30–60 days e.g. phone bill of Sept is normally paid in Oct.
- (iv) **Bills Payable:** There are times when suppliers do not give clean credit. They supply goods against a promissory note to be signed as a promise to pay after or on a particular date.
- These are called as bills payable or notes payable.
- (v) **Bank Overdrafts:** Banks may give fund facilities like overdraft whereby, business is permitted to issue cheques up to a certain limit. The bank will honour these cheques and will recover this money from business. This is a short term obligation.

B. Assets

In accounting language, all debit balances in personal and real accounts are called as assets. Assets are broadly classified into fixed assets and current assets.

(a) **Fixed Assets:** These represent the facilities or resources owned by the business for a longer period of time. The basic purpose of these resources is not to buy and sell them, but to use for future earnings. The benefit from use of these assets is spread over a very long period. The fixed assets could be in tangible form such as buildings, machinery, vehicles, computers etc, whereas some could be in intangible form viz. patents, trademarks, goodwill etc. The fixed assets are subject to wear and tear which is called as depreciation. In the balance sheet, fixed assets are always shown as "original cost less depreciation".

(b) **Investments:** These are funds invested outside the business on a temporary basis. At times, when the business has surplus funds, and they are not immediately required for business purpose, it is prudent to invest it outside business e.g. in mutual funds or fixed deposit. The purpose is to earn a reasonable return on this money instead of keeping them idle. These are assets shown separately in balance sheet.

Investments can be classified into Current Investments and Non-current Investments.

Non-current Investments are investments which are restricted beyond the current period as to sale or disposal.

Whereas, current investments are investments that are by their nature readily realizable and is intended to be held for not more than one year from the date on which such investment is made.

(c) **Current Assets:** An asset shall be classified as Current when it satisfies any of the following :

- It is expected to be realised in, or is intended for sale or consumption in the organisation's normal Operating Cycle,
- It is held primarily for the purpose of being traded,
- It is due to be realised within 12 months after the Reporting Date, or
- It is Cash or Cash Equivalent unless it is restricted from being exchanged or used to settle a Liability for at least 12 months after the Reporting Date.

Current assets comprise of:

(i) **Stocks:** This includes stock of raw material, semi-finished goods or WIP, and finished goods.

Stocks are shown at lesser of the cost or market price. Provision for obsolescence, if any, is also reduced. Generally, stocks are physically counted and compared with book stocks to ensure that there are no discrepancies. In case of discrepancies, the same are adjusted to P & L A/c and stock figures are shown as net of this adjustment.

(ii) **Debtors:** They represent customer balances which are not paid. The bad debts or a provision for bad debt is reduced from debtors and net figure is shown in balance sheet.

(iii) **Bills receivables:** Credit to customers may be given based on a bill to be signed by them payable to the business at an agreed date in future. At the end of accounting period, the bills accepted but not yet paid are shown as bills receivables.

(iv) **Cash in Hand:** This represents cash actually held by the business on the balance sheet date. This cash may

be held at various offices, locations or sites from where the business activity is carried out. Cash at all locations is physically counted and verified with the book balance. Discrepancies if any are adjusted.

(v) Cash at Bank: Dealing through banks is quite common. Funds held as balances with bank are also treated as current asset, as it is to be applied for paying to suppliers. The balance at bank as per books of accounts is always reconciled with the balance as per bank statement, the reasons for differences are identified and required entries are passed.

(vi) Prepaid Expenses: They represent payments made against which services are expected to be received in a very short period.

(vii) Advances to suppliers: When amounts are paid to suppliers in advance and goods or services are not received till the balance sheet date, they are to be shown as current assets. This is because advances paid are like right to claim the business gets.

Please note that both current assets and current liabilities are used in day-to-day business activities. The current assets minus current liabilities are called as working capital or net current assets. The following report is usual horizontal form of balance sheet. Please note that the assets are normally shown in descending order of their liquidity. Also, capital, long term liabilities and short term liabilities are shown in that order.

In case other than Company :

Liabilities	Amount	Assets	Amount
Capital (separate figures are shown for each owner)		Fixed Assets:	
Long term Liabilities:		Land less depreciation	
Loans from banks or financial Institutions		Building less depreciation	
Current Liabilities:		Plant and Machinery less depreciation	
Sundry creditors		Vehicles less depreciation	
Bills payable		Computer systems less depreciation	
Advances from customers		Office equipments less depreciation	
Outstanding expenses		Current Assets:	
		Stocks	
		Sundry debtors less provisions	
		Bills receivables	
		Cash in hand	
		Cash at bank	
		Prepaid expenses	
		Advances to suppliers	
Total		Total	

Illustrations 4.

Following is the Trial Balance of M/s Brijesh and Sons. Prepare final accounts for the year ended on 31st March 2013.

Particulars	Debit (₹)	Credit (₹)
Stock as on 01.04.2012: Finished goods	2,00,000	
Purchases and Sales	22,00,000	35,00,000
Bills receivables	50,000	
Returns	1,00,000	50,000

Carriage Inwards	50,000	
Debtors and Creditors	2,00,000	4,00,000
Carriage Outwards	40,000	
Discounts	5,000	5,000
Salaries and wages	2,20,000	
Insurance	60,000	
Rent	60,000	
Wages and salaries	80,000	
Bad debts	10,000	
Furniture	4,00,000	
Brijesh's capital		5,00,000
Brijesh's drawing	70,000	
Loose tools	1,00,000	
Printing & stationery	30,000	
Advertising	50,000	
Cash in hand	45,000	
Cash at bank	2,00,000	
Petty Cash	5,000	
Machinery	3,00,000	
Commission	10,000	30,000
Total	44,85,000	44,85,000

Adjustments: (i) Finished goods stock. Stock on 31st March was valued at Cost price ₹ 4,20,000 and market price ₹ 400,000. (ii) Depreciate furniture @ 10% p.a. and machinery @ 20% p.a. on reducing balance method. (iii) Rent of ₹ 5,000 was paid in advance. (iv) Salaries & wages due but not paid ₹ 30,000. (v) Make a provision for doubtful debts @ 5% on debtors. (vi) Commission receivable ₹ 5,000.

Solution :

Trading Account for the year ended 31st March 2013					
Dr.			Cr.		
Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
Opening stock :			Sales	35,00,000	
Finished goods		2,00,000	Less: Sales Returns	1,00,000	34,00,000
Purchases	22,00,000				
Less: Purchases returns	50,000	21,50,000	Closing stock		
Carriage inwards		50,000	Finished goods		4,00,000
Wages & salaries		80,000			
Gross Profit c/d		13,20,000			
		38,00,000			38,00,000

Profit & Loss Account for the year ended 31st March 2013					
Dr.			Cr.		
Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
Administrative expenses	-		Gross Profit b/d		13,20,000
Salaries & wages	2,20,000		Discount received		5,000
Add: Not paid	30,000	2,50,000	Commission received	30,000	
Depreciation on furniture		40,000	Add : receivable	5,000	35,000
Depreciation of Machinery		60,000			
Insurance		60,000			

Rent	60,000			
Less: Paid in advance	5,000	55,000		
Printing & Stationery		30,000		
Selling & Distribution expenses:				
Advertising		50,000		
Carriage Outwards		40,000		
Discounts		5,000		
Bad debts		10,000		
Commission		10,000		
Provision for doubtful debts		10,000		
Net profit		740,000		
		13,60,000		13,60,000

Dr. Balance Sheet as on 31st March 2013 Cr.

Liabilities	Amount (₹)	Amount (₹)	Assets	Amount (₹)	Amount (₹)
Brijesh's Capital	5,00,000		Fixed Assets:		
Less : Drawings	70,000		Furniture	400,000	
Add : Net Profit for the year	7,40,000	11,70,000	Less: Depreciation	40,000	3,60,000
Long term Liabilities:		-	Machinery	300,000	
			Less: Depreciation	60,000	2,40,000
Current Liabilities:			Loose tools		1,00,000
Sundry creditors		4,00,000	Current Assets:		
Outstanding salaries & wages		30,000	Stocks		4,00,000
			Sundry debtors	200,000	
			Less: Provision for doubtful debts	10,000	1,90,000
			Bills receivables		50,000
			Cash in hand		45,000
			Cash at bank		2,00,000
			Petty cash		5,000
			Prepaid Rent		5,000
			Commission receivable		5,000
		16,00,000			16,00,000

Notes :

- (1) Closing stock is valued at market price here as it is less than cost price (conservatism concept)
- (2) Returns in debit column mean sales return, while that in credit column means purchase returns
- (3) Discounts in debit column mean allowed (expense) and that in credit means received (income)
- (4) Commission in debit column mean allowed (expense) and that in credit means received (income)
- (5) There are two peculiar items given in the TB. One is Salaries & wages and the other is Wages and salaries. The interpretation is – where first reference is made to wages, it's assumed to be directly for goods and taken to Trading A/c. If the first reference is to salaries, it's assumed to be related to office and taken to P & L.

Illustrations 5.

Mr. Arvindkumar had a small business enterprise. He has given the trial balance as at 31st March 2013

Particulars	Debit (₹)	Credit (₹)
Mr. Arvinkumar's Capital		1,00,000
Machinery	36,000	
Depreciation on machinery	4,000	
Repairs to machinery	5,200	
Wages	54,000	
Salaries	21,000	
Income tax of Mr. Arvindkumar	1,000	
Cash in hand	4,000	
Land & Building	1,49,000	
Depreciation on building	5,000	
Purchases	2,50,000	
Purchase returns		3,000
Sales		4,98,000
Citi Bank		7,600
Accrued Income	3,000	
Salaries outstanding		4,000
Bills receivables	30,000	
Provision for doubtful debts		10,000
Bills payable		16,000
Bad debts	2,000	
Discount on purchases		7,080
Debtors	70,000	
Creditors		62,520
Opening stock	74,000	
Total	7,08,200	7,08,200

Additional information:

- (1) Stock as on 31st March 2013 was valued at ₹ 60,000
- (2) Write off further ₹ 6,000 as bad debt and maintain a provision of 5% on doubtful debt.
- (3) Goods costing ₹ 10,000 were sent on approval basis to a customer for ₹ 12,000 on 30th March, 2013. This was recorded as actual sales.
- (4) ₹ 2,400 paid as rent for office was debited to Landlord's A/c and was included in debtors.
- (5) General Manager is to be given commission at 10% of net profits after charging his commission.
- (6) Works manager is to be given a commission at 12% of net profit before charging General Manager's commission and his own.

You are required to prepare final accounts in the books of Mr. Arvindkumar.

Solution :
In the books of Mr. Arvindkumar
Dr.
Trading Account for the year ended 31st March 2013
Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)

Opening stock:			Sales	4,98,000	
Finished goods		74,000	Less: Sent on approval	(12,000)	4,86,000
Purchases	2,50,000				
Less: Purchases returns	(3,000)	2,47,000	Closing stock:		
			Finished goods	60,000	
Wages		54,000	Add sent on approval	10,000	70,000
Gross Profit c/d		181,000			
		5,56,000			5,56,000

Dr.

Profit and Loss Account for the year ended 31st March 2013

Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
Administrative expenses:			Gross Profit b/d		1,81,000
Salaries		21,000	Discount received		7,080
Repairs to machinery		5,200			
Depreciation of Machinery		4,000			
Depreciation of Building		5,000			
Rent		2,400			
Selling & Distribution expenses:					
Bad debts	2,000				
Additional bad debts	6,000				
Provision for doubtful debts	2,480				
Less: Provision opening	(10,000)	480			
Commission to works manager		18,000			
Commission to General Manager		12,000			
Net profit		1,20,000			
		1,88,080			1,88,080

Balance Sheet as on 31st March 2013

Liabilities	Amount (₹)	Amount (₹)	Assets	Amount (₹)	Amount (₹)
Arvind kumar's Capital	1,00,000		Fixed Assets:		
Less: drawings (income tax)	(1,000)		Land & building		1,49,000
Add: Net Profit for the year	1,20,000	2,19,000	Machinery		36,000
Long term Liabilities:		-	Current Assets:		
Current Liabilities:			Stocks	60,000	
Sundry creditors		62,520	Add: Sent on approval	10,000	70,000
Outstanding salaries		4,000	Sundry debtors	70,000	

			Less: Goods on approval	(12,000)	
Citi Bank Overdraft		7,600	Less: Bad debts	(6,000)	
Bills payable		16,000	Less: Related to landlord	(2,400)	
Commission payable		30,000	Less: Provision for doubtful debts	(2,480)	47,120
			Bills receivable		30,000
			Cash in hand		4,000
			Accrued Income		3,000
		3,39,120			3,39,120

Notes:

- (1) The closing entries are passed for the items: depreciation, accrued income, outstanding salary. Hence, they are directly taken to the respective places in Balance sheet and P & L A/c.
- (2) Income tax paid for Mr. Arvindkumar will be treated as drawings.
- (3) Commission payable to works manager & general manager is computed as below:

	₹
Profit before charging any commission	1,50,000
Commission to works manager @ 12% on 1,50,000	18,000
Profit after works manager's commission	1,32,000
Commission to General Manager	12,000
(1,32,000/110 x 100)	

Illustrations 6.

Abhay runs a small shop and deals in various goods. He has not been able to tally his trial balance and has closed it by taking the difference to Suspense A/c. It is given below.

Particulars (as on 31 st March 2013)	Debit (₹)	Credit (₹)
Abhay's capital		1,50,000
Drawings	75,000	
Fixed assets	1,35,000	
Opening stock	36,500	
Purchases & returns	6,75,000	13,500
Sales & returns	34,000	8,50,000
Due from customer & to creditors	95,000	3,25,000
Expenses	45,750	
Cash		3,000
Bank deposits & interest earned	55,000	5,750
Suspense A/c		4,000
Advertising	2,00,000	
Total	13,51,250	13,51,250

Mr. Abhay has requested you to help him in tallying his trial balance and also prepare his final accounts. On investigation of his books you get the following information:

- (i) Closing Stock on 31st March 2013 was ₹ 45,000 at cost and could sell over this value.
- (ii) Depreciation of ₹ 13,500 needs to be provided for the year.
- (iii) A withdrawal slip indicated a cash withdrawal of ₹ 15,000 which was charged as drawing. However, it was

noticed that ₹ 11,000 was used for business purpose only and was entered as expenses in cash book.

- (iv) Goods worth ₹ 19,000 were purchased on 24th March 2013 and sold on 29th March 2013 for ₹23,750. Sales were recorded correctly, but purchase invoice was missed out.
- (v) Purchase returns of ₹ 1,500 were routed through sales return. Party's A/c was correctly posted.
- (vi) Expenses include ₹ 3,750 related to the period after 31st March 2013.
- (vii) Purchase book was over-cast by ₹ 1,000. Posting to suppliers' A/c is correct.
- (viii) Advertising will be useful for generating revenue for 5 years.

Solution: Rectification of errors:

- (a) Cash withdrawn was recorded as

Cash A/c	Dr	15,000	
To Bank			15,000

But it was charged to drawing and ₹ 11,000 was recorded as expenses as well i.e.

Drawings A/c	Dr	15,000	
Expenses A/c	Dr	11,000	
To Cash			26,000

This resulted in negative cash of ₹ 11,000. The rectification entry to be passed is

Cash A/c	Dr	11,000	
To Drawings			11,000

- (b) Omitted transaction to be recorded

Purchases A/c	Dr	19,000	
To Suppliers' A/c			19,000

- (c) Incorrect recording of purchase returns corrected by

Suspense A/c	Dr	3,000	
To Purchase return A/c			1,500
To sales return A/c		1,500	

- (d) Incorrect expenses rectified by

Prepaid expenses A/c	Dr	3,750	
To Expenses A/c			3,750

- (e) Over-casting of purchase book rectified by

Suspense A/c	Dr	1,000	
To Purchases			1,000

Based on these rectifications we can now proceed to complete the final accounts.

Dr.

Trading Account for the year ended 31st March, 2013

Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To Opening stock	-	36,500	By Sales	8,50,000	
To Purchases	6,75,000		Less: Returns	(34,000)	
Less: Returns	(13,500)		Add: Rectification	1,500	8,17,500
Less: Additional returns	(1,500)		By Closing stock		45,000
Add: Purchases missed out	19,000				
Less: Over-casting rectified	(1,000)	6,78,000			
To Gross Profit c/d		1,48,000			
		8,62,500			8,62,500

Dr. Profit and Loss Account for the year ended 31st March, 2013			Cr.		
Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To, Expenses	45,750	42,000	By, Gross Profit b/d		1,48,000
Less : Prepaid	3,750				
To, Depreciation		13,500	By, Interest on Bank deposits		5,750
To, Advertising		2,00,000	By, Net Loss		1,01,750
		2,55,500			2,55,500

Balance Sheet as on 31st March, 2013

Liabilities	Amount (₹)	Amount (₹)	Assets	Amount (₹)	Amount (₹)
Abhay's Capital	1,50,000	86,000	Fixed Assets		
Add: Wrong charge to drawing	11,000		Gross Block	1,35,000	
	1,61,000		Less: Depreciation	13,500	1,21,500
Less: Drawings	75,000	3,44,000	Current Assets:		
Current Liabilities:			Stocks		45,000
Sundry Creditors	3,25,000		Sundry Debtors		95,000
Add: Missed out purchase	19,000		Cash in hand	(3,000)	
			Add: Rectification	11,000	8,000
		4,30,000	Fixed deposit with Bank		55,000
			Prepaid expenses		3,750
			Miscellaneous Expenditure:		
			Profit & Loss (Dr.)		1,01,750
					4,30,000

Note : The expenditure incurred on intangible items after the date AS 26 became/becomes mandatory (01.04.2003 or 01.04.2004, as the case may be) would have to be expensed when incurred since these do not meet the definition of an 'asset' as per AS 26. Hence, full amount of Advertisement expense is charged to Profit & Loss Account.

Illustration 7.

Mr. Oswal maintains his accounts on Mercantile basis. The following Trial Balance has been prepared from his books as at 31st March, 2013 after making necessary adjustments for outstanding and accrued items as well as depreciation:

**Trial Balance
as at 31st March, 2013**

Particulars	Dr. (₹)	Cr. (₹)
Plant and Machinery	2,12,500	
Sundry Creditors		2,64,000
Sales		6,50,000
Purchases	4,20,000	
Salaries	40,000	

Prepaid Insurance	370	
Advance Rent	2,000	
Outstanding Salary		6,000
Advance Salary	2,500	
Electricity Charges	2,650	
Furniture and Fixtures	72,000	
Opening Stock	50,000	
Outstanding Electricity Charges		450
Insurance	1,200	
Rent	10,000	
Miscellaneous Expenses	14,000	
Cash in hand	3,000	
Investments	80,000	
Drawings	24,000	
Dividend from Investments		8,000
Accrued Dividend from Investments	1,500	
Depreciation on Plant and Machinery	37,500	
Depreciation on Furniture	8,000	
Capital Account		2,11,970
Telephone Charges	6,000	
Sundry Debtors	1,70,500	
Stationery and Printing	1,200	
Cash at Bank	65,000	
Interest on Loan	8,000	
Interest Due but not paid on loan		1,500
Loan Account		90,000
	12,31,920	12,31,920

Additional Information:

- (i) Salaries include ₹ 10,000 towards renovation of Proprietor's residence.
(ii) Closing Stock amounted to ₹ 75,000.

Mr. Oswal, however, request you to prepare a Trading and Profit & Loss Account for the year ended 31st March, 2013 and a Balance Sheet as on that date following cash basis of accounting.

Solution:

In the books of Mr. Oswal
Trading and Profit and Loss Account
for the year ended 31st March, 2013

Dr.

Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To, Opening Stock		50,000	By, Sales		6,50,000
`` Purchases		4,20,000	`` Closing Stock		75,000
`` Profit & Loss A/c.		2,55,000			
Gross Profit transferred		7,25,000			7,25,000
To, Salaries	40,000		By, Trading A/c.		
Less: Outstanding	6,000		-Gross Profit transferred		2,55,000
Salaries	34,000		`` Dividend	8,000	
Add: Advance Salary	2,500		Less: Accrued Dividend	1,500	6,500

	36,500			
Less: Renovation (Drawings)	10,000	26,500		
``Insurance	1,200			
Add: Prepaid	370	1,570		
``Rent	10,000			
Add: Advance Rent	2,000	12,000		
``Electricity Charges	2,650			
Less: Outstanding	450	2,200		
``Miscellaneous Expenses		14,000		
``Stationery & Printing		1,200		
``Depreciation:				
Plant & Machinery	37,500			
Furniture & Fixtures	8,000	45,500		
``Interest on Loan	8,000			
Less: Outstanding	1,500	6,500		
``Telephone Charges		6,000		
``Capital Account				
Net Profit transferred		1,46,030		
		2,61,500		2,61,500

Balance Sheet as at 31st March, 2013

Liabilities	Amount (₹)	Amount (₹)	Assets	Amount (₹)	Amount (₹)
Capital Account	2,11,970		Plant and Machinery (at cost less depreciation)		2,12,500
Add: Net Profit	1,46,030		Furniture & Fixtures (at cost less depreciation)		72,000
	3,58,000		Investments		80,000
Less: Drawings (24,000+10,000)	34,000	3,24,000	Stock-in-Trade		75,000
			Debtors		1,70,500
Loan Account		90,000	Cash at Bank		65,000
Sundry Creditors		2,64,000	Cash in hand		3,000
		6,78,000			6,78,000

Illustration 8.

The following Trial Balance has been prepared from the books of Mr. Sexena as on 31st March, 2013 after making necessary adjustments for depreciation on Fixed Assets, outstanding and accrued items and difference under Suspense Account.

Trial Balance as at 31st March, 2013

Particulars	Dr. (₹)	Particulars	Cr. (₹)

Machineries	1,70,000	Sundry Creditors	82,000
Furniture	49,500	Capital Account	2,45,750
Sundry Debtors	38,000	Outstanding Expenses:	
Drawings	28,000	Salaries	1,500
Travelling Expenses	6,500	Printing	600
Insurance	1,500	Audit Fees	1,000
Audit Fees	1,000	Bank Interest	1,200
Salaries	49,000	Discounts	1,800
Rent	5,000	Sales (Less Return)	6,80,000
Cash in hand	7,800		
Cash at Bank	18,500		
Stock-in-trade (1-4-2012)	80,000		
Prepaid Insurance	250		
Miscellaneous Expenses	21,200		
Discounts	1,200		
Printing & Stationery	1,500		
Purchase (Less Returns)	4,60,000		
Depreciation:			
Machineries	30,000		
Furniture	5,500		
Suspense Account	39,400		
	10,13,850		10,13,850

On the subsequent scrutiny following mistakes were noticed:

- A new machinery was purchase for ₹ 50,000 but the amount was wrongly posted to Furniture Account as ₹ 5,000.
- Cash received from Debtors ₹ 5,600 was omitted to be posted in the ledger.
- Goods withdrawn by the proprietor for personal use but no entry was passed ₹ 5,000.
- Sales included ₹ 30,000 as goods sold cash on behalf of Mr. Thakurlal who allowed 15% commission on such sales for which effect is to be given.

You are further told that:-

- Closing stock on physical verification amounted to ₹ 47,500.
- Depreciation on Machineries and Furniture has been provided @ 15% and 10%, respectively, on reducing balancing system.

Full year's depreciation is provided on addition.

You are requested to prepare a Trading and Profit & Loss Account for the year ended 31st March 2013 and a Balance Sheet as on that date so as to represent a True and Correct picture.

Solution:

In the books of Mr. Sexena
Trading and Profit and Loss Account
for the year ended 31st March, 2013

Dr.

Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To, Opening Stock		80,000	By, Sales (₹ 6,80,000 - ₹ 30,000)		6,50,000

`` Purchases	4,60,000		`` Closing Stock		47,500
Less: Drawings	5,000	4,55,000			
`` Profit & Loss A/c.					
Gross Profit transferred		1,62,500			
		6,97,500			6,97,500
To, Salaries:		49,000	By, Trading A/c. (Gross Profit)		1,62,500
`` Rent		5,000	`` Bank Interest		1,200
`` Insurance		1,500	`` Selling Commission		
`` Audit Fees		1,000	(15% on ₹ 30,000)		4,500
`` Printing & Stationery		1,500	`` Discount Received		1,800
`` Miscellaneous Expenses		21,200			
`` Discount Allowed		1,200			
`` Travelling Expenses		6,500			
`` Depreciation:					
Machinery	37,500				
Furniture	5,000	42,500			
`` Capital Account (Net Profit transferred)		40,600			
		1,70,000			1,70,000

Balance Sheet
as at 31st March, 2013

Liabilities	Amount (₹)	Amount (₹)	Assets	Amount (₹)	Amount (₹)
Capital Account	2,45,750		Machinery	2,50,000 ¹	
Add: Net Profit	40,600		Less: Depreciation	37,500	2,12,500
	2,86,350				
Less: Drawings (28,000+5,000)	33,000	2,53,350	Furniture	50,000 ²	
			Less: Depreciation	5,000	45,000
Sundry Creditors		82,000	Stock		47,500
Outstanding Liabilities:			Debtors (38,000-5,600)		32,400
Salaries	1,500		Cash		7,800
Audit Fees	1,000		Bank		18,500
Printing	600	3,100	Prepaid Insurance		250
Thakurlal's A/c. (30,000 – 4,500)		25,500			
		3,63,950			3,63,950

Notes:

	₹
1. Machinery as per Trial Balance	1,70,000
Add: Depreciation	30,000
	2,00,000
Additions	50,000
	2,50,000
2. Furniture	49,500

Add: Depreciation	5,500
	<u>55,000</u>
Less: Wrong Debit	5,000
3. Suspense A/c. is eliminated by item	<u>50,000</u>
(i) ₹ 45,000 (50,000 – 5,000) and item	
(ii) by 5,600 (debited), respectively.	

Illustration 9.

The following Trail Balance has been extracted from the books of Mr. Agarwal as on 31.3.2013:

Trial Balance as on 31.3.2013

Particulars	Dr. (₹)	Particulars	Cr. (₹)
Purchase	6,80,000	Sales	8,38,200
Sundry Debtors	96,000	Capital Account	1,97,000
Drawings	36,000	Sundry Creditors	1,14,000
Bad Debts	2,000	Outstanding Salary	2,500
Furniture & Fixtures	81,000	Sale of Old Papers	1,500
Office Equipments	54,000	Bank Overdraft (UBI)	60,000
Salaries	24,000		
Advanced Salary	1,500		
Carriage Inward	6,500		
Miscellaneous Expenses	12,000		
Travelling Expenses	6,500		
Stationery & Printing	1,500		
Rent	18,000		
Electricity & Telephone	6,800		
Cash In Hand	5,900		
Cash at Bank (SBI)	53,000		
Stock (1.4.2012)	50,000		
Repairs	7,500		
Motor Car	56,000		
Depreciation:			
Furniture 9,000			
Office Equipment 6,000	15,000		
	<u>12,13,200</u>		<u>12,13,200</u>

Additional Information:

- Sales includes ₹ 60,000 towards goods for cash on account of a joint venture with Mr. Reddy who incurred ₹ 800 as forwarding expenses. The joint venture earned a profit of ₹ 15,000 to which Mr. Reddy is entitled to 60%
- The motor car account represents an old motor car which was replaced on 1.4.2012 by a new motor car costing ₹ 1,20,000 with an additional cash payment of ₹ 40,000 laying debited to Purchase Account.
- UBI has allowed an overdraft limit against hypothecation of stocks keeping a margin of 20%. The present balance is the maximum as permitted by the Bank.
- Sundry Debtors include ₹ 4,000 as due from Mr. Trivedi and Sundry Creditors include ₹ 7,000 as payable to him.
- On 31.3.2013 outstanding rent amounted to ₹ 6,000 and you are informed that 50% of the total rent is attributable towards Agarwal's resident.
- Depreciation to be provided on motor car @ 20% (excluding sold item).

Mr. Agarwal requests you to prepare a Trading and Profit & Loss Account for the year ended 31.3.2013 and a Balance Sheet as on that date.

Solution.

In the books of Mr. Agarwal
Trading and Profit and Loss Account
for the year ended 31st March, 2013

Dr.

Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To, Opening Stock		50,000	By, Sales	8,38,200	
`` Purchases	6,80,000		Less: Sale on account of Joint Venture	60,000	7,78,200
Less: Motor Car	40,000	6,40,000	`` Closing Stock (W.N. 1)		75,000
`` Carriage Inward		6,500			
`` Profit & Loss A/c		1,56,700			
-Gross Profit transferred					
		8,53,200			8,53,200
To, Salaries		24,000	By, Trading A/c.		
`` Travelling Expenses		6,500	-Gross Profit transferred		1,56,700
`` Printing & Stationery		1,500	`` Sale of old papers		1,500
`` Electricity & Telephone		6,800	`` Profit on Joint Venture (40% of ₹ 15,000)		6,000
`` Rent	18,000		`` Profit on replacement of Motor Car (W. N. 2) [(1,20,000–(56,000+40,000))]		24,000
Add: Outstanding	6,000				
	24,000				
Less: Drawings	12,000	12,000			
`` Bad Debts		2,000			
`` Miscellaneous Expenses		12,000			
`` Repairs		7,500			
`` Depreciation on:					
Furniture	9,000				
Office Equipment	6,000				
Motor Car (W.N. 3)	24,000	39,000			
`` Capital Account					
- Net Profit transferred		76,900			
		1,88,200			1,88,200

Balance Sheet
as at 31st March, 2013

Liabilities	Amount (₹)	Amount (₹)	Assets	Amount (₹)	Amount (₹)
Capital Account	1,97,000		Furniture & Fixtures	90,000	
Add: Net Profit	76,900		Less: Depreciation	9,000	
	2,73,900				81,000
Less: Drawings (36,000+12,000)	48,000		Office Equipment	60,000	
		2,25,900	Less: Depreciation	6,000	
Bank Overdraft		60,000			54,000
Creditors	1,14,000		Motor Car	56,000	

Less: Due to Trivedi	4,000		Additions	1,20,000	
		1,10,000		1,76,000	
			Less: Sold	56,000	
				1,20,000	
			Less: Depreciation	24,000	
Amount payable to Reddy (60,000 - 6,000)		54,000			96,000
Outstanding Liabilities:			Stock		75,000
Salaries	2,500		Debtors	96,000	
Rent	6,000		Less: Due from Trivedi	4,000	
		8,500			92,000
			Cash		5,900
			Bank		53,000
			Prepaid Salary		1,500
		4,58,400			4,58,400

Workings1. **Depreciation on Motor Car**

on new motor car i.e., @ 20% on ₹ 1,20,000 = ₹ 24,000

2. **Profit on Replacement of Motor Car**

		₹
Cost of new Motor Car		1,20,000
Less: Exchange Value	56,000	
Cash Payment	40,000	96,000
Profit on replacement		24,000

3. **Closing Stock**

Maximum allowable limit (100 – 20)% = 80% of stock.

Overdraft is ₹ 60,000 which is equal to 80%.

$$\begin{aligned}\text{So, closing stock} &= ₹ 60,000 \times \frac{100}{80} \\ &= ₹ 75,000.\end{aligned}$$

FINAL ACCOUNTS OF PARTNERSHIP FIRM**Illustration 10.**

From the following particulars prepare a Final Accounts of M/s. X & Y for the year ended 31st March 2013.

Particulars	Amount (₹)	Particulars	Amount (₹)
Sales	8,20,000	Land	11,000
Opening Stock	3,00,000	Purchase	3,80,000
Loan (Dr.)	20,000	Interest (Cr.)	1,000
Wages	60,000	Salaries	40,000
Carriage Inwards	4,000	Carriage Outward	2,000
Returns inward	4,000	Returns Outwards	3,000
Furniture	10,000	Trade charges	8,000
Drawings		Capital	
- X	12,000	- X	24,000
- Y	10,000	- Y	16,000
Cash	3,000		

Additional Information:

- (i) Closing Stock amounted to ₹ 1,20,000;
 - (ii) Provide Interest on drawings (on an average 6 months) and interest on capital @ 6% and 4% respectively.
 - (iii) Y is to get a salary of ₹ 400 p.m.
 - (iv) X is to get a commissions @ 2% on gross sales
 - (v) 50% of the profit is to be transferred to Reserve Fund.
 - (vi) Depreciations on furniture @ 10% p.a.
- The partners share profit and loss equally.

Solution:

In the books of M/s. X & Y

Dr. **Trading and Profit and Loss Account for the year ended 31st March, 2013** Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To, Opening Stock		3,00,000	By, Sales	8,20,000	
`` Purchases	3,80,000		Less: Return Inwards	4,000	8,16,000
Less: Returns Outwards	3,000	3,77,000	`` Closing Stock		1,20,000
`` Wages		60,000			
`` Carriage Inward		4,000			
`` Profit & Loss A/c					
-Gross Profit transferred		1,95,000			
		9,36,000			9,36,000
To, Salaries		40,000	By, Trading A/c.		
`` Carriage Outward		2,000	- Gross Profit		1,95,000
`` Trade Charges		8,000	`` Interest		1,000
`` Depreciation on:					
- Furniture		1,000			
To, P&L Appropriation A/c.					
- Net Profit transferred		1,45,000			
		1,96,000			1,96,000

**Profit and Loss Appropriation Account
for the year ended 31st March, 2013**

Dr. Cr.

Particulars	Amount (₹)	Amount (₹)	Particulars	Amount (₹)	Amount (₹)
To, Interest on Capital			By, Profit and Loss A/c		1,45,000
X:	960		-Net Profit		
Y:	640	1,600	By, Interest on Drawings:		
			X:	360	
To, Salary			Y:	300	660
Y:		4,800			
To, Commission – X		16,400			
`` Reserve Fund (50%)		61,430			
`` Net Divisible Profit					
X:	30,715				
Y:	30,715				
		61,430			
		1,45,660			1,45,660

Capital Account

Dr.

Cr.

Particulars	X (₹)	Y (₹)	Particulars	X (₹)	Y (₹)
To, Drawings	12,000	10,000	By, Balance b/d.	24,000	16,000
`` Interest on Drawings	360	300	`` Interest on Capital	960	640
`` Balance c/d.	59,715	41,855	`` Salary	---	4,800
			`` Commission	16,400	---
			`` Share of Profit	30,715	30,715
	72,075	52,155		72,075	52,155

Balance Sheetas at 31st March, 2013

Liabilities	Amount (₹)	Assets	Amount (₹)	Amount (₹)
Capital :		Land		11,000
X	59,715	Furniture	10,000	
Y	41,855	Less: Depreciation	1,000	9,000
Reserve Fund	61,430	Loan		20,000
		Closing Stock		1,20,000
		Cash		3,000
	1,63,000			1,63,000

5

RATIO ANALYSIS

4.1 FINANCIAL RATIO ANALYSIS

Ratio analysis is the process of determining and interpreting numerical relationships based on financial statements. A ratio is a statistical yard stick that provides a measure of the relationship between variables or figures. This relationship can be expressed as percent (cost of goods sold as a percent of sales) or as a quotient (current assets as a certain number of times the current liabilities).

As ratios are simple to calculate and easy to understand there is a tendency to employ them profusely. While such statistical calculations stimulate thinking and develop understanding there is a danger of accumulation of a mass of data that obscures rather than clarifies relationships. The financial analyst has to steer a careful course. His experience and objectives of analysis help him in determining which of the ratios are more meaningful in a given situation.

The Parties Interested: The persons interested in the analysis of financial statements can be grouped under three heads:

(i) Owners or investors; (ii) Creditors; and (iii) Financial executives. Although all these three groups are interested in the financial conditions and operating results of an enterprise the primary information that each seeks to obtain from these statements is to serve. Investors desire a primary basis for estimating earning capacity. Creditors (trade and financial) are concerned primarily with liquidity and ability to pay interest and redeem loan within a specific period. Management is interested in evolving analytical tools that will measure costs, efficiency, liquidity and profitability with a view to making intelligent decisions.

Significance:

- (i) Commercial bankers and trade creditors and the institutional lenders are mostly concerned with the ability of a borrowing enterprise to meet its financial obligations timely. As a result they are most interested in ratios like the current ratio, acid test ratio, turnover of receivables, inventory turnover, coverage of interest by level of earnings, etc.
- (ii) Long-term creditors would be interested in the working capital position of the borrower as an indication of ability to pay interest and principle in case earnings decline. So, they are interested in the ratios of total debt to equity, net worth to total assets, long-term debt to equity, long term debt to net working capital, fixed assets to networth, fixed assets to long term debt, fixed debt to capitalization etc. The number of times fixed charges are covered by earnings before interest and taxes will be of particular interest for such long-term creditors.
- (iii) Investors in shares are primarily interested in per share ratio like earnings per share, book value per share, market price per share, dividends per share, etc. They would also be interested in knowing the capitalization rate ($E/P \text{ Ratio} = \text{Earnings per share} / \text{Price per share ratio}$) which is the reciprocal of P/E Ratio ($\text{Price} / \text{Earnings ratio}$) and also the dividend yield, i.e.; D/P Ratio.

Advantages of Ratio Analysis

Ratio Analysis is (useful) relevant in assessing the performance of a firm in respect of the following purposes:

- (i) **To measure the liquidity position:** The purpose of ratio analysis to measure the liquidity position of a firm.

Whether the firm is able to meet its current obligations when they become due or not? A firm can be said to be liquid, if it has sufficient liquid funds to pay the interest charges on short-term debt within a year. The liquidity ratio are useful in credit analysis by banks and other financial institutions.

- (ii) **To know the solvency position:** Ratio analysis is helpful for assessing the long-term financial liability of the firm. The long term solvency is measured through the leverage, and profitability ratios. These ratios reveal the strengths and weaknesses of a firm in respect of the solvency position. The leverage ratios indicates the proportion of various sources of finance in the firms capital structure, particularly the ratio of debt and equity share capital.
- (iii) **Operating efficiency or turnover of the firm:** The ratios are helpful in measuring the operating efficiency or the turnover of the firm. These ratios indicate the efficiency in utilizing the assets of the firm such as fixed assets turnover ratio, total resources turnover ratio etc.
- (iv) **To assess the profitability position of the firm:** The ratios are useful to assess and measure the profitability of the firm in respect of sales and the investments. These ratios are concerned about the over -all profitability of the firm.
- (v) **Inter - firm and intra – firm comparison:** Ratios are not only reflects the financial position of a firm, but also serves as a tool for remedial actions. This is made possible only due to inter-firm comparison. This would demonstrate the relative position of the firm vis-à-vis its competitors. If there is any variance in the ratios either with the industry average or with, those of competitors, the firm has to identify the reasons and would take remedial measures.
- (vi) **Trend Analysis:** The trend analysis of ratios indicates whether the financial position of a firm is improving or deteriorating over the years. The significance of a trend analysis of ratio lies in the fact that the analysis can know the direction of movement whether the movement is favourable or unfavourable.

Thus, ratio analysis is considered better than a mere comparison of figures in carrying out an over - all appraisal of a company's business.

Standards for Comparison:

For making a proper use of ratios, it is essential to have fixed standards for comparison. A ratio by itself has very little meaning unless it is compared to some appropriate standard. Selection of proper standards of comparison is most important element in ratio analysis. The four most common standards used in ratio analysis in Financial Management are: absolute, historical, horizontal and budgeted.

Absolute: Absolute standards are those which become generally recognized as being desirable regardless of the type of company, the time, stage of business cycle and the objectives of the analyst.

Historical: Historical (also known as internal) standards involves comparing a company's own past performance as a standard for the present or future. But this standard may not provide a sound basis for judgment as the historical figure may not have represented an acceptable standard. It is also called as intra firm comparison.

Horizontal: In case of horizontal (external) standards, one company is compared with another or with the average of other companies of the same nature. It is also called as inter-firm comparison.

Budgeted: The budgeted standard is arrived at after preparing the budget for a period. Ratio developed from actual performance are compared to the planned ratios in the budget in order to examine the degree of accomplishment of the anticipated targets of the firm.

Limitations of Ratio Analysis:

- (i) It is always a challenging job to find an adequate standard. The conclusions drawn from the ratios can be no better than the standards against which they are compared.
- (ii) It is difficult to evaluate the differences in the factors that affect the company's performance in a particular year as compared with that of another year and that of another company. The task becomes more difficult when comparison is made of one company with another when they are of substantially different size, age and diversified products.
- (iii) While making comparisons of ratios, due allowance should be made for changes in price level. A change in price level can seriously affect the validity of comparisons of ratios computed for different time periods and particularly in case of ratios whose numerator and denominator are expressed in different units of currency.
- (iv) Comparisons are also become difficult due to differences in definition. The terms like gross profit, operating

profit, net profit etc. have not got precise definitions and there is considerable diversity in practice as to how they should be measured.

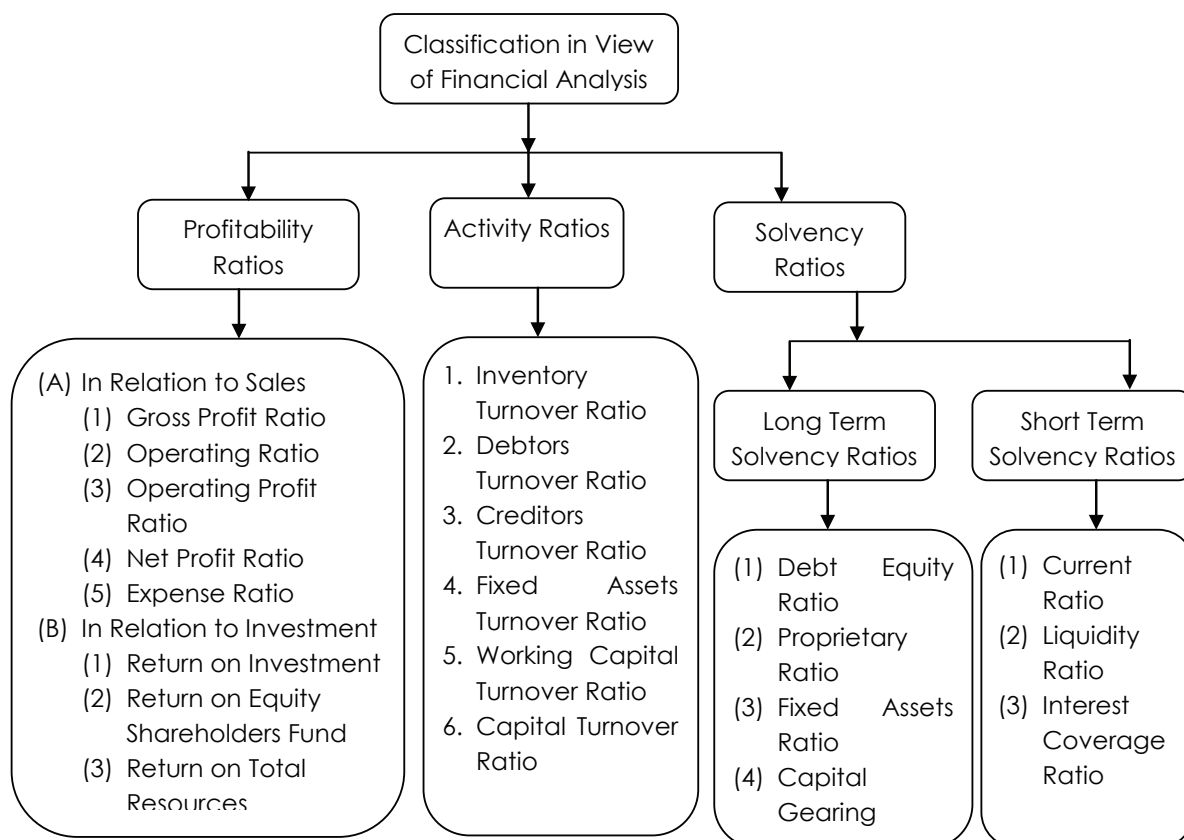
- (v) A Balance Sheet may fail to reflect the average or typical situation, as it is prepared as of one moment of time. It ignores short-term fluctuations in assets and equities that may occur within the period covered by the two Balance Sheet dates.
- (vi) Various differences are found among the accounting methods used by different companies which variously affect the comparability of financial statements. Methods of recording and valuing assets, write-offs, costs, expenses etc differ from company to company.
- (vii) As ratios are simple to calculate and easy to understand, there is a tendency to over-employ them. While such statistical approach stimulates thinking, it is also likely to lead to the accumulation of a mass of data; if due care is not taken, that might obscure rather than clarify relationships.

Window Dressing:

The term window dressing means manipulation of accounts in a way so as to conceal vital facts and present the financial statements in a way to show a better position than what it actually is. On account of such a situation, presence of a particular ratio may not be a definite indicator of good or bad management. For example, a high stock turnover ratio is generally considered to be an indication of operational efficiency of the business. But this might have been achieved by unwarranted price reductions or failure to maintain proper stock of goods.

Similarly, the current ratio may be improved just before the Balance Sheet date by postponing replenishment of inventory. For example, if a company has got current assets of ₹ 4,000 and current liabilities of ₹ 2,000 the current ratio is 2, which is quite satisfactory. In case the company purchases goods of ₹ 2,000 on credit, the current assets would go up to ₹ 6,000 and current liabilities to ₹ 4,000. Thus reducing the current ratio to 1.5. The company may, therefore, postpone the purchases for the early next year so that its current ratio continues to remain at 2 on the Balance Sheet date. Similarly, in order to improve the current ratio, the company may pay off certain pressing current liabilities before the Balance Sheet date. For example, if in the above case the company pays current liabilities of ₹ 1,000, the current liabilities would stand reduced to ₹ 1,000, current assets would stand reduced to ₹ 3,000 but the current ratio would go up to 3.

Classification of Ratios:



Profitability Ratios

These ratios give an indication of the efficiency with which the operations of business are carried on. The following are the important profitability ratios:

(i) Overall Profitability Ratio:

This is also called as Return on Investment (ROI) or Return on Capital Employed (ROCE) ratio. It indicates the percentage of return on the total capital employed in the business. It is calculated as follows:

$$\text{ROI} = \text{Operating Profit} / \text{Capital Employed}$$

The term 'Operating Profit' means "profit before interest and tax while the term 'capital employed' refer to the sum-total of long-term funds employed in the business.

Significance. ROI measures the profit which a firm earns by investing a unit of capital. It is desirable to ascertain this periodically. The profit being the net result of all operations, ROI, expresses all efficiencies or inefficiencies of a business collectively. Thus, it is a dependable measure for judging the overall efficiency or inefficiency of the business.

(ii) Price Earning Ratio (P/E Ratio):

This ratio indicates the number of times the earning per share is covered by its market price. It is calculated as follows:

$$\text{P/E Ratio} = \frac{\text{Market Price Per Equity Share}}{\text{Earning Per Share}}$$

For example, if the market price of an equity share is ₹ 20 and earnings per share is ₹ 5, the price earnings ratio will be 4 (i.e., $20 \div 5$). This means for every one rupee of earning people are prepared to pay ₹ 4. In other words, the rate of return expected by the investors is 25%

Significance. P/E Ratio helps the investors in deciding whether to buy or not to buy the shares of a company at a particular price. For Instance, in the example given, if the EPS falls to ₹ 3, the market price of the share should be ₹ 12 (i.e. 3×4). In case the market price of the share is ₹ 15, it will not be advisable to purchase the company's shares at that price.

(iii) Gross Profit Ratio (GPR):

This ratio expresses the relationship between Gross Profit and Net Sales. It can be computed as follows:

$$\text{GPR} = \frac{\text{Gross Profit}}{\text{Net Sales (i.e., Sales less returns)}} \times 100$$

Significance: The ratio indicates the overall limit within which a business must manage its operating expenses. It also helps in ascertaining whether the average percentage of mark-up on the goods is maintained.

(iv) Net Profit Ratio (NPR):

The ratio indicates net margin earned on a sale of ₹ 100. It is calculated as follows:

$$\text{NPR} = \frac{\text{Net Profit}}{\text{Net Sales}} \times 100$$

Significance: The ratio helps in determining the efficiency with which the affairs of a business are being managed. Constant increase in the above ratio year after year is a definite indication of improving conditions of the business.

(v) Operating Ratio:

This ratio is a complementary of net profit ratio. In case the net profit ratio is 20%, the operating ratio will be 80%. It is calculated as follows:

$$\text{Operating Ratio} = \frac{\text{Operating Cost}}{\text{Net Sales}} \times 100$$

Operating cost includes cost of direct materials, direct labour, direct expenses and all overheads. Financial charges such as interest, provision for taxation, etc. are not to be included in operating cost.

Significance: The ratio is the test of the operational efficiency with which the business has carried on. The operat-

ing ratio should be low enough to leave a portion of sales for giving a fair return to the investor

(vi) Fixed Charges Cover Ratio (FCCR):

The ratio indicates the number of times the fixed financial charges are covered by income before interest and tax. This ratio is calculated as follows:

$$\text{FCCR} = \frac{\text{Income before Interest and Tax}}{\text{Interest}}$$

Significance: The ratio is significant from the lender's point of view. It indicates whether the business would earn sufficient profits to pay periodically the interest charges. Higher the ratio, better it is.

(vii) Pay-out Ratio:

The ratio indicates what proportion of earning per share has been used for paying dividend. It can be calculated as follows:

$$\text{Pay-Out Ratio} = \frac{\text{Dividend per equity share}}{\text{Earning per equity share}}$$

Significance: The ratio is an indicator of the amount of earnings that have ploughed back in the business. The lower the pay-out ratio, the higher will be the amount of earnings ploughed back in the business. A lower pay-out ratio means a stronger financial position of the company.

(viii) Dividend Yield Ratio (DYR):

The ratio is calculated by comparing the rate of dividend per share with its market value. It is calculated as follows:

$$\text{DYR} = \frac{\text{Dividend Per Share}}{\text{Market Price Per Share}} \times 100$$

Significance: The ratio helps an intending investor in knowing the effective return he is going to get on his investment. For example, if the market price of a share is ₹ 25, paid-up value is ₹ 10 and dividend rate is 20%. The dividend yield ratio is 8% (i.e. $100 \times 2/25$). The intending investor can now decide whether it will be advisable for him to go for purchasing the shares of the company or not at the price prevailing in the market.

(ix) Return on Shareholders funds or Return on Net Worth:

This ratio expresses the net profit in terms of the equity shareholders funds. This ratio calculated as follows:

$$\text{Net Worth} = \frac{\text{Net Profit after Interest \& Tax}}{\text{Net Worth}} \times 100 \quad [\text{Net Worth} = \text{Equity Capital} + \text{Reserves \& Surplus}]$$

Significance: This ratio is an important yardstick of performance for equity shareholders since it indicates the return on the funds employed by them.

Turnover Ratios / Activity Ratio

These ratios indicate the efficiency with which capital employed is rotated in the business. The various turnover ratios are as follows:

(i) Over-all Turnover Ratio:

The ratio indicates the number of times the capital employed has been rotated in the process of doing a business. The ratio is computed as follows:

$$\text{Overall Turnover Ratio} = \frac{\text{Net Sales}}{\text{Capital Employed}}$$

Significance: The overall profitability of a business depends on two factors, viz., (a) the profit margin, and (b) turnover. The profit margin is disclosed by the net profit ratio while the turnover is indicated by the overall turnover ratio. A business with a lower profit margin can achieve a higher ROI if its turnover is high. This is the reason for wholesalers earning a larger return on their investment even when they have a lower profit margin. A business should not, therefore, increase its profit margin to an extent that it results in reduced turn-over resulting in reduction of overall profit.

(ii) Fixed Assets Turnover Ratio:

The ratio indicates the extent to which the investment in fixed assets has contributed towards sales. The ratio can be calculated as follows:

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Net Fixed Assets}}$$

Significance: The comparison of fixed assets turnover ratio over a period of time indicates whether the investment in fixed assets has been judicious or not. Of course, investment in fixed assets does not push up sales immediately but the trend of increasing sales should be visible. If such trend is not visible or increase in sales has not been achieved after the expiry of a reasonable time it can be very well said that increased investments in fixed assets has not been judicious.

(iii) Debtors' Turnover Ratio:

The ratio indicates the speed with which money is collected from the debtor. It is computed as follows:

$$\text{Debtors Turnover Ratio} = \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$$

The term average account receivable includes trade debtors and bills receivable. Average accounts receivable are computed by taking the average receivables in the beginning and at the end of the accounting year. The higher the ratio, better it is.

Debtors turnover ratio is used for computing the debt collection period. The formula for its computation is as follows:

$$\text{Debt Collection Period} = \frac{\text{Months or days in a year}}{\text{Debtors turnover ratio}} \times \frac{\text{Average Debtors}}{\text{Credit Sales}} \times 365$$

For example, if the credit sales are ₹ 80,000, average accounts receivable ₹ 20,000, the debtors' turnover ratio and debt collection period will be computed as follows:

$$\text{Debtors Turnover Ratio} = \frac{80,000}{20,000} = 4$$

$$\text{Debts Collection Period} = \frac{12 \text{ months}}{4} = 3 \text{ months}$$

This means on an average three months credit is allowed to the debtor. An increase in the credit period would result in unnecessary blockage of funds and with increased possibility of losing money due to debts becoming bad.

Significance: Debtors Turnover Ratio or Debt Collection Period Ratio measures the quality of debtors since it indicates the speed with which money is collected from the debtor. A shorter collection period implies prompt payment by debtors. A longer collection period implies too liberal and inefficient credit collection performance. The credit policy should neither be too liberal nor too restrictive. The former will result in more blockage of funds and bad debts while the latter will cause lower sales which will reduce profits.

(iv) Creditors Turnover Ratio:

This is similar to Debtors Turnover Ratio. It indicates the speed with which payments for credit purchases are made to creditor it can be computed as follows:

$$\text{Creditors Turnover Period} = \frac{\text{Credit Purchases}}{\text{Average Accounts Payable}}$$

The term 'accounts payable' include trade creditors and bills payable.

From the creditors turnover, ratio, creditors payment period can be computed as follows:

$$\text{Credit Period Enjoyed} = \frac{\text{Months or days in a year}}{\text{Creditors Turnover}}$$

For example, if the credit purchases during a year are ₹1,00,000, Average accounts payable ₹ 25,000, the Creditors Turnover Ratio will be '4' (i.e., 1,00,000 / 25,000) while the creditors payment period would be 3 months (i.e., 12 months/4).

Significance: The creditors turnover ratio and the creditors payment period indicate about the promptness or otherwise in making payment for credit purchases. A higher creditors turnover ratio or a lower creditors payment period signifies that the creditors are being paid promptly thus enhancing the credit-worthiness of the company. However, a very favourable ratio to this effect also shows that the business is not taking full advantage of credit facilities which can be allowed by the creditors.

(v) Stock Turnover Ratio

The ratio indicates whether the investment in inventory is efficiently used and whether it is within proper limits. It is calculated as follows:

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of Goods Sold during the year}}{\text{Average Inventory}}$$

Average inventory is calculated by taking the average of inventory at the beginning and at the end of the accounting year.

Significance: The ratio signifies the liquidity of inventory. A high inventory turnover ratio indicates brisk sales and vice-versa. The ratio is therefore a measure to discover possible trouble in the form of overstocking or over-valuation of inventory.

Financial Ratios:

They are also termed as 'Solvency Ratios'. These ratios indicate about the financial position of the company. A company is considered to be financially sound if it is in a position to carry on its business smoothly and meet all its obligations both short-term and long-term without strain. The Financial or Solvency Ratios can therefore be classified into following categories:

- (i) Long-term Solvency Ratios, which include fixed assets ratio, debt equity ratio and proprietary ratio;
- (ii) Short-term Solvency Ratios, which include current ratio, liquidity ratio, super-quick ratio and defensive interval ratio & debt service coverage ratio.

Each of these ratios are now being discussed in detail in the following pages:

Long-term Solvency Ratios

(i) Fixed Assets Ratio:

The ratio indicates the extent to which fixed assets have been acquired by use of long-term funds. The ratio is expressed as follows:

$$\text{Fixed Assets Ratio} = \frac{\text{Net Fixed Assets}}{\text{Long-term Funds}}$$

The term 'Net Fixed Assets' means original cost of fixed assets less depreciation to date. The ratio should not be more than '1'. The ideal ratio is 0.67.

Significance: It is sound principle that fixed assets should be financed out of long-term funds. As a matter of fact a part of working capital termed as core-working capital, should also be financed by long-term funds. The ratio is therefore an indication of the fact whether the company has followed sound financial policy or not. In case the ratio is more than '1', it shows that a part of working capital has also been used to acquire fixed assets, which may prove quite troublesome for the company.

(ii) Debt-Equity Ratio:

The ratio is determined to ascertain the proportion between the 'outsiders' 'funds and share-holders funds' in the capital structure of an enterprise. The term outsiders', funds is generally used to represent total long-term debt. The ratio can be computed as follows:

$$\text{Debit - Equity Ratio} = \frac{\text{Total Long-term Debt}}{\text{Shareholder's Funds}}$$

The ratio may also be calculated for ascertaining proportion of long-term debt in the total long-term funds. In such a case the ratio will be computed as follows:

$$= \frac{\text{Total Long-term Debt}}{\text{Total Long-term Funds}}$$

The ratio is considered to be ideal if the shareholders' funds are equal to total long-term debt. However, these days the ratio is also acceptable if the total long-term debt does not exceed twice of shareholders' funds.

Significance: The ratio is an indication of the soundness of the long-term financial policies pursued by the business enterprise. The excessive dependence on outsiders' funds may cause insolvency of the business. The ratio provides the margin of safety to the creditors. It tells the owners the extent to which they can gain by maintaining control with a limited investment.

(iii) Proprietary Ratio

It is a variant of Debt-Equity Ratio. It establishes relationship between the proprietors' or shareholders' funds and the total tangible assets. It may be expressed as follows:

$$\text{Proprietary Ratio} = \frac{\text{Shareholder's Funds}}{\text{Total Tangible Assets}}$$

Significance: The ratio focuses attention on the general financial strength of the business enterprise. The ratio is of particular importance to the creditors who can find out the proportion of shareholders funds in the total assets employed in the business. A high proprietary ratio will indicate a relatively little danger to the creditors or vice-versa in the event of forced reorganization or winding up of the company.

Short-term Solvency Ratios

(i) Current Ratio

The ratio is an indicator of the firm's commitment to meet its short-term liabilities. It is expressed as follows:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

An ideal current ratio is '2'. However, a ratio of 1.5 is also acceptable if the firm has adequate arrangements with its bankers to meet its short-term requirements of funds.

Significance: The ratio is an index of the concern's financial stability, since, it shows the extent to which the current assets exceed its current liabilities. A higher current ratio would indicate inadequate employment of funds, while a poor current ratio is a danger signal to the management.

(ii) Liquidity Ratio / Quick Ratio / Acid Test Ratio:

The ratio is also termed as Acid Test Ratio or Quick Ratio. The ratio is ascertained by comparing the liquid assets i.e., current assets (excluding stock and prepaid expenses) to current liabilities. The ratio may be expressed as follows:

$$\text{Liquidity Ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}}$$

$$\text{Liquid Assets} = \text{Current Assets} - \text{Inventory} - \text{Prepaid Expenses}$$

Some accountants prefer the term liquid liabilities for current liabilities. The term 'liquid liabilities' means liabilities payable within a short period. Bank overdraft and cash credit facilities (if they become permanent modes of financing) are excluded from current liabilities for this purpose. The ratio may be expressed as follows:

$$\text{Liquidity Ratio} = \frac{\text{Liquid Assets}}{\text{Liquid Liabilities}}$$

$$\text{Liquid Liability} = \text{Current Liability} - \text{Bank Overdraft} - \text{Cash Credit}$$

The ideal ratio is '1'.

Significance: The ratio is an indicator of short-term solvency of the company. A comparison of the current ratio to quick ratio should also indicate the inventory hold-ups. For instance, if two units have the same current ratio but different liquidity ratios, it indicates over-stocking by the concern having low liquidity ratio as compared to the firm which has a higher liquidity ratio.

(iii) Super-quick Ratio:

It is a slight variation of quick ratio. It is calculated by comparing the super quick assets with the current liabilities (or liquid liabilities) of a firm. The ratio may be expressed as follows:

$$\text{Super-quick Ratio} = \frac{\text{Super Quick Assets}}{\text{Current Liabilities}}$$

The term 'Super-Quick Assets' means current assets excluding stock, prepaid expenses and debtors. Thus, super-quick assets comprise mainly cash, bank balance and marketable securities.

Significance: This ratio is the most rigorous test of a firm's liquidity position. In case the ratio is '1', it means the firm can meet its current liabilities any time.

The ratio is a conservation test and not widely used in practice.

(iv) Defensive-Interval Ratio (DIR)

This ratio denotes the liquidity of a firm in relation to its ability to meet projected daily expenditure from operations. It can be expressed as follows:

$$\text{Defensive Interval Ratio} = \frac{\text{Liquid Assets (quick assets)}}{\text{Daily Cash requirements (Projected)}}$$

Daily cash requirements (projected) = Projected cash operating expenditure/Number of days in a year.

Significance: The DIR is thought by many people to be a better liquidity measure than the quick and current ratios. Because these ratios compare assets to liabilities rather than comparing assets to expenses, the DIR and current/quick ratios would give quite different results if the company had a lot of expenses, but no debt.

(v) Debt Service Coverage Ratio (DSCR)

This ratio indicates whether the business is earning sufficient profits to pay not only the interest charged, but also whether due of the principal amount. The ratio is calculated as follows:

$$\text{Debt Service Coverage Ratio} = \frac{\text{Profit after Taxes} + \text{Depreciation} + \text{Interest on Loan}}{\text{Interest on Loan} + \text{Loan repayment in a year}}$$

Significance: The ratio is the key indicator to the lender to assess the extent of ability of the borrower to service the loan in regard to timely payment of interest and repayment of loan instalment. A ratio of 2 is considered satisfactory by the financial institutions; the greater debt service coverage ratio indicates the better debt servicing capacity of the organization.

Ratios in Different Industries:

1) Ratios used in hotel industry:

The variety of ratios used by hotel industry which are:

- 1) Room Occupancy Ratio
- 2) Bed Occupancy Ratio
- 3) Double Occupancy Ratio
- 4) Seat Occupancy Ratios etc.

2) Ratios used in transport industry:

The following important ratios are used in transport industry:

- 1) Passenger Kilometers
- 2) Seat occupancy Ratios
- 3) Operating cost per kilometer

3) Bank Industry:

The following important ratios are used in Bank Industry:

- 1) Operating expenses ratios for various periods
- 2) Loans to deposits ratios
- 3) Operating income ratios for various periods

4) Telecom Industry:

The following important ratios are used in telecom Industry.

- 1) Average duration of the outgoing call
- 2) Number of outgoing calls per connection
- 3) Revenue per customer

Illustration 1:

Following is the Profit and Loss Account and Balance Sheet of PKJ Ltd. Redraft them for the purpose of analysis and calculate the following ratios:

- 1) Gross Profit Ratio
- 2) Overall Profitability Ratio
- 3) Current Ratio
- 4) Debt-Equity Ratio
- 5) Stock-Turnover Ratio
- 6) Finished goods Turnover Ratio
- 7) Liquidity ratio

Dr.

Profit and Loss A/c

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
Opening stock of finished goods	1,00,000	Sales	10,00,000
Opening stock of raw material	50,000	Closing stock of raw material	1,50,000
Purchase of raw material	3,00,000	Closing stock of finished goods	1,00,000
Direct wages	2,00,000	Profit on sale of shares	50,000
Manufacturing Exp	1,00,000		
Administration Exp	50,000		
Selling & distribution Exp	50,000		
Loss on sale of Plant	55,000		
Interest on debentures	10,000		
Net Profit	3,85,000		
	13,00,000		13,00,000

Balance Sheet

Liabilities	Amount (₹)	Assets	Amount (₹)
Equity share capital	1,00,000	Fixed assets	2,50,000
Preference share capital	1,00,000	Stock of raw material	1,50,000
Reserves	1,00,000	Stock of finished goods	1,00,000
Debentures	2,00,000	Bank balance	50,000
Sundry Creditors	1,00,000	Debtors	1,00,000
Bills Payable	50,000		
	6,50,000		6,50,000

Solution:

PKJ Ltd.
Income Statement

(₹)

Sales		1,00,00,000
(-) Cost of goods sold:		
Raw material consumed (50,000 + 3,00,000 – 1,50,000)	2,00,000	

Wages	2,00,000	
Manufacturing expenses	1,00,000	
Cost of production	5,00,000	
(+) Opening stock of finished goods	1,00,000	
(-) Closing stock of finished goods	(1,00,000)	(5,00,000)
Gross profit		5,00,000
(-) Operating expenses:		
Administrative expenses	50,000	
Selling and distribution	50,000	(1,00,000)
Operating profit		4,00,000
(+) Non operating income (Profit on Sale of Shares)		50,000
(-) Loss on sale of plant		(55,000)
EBIT		3,95,000
(-) Interest		(10,000)
EBT / Net Profit		3,85,000

Position Statement

	(₹)
Bank	50,000
Debtors	1,00,000
Liquid Assets	1,50,000
(+) Stock (R.M.+F.G.)	2,50,000
Current Assets	4,00,000
(-) Current liabilities (S.C.B.P.)	(1,50,000)
Working capital	2,50,000
(+) Fixed assets	2,50,000
Capital employed in business	5,00,000
(-) External liabilities	(2,00,000)
Shareholders funds	3,00,000
(-) Preference share capital	(1,00,000)
Equity share capital	2,00,000

Represented by

Equity share capital	1,00,000
(+) Reserves	1,00,000
	2,00,000

$$(1) \text{ Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100 = \frac{5,00,000}{10,00,000} \times 100 = 50\%$$

$$(2) \text{ Overall Profitability Ratio} = \frac{\text{Operating Profit}}{\text{Capital Employed}} \times 100 = \frac{4,00,000}{5,00,000} \times 100 = 80\%$$

$$(3) \text{ Current Ratio} = \frac{4,00,000}{1,50,000} = 2.67 \text{ times}$$

$$(4) \text{ Debt equity Ratio} = \frac{\text{Long term debt}}{\text{Long term fund}} \times 100 = \frac{2,00,000}{5,00,000} = 0.4$$

$$(5) \text{ Stock Turnover Ratio} = \frac{\text{Raw Material Consumed}}{\text{Average Stock of raw material}} = \frac{2,00,000}{1,00,000} = 2$$

$$[\text{Average stock of Raw Material} = \frac{50,000 + 1,50,000}{2} = 1,00,000]$$

$$(6) \text{ Finished Goods Turnover Ratio} = \frac{\text{COGS}}{\text{Average Stock of finished goods}} = \frac{5,00,000}{1,00,000} = 5$$

$$[\text{Average stock of Finished Goods} = \frac{1,00,000 + 1,00,000}{2} = 1,00,000]$$

$$(7) \text{ Liquidity Ratio} = \frac{\text{Liquid Assets}}{\text{Liquid Liabilities}} = \frac{1,50,000}{1,50,000} = 1$$

$$\begin{aligned} \text{Liquid Assets} &= \text{Current Assets} - \text{Inventories} - \text{Prepaid Expenses} \\ &= 4,00,000 - 1,50,000 - 1,00,000 \end{aligned}$$

$$\begin{aligned} \text{Liquid Liability} &= \text{Current Liability} - \text{Bank Overdraft} - \text{Cash Credit} \\ &= 1,50,000 - 0 \\ &= ₹ 1,50,000 \end{aligned}$$

Illustration 2:

A company has a profit margin of 20% and asset turnover of 3 times. What is the company's return on investment? How will this return on investment vary if?

- (i) Profit margin is increased by 5%?
- (ii) Asset turnover is decreased to 2 times?
- (iii) Profit margin is decreased by 5% and asset turnover is increase to 4 times?

Solution:

$$\begin{aligned} \text{Net profit ratio} &= 20\% \text{ (given)} \\ \text{Assets turnover ratio} &= 3 \text{ times (given)} \\ \text{Return on Investment (ROI)} &= \text{Net Profit ratio} \times \text{Assets turnover ratio} \\ &= 20\% \times 3 \text{ times} = 60\% \end{aligned}$$

(i) If net profit ratio is increased by 5%:

$$\text{Then Revised Net Profit Ratio} = 20 + 5 = 25\%$$

$$\text{Asset Turnover Ratio (as before)} = 3 \text{ times}$$

$$\text{ROI} = 25\% \times 3 \text{ times} = 75\%$$

(ii) If assets turnover ratio is decreased to 2 times:

$$\text{NP Ratio (as before)} = 20\%$$

$$\text{Revised Asset Turnover Ratio} = 2 \text{ times}$$

$$\text{ROI} = 20\% \times 2 \text{ times} = 40\%$$

(iii) If net profit ratio falls by 5% and assets turnover ratio raises to 4 times:

$$\text{Then Revised NP Ratio} = 20 - 5 = 15\%$$

$$\text{Revised Asset Turnover Ratio} = 4 \text{ times}$$

$$\text{ROI} = 15\% \times 4 = 60\%$$

Illustration 3:

The following is the Balance Sheet of M/S Yamuna Enterprise for the year ended 31-12-2015:

Balance Sheet as on 31st December, 2015

Liabilities	Amount (₹)	Assets	Amount (₹)
Equity share capital	1,00,000	Cash in hand	2,000
12% Preference share capital	1,00,000	Cash in bank	10,000
16% Debentures	40,000	Bills Receivable	30,000
18% Public debts	20,000	Investment	20,000
Bank overdraft	40,000	Debtors	70,000
Creditors	60,000	Stock	40,000
Outstanding Creditors	7,000	Furniture	30,000
Proposed dividends	10,000	Machinery	1,00,000
Reserves	1,50,000	Land & Building	2,20,000
Provision for taxation	20,000	Goodwill	35,000
Profit & Loss Account	20,000	Preliminary expenses	10,000
	5,67,000		5,67,000

During the year provision for taxation was ₹ 20,000. Dividend was proposed at ₹ 10,000. Profit carried forward from the last year was ₹ 15,000. You are required to calculate:

- Short term solvency ratios, and
- Long term solvency ratios.

Solution:

Short term solvency ratios:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{1,52,000}{1,37,000} = 1.109 \text{ times}$$

$$\text{Current Assets} = 2,000 + 10,000 + 30,000 + 70,000 + 40,000 = 1,52,000$$

$$\text{Current Liabilities} = 40,000 + 60,000 + 7,000 + 10,000 + 20,000 = 1,37,000$$

The ideal ratio is 2 but in the instant case it is only 1.109. hence, it is not satisfactory.

$$\text{Liquid Ratio} = \frac{\text{Liquid Assets}}{\text{Liquid Liabilities}} = \frac{1,12,000}{97,000} = 1.155 \text{ times}$$

$$\begin{aligned} \text{Liquid Assets} &= \text{Current Assets} - \text{Inventory} \\ &= 1,52,000 - 40,000 \\ &= 1,12,000 \end{aligned}$$

$$\begin{aligned} \text{Liquid Liability} &= \text{Current Liability} - \text{Bank Overdraft} - \text{Cash Credit} \\ &= 1,37,000 - 40,000 \\ &= 97,000. \end{aligned}$$

This indicates that the company's EBIT covers 4.5 times of its interest expenses, which is quite satisfactory.

Calculation of EBIT

	(₹)
Profit retained	5,000

(+) Proposed dividend	10,000
PAT	15,000
(+) Tax	20,000
PBT	35,000
(+) Interest [6400 + 3600]	10,000
EBIT	45,000

Interest = 16% of 40,000 + 18% of 20,000 = 6400 + 3600 = 10,000

Long term solvency ratios:

$$\text{Debt Equity Ratio} = \frac{\text{Long Term Debt}}{\text{Long Term Fund}} = \frac{60,000}{3,85,000} = 0.156 \text{ times}$$

Long term debt:

	(₹)
Debentures	40,000
Public debt	20,000
	60,000

Long term fund

	(₹)
Equity Share Capital	1,00,000
Preference Share Capital	1,00,000
Debentures	40,000
Public Debts	20,000
Reserves	1,50,000
Profit and Loss Account	20,000
	4,30,000
Less: Goodwill	35,000
Preliminary Expenses	10,000
	3,85,000

Share holder funds:	(₹)
Equity capital	1,00,000
Preference capital	1,00,000
Reserves	1,50,000
P & L A/c	20,000
(-) Good will	35,000
(-) Preliminary exp	10,000
	3,25,000

Long term debt/ share holders funds = 60,000 / 3,25,000 = 0.18 times

Both are quite satisfactory.

It seems the company has adopted a conservative policy for raising finance. Under such policy the equity share holders may not avail the benefit of trading on equity.

→ Fixed Assets Ratio = Fixed Assets / Long Term Funds = 3,50,000 / 3,85,000 = 0.91 times

The ratio is satisfactory.

→ Proprietary Ratio Share holder Funds / Total Tangible Assets

= [3,25,000 / (5,67,000 - 4,50,00)] = 0.6226 times

Ratio is ideal. And long term position is quite satisfactory, it is advised to improve short term solvency.

Illustration 4:

Following is the Balance Sheet of Sun Ltd., as on December 31, 2015.

Liabilities	Amount (₹)	Assets	Amount (₹)
Equity Share Capital	20,000	Goodwill	12,000
Capital Reserves	4,000	Fixed Assets	28,000
8% Loan on mortgage	16,000	Stocks	6,000
Trade creditors	8,000	Debtors	6,000
Bank over draft	2,000	Investments	2,000
Taxation:		Cash in hand	6,000
Current	2,000		
Future	2,000		
Profit & Loss A/c:			
PAT for the year			
Less: Transfer to: 12,000			
Reserves 4,000			
Dividend 2,000	6,000		
	60,000		60,000

Sales amounted to ₹1,20,000. Calculate ratio for (a) testing liquidity, and (b) testing solvency.

Solution:

Ratios for testing liquidity

1. Current Ratio = Current Assets/ Current Liabilities = 20,000/12,000 = 1.67 times
2. Liquidity Ratio = Liquid Assets/ Current Liabilities = 14,000/12,000 = 1.17 times

The liquid position of the company is satisfactory. Both the current ratio and liquidity ratio are satisfactory.

Ratios for testing solvency

1. Debt- equity Ratio = Share holders Funds/ Total Long Term Funds = 18,000/36,000 = 0.5 times
2. Fixed Assets Ratio = Net profit before interest and tax/ Interest = 14,000/1,280 = 10.94 times

All solvency ratios are very much favorable to the company judged from the above, the company has satisfactory position both from liquidity and solvency viewpoints.

Working notes:

1. Current Assets

	(₹)
Stock	6,000
Debtors	6,000

Investments*	2,000
Cash in hand	6,000
	20,000

* presumed to be short- term.

2. Current Liabilities

	(₹)
Trade creditors	8,000
Bank overdraft	2,000
Taxation*	2,000
	12,000

* excluding future taxation presumed to be payable after a year.

3. Liquid Assets

	(₹)
Current Assets	20,000
Less: Stock	6,000
	14,000

4. Liquid Liability

	(₹)
Current Liability	12,000
Less: Bank Overdraft	2,000
	10,000

5. Share holders' Funds

Equity share capital	20000	
Capital reserves	4000	
P & L accounts balance	6000	30000
Less: Goodwill		12000
		18000

6. Long Terms Funds

	(₹)
Share holders' funds	18,000
Mortgage loan	16,000
Future taxation	2,000
	36,000

7. Interest Calculation:

8% of 16,000 = 1,280

Illustration 5:

With the help of the following information complete the Balance Sheet of PKJ Ltd.

Equity share capital	₹ 1,00,000
The relevant ratios of the company are as follows:	

Current debt to total debt	40
Total debt to owner's equity	60
Fixed assets to owner's equity	60
Total assets turnover	2 Times
Inventory turnover	8 Times

Solution:

**In the Books of PKJ Ltd.
Balance Sheet**

Liabilities	Amount (₹)	Assets	Amount (₹)
Owners equity	1,00,000	Fixed Assets	60,000
Current debt	24,000	Cash	60,000
Long term debt	36,000	Inventory	40,000
	1,60,000		1,60,000

Working Notes:

- Fixed assets = $0.60 \times \text{Owners equity} = 0.60 \times ₹ 1,00,000 = ₹ 60,000$.
- Total debt = $0.60 \times \text{Owners equity} = 0.60 \times ₹ 1,00,000 = ₹ 60,000$.
- Total assets consisting of fixed assets and current assets must be equal to ₹ 1,60,000 (Assets = Liabilities + Owners equity). Since fixed assets are ₹ 60,000 hence, current assets should be ₹ 1,00,000.
- Total equity = Total debt + Owners equity = ₹ 60,000 + ₹ 1,00,000 = ₹ 1,60,000.
- Total assets turnover = 2 Times; Inventory turnover = 8 Times. Therefore, Inventory/Total assets = $2/8 = 1/4$; Total assets = ₹ 1,60,000. Therefore, Inventory = $1,60,000 / 4 = 40,000$.
- Cash = ₹ 1,00,000 – ₹ 40,000 = ₹ 60,000.

Illustration 6:

Using the following data, prepare the Balance Sheet:

Gross profits	₹ 54,000
Shareholders Funds	₹ 6,00,000
Gross Profit Margin	20%
Credit Sales to Total Sales	80%
Total Assets turnover	0.3 times
Inventory turnover	4 times
Average collection period (a 360 days year)	20 days
Current ratio	1.8
Long-term Debt to Equity	40%

Solution:

Balance Sheet

Liabilities	Amount (₹)	Assets	Amount (₹)
Creditors (bal. Fig.)	60,000	Cash	42,000
Long Term Debts	2,40,000	Debtors	12,000
Share Holders Fund	6,00,000	Inventory	54,000
		Fixed Assets (bal. fig).	7,92,000

	9,00,000		9,00,000

Working Notes:**1. Gross Profit:**

$$\begin{aligned}\text{GP Margin} &= 20\% \\ \text{GP} &= ₹ 54,000 \\ \text{Sales} &= 54,000 / 20\% = ₹ 2,70,000\end{aligned}$$

2. Credit Sales:

$$\begin{aligned}\text{Credit Sales} &= 80\% \text{ of Total Sales} \\ &= 2,70,000 \times 80\% = ₹ 2,16,000\end{aligned}$$

3. Total Assets:

$$\begin{aligned}\text{Total Assets Turnover} &= \text{Sales} / \text{Total Assets} = 0.3 \text{ Times} \\ \text{Total Assets} &= 2,70,000 / 0.3 = ₹ 9,00,000\end{aligned}$$

4. Inventory Turnover:

$$\begin{aligned}\text{Inventory Turnover} &= \text{Cost of Goods Sold} / \text{Inventory} \times 100 \\ &= 2,70,000 - 54,000 / \text{Inventory} \\ \text{Inventory} &= 2,16,000 / 4 = ₹ 54,000\end{aligned}$$

5. Debtors:

$$\text{Debtors} = \text{Credit Sales} \times 20 / 360 \text{ days} = ₹ 12,000$$

6. Creditors:

$$\begin{aligned}\text{Total Assets} &= 9,00,000 \\ \text{Total of Balance Sheet} &= 9,00,000 \\ \text{Now, Long Term Debt} &= \text{Long Term Debt} / \text{Equity} = 40\% \\ \text{Long Term Debt} &= 40\% \text{ of equity} \\ &= 6,00,000 \times 40\% = ₹ 2,40,000\end{aligned}$$

Now Balancing figure of Liability side is creditors:

$$\begin{aligned}&= 9,00,000 - 6,00,000 \text{ (Equity)} - 2,40,000 \text{ (Long Term Debt)} \\ &= ₹ 60,000\end{aligned}$$

$$\text{Creditors} = ₹ 60,000$$

7. Current Ratio – Cash:

$$\text{Current ratio} = \text{Current Assets} / \text{Current Liabilities}$$

$$1.8 = \text{Debtors} + \text{Inventory} + \text{Cash} / \text{Creditors}$$

$$1.8 = 12,000 + 54,000 + \text{Cash} / 60,000$$

$$1,08,000 = 66,000 + \text{Cash}$$

$$\text{Cash} = ₹ 42,000$$

8. Fixed Assets:

Balancing figure on Assets Side is Fixed Assets.

9. Sales

$$\text{COGS} = \text{Sales} - \text{G.P.}$$

$$\text{COGS} = ₹ 2,70,000 - 54,000 = ₹ 2,16,000$$

Illustration 7:

PKJ Limited has the following Balance Sheets as on March 31, 2016 and March 31, 2015:

Balance Sheet

(₹ in Lakhs)

Particulars	March 31, 2015	March 31, 2016
Source of Funds		
Shareholders Funds	2,377	1,472
Loan Funds	3,570	3,083
	5,947	4,555
Application of Funds		
Fixed Assets	3,466	2,900
Cash and bank	489	470
Debtors	1,495	1,168
Stock	2,867	2,407
Other Current Assets	1,567	1,404
Less: Current Liabilities	(3,937)	(3,794)
	5,947	4,555

The Income Statement of the PKJ Ltd. for the year ended is as follows:

(₹ in Lakhs)

	March 31, 2015	March 31, 2016
Sales	22,165	13,882
Less: Cost of Goods sold	20,860	12,544
Gross Profit	1,305	1,338
Less: Selling, General and Administrative expenses	1,135	752
Earning before Interest and Tax (EBIT)	170	586
Less: Interest Expenses	113	105
Profits before Tax	57	481
Less: Tax	23	192
Profits after Tax (PAT)	34	289

Required:

- Calculate for the year 2015-16:
 - Inventory Turnover Ratio
 - Financial Leverage
 - Return on Investment (ROI)
 - Return on Equity (ROE)
 - Average Collection period.
- Give a brief comment on the Financial Position of PKJ Limited.

Solution:**1. Ratios for the year 2015-16**

(a) Inventory Turnover Ratio

$$\begin{aligned}
 &= \text{Cost of goods sold} / \text{Average Inventory} \\
 &= 20,860 / (2,867 + 2,407) / 2 \\
 &= 20,860 / 2,637 = 7.910
 \end{aligned}$$

(b) Financial Leverage

	2015-2016	2014 - 2015
= EBIT / EBT	= 170 / 57	= 586 / 481
	= 2.98	= 1.22

(c) Return on Investment

$$\begin{aligned}
 \text{ROI} &= \text{NOPAT} / \text{Sales} \times \text{Sales} / \text{Average Capital employed} \\
 &= \frac{57 \times (1 - 0.4)}{22,165} \times \frac{22,165}{(5,947 + 4,555) / 2} \\
 &= \frac{57 \times (0.6)}{22,165} \times \frac{22,165}{5,251} \\
 &= 34.2 / 5,251 \\
 &= 0.65\%
 \end{aligned}$$

(d) Return on Equity

$$\begin{aligned}
 \text{ROE} &= \text{PAT} / \text{Average share holders fund} \\
 &= 34 / [(2,377 + 1,472) / 2] \\
 &= 34 / 1,924.5 \\
 &= 1.77\%
 \end{aligned}$$

(e) Average Collection Period

$$\begin{aligned}
 \text{Average Collection Period} &= \text{Average Debtors} / \text{Average Sales per day} \\
 &= [(1,495 + 1,168) / 2] / [22,165 / 365 \text{ days}] \\
 &= 1,331.5 / 60.73 = 22 \text{ days.}
 \end{aligned}$$

Financial position of PKJ Limited

A careful analysis of above Balance Sheet shows that current ratio of company is 1.5 which is less than the standard (i.e. 2) and short-term solvency ratio is therefore not satisfactory. At the same time lot of capital is blocked in inventory as compared to previous year. This affects liquidity of the firm.

As regards utilization of Debt Capital, the percentage of debts to total assets is not high, but as compared to equity, debt content is more in capital structure. Company is said to be levered with higher proportion of debt in its capital structure. This situation involves considerable risk to shareholders in capital structuring, the company should ensure that cost of debt remains lower than return on investment.

Illustration 8:

The following figures and ratios are related to a company:

(a) Sales for the year (all credit)	₹ 30,00,000
(b) Gross Profit ratio	25 per cent
(c) Fixed assets turnover (basis on cost of goods sold)	1.5
(d) Stock turnover (basis on cost of goods sold)	6
(e) Liquid ratio	1:1

(f) Current ratio	1.5 : 1
(g) Debtors collection period	2 months
(h) Reserve and surplus to share capital	0.6 : 1
(i) Capital gearing ratio	0.5
(j) Fixed assets to net worth	1.20 : 1

You are required to prepare Balance Sheet of the company on the basis of above details.

Solution:

Preparation of Balance Sheet of a Company

Working Notes:

1. Cost of Goods Sold $= \text{Sales} - \text{Gross Profit} (=25\% \text{ of Sales})$
 $= ₹ 30,00,000 - ₹ 7,50,000$
 $= ₹ 22,50,000$
2. Closing Stock $= \text{Cost of Goods sold} / \text{Stock Turnover}$
 $= ₹ 22,50,000 / 6$
 $= ₹ 3,75,000$
3. Fixed Assets $= \text{Cost of Goods Sold} / \text{Fixed Assets Turnover}$
 $= ₹ 22,50,000 / 1.5$
 $= ₹ 15,00,000$
4. Current Assets:
 Current Ratio Stock $= 1.5 \text{ and Liquid Ratio} = 1$
 $= 1.5 - 1 = 0.5$
 Current Assets $= \text{Amount of Stock} \times 1.5 / 0.5$
 $= ₹ 3,75,000 \times 1.5 / 0.5 = ₹ 11,25,000$
5. Liquid Assets (Debtors and Cash) $= \text{Current Assets} - \text{Stock}$
 $= ₹ 11,25,000 - ₹ 3,75,000$
 $= ₹ 7,50,000$
6. Debtors $= \text{Sales} \times \text{Debtors Collection Period} / 12$
 $= ₹ 30,00,000 \times 2 / 12$
 $= ₹ 5,00,000$
7. Cash $= \text{Liquid Assets} - \text{Debtors}$
 $= ₹ 7,50,000 - ₹ 5,00,000$
 $= ₹ 2,50,000$
8. Net worth $= \text{Fixed Assets} / 1.2$
 $= ₹ 15,00,000 / 1.2$
 $= ₹ 12,50,000$
9. Reserves and Surplus
 Reserves and Share Capital $= 0.6 + 1 = 1.6$
 Reserves and Surplus $= ₹ 12,50,000 \times 0.6 / 1.6$
 $= ₹ 4,68,750$
10. Share capital $= \text{Net worth} - \text{Reserves and Surplus}$
 $= ₹ 12,50,000 - ₹ 4,68,750$

$$= ₹ 7,81,250$$

11. Current Liabilities

$$= \text{Current Assets} / \text{Current Ratio}$$

$$= ₹ 11,25,000 / 1.5$$

$$= ₹ 7,50,000$$

12. Long-Term Debts

$$\text{Capital Gearing Ratio} = \text{Long-term Debts} / \text{Equity shareholder's Fund Long – Term Debts}$$

$$= ₹ 12,50,000 \times 0.5$$

$$= ₹ 6,25,000$$

Balance Sheet of a Company

Liabilities	Amount (₹)	Assets	Amount (₹)
Equity Share Capital	7,81,250	Fixed Assets	15,00,000
Reserves and Surplus	4,68,750	Current Assets	
Long-term Debts	6,25,000	Stock	3,75,000
Current Liabilities	7,50,000	Debtors	5,00,000
		Cash	2,50,000
	26,25,000		26,25,000

Illustration 9:

PKJ Limited has made plans for the next year 2015-16. It is estimated that the company will employ total assets of ₹ 25,00,000; 30% of assets being financed by debt at an interest cost of 9% p.a. The direct costs for the year are estimated at ₹ 15,00,000 and all other operating expenses are estimated at ₹ 2,40,000. The sales revenue are estimated at ₹ 22,50,000. Tax rate is assumed to be 40%.

Required to calculate:

- Net profit margin
- Return on Assets
- Asset turnover
- Return on equity

Solution:

The net profit is computed as follows:

Particulars	(₹)
Sales Revenue	22,50,000
Less: Direct Costs	15,00,000
Gross Profits	7,50,000
Less: Operating Expense	2,40,000
EBIT	5,10,000
Less: Interest (9% x 7,50,000)	67,500
EBT	4,42,500
Less: Taxes (@ 40%)	1,77,000
PAT	2,65,500

(a) Net Profit Margin

$$\text{Net Profit Margin} = \text{EBIT} (1-t) / \text{Sales} \times 100$$

$$= 5,10,000 \times (1 - 0.4) / 22,50,000 = 13.6\%$$

(b) Return on Assets (ROA)

$$\begin{aligned} \text{ROA} &= \text{EBIT} (1-t) / \text{Total Assets} \\ &= 5,10,000 (1 - 0.4) / 25,00,000 \\ &= 3,06,000 / 25,00,000 = 0.1224 = 12.24\% \end{aligned}$$

(c) Asset Turnover

$$\begin{aligned} \text{Asset Turnover} &= \text{Sales} / \text{Assets} \\ &= 22,50,000 / 25,00,000 = 0.9 \end{aligned}$$

(d) Return on Equity (ROE)

$$\begin{aligned} \text{ROE} &= \text{PAT} / \text{Equity} \\ &= 2,65,500 / 17,50,000 = 15.17\% \end{aligned}$$

Illustration 10:

With the help of the following ratios regarding Indu Films draw the Balance Sheet of the company for the year 2015:

Current Ratio	2.5
Liquidity ratio	1.5
Net working capital	₹ 3,00,000
Stock turnover ratio (cost of sales / closing stock)	6 times
Gross profit ratio	20%
Fixed Assets turnover ratio (on cost of sales)	2 times
Debt collection period	2 months
Fixed Assets to share holders net worth	0.80
Reserve and surplus to capital	0.5

Solution:

Balance Sheet of Indu Films for the year 2015

Liabilities	Amount (₹)	Assets	Amount (₹)
Share capital	5,00,000	Fixed assets	6,00,000
Reserve and surplus	2,50,000	Stock	2,00,000
Long-term borrowings (Bal. Fig.)	1,50,000	Debtors	2,50,000
Current liabilities	2,00,000	Bank	50,000
	11,00,000		11,00,000

Working notes:

If Current Liabilities	1
Current Assets	2.5
It means difference on Working Capital	1.5
Working Capital is 1.5	₹ 3,00,000
Therefore, Current Assets	₹ 5,00,000
Current Liabilities	₹ 2,00,000

As Liquidity Ratio	1.5
And Current Liabilities	₹ 2,00,000
(Bank and Debtors) (2,00,000 x 1.5)	₹ 3,00,000
Stock (5,00,000-3,00,000) i.e., Current Assets- Liquid Assets	₹ 2,00,000
Cost of sales (as stock turnover ratio is 6)	₹ 12,00,000
Sales (as G.P. ratio is 20%, $1,200,000 + 20/80 \times 1,200,000$)	₹ 15,00,000
Fixed Assets are ₹ 1,200,000/2, since Debtors collection	
Fixed Assets Turnover Ratio is 2 times	₹ 6,00,000
Debtors are ₹ 1,500,000/6 since debtors collection period is 2 months	₹ 2,50,000
Shareholders' net worth $600,000 \times 1/0.80$	₹ 7,50,000
Out of shareholders' net worth Reserves and Surplus ($7,50,000 \times 0.5/1.5$)	₹ 2,50,000
Therefore, Share capital	₹ 5,00,000

6

FUND FLOW STATEMENT AND CAS FLOW STATEMENT

The Balance Sheet provides only a static view of the business. It is a statement of assets and liabilities on a particular date. It does not show the movement of funds. In business concerns, funds flow from different sources and similarly funds are invested in various sources of investment. It is a continuous process. The study and control of this funds flow process is the main objective of Financial Management to assess the soundness and solvency of a business., financing and investing activities over the related period. Like the Balance Sheet, even the Profit and Loss Account does not depict the changes that have taken place in financial condition of a business concern between two dates. Hence there is a need to prepare an additional statement to know the changes in assets, liabilities and owners' equity between dates of two Balance Sheets. Such a statement is called Funds Flow Statement or Statement of Sources and Uses of funds or where come and where gone statement.

The Funds Flow Statement, which is also known as the Statement of Changes in financial position, is yet another tool of analysis of financial statements.

Meaning and concepts of funds

Funds Flow Statement is a widely used tool in the hands of financial executives for analysing the financial performance of a business concern. Funds keep on moving in a business which itself is based on a going concern concept.

The term Funds has a variety of meanings.

In a narrow sense: In a narrow sense fund means only cash. Funds Flow Statement prepared on this basis is called as Cash Flow Statement. In this type of statement only in flow and outflow of cash is taken into account.

In a broader sense: In a broader sense the term fund refers to money value in whatever form it may exist. Here funds mean all financial resources in the form of men, materials, money, machinery etc.

Popular sense: In a popular sense the term funds means Working Capital i.e., the excess of Current Assets over Current Liabilities. When the funds move inwards or outwards they cause a flow or rotation of funds. Here the word fund means Net Working Capital. In short, if funds mean working capital, then the statement prepared on the basis is called Funds Flow Statement.

Funds Flow Statement gives detailed analysis of changes in distribution of resources between two Balance Sheet dates. This statement is widely used by the financial analysts and credit granting institutions and Finance Managers in performing their jobs. Thus, Funds, Flow Statement, in general is able to present that information which either is not available or not readily apparent from an analysis of other financial statements.

Definitions:

A statement of sources and application of funds is a technical device designed to analyse the changes in the financial condition of a business enterprise between two dates.

- Foulke

Funds Flow Statement describes the sources from which additional funds were derived and the use to which these sources were put.

- Anthony

Significance of funds flow statement

It is very useful tool in the Financial Managers analytical kit. It provides a summary of management decisions on financing activities of the firm and investment policy. The following are the advantages of Funds Flow Statement.

- (i) **Analysis of financial operations:** The Funds Flow Statement reveals the net affect of various transactions on the operational and financial position of the business concern. It determines the financial consequences of

business operations. This statement discloses the causes for changes in the assets and liabilities between two different points of time. It highlights the effect of these changes on the liquidity position of the company.

- (ii) **Financial policies:** Funds Flow Statement guides the management in formulating the financial policies such as dividend, reserve etc.
- (iii) **Control device:** It serves as a measure of control to the management. If actual figures are compared with budgeted projected figures, management can take remedial action if there are my deviations.
- (iv) **Evaluation of firm's financing:** Funds Flow Statement helps in evaluating the firm's financing. It shows how the funds were obtained from various sources and used in the past. Based on this, the financial manager can take corrective action.
- (v) **Acts as a future guide:** Funds Flow Statement acts as a guide for future, to the management. It helps the management to know various problems it is going to face in near future for want of funds.
- (vi) **Appraising the use of working capital:** Funds Flow Statement helps the management in knowing how effectively the working capital put into use.
- (vii) **Reveals financial soundness:** Funds Flow Statement reveals the financial soundness of the business to the creditors, banks, financial institutions.
- (viii) **Changes in working capital:** Funds Flow Statement highlights the changes in working capital. This helps the management in framing its investing policy.
- (ix) **Assessing the degree of risk:** Funds Flow Statement helps the bankers, creditors, financial institutions in assessing the degree of risk involved in granting the credit to the business concern.
- (x) **Net results:** This statement reveals the net results of operations during the year in terms of cash.

Limitations of Funds Flow Statement

The following are the important limitations of Funds Flow Statement

- (i) Funds Flow Statement is not a substitute of Income Statement or a Balance Sheet. It furnished only some additional information as regards changes in Working Capital.
- (ii) This statement lacks originality. It is simply rearrangement of data appearing in account books.
- (iii) It indicates only the past changes. It can not reveal continuous changes.
- (iv) When both the aspects of the transaction are current, they are not considered.
- (v) When both the aspects of the transaction are non-current, even then they are not included in funds flow statement.
- (vi) Some Management Accountants are of the opinion that this statement is not ideal tool for financial analysis.
- (vii) Funds Flow Statement is historic in nature. Hence this projected funds flow statement cannot be prepared with much accuracy.

Sources of Funds:

- (i) Issue of share capital.
- (ii) Funds from business operations
- (iii) Issue of debentures of long term loans.
- (iv) Sale of fixed assets or long term investments.
- (v) Non-trading income.
- (vi) Decrease in working capital.
- (vii) Any other increase in liability and decrease in asset.

Application of Funds:

- (i) Redemption of preference share capital.
- (ii) Redemption of debentures.
- (iii) Repayment of long-term loans.

- (iv) Purchase of fixed assets or long term investments.
- (v) Payment of dividends and tax.
- (vi) Any other non-trading payment.
- (vii) Funds lost through business operations.
- (viii) Increase in working capital.
- (ix) Any other decrease in liability and increase in asset.

4.3 CASH FLOW ANALYSIS

Cash Flow Statement reveals the causes of changes in cash position of business concern between two dates of Balance Sheets. According to Accounting Standard - 3 (Revised) an enterprise should prepare a Cash Flow Statement and should present it for each period with financial statements prepared. AS-3 (Revised) has also given the meaning of the words cash, cash equivalent and cash flows.

- (i) **Cash:** This includes cash on hand and demand deposits with banks.
- (ii) **Cash equivalents:** This includes purely short term and highly liquid investments which are readily convertible into cash and which are subject to an insignificant risk of changes in value. Therefore an investment normally qualifies as a cash equivalent only when it has a short maturity, of say three months or less.
- (iii) **Cash flows:** This includes inflows and outflows of cash and cash equivalents. If the effect of transaction results in the increase of cash and its equivalents, it is called an inflow (source) and if it results in the decrease of total cash, it is known as outflow (use of cash).

Classification of Cash Flows

According to AS-3 (Revised) cash flows are classified into three main categories:

- A. Cash flows from Operating Activities.
- B. Cash flows from Investing Activities.
- C. Cash flows from Financing Activities.

A. Cash flows from Operating Activities: Operating activities are the principal revenue-producing activities of the enterprise and other activities that are not investing or financing activities.

The amount of cash flows arising from operating activities is a key indicator of the extent to which the operations of the enterprise have generated sufficient cash flows to maintain the operating capability of the enterprise, pay dividends, repay loans, and make new investments without recourse to external sources of financing.

Cash flows from operating activities are primarily derived from the principal revenue-producing activities of the enterprise. The following are the important operating activities:-

- (i) Cash receipts from the sale of goods and the rendering of services.
- (ii) Cash receipts from royalties, fees, commissions and other revenue.
- (iii) Cash payments to suppliers for goods and services.
- (iv) Cash payments to and on behalf of employees.
- (v) Cash receipts and cash payments of an insurance enterprise for premiums and claims, annuities and other policy benefits,
- (vi) Cash payments or refunds of income taxes unless they can be specifically identified with financing and investing activities,
- (vii) Cash receipts and payments relating in future contracts, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purposes.
- (viii) Some transactions such as the sale of an item of plant, may give rise to a gain or loss which is included in the determination of net profit or loss. However, the cash flows relating to such transactions are cash flows from

investing activities.

An enterprise may hold securities and loans for dealing or trading purposes, in which case they are similar to inventory acquired specifically for sale. Therefore, cash flows arising from the purchase and sale of dealing or trading activities are classified as operating activities. Similarly cash advances and loans made by financial enterprises are usually classified as operating activities since they relate by the main revenue producing activity of that enterprise.

B. Cash flows from Investing Activities: Investing activities are the acquisition and disposal of long-term assets and other investments not included in cash equivalents. The separate disclosure of cash flows arising from investing activities is important because the cash flows represent the extent to which expenditures have been made for resources intended to generate future income and cash flows.

Examples of cash flows arising from Investing Activities are:

- (i) Cash payments to acquire fixed assets (including intangibles). These payments include those relating to capitalised research & development costs and self constructed fixed assets.
- (ii) Cash receipts from disposal of fixed assets (including intangibles).
- (iii) Cash payments to acquire shares, warrants, or debt instruments of other enterprises and interests in joint ventures.
- (iv) Cash receipts from disposal of shares, warrants, or debt instruments of other enterprises and interests in joint venture.
- (v) Cash advances and loans made to third parties (other than advances and loans made by a financial enterprise).
- (vi) Cash receipts from the repayment of advances and loans made to third parties (other than advances and loans of a financial enterprise).
- (vii) Cash payments for future contracts, forward contracts, option contracts, and swap contracts except when the contracts are held for dealing or trading purposes or the payments are classified as financing activities and
- (viii) Cash receipts from future contracts, forward contracts, option contracts and swap contracts except when the contracts are held for dealing or trading purpose, or the receipts are classified as financing activities.

When a contract is accounted for as a hedge of an identifiable position, the cash flows of the contract are classified in the same manner as the cash flows of the position being hedged.

C. Cash flows from financing activities: Financing activities are activities that result in changes in the size and composition of the owners capital (including Preference Share Capital in the case of a company) and borrowing of the enterprise.

The separate disclosure of cash flows arising from financing activities is important because it is useful in predicting claims on future cash flows by providers of funds (both capital and borrowing) to the enterprise.

Examples of cash flows arising from financing activities are:

- (i) Cash proceeds from issuing shares or other similar instruments.
- (ii) Cash proceeds from issuing debentures loans, notes, bonds and other short-or long-term borrowings and
- (iii) Cash repayments of amounts borrowed such as redemption of debentures, bonds, preference shares.

Treatment of some typical items: AS - 3 (Revised) has also provided for the treatment of cash flows from some peculiar items as discussed below :

Extraordinary Items: The cash flows associated with extraordinary items should be classified as arising from operating, investing or financing activities as appropriate and separately disclosed in the Cash Flows Statement to enable users to understand their nature and effect on the present and future cash flows of the enterprise.

Interest and Dividends: Cash flows from interest and dividends received and paid should be disclosed separately. Further, the total amount of interest paid during the period should be disclosed in the Cash Flow Statement whether it has been recognised as an expense in the statement of profit and loss or capitalised. The treatment of interest and dividends received and paid depends upon the nature of the enterprise. For this purpose, the enterprises are classified as (i) Financial enterprises, and (ii) Other enterprises.

(i) **Financial enterprises:** In the case of financial enterprises, cash flows arising from interest paid and interest and dividend received should be classified as cash flows arising from operating activities.

(ii) **Other enterprises:** In the case of other enterprises, cash flows arising from interest paid should be classified as cash flows from **financing activities** while interest and dividends received should be classified as cash flows from **investing activities**. Dividends paid should be classified as cash flows from financing activities.

(c) Taxes on income: Cash flows arising from taxes on income should be separately disclosed and should be classified as cash flows from operating activities unless they can be specifically identified with financing and investing activities.

(d) Acquisitions and disposals of subsidiaries and other business units : The aggregate cash flows arising from acquisitions and from disposals of subsidiaries or other business units should be presented separately and classified as investing activities. An enterprise should disclose, in aggregate in respect of both acquisition and disposal of subsidiaries or other business units during the period each of the following:

(i) The total purchase or disposal consideration and

(ii) The portion of the purchase or disposal consideration discharged by means of cash and cash equivalents.

The separate presentation of the cash flow effects of acquisitions and disposals of subsidiaries and other business units as single line items helps to distinguish those cash flows from other cash flows. The cash flow effects of disposals are not deducted from those of acquisitions.

(e) Foreign currency cash flows: Cash flows arising from transactions in a foreign currency should be recorded in an enterprise's reporting currency by applying to the foreign currency amount the exchange rate between the reporting currency and the foreign currency at the date of the cash flow. The effect of changes in exchange rates on cash and cash equivalents held in a foreign currency should be reported as a separate part of the reconciliation of the changes in cash and cash equivalents during the period.

Unrealised gains and losses arising from changes in foreign exchange rates are not cash flows. However, the effect of exchange rate changes on cash and cash equivalents held or due in a foreign currency is reported in the Cash Flow Statement in order to reconcile cash and cash equivalents at the beginning and at the end of the period. This amount is presented separately from cash flows from operating investing and financing activities and includes the difference, if any had those cash flows been reported at the end of period exchange rates.

(f) Non-cash transactions: Many investing and financing activities do not have a direct impact on current cash flows although they do affect the capital and asset structure of an enterprise.

Examples of non-cash transactions are:

(i) The acquisition of assets by assuming directly related activities.

(ii) The acquisition of an enterprise by means of issue of shares; and

(iii) The conversion of debt to equity.

Investing and financing transactions that do not require the use of cash or cash equivalents should be excluded from a Cash Flow Statement. Such transactions should be disclosed elsewhere in the financial statements in a way that provides all the relevant information about these investing and financing activities.

Methods of Calculating Cashflows (Used in) Operating Activities

There are two methods of reporting cash flows from operating activities namely (1) Direct Method and (2) Indirect Method.

A. The Direct Method: Under the direct method, cash receipts (inflows) from operating revenues and cash payments (outflows) for operating expenses are calculated to arrive at cash flows from operating activities. The difference between the cash receipts and cash payments is the net cash flow provided by (or used in) operating activities. The following are the examples of cash receipts and cash payments (called cash flows) resulting from operating activities:

(a) Cash receipts from the sale of goods and the rendering of services.

(b) Cash receipts from royalties, fees commissions and other revenues

(c) Cash payment to suppliers for goods and services

(d) Cash payment to and on behalf of employees.

- (e) Cash receipts and cash payment of an insurance enterprise for premiums and claims annuities and other policy benefits.
- (f) Cash payments or refund of income taxes unless they can be specifically identified with financing and investing activities. and
- (g) Cash receipts and payments relating to future contracts, forward contracts, option contracts and swap contracts when the contracts are held for dealing or trading purposes. The formation about major classes of gross cash receipts and gross cash payments may be obtained either:
 - (a) From accounting records of the enterprise; or
 - (b) By adjusting sales, cost of sales (interest and similar income and interest expense and similar charges for a financial enterprise) and other items in the statement of profit and loss for;
 - (i) Changes during the period in inventories and operating receivables and payables,
 - (ii) Other non-cash items, and
 - (iii) Other items for which the cash effects are investing or financing cash flows.

Format of Cash Flow Statement: AS-3 (Revised) has not provided any specific format for preparing a Cash Flows Statement. The Cash Flow Statement should report cash flows during the period classified by operating, investing and financing activities; a widely used format of Cash Flow Statement is given below:

Cash Flow Statement (for the year ended.....)

Particulars	(₹)	(₹)
Cash Flows from Operating activities		
Cash receipts from customers	xxx	
Cash paid to suppliers and employees	(xxx)	
Cash generated from operations	xxx	
Income tax paid	(xx)	
Cash flow before extraordinary items	xxx	
Extraordinary items	xxx	
Net cash from (used in) Operating activities		xxx
(Or)		
Net profit before tax and extraordinary items	xxx	
Adjustments for non-cash and non-operating items		
(List of individual items such as depreciation, foreign exchange loss, loss on sale of fixed assets, interest income, dividend income, interest expense etc.)	xxx	
Operating profit before working capital changes	xxx	
Adjustments for changes in current assets and current liabilities		
(List of individual items)	xxx	
Cash generated from (used in) operations before tax	xxx	
Income tax paid	xxx	
Cash flow before extraordinary items	xxx	
Extraordinary items (such as refund of tax)	xxx	
Net Cash from (used in) Operating activities		xxx

Particulars	(₹)	(₹)
Cash Flows from investing activities		
Individual items of cash inflows and outflows from financing activities	xxx	

(such as purchase/sale of fixed assets, purchase or sale of investments, interest received, dividend received etc.)	xxx	
Net cash from (used in) investing activities		xxx
Cash Flows from Financing Activities		
Individual items of cash inflows and outflows from financing activities	xxx	
(such as) proceeds from issue of shares, long-term borrowings, repayments of long-term borrowings, interest paid, dividend paid etc.)	xxx	xxx
Net increase (decrease) in cash and cash equivalents		xxx
Cash and cash equivalents at the beginning of the period		xxx
Cash and cash equivalents at the end of the period		xxx

B. The Indirect Method: Under the indirect method, the net cash flow from operating activities is determined by adjusting net profit or loss for the effect of:

- Non-cash items such as depreciation, provisions, deferred taxes, and unrealised foreign exchange gains and losses;
- Changes during the period in inventories and operating receivables and payables.
- All other items for which the cash effects are investing or financing cash flows.

The indirect method is also called reconciliation method as it involves reconciliation of net profit or loss as given in the Profit and Loss Account and the net cash flow from operating activities as shown in the Cash Flow Statement. In other words, net profit or losses adjusted for non-cash and non-operating items which may have been debited or credited to Profit and Loss Account as follows.

Calculation of Cash Flow from Operating Activities

Particulars	(₹)	(₹)
Net profit before tax and extraordinary items		xxx
Add : Non-cash and non-operating items which have already been debited to P.L. Account		
(a) Depreciation	xxx	
(b) Transfer to reserves and provisions	xxx	
(c) Good will written off	xxx	
(d) Preliminary expenses written off	xxx	
(e) Other intangible assets written off such as discount or loss on issue of shares / debentures, underwriting commission etc.	xxx	
(f) Loss on sale or disposal of fixed assets	xxx	
(g) Loss on sale of investments	xxx	
(h) Foreign exchange loss	xxx	xxx
Less : Non-cash and non-operating items which have already been credited to P.L. Account		xxx
(a) Gain on sale of fixed assets	xxx	
(b) Profit on sale of investments	xxx	
(c) Income from interest or dividends on investments	xxx	
(d) Appreciation	xxx	
(e) Reserves written back	xxx	
(f) Foreign exchange gain	xxx	xxx

Particulars	(₹)	(₹)
		xxx
Operating Profit Before Working Capital Changes		

Adjustments for changes in current operating assets and liabilities:		
Add : Decrease in Accounts of Current Operating Assets (except cash and cash equivalents) such as :		
Decrease in trade debts	xxx	
Decrease in bills receivables	xxx	
Decrease in inventories / stock-in-trade	xxx	
Decrease in prepaid expenses etc.	xxx	
Add : Increase in accounts of current operating liabilities (except Bank overdraft) such as :		
Increase in creditors	xxx	
Increase in bills payable	xxx	
Increase in outstanding expenses	xxx	xxx
		xxxx
Less : Increase in accounts of current operating assets (as stated above)		xxx
		xxx
Less : Decrease in accounts of current operating liabilities (as stated above)		xxx
Cash generated from (used in) operations before tax		xxx
Less : Income tax paid		xxx
Cash flows before extraordinary items		xxx
Add / Less : Extraordinary items if any		xxx
Net cash flow from (used in) operating activities		xxx

Need of Preparing Cash Flow Statement

Cash Flow Statement shows the changes in cash position between two Balance Sheet dates. It provides the details in respect of cash generated through operating, investing and financial activities and utilised for operating, investing and financial activities. The transactions which increase the cash position of the business are known as Inflows of cash (ex: Sale of current and fixed assets, Issue of shares and debentures etc.) The transactions which decrease the cash position are known as outflows (ex: Purchase of Current and Fixed Assets, redemption of Debentures, and Preference Shares and other long term debts). Cash Flow Statement concentrates on transactions that have a direct impact on cash. This statement depicts factors responsible for such inflow and outflow of cash.

- (i) Cash Flow Statement reveals the causes of changes in cash balances between two Balance Sheet dates.
- (ii) This statement helps the management to evaluate its ability to meet its obligations i.e., payment to creditors, the payment of bank loan, payment of interest, taxes, dividend etc.
- (iii) It throws light on causes for poor liquidity in spite of good profits and excessive liquidity in spite of heavy losses.
- (iv) It helps the management in understanding the past behaviour of cash cycle and in controlling the use of cash in future.
- (v) Cash Flow Statements helps the management in planning repayment of loans, replacement of assets etc.
- (vi) This statement is helpful in short-term financial decisions relating to liquidity.
- (vii) This statement helps the management in preparing the cash budgets properly.
- (viii) This statement helps the financial institution who lends advances to business concerns in estimating their repaying capacities.
- (ix) Since a Cash Flow Statement is based on the cash basis of accounting it is very useful in evaluation of cash position of a firm.
- (x) Cash Flow Statement discloses the complete story of cash movement. The increase in, or decrease of cash and the reason therefore can be known.
- (xi) Cash Flow Statement provides information of all activities such as operating, investing, and financing activi-

ties separately.

- (xii) Since Cash Flow Statement provides information regarding the sources and utilisation of cash during a particular period, it is easy for the management to plan carefully for the cash requirements in the future, for the purpose of redeeming long-term liabilities or and replacing some fixed assets.
- (xiii) A projected Cash Flow Statement reveals the future cash position of a concern. Through this Cash Flow Statement the firm can know how much cash it can generate and how much cash will be needed to make various payments.
- (xiv) Cash Flow Statement prepared according the AS-3 (Revised) is more suitable for making comparison than the funds flow statements as there is no standard formats used for the same.

Limitations of Cash Flow Statement

Cash Flow Statement suffers from the following limitations.

- (i) A Cash Flow Statement only reveals the inflow and outflow of cash. The cash balance disclosed by the Cash Flow Statement may not represent the real liquid position of the concern.
- (ii) Cash Flow Statement is not suitable for judging the profitability of a firm as non-cash changes are ignored while calculating cash flows from operating activities.
- (iii) Cash Flow Statement is not a substitute for Income Statement or Funds Flow Statement. Each of them has a separate function to perform. Net Cash Flow disclosed by Cash Flow Statement does not necessarily be the net income of the business, because net income is determined by taking into account both cash and non-cash items.
- (iv) Cash Flow Statement is based on cash accounting. It ignores the basic accounting concept of a accrual basis.
- (v) Cash Flow Statement reveals the movement of cash only. In preparation it ignores most liquid current assets (ex: Sundry debtors, Bills Receivable etc.)
- (vi) It is difficult to precisely define the term cash. There are controversies among accountants over a number of near cash items like cheques, stamps, postal orders etc., to be included in cash.
- (vii) Cash Flow Statement does not give a complete picture of financial position of the concern.

Differences between Funds Flow Statement and Cash Flow Statement

The following are the main differences between a Funds Flow Statement and a Cash Flow Statement:-

Funds Flow Statement	Cash Flow Statement
1. Funds Flow Statement reveals the change in working capital between two Balance Sheet dates	Cash Flow Statement reveals the changes in cash position between two balance sheet dates.
2. Funds Flow Statement is based on accounting	Cash Flow Statement is based on cash basis of accounting
3. In the case of Funds Flow Statement a schedule of changes in working capital is prepared.	No such schedule of changes in working capital is prepared for a Cash Flow Statement.
4. Funds Flow Statement is useful in planning, Intermediate and long term financing.	Cash Flow Statement as a tool of financial analysis is more useful for short-term analysis and cash planning.
5. Funds Flow Statement deals with all components of working capital.	Cash Flow Statement deals only with cash and cash equivalents.
6. Funds Flow Statement reveals the sources and application of funds. The difference represents net increase or decrease in working capital.	Cash Flow Statement is prepared by taking into consideration the inflows and outflows in terms of operating, investing and financing activities. The net difference represents the net increase or decrease in cash and cash equivalents.

Illustration – Fund Flow Statement

Illustration 11:

From the following Balance Sheet of PKJ Ltd., Prepare Funds Flow Statement for 2016.

₹ '000

Liabilities	31-3-15	31-3-16	Assets	31-3-15	31-3-16
Equity Share Capital	150	200	Goodwill	50	40
9% Redeemable Preference Share capital	75	50	Land & Buildings	100	85
Capital Reserve	—	10	Plant & Machinery	40	100
General Reserve	20	25	Investments	10	15
Profit & Loss Account	15	24	Sundry Debtors	70	85
Proposed Dividend	21	25	Stock	39	55
Sundry Creditors	13	24	Bills Receivable	10	15
Bills Payable	10	8	Cash in hand	7	5
Liability for Expenses	15	18	Cash at bank	5	4
Provision for tax	20	25	Preliminary Exp.	8	5
	339	409		339	409

Additional information:

1. A part of land was sold out in 2016, and the profit was credited to Capital Reserve.
2. A machine has been sold for ₹5,000 (written down value of the machinery was ₹6,000). Depreciation of ₹5,000 was charged on plant in 2016.
3. An interim dividend of ₹10,000 has been paid in 2016.
4. An Amount of ₹1,000 has been received as dividend on investment in 2016.

Solution:**Funds flow Statement**

Sources	(₹ '000)	Application	(₹ '000)
Funds from Operation	67	Investment Purchased	5
Sale proceed of Plant	5	Increase in Working Capital	16
Sale proceed of Land	25	Purchase of Plant & Machinery	71
Issue of Equity Share Capital	50	Redemption of Preference Share Capital	25
Dividend on Investments received	1	Proposed Dividend for last year	21
		Interim dividend paid	10
	148		148

Working Note 1:**1. Calculation of changes in Working Capital:**

	Amount (₹) in '000	
Current Asset	31-3-15	31-3-16
Debtors	70	85
Stock	39	55
B/R	10	15
Cash in hand	7	5
Cash at bank	5	4
A: Total Current Assets	131	164

	Amount (₹) in '000

Current Liabilities	31-3-15	31-3-16
Creditors	13	24
B/P	10	8
Liabilities for exp.	15	18
Provision for Tax	20	25
B: Total Current Liabilities	58	75
Working capital (A-B)	73	89

Increase in working capital $89 - 73 = 16$

2. Calculation of Fixed assets purchase during the year

Plant and Machinery A/c

Dr.		Cr.	
Particulars	(₹ '000)	Particulars	(₹ '000)
To Balance b/d	40	By Bank – sale proceeds	5
To Bank – Purchases (Bal. fig.)	71	By P & L-Loss	1
		By Depreciation	5
		By Balance C/f	100
	111		111

Land and Building A/c

Dr.		Cr.	
Particulars	(₹ '000)	Particulars	(₹ '000)
To Balance b/d	100	By Bank (Bal. fig.)	25
To Profit-Transfer to C/R	10	By balance c/f	85
	110		110

3. Calculation of Funds from Operation

P&L Adjustment A/c

Dr.		Cr.	
Particulars	(₹ '000)	Particulars	(₹ '000)
To Depreciation	5	By balance b/d	15
To Loss on sale of machinery	1	By Dividend Received	1
To Interim Dividend	10		
To Transfer to G/R	5		
To Proposed Dividend	25		
To Goodwill written off	10		
To Preliminary exp. written off	3		
To Closing balance	24	Funds from Operation (Bal. fig.)	67
	83		83

Illustration 12:

The Balance Sheets of A, B, & C Co. Ltd. as at the end of 2015 and 2016 are given below:

LIABILITIES	2015 (₹)	2016 (₹)	ASSETS	2015 (₹)	2016 (₹)
Share Capital	1,00,000	1,50,000	Freehold land	1,00,000	1,00,000

Share premium	---	5,000	Plant at cost	1,04,000	1,00,000
General Reserve	50,000	60,000	Furniture at cost	7,000	9,000
Profit & Loss Account	10,000	17,000	Investments	60,000	80,000
6% Debentures	70,000	50,000	Debtors	30,000	70,000
Provision for Depreciation on Plant	50,000	56,000	Stock	60,000	65,000
Provision for Dep. on Furniture	5,000	6,000	Cash	30,000	45,000
Provision for taxation	20,000	30,000			
Sundry Creditors	86,000	95,000			
	3,91,000	4,69,000		3,91,000	4,69,000

A plant purchased for ₹ 4,000 (Depreciation ₹ 2,000) was sold for Cash for ₹ 800 on September 30, 2015. On June 30, 2015 an item of furniture was purchased for ₹ 2,000. These were the only transactions concerning fixed assets during 2015. A dividend of 22½ % on original shares was paid. You are required to prepare funds Flow Statement and verify the results by preparing a schedule of changes in Working Capital.

Solution:**Calculation of changes in Working Capital**

Current Asset	2015	2016	Current Liabilities	2015	2016
Debtors	30,000	70,000	Creditors	86,000	95,000
Stock	60,000	65,000	Provision for Tax	20,000	30,000
Cash	30,000	45,000	B: Total Current Liabilities	1,06,000	1,25,000
A: Total Current Assets	1,20,000	1,80,000	Working capital (A-B)	14,000	55,000

Increase in working capital ₹ 55,000 – ₹ 14,000 = ₹ 41,000

Funds flow Statement

Sources	Amount (₹)	Application	Amount (₹)
Funds from Operation	49,700	Investment Purchased	20,000
Sale proceed of plant	800	Increase in Working Capital	41,000
Issue of Equity Share Capital with premium	55,000	Dividend paid	22,500
		Purchase of furniture	2,000
		Redemption of Debentures	20,000
	1,05,500		1,05,500

Working Note:**1. Calculation of Depreciation provide during the year****Provision for depreciation on plant**

Opening Balance	50,000
Less: Depreciation on plant sold	2,000
	48,000
Depreciation provided during the year (b/f)	8,000
Depreciation at the end	56,000

Total Depreciation provided during the year

On Plant (as above)	8,000
On Furniture (6,000-5,000)	1,000
Total depreciation provided during the year	9,000

Investment A/c

Dr.		Cr.	
Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	60,000		
To Bank – purchases (Bal. Fig)	20,000	By Balance c/f	80,000
	80,000		80,000

P & L Adjustment A/c

Dr.		Cr.	
Particulars	Amount (₹)	Particulars	Amount (₹)
To Depreciation	9,000	By Balance b/d	10,000
To Transfer to G/R	10,000		
To Loss on Sale of Plant	1,200		
To Dividend (1,00,000 × 22.5%)	22,500		
To Balance c/f	17,000	By Funds from Operation (Bal Fig)	49,700
	59,700		59,700

Illustration 13:

From the Balance Sheet of A Ltd., Please prepare:

- A Statement of changes in the Working Capital.
- Funds Flow Statement.

BALANCE SHEET

LIABILITIES	31st March		ASSETS	31st March	
	2015 (₹)	2016 (₹)		2015 (₹)	2016 (₹)
Equity Share Capital:	3,00,000	4,00,000	Goodwill	1,15,000	90,000
8% Preference share capital	1,50,000	1,00,000	Land & Buildings	2,00,000	1,70,000
P & L A/c	30,000	48,000	Plant	80,000	2,00,000
General Reserve	40,000	70,000	Debtors	1,60,000	2,00,000
Proposed Dividend	42,000	50,000	Stock	77,000	1,09,000
Creditors	55,000	83,000	Bills Receivable	20,000	30,000
Bills Payable	20,000	16,000	Cash in hand	15,000	10,000
Provision for Taxation	40,000	50,000	Cash at Bank	10,000	8,000
	6,77,000	8,17,000		6,77,000	8,17,000

Following is the additional information available:

- Depreciation of ₹ 10,000 and ₹ 20,000 have been charged on Plant and Land and Buildings respectively in 2016.
- Interim dividend of ₹ 20,000 has been paid in 2016.
- Income tax of ₹ 35,000 has been paid in 2016.

Solution:

A. Calculation of changes in Working Capital:

Current Asset	2015	2016
Debtors	1,60,000	2,00,000
Stock	77,000	1,09,000
B/R	20,000	30,000

Cash in hand	15,000	10,000
Cash at Bank	10,000	8,000
A: Total Current Assets	2,82,000	3,57,000

Current Liabilities	2015	2016
Creditors	55,000	83,000
B/P	20,000	16,000
B: Total Current Liabilities	75,000	99,000
Working capital (A-B)	2,07,000	2,58,000

Increase in working capital ₹ 2,58,000 – ₹ 2,07,000 = ₹ 51,000

B. Funds flow Statement

Sources of fund		Application of fund	
Funds from Operation	2,30,000	Purchases of Plant	1,30,000
Sale proceed of Land & Building	10,000	Increase in Working Capital	51,000
Issue of Equity Share Capital	1,00,000	Tax Paid	35,000
		Redemption of Preference Share Capital	50,000
		Proposed Dividend	42,000
		Interim Dividend paid	20,000
		Preference Dividend paid	12,000
			3,40,000

Working Note:

1. Land & Buildings A/c

Dr.

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	2,00,000	By Depreciation provided	20,000
		By Bank – sale proceeds (b/f)	10,000
		By Balance c/f	1,70,000
	2,00,000		2,00,000

2. Plant A/c

Dr.

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	80,000	By Depreciation provided	10,000
To Bank (b/f)	1,30,000	By Balance c/f	2,00,000
	2,10,000		2,10,000

3. Provision for Tax A/c

Dr.

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Bank – paid	35,000	By Balance b/d	40,000
To balance c/f	50,000	By P & L A/c –provided	45,000
	85,000		85,000

4. P & L Adjustment A/c

Dr.

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Depreciation	30,000	By Balance b/d	30,000
To Preference Dividend (1,50,000 x 8%)	12,000		
To Transfer to G/R	30,000		
To Provision for Tax	45,000		
To Proposed Dividend	50,000		
To Goodwill written off	25,000		
To Interim Dividend	20,000		
To Balance C/f	48,000	By Funds from Operation (b/f)	2,30,000
	2,60,000		2,60,000

Illustration 14:

From the following figures, prepare a statement showing the changes in the Working Capital and Funds Flow Statement during the year 2015.

ASSETS:	Dec.31, 2014	Dec.31, 2015
Fixed Assets (net) ₹	5,10,000	6,20,000
Investments	30,000	80,000
Current Assets	2,40,000	3,75,000
Discount on debentures	10,000	5,000
	7,90,000	10,80,000
Liabilities:		
Equity share capital	3,00,000	3,50,000
Preference share capital	2,00,000	1,00,000
Debentures	1,00,000	2,00,000
Reserves	1,10,000	2,70,000
Provision for doubtful debts	10,000	15,000
Current Liabilities	70,000	1,45,000
	7,90,000	10,80,000

You are informed that during the year:

- A machine costing ₹ 70,000 book value ₹ 40,000 was disposed of for ₹ 25,000.
- Preference share redemption was carried out at a premium of 5% and
- Dividend at 15% was paid on equity shares for the year 2014.

Further:

- The provision for depreciation stood at ₹ 1,50,000 on 31.12.14 and at ₹ 1,90,000 on 31.12.15; and
- Stock which was valued at ₹90,000 as on 31.12.14; was written up to its cost, ₹ 1,00,000 for preparing Profit and Loss account for the year 2015.

Solution:
Funds Flow Statement

Sources of fund	Amount (₹)	Applications of fund	Amount (₹)
Sale of Fixed Assets	25,000	Increase in Working Capital	50,000

Funds from Operation	2,95,000	Purchase of Fixed Assets	2,20,000
Issue of shares	50,000	Purchase of Investments	50,000
Debentures	1,00,000	Redemption of Preference Shares	1,05,000
		Dividend paid	45,000
	4,70,000		4,70,000

Working note:**1. Changes in Working Capital**

	2014	2015
Current Assets	2,40,000	3,75,000
(+) Stock under valued	10,000	
	2,50,000	3,75,000
Current Liabilities	70,000	1,45,000
Net Working Capital	1,80,000	2,30,000
Increase in Working Capital	50,000	

2. Depreciation

	(₹)
Opening Provision	1,50,000
(-) Provided on sale of asset	30,000
	1,20,000
(+) Provided during the year (b/f)	70,000
Closing provision	1,90,000

3. Purchase & sale of Fixed Assets

	(₹)
Opening (2016)	5,10,000
(-) Provided on sale of asset	40,000
(-) Sold	4,70,000
(-) Depreciation provided	70,000
	4,00,000
(+) Purchases (b/f)	2,20,000
Closing (2016)	6,20,000

P&L Adjustment A/c

Particulars	Amount (₹)	Particulars	Amount (₹)
To Depreciation	70,000	By Balance b/d (110000+10000)	1,20,000
To Loss on Sale of Fixed Assets	15,000	By Funds from Operations	2,95,000
To Loss on Redemption of Shares	5,000	By Funds from Operations (Bal. figure)	
To Discount written off	5,000		
To Provision for Doubtful debt	5,000		
To Dividend	45,000		

To Balance c/d	2,70,000		
	4,15,000		4,15,000

Illustration 15:

The directors of Chintamani Ltd. present you with the Balance Sheets as on 30th June, 2015 and 2016 and ask you to prepare statements which will show them what has happened to the money which came into the business during the year 2016.

	(₹)	(₹)
Liabilities:	30.6.15	30.6.16
Authorised Capital 15,000 shares of ₹ 100 each	15,00,000	15,00,000
Paid up capital	10,00,000	14,00,000
Debentures (2016)	4,00,000	---
General Reserve	60,000	40,000
P & L Appropriation A/c	36,000	38,000
Provision for the purpose of final dividends	78,000	72,000
Sundry Trade Creditors	76,000	1,12,000
Bank Overdraft	69,260	1,29,780
Bills Payable	40,000	38,000
Loans on Mortgage	—	5,60,000
	17,59,260	23,89,780
Assets		
Land & Freehold Buildings	9,00,000	9,76,000
Machinery and Plant	1,44,000	5,94,000
Fixtures and Fittings	6,000	5,500
Cash in hand	1,560	1,280
Sundry Debtors	1,25,600	1,04,400
Bills Receivable	7,600	6,400
Stock	2,44,000	2,38,000
Prepayments	4,500	6,200
Share in other companies	80,000	2,34,000
Goodwill	2,40,000	2,20,000
Preliminary expenses	6,000	4,000
	17,59,260	23,89,780

You are given the following additional information:

- Depreciation has been charged (i) on Freehold Buildings @ 2½% p.a. on cost ₹10,00,000. (ii) on Machinery and Plant ₹32,000 (iii) on Fixtures and Fittings @5% on cost, ₹10,000. No depreciation has been written off on newly acquired Building and Plant and Machinery.
- A piece of land costing ₹1,00,000 was sold in 2016 for ₹2,50,000. The sale proceeds was credited to Land and Buildings.
- Shares in other companies were purchased and dividends amounting to ₹6,000 declared out of profits made prior to purchase has received and used to write down the investment (shares).
- Goodwill has been written down against General Reserve.
- The proposed dividend for the year ended 30th June 2015 was paid and, in additions, an interim dividend, ₹52,000 was paid.

Solution:**Funds Flow Statement**

Sources of fund	Amount (₹)	Applications of fund	Amount (₹)
Decrease in Working capital	1,21,500	Purchase of land and building	2,01,000
Sale proceed of land	2,50,000	Purchase of plant and machinery	4,82,000
Dividend received	6,000	Purchase of shares	1,60,000
Issue of shares	4,00,000	Redemption of debentures	4,00,000
Loan	5,60,000	Dividends for 2011 paid	78,000
Funds from operations	35,500	Interim dividend paid	52,000
	13,73,000		13,73,000

Working Note**1. Changes in working capital**

	2015	2016
Current Assets		
Cash	1,560	1,280
Debtors	1,25,600	1,04,400
Bills Receivable	7,600	6,400
Prepaid	4,500	6,200
Stock	2,44,000	2,38,000
	3,83,260	3,56,280
Current liabilities		
Creditors	76,000	1,12,000
Overdraft	69,260	1,29,780
Bills Payable	40,000	38,000
	1,85,260	2,79,780
Working Capital	1,98,000	76,500
Decrease in working capital		1,21,500

Working note No. 2: Depreciation

On Buildings	25,000
On Plant & Machinery	32,000
On Furniture & Fittings	500
	57,500

3. Purchase or sale of Fixed Assets / Investments:**Land and buildings:**

	(₹)
WDV (2015)	9,00,000
(-) Depreciation	25,000
	8,75,000

(-) Land sold	2,50,000
	6,25,000
(+) Purchases (b/f)	2,01,000
(+) Profit on sale	8,26,000
WDV (2016)	1,50,000

Plant & machinery:

	(₹)
WDV (2015)	9,76,000
(-) Depreciation	1,44,000
	32,000
(+) Purchase (b/f)	1,12,000
WDV (2016)	4,82,000
	5,94,000

Investments:

	(₹)
WDV (2015)	80,000
(-) Dividend in capital nature	6,000
	74,000
(+) Purchases (b/f)	1,60,000
WDV (2016)	2,34,000

4. P & L Adjustment A/c

Particulars	Amount (₹)	Particulars	Amount (₹)
To depreciation	57,500	By Balance b/d	36,000
To dividend proposed	72,000	By Profit on sale of Land	1,50,000
To preliminary expenses written off	2,000	By funds from operation (bal figure)	35,500
To interim dividend	52,000		
To balance c/d	38,000		
	2,21,500		2,21,500

Illustration 16:

The following is the Balance Sheets of the Andhra Industrial Corporation Ltd. as on 31st December 2015 and 2016.

BALANCE SHEET

Assets:	2015	2016
Fixed Assets: Property	1,48,500	1,44,250
Machinery	1,12,950	1,26,200
Goodwill	----	10,000
Current Assets: Stock	1,10,000	92,000
Trade Debtors	86,160	69,430
Cash at Bank	1,500	11,000
Pre-payments	3,370	1,000

	4,62,480	4,53,880
Liabilities:		
Shareholders funds: Paid up Capital	2,20,000	2,70,000
Reserves	30,000	40,000
Profit and Loss Account	39,690	41,220
Current Liabilities: Creditors	39,000	41,660
Bills Payable	33,790	11,000
Bank Overdraft	60,000	–
Provision for taxation	40,000	50,000
	4,62,480	4,53,880

During the year ended 31st December, 2016, a dividend of ₹ 26,000 was paid and assets of another company were purchased for ₹ 50,000 payable in fully paid-up shares. Such assets purchased were:

Stock ₹ 21,640; Machinery ₹ 18,360; and Goodwill ₹ 10,000. In addition Plant at a cost of ₹ 5,650 was purchased during the year; depreciation on Property ₹ 4,250; on Machinery ₹ 10,760. Income tax during the year amounting to ₹ 28,770 was charged to provision for taxation. Net profit for the year before tax was ₹ 76,300.

Prepare Funds Flow Statement for the year 2016.

Solution:

Funds Flow Statement

Sources	Amount (₹)	Applications	Amount (₹)
Issue of shares for stock	21,640	Increase in working capital	52,530
Funds from operation	91,310	Purchase of machinery	5,650
		Tax paid	28,770
		Dividend paid	26,000
	1,12,950		1,12,950

Working Note:

Provision for Tax A/c

Particulars	Amount (₹)	Particulars	Amount (₹)
To Cash paid	28,770	By balance b/d	40,000
To Balance c/d	50,000	By P&L A/c (b/f)	38,770
	78,770		78,770

Verification of P & L A/c Balance

	(₹)	(₹)
Opening P & L a/c		39,690
(+) net profit as per P & L A/c	76,300	
(-) provision for tax	38,770	
	37,530	
(-) dividend	26,000	
(-) transfer to reserve	10,000	
Retained		1,530

Profit at the end of the year		41,220

Changes in Working Capital

	(₹)	(₹)
	Opening	Closing
Current assets :		
Stock	1,10,000	92,000
Debtors	86,160	69,430
Cash	1,500	11,000
Pre-Payment	3,370	1,000
	2,01,030	1,73,430
Current liabilities		
Creditors	39,000	41,660
Bills payable	33,790	11,000
Overdraft	60,000	52,660
	1,32,790	
Net Working Capital	68,240	1,20,770
Increase in Working Capital	52,530	

4. Depreciation provided during the year

On Property	4,250
On machinery	10,760
	15,010

5. Purchase/sale of Fixed Assets

	Property	Machinery
WDV opening	1,48,500	1,12,950
(-) Depreciation	4,250	10,760
	1,44,250	1,02,190
(+) Purchases	Ni	18,360 (by issue of shares)
WDV at the end		5,650 (by cash)
	1,44,250	1,26,200

P & L Adjustment A/c

Dr.

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Depreciation	15,010	By Balance b/d	39,690
To Dividend	26,000	By Funds from Operations(b/f)	91,310
To Transfer to reserve	10,000		
To Provision for tax	38,770		
To Balance c/d	41,220		
	1,31,000		1,31,000

Illustration 17:

The following is the Balance Sheet of Gama Limited for the year ending March 31, 2015 and March 31, 2016;

Particulars	2015 (₹)	2016 (₹)
Capital and Liabilities		
Share Capital	6,75,000	7,87,500
General Reserves	2,25,000	2,81,250
Capital Reserve (Profit on Sale of Investment)	--	11,250
Profit & Loss Account	1,12,500	2,25,000
15% Debentures	3,37,500	2,25,000
Accrued Expenses	11,250	13,500
Creditors	1,80,000	2,81,250
Provision for Dividends	33,750	38,250
Provision for Taxation	78,750	85,500
Total	16,53,750	19,48,500
Assets		
Fixed Assets	11,25,000	13,50,000
Less: Accumulated depreciation	2,25,000	2,81,250
Net Fixed Assets	9,00,000	10,68,750
Long – Term Investments (at cost)	2,02,500	2,02,500
Stock (at cost)	2,25,000	3,03,750
Debtors (net of provision for doubtful debts of ₹ 45,000 and ₹ 56,250 respectively for 2015 and 2016 respectively)	2,53,125	2,75,625
Bills receivables	45,000	73,125
Prepaid Expenses	11,250	13,500
Miscellaneous Expenditure	16,875	11,250
Total	16,53,750	19,48,500

Additional Information:

- During the year 2015-16, fixed assets with a net book value of ₹11,250 (accumulated depreciation, ₹ 33,750) was sold for ₹ 9,000.
- During the year 2015-16, Investments costing ₹90,000 were sold, and also Investments costing ₹90,000 were purchased.
- Debentures were retired at a Premium of 10%.
- Tax of ₹61,875 was paid for 2015-16.
- During the year 2015-16, bad debts of ₹ 15,750 were written off against the provision for Doubtful Debt account.
- The proposed dividend for 2007-2008 was paid in 2015-16.

Required:

Prepare a Fund Flow Statement (Statement of changes in Financial Position on working capital basis) for the year ended March 31, 2016.

Solution:

In the books of Gama Ltd.
Fund Flow Statement
For the year ended March 31, 2016

Sources of Fund	Amount (₹)	Application of Funds	Amount (₹)
Increase in Share Capital	1,12,500	Debenture Redemption	1,12,500
Sale of Assets	9,000	Redemption Premium	11,250
Fund from operation	3,84,750	Tax paid	61,875
Sale of Investment	1,01,250	Dividend paid	33,750
		Increase in WC	28,125
		Purchase of fixed assets	2,70,000
		Purchase of investment	90,000
	6,07,500		6,07,500

Working Notes:

Statement showing funds from Operations

Particulars	Amount (₹)	Amount (₹)
Net Profit [2,25,000 – 1,12,500]		1,12,500
Add: Transfer to General Reserve (2,81,250 – 2,25,000)	56,250	
Loss on sale of fixed assets (11,250 – 9,000)	2,250	
Premium on Redemption of Debentures (1,12,500 × 10%)	11,250	
Provision for Tax	68,625	
Provision for Dividend	38,250	
Depreciation	90,000	
Misc. exp. w/off	5,625	2,72,250
Funds from Operation (16,875 – 11,250)		3,84,750

Statement showing changes in Working Capital

Particulars	Amount (₹)	Amount (₹)
	2015	2016
Current Assets		
Stock	2,25,000	3,03,750
Debtors	2,53,125	2,75,625
Bills Receivables	45,000	73,125
Prepaid Expenses	11,250	13,500
Total Current Assets (A)	5,34,375	6,66,000
Current Liabilities		
Accrued Expenses	11,250	13,500
Creditors	1,80,000	2,81,250
Total Current Liabilities	1,91,250	2,94,750
Working Capital (A) – (B)	3,43,125	3,43,125
Increase in Working Capital		28,125

Provision for Doubtful Debt A/c

Dr.

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Bad Debts	15,750	By Balance b/d	45,000
To Balance c/d	56,250	By P & L A/c	27,000

	72,000		72,000

Provision for Dividends

Dr.

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Div. paid	33,750	By Balance b/d	33,750
To Balance c/d	38,250	By P & L A/c	38,250
	72,000		72,000

Provision for Tax

Dr.

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Tax paid	61,875	By Balance b/d	78,750
To Balance c/d	85,500	By P & L A/c	68,625
	1,47,375		1,47,375

Accumulated Depreciation A/c

Dr.

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Asset sold	33,750	By Balance b/d	2,25,000
To Balance c/d	2,81,250	By P & L A/c	90,000
	3,15,000		3,15,000

Fixed Assets A/c

Dr.

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	11,25,000	By Account Depreciation	33,750
To Bank	2,70,000	By Bank	9,000
		By P & L A/c	2,250
		By Balance c/d	13,50,000
	13,95,000		13,95,000

ILLUSTRATION – CASH FLOW STATEMENT**Illustration 18:**

From the information contained in Income Statement and Balance Sheet of 'A' Ltd, prepare Cash Flow Statement.

Income Statement for the year ended March 31, 2016

	(₹)
Net Sales (A)	2,52,00,000
Less:	
Cash cost of sales	1,98,00,000
Depreciation	6,00,000
Salaries and Wages	24,00,000
Operating Expenses	8,00,000
Provision for Taxation	8,80,000

	(B)	2,44,80,000
Net Operating Profit (A – B)		7,20,000
Non-recurring Income – Profits on sale of equipment		1,20,000
		8,40,000
Retained earnings and Profits brought forward		15,18,000
		23,58,000
Dividends declared and paid during the year		7,20,000
Profit and Loss A/c balance as on March 31, 2016		16,38,000

Balance Sheet as on

	(₹)	(₹)
Assets	March 31, 2015	March 31, 2016
Fixed Assets:		
Land	4,80,000	9,60,000
Buildings and Equipment	36,00,000	57,60,000
Current Assets:		
Cash	6,00,000	7,20,000
Debtors	16,80,000	18,60,000
Stock	26,40,000	9,60,000
Advances	78,000	90,000
	90,78,000	1,03,50,000

Balance Sheet as on

	(₹)	(₹)
Liabilities and Equity	March 31, 2015	March 31, 2016
Share Capital	36,00,000	44,40,000
Surplus in Profit and Loss A/c	15,18,000	16,38,000
Sundry Creditors	24,00,000	23,40,000
Outstanding Expenses	2,40,000	4,80,000
Income – Tax payable	1,20,000	1,32,000
Accumulated Depreciation on Buildings and Equipment	12,00,000	13,20,000
	90,78,000	1,03,50,000

The original cost of equipment sold during the year 2015-16 was ₹ 7,20,000.

Solution:
Working Notes:
1. Cash receipt from customers:

	(₹)
Sales revenue	2,52,00,000
Add: Debtor at beginning	16,80,000
	2,68,80,000
Less: Debtor at the end	18,60,000
Total cash receipt from customer	2,50,20,000

2. Income tax paid:

	(₹)
Tax payable at beginning	1,20,000
Add: Provision for taxation	8,80,000
	10,00,000
Less: Tax payable at the end	1,32,000
Tax paid during the year	8,68,000

3. Cash paid to supplier & employee

	(₹)	(₹)
Cost of goods sold		1,98,00,000
Add: Operating expenses		8,00,000
Salary and wages		24,00,000
		2,30,00,000
Add: Creditor at the beginning	24,00,000	
Stock at the end	9,60,000	
Advance at the end	90,000	
Outstanding exp. at the beginning	2,40,000	36,90,000
		2,66,90,000
Less: Creditors at the end	23,40,000	
Stock at the beginning	26,40,000	
Advance at the beginning	78,000	
Outstanding expenses at the end	4,80,000	55,38,000
Total Cash Paid		2,11,52,000

4. Accumulated depreciation on equipment sold

	(₹)
Accumulated depreciation at beginning	12,00,000
Add: Depreciation for the year	6,00,000
	18,00,000
Less: Accumulated depreciation at the end	13,20,000
Accumulated depreciation on equipment sold	4,80,000

5. Sale price of equipment

	(₹)
Cost Price	7,20,000
Less: Accumulated depreciation	4,80,000
	2,40,000
Add: Profit on sale	1,20,000
Sale price	3,60,000

6. Purchase of building and equipments:

	(₹)
Opening balance	36,00,000
Less: Cost of equipment sold	7,20,000

	28,80,000
Balance at end	57,60,000
Purchase during the year	28,80,000

Cash Flow Statement of A Ltd. for the year ended 31st March 2016

(A) Cash flow from Operating Activity:	(₹)	(₹)
Cash receipt from customers	2,50,20,000	
Less: Cash paid to supplier & employees	2,11,52,000	
Cash generated from operation	38,68,000	
Less: Income tax paid	(8,68,000)	
Net cash from operating activity		30,00,000
(B) Cash flow from Investing Activity:		
Purchase of land	(4,80,000)	
Purchase of building & equipment	(28,80,000)	
Sale of equipment	3,60,000	
Net cash used in financing activity		(30,00,000)
(C) Cash flow from Financing Activity:		
Issue of share capital	8,40,000	
Dividends paid	(7,20,000)	
Net cash from financing activity		1,20,000
Net increase in cash & cash equivalent		1,20,000
Cash & Cash equivalent at beginning		6,00,000
Cash & Cash equivalent at the end		7,20,000

Illustration 19:

The Balance Sheet of JK Limited as on 31st March, 2015 and 31st March, 2016 are given below:

Balance Sheet as on

(₹ '000')

Liabilities	31.03.15	31.03.16	Assets	31.03.15	31.03.16
Share Capital	1,440	1,920	Fixed Assets	3,840	4,560
Capital Reserve	--	48	Less: Depreciation	1,104	1,392
General Reserve	816	960	Net Fixed Asset	2,736	3,168
Profit and Loss A/c	288	360	Investment	480	384
9% Debenture	960	672	Cash	210	312
Current Liabilities	576	624	Other Current Assets		
Proposed Dividend	144	174	(including Stock)	1,134	1,272
Provision for Tax	432	408	Preliminary Expenses	96	48
Unpaid Dividend	--	18			
	4,656	5,184		4,656	5,184

Additional Information:

- During the year 2015-2016, Fixed Assets with a book value of ₹2,40,000 (accumulated depreciation ₹ 84,000) was sold for ₹ 1,20,000.

2. Provided ₹ 4,20,000 as depreciation.
3. Some investments are sold at a profit of ₹48,000 and profit was credited to Capital Reserve.
4. It decided that stocks be valued at cost, whereas previously the practice was to value stock at cost less 10 per cent. The stock was ₹ 2,59,200 as on 31.03.15. The stock as on 31.03.16 was correctly valued at ₹ 3,60,000.
5. It decided to write off Fixed Assets costing ₹60,000 on which depreciation amounting to ₹ 48,000 has been provided.
6. Debentures are redeemed at ₹ 105.

Required:

Prepare a Cash Flow Statement.

Solution:**Cash Flow Statement (as on 31st March, 2016)**

	(₹)	(₹)	(₹)
1. Cash flows from Operating Activities			
Profit and Loss A/c [3,60,000 -(2,88,000 + 28,800)]			43,200
Adjustments:			
Increase in General Reserve	1,44,000		
Depreciation	4,20,000		
Provision for Tax	4,08,000		
Loss on Sale of Machine	36,000		
Premium on Redemption of debenture	14,400		
Proposed Dividend	1,74,000		
Preliminary Exp written off	48,000		
Fixed Assets written off	12,000		12,56,400
Funds from operation			12,99,600
Increase in Sundry Creditors			48,000
Increase in Current Assets [12,72,000 -(11,34,000 + 28,800)]			(1,09,200)
Cash before Tax			12,38,400
Tax paid			4,32,000
Net Cash from operating activities			8,06,400
2. Cash from Investing Activities			
Purchase of fixed assets		(10,20,000)	
Sale of Investment		1,44,000	
Sale of Fixed Assets		1,20,000	(7,56,000)
3. Cash from Financing Activities			
Issue of Share Capital		4,80,000	
Redemption of Debenture		(3,02,400)	
Dividend paid		(1,26,000)	51,600
Net increase in Cash and Cash equivalents			1,02,000
Opening Cash and Cash equivalents			2,10,000
Closing Cash			3,12,000

Working Notes:

Fixed Assets Account

Dr.		Cr.	
Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	27,36,000	By Cash	1,20,000
To Purchases (balancing figure)	10,20,000	By Loss on sales	36,000
		By Depreciation	4,20,000
		By Assets written off	12,000
		By Balance c/d	31,68,000
	37,56,000		37,56,000

Depreciation Account

Dr.		Cr.	
Particulars	Amount (₹)	Particulars	Amount (₹)
To Fixed Assets (on sales)	84,000	By Balance b/d	11,04,000
To Fixed Assets w/o	48,000	By Profit and Loss A/c	4,20,000
To Balance c/d	13,92,000		
	15,24,000		15,24,000

Illustration 20:

Balance Sheets of a company as on 31st March, 2015 and 2016 were as follows:

(₹'000')

Liabilities	31.03.15	31.03.16	Assets	31.03.15	31.03.16
Equity share capital	10,00,000	10,00,000	Goodwill	1,00,000	80,000
8% Pref. Share capital	2,00,000	3,00,000	Land and Building	7,00,000	6,50,000
General Reserve	1,20,000	1,45,000	Plant and Machinery	6,00,000	6,60,000
Securities Premium	---	25,000	Investments (non trading)	2,40,000	2,20,000
Profit & Loss A/c.	2,10,000	3,00,000	Stock	4,00,000	3,85,000
11% Debentures	5,00,000	3,00,000	Debtors	2,88,000	4,15,000
Creditors	1,85,000	2,15,000	Cash and Bank	88,000	93,000
Provision for tax	80,000	1,05,000	Prepaid Expenses	15,000	11,000
Proposed Dividend	1,36,000	1,44,000	Premium on Redemption of debenture	---	20,000
	24,31,000	25,34,000		24,31,000	25,34,000

Additional Information:

- Investments were sold during the year at a profit of ₹ 15,000.
- During the year an old machine costing ₹ 80,000 was sold for ₹ 36,000. Its written down value was ₹ 45,000.
- Depreciation charged on Plant and Machinery @ 20% on the opening balance.
- There was no purchase or sale of Land and Building.
- Provision for tax made during the year was ₹ 96,000.
- Preference shares were issued for consideration of cash during the year.

You are required to prepare:

- Cash Flow Statement as per AS-3.
- Schedule of changes in Working Capital.

Solution:**a. Cash Flow Statement as per AS-3.****Cash Flow Statement for the year ending 31st March, 2016**

	Particulars	Amount (₹)	Amount (₹)
A	Cash flow from Operating Activities		
	Profit and Loss A/c as on 31.3.2016		3,00,000
	Less: Profit and Loss A/c as on 31.3.2015		2,10,000
			90,000
	Add: Transfer to General Reserve	25,000	
	Provision for Tax	96,000	
	Proposed Dividend	1,44,000	2,65,000
	Profit before Tax		3,55,000
	Adjustment for Depreciation		
	Land and Building	50,000	
	Plant and Machinery	1,20,000	1,70,000
	Profit on Sale of Investments		(15,000)
	Loss on Sale of Plant and Machinery		9,000
	Goodwill written off		20,000
	Interest on Debenture		33,000
	Operating Profit before Working Capital changes		5,72,000
	Adjustment for Working Capital changes:		
	Decrease in Prepaid Expenses		4,000
	Decrease in Stock		15,000
	Increase in Debtors		(1,27,000)
	Increase in Creditors		30,000
	Cash generated from Operations		4,94,000
	Income tax paid		(71,000)
	Net Cash Inflow from Operating Activities (a)		4,23,000
B	Cash flow from Investing Activities		
	Sale of Investment		35,000
	Sale of Plant and Machinery		36,000
	Purchase of Plant and Machinery		(2,25,000)
	Net Cash Outflow from Investing Activities (b)		(1,54,000)
C	Cash flow from Financing Activities		
	Issue of Preference Shares		1,00,000
	Premium received on issue of securities		25,000
	Redemption of Debentures at a premium		(2,20,000)
	Dividend paid		(1,36,000)
	Interest paid to Debenture holders		(33,000)
	Net Cash outflow from Financing Activities (c)		(2,64,000)
	Net increase in Cash and Cash Equivalents during the year (a+b+c)		5,000
	Cash and Cash Equivalents at the beginning of the year		88,000

Cash and Cash Equivalents at the end of the year.	93,000

Working Notes:

Provision for the Tax Account

Dr.		Cr.	
Particulars	Amount (₹)	Particulars	Amount (₹)
To Bank (paid)	71,000	By Balance b/d	80,000
To Balance c/d	1,05,000	By Profit and Loss A/c	96,000
	1,76,000		1,76,000

Investment Account

Dr.		Cr.	
Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	2,40,000	By balance (bal fig)	35,000
To profit and loss (profit on sale)	15,000	By balance c/d	2,20,000
	2,55,000		2,55,000

Plant & Machinery Account

Dr.		Cr.	
Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	6,00,000	By Bank (sale)	36,000
To Bank A/c (Purchase)	2,25,000	By Profit and Loss A/c (loss on sale)	9,000
		By Depreciation	1,20,000
		By Balance c/d	6,60,000
	8,25,000		8,25,000

Note:

In this question, the date of redemption of debentures is not mentioned. So, it is assumed that the debentures are redeemed at the beginning of the year.

b. Schedule of change in Working Capital

Particulars	31 March 2015 (₹)	31 March 2016 (₹)	Changes in Working Capital	
			Increase (₹)	Decrease (₹)
Current Assets				
Stock	4,00,000	3,85,000	--	15,000
Debtors	2,88,000	4,15,000	1,27,000	--
Prepaid Expenses	15,000	11,000	--	4,000
Cash and Bank	88,000	93,000	5,000	--
Total (A)	7,91,000	9,04,000		
Current Liabilities				
Creditors	1,85,000	2,15,000	--	30,000
Total (B)	1,85,000	2,15,000		
Working Capital (A-B)	6,06,000	6,89,000		83,000
Increase in Working Capital	83,000	--	--	
	6,89,000	6,89,000	1,32,000	1,32,000

Illustration 21:

The Balance Sheets of a company as on 31st March, 2015 and 2016 are given below:

(₹)

Liabilities	31.03.15	31.03.16	Assets	31.03.15	31.03.16
Equity Share Capital	14,40,000	19,20,000	Fixed Assets	38,40,000	45,60,000
Capital Reserve	--	48,000	Less: Depreciation	(11,04,000)	(13,92,000)
General Reserve	8,16,000	9,60,000		27,36,000	31,68,000
Profit & Loss A/c	2,88,000	3,60,000	Investment	4,80,000	3,84,000
9% Debentures	9,60,000	6,72,000	Sundry Debtors	12,00,000	14,00,000
Sundry Creditors	5,50,000	5,90,000	Stock	1,40,000	1,84,000
Bills Payable	26,000	34,000	Cash in hand	4,000	--
Proposed Dividend	1,44,000	1,72,800	Preliminary Expenses	96,000	48,000
Provision for tax	4,32,000	4,08,000			
Unpaid dividend	--	19,200			
	46,56,000	51,84,000		46,56,000	51,84,000

Additional Information:

During the year ended 31st March, 2016 the company:

- Sold a machine for ₹ 1,20,000; the cost of machine was ₹ 2,40,000 and depreciation provided on it was ₹ 84,000.
- Provided ₹ 4,20,000 as depreciation on fixed assets.
- Sold some investment and profit credited to capital reserve.
- Redeemed 30% of the debenture @ 105.
- Decided to write off fixed assets costing ₹ 60,000 on which depreciation amounting to ₹ 48,000 has been provided.

You are required to prepare Cash Flow Statement as per AS-3.

Solution:

Cash Flow Statement for the year ending 31st March, 2016

	Particulars	Amount (₹)	Amount (₹)
A	Cash flow from Operating Activities		
	Profit and Loss A/c (3,60,000 – 2,88,000)		72,000
	Adjustments:		
	Increase in General Reserve	1,44,000	
	Depreciation	4,20,000	
	Provision for Tax	4,08,000	
	Loss on Sale of Machine	36,000	
	Premium on Redemption of Debentures	14,400	
	Proposed Dividend	1,72,800	
	Preliminary Expenses written off	48,000	
	Fixed Assets written off	12,000	
	Interest on Debentures	60,480	13,15,680
	Funds from Operations		13,87,680
	Increase in Sundry Creditors	40,000	
	Increase in Bills Payable	8,000	

		48,000	
	Increase in Sundry Debtors	(2,00,000)	
	Increase in Stock	(44,000)	(1,96,000)
	Cash before tax		11,91,680
	Less: Tax paid		4,32,000
	Cash in flows from Operating Activities		7,59,680
B	Cash in flows from Investing Activities		
	Purchase of Fixed Assets	(10,20,000)	
	Sale of Investment	1,44,000	
	Sale of Fixed Assets	1,20,000	
	Cash out flows from Investing Activities		(7,56,000)
C	Cash Flows from Financing Activities		
	Issue of share capital	4,80,000	
	Redemption of Debentures	(3,02,400)	
	Dividend Paid (1,44,000 – 19,200)	(1,24,800)	
	Interest on Debentures	(60,480)	
	Cash outflow from Financing Activities		(7,680)
	Net Increase in Cash and Cash Equivalents		(4,000)
	Cash and Cash Equivalents at the beginning of the year		4,000
	Cash and Cash Equivalents at the end of the year		Nil

Working Note:

- (1) It is presumed that the 30 percent debentures have been redeemed at the beginning of the year.
 (2)

Dr

Fixed Assets Account

Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	27,36,000	By Cash	1,20,000
To Purchases (balance figure)	10,20,000	By Loss on sales	36,000
		By Depreciation	4,20,000
		By Assets written off	12,000
		By Balance c/d	31,68,000
	37,56,000		37,56,000

Illustration 22:

The summarized Balance Sheet of XYZ Limited as at 31st March, 2015 and 2016 are given below:

Liabilities	2015 (₹)	2016 (₹)	Assets	2015 (₹)	2016 (₹)
Preference share capital	4,00,000	2,00,000	Plant and Machinery	7,00,000	8,20,000
Equity share capital	4,00,000	6,60,000	Long term investment	3,20,000	4,00,000
Share Premium A/c	40,000	30,000	Goodwill	---	30,000
Capital Redemption Reserve	---	1,00,000	Current Assets	9,10,000	11,41,000
General Reserve	2,00,000	1,20,000	Short term investment (less than 2 months)	50,000	84,000
P & L A/c	1,30,000	1,75,000	Cash and Bank	1,00,000	80,000

Current Liabilities	6,40,000	9,00,000	Preliminary Expenses	40,000	20,000
Proposed Dividend	1,60,000	2,10,000			
Provision for tax	1,50,000	1,80,000			
	21,20,000	25,75,000		21,20,000	25,75,000

Additional Information:

During the year 2016 the company:

1. Preference share capital was redeemed at a premium of 10% partly out of proceeds issue of 10,000 equity shares of ₹10 each issued at 10% premium and partly out of profits otherwise available for dividends.
2. The company purchased plant and machinery for ₹95,000. It also acquired another company stock ₹25,000 and plant and machinery ₹1,05,000 and paid ₹1,60,000 in Equity share capital for the acquisition.
3. Foreign exchange loss of ₹1,600 represents loss in value of short term investment.
4. The company paid tax of ₹1,40,000.

You are required to prepare Cash Flow Statement.

Solution:**Cash Flow Statement as per AS 3 for the year ending 31st March, 2016**

	Particulars	Amount (₹)	Amount (₹)
A	Cash flow from Operating Activities		
	Profit before tax (2,75,000 + 1,70,000)	4,45,000	
	Add: Depreciation on machinery	80,000	
	Foreign exchange loss	1,600	
	Preliminary expenses written off	20,000	
	Cash flow before working capital adjustment	5,46,600	
	Add: Stock acquired from other company	25,000	
	Increase in Current Liabilities	2,60,000	
	Less: Increase in Current Assets	(2,31,000)	
	Cash flow before tax paid	6,00,600	
	Less: Tax paid	(1,40,000)	
	Cash flow from operating activities		4,60,600
B	Cash flow from Investing Activities		
	Purchase of Machinery	(95,000)	
	Purchase of Investment	(80,000)	(1,75,000)
C	Cash flow from Financing Activities		
	Issue of shares at premium	1,10,000	
	Payment of Dividend	(1,60,000)	
	Redemption of preference shares at premium	(2,20,000)	(2,70,000)
	Net increase/decrease in cash and cash equivalent (a+b+c)		15,600
	Cash and cash equivalent at the beginning of the year		1,50,000
	Cash and cash equivalent at the end of the year		1,65,600

Working Notes:

Dr.		Plant and Machinery Account		Cr.	
Particulars	Amount (₹)	Particulars	Amount (₹)		
To Balance b/d	7,00,000	By Depreciation (balancing figure)	80,000		
To Bank A/c	95,000	By Balance c/f	8,20,000		

To acquired from other	1,05,000		
	9,00,000		9,00,000

Dr. Provision for Tax Account Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Bank A/c	1,40,000	By Balance b/d	1,50,000
To Balance c/f	1,80,000	By P & L	1,70,000
	3,20,000		3,20,000

Dr. Profit for the year 2016 Cr.

Particulars	Amount (₹)
P & L Account (1,75,000 – 1,30,000)	45,000
Transfer to general reserve (1,20,000 + 1,00,000 for Redemption – Opening 2,00,000)	20,000
Proposed dividend	2,10,000
Net profit	2,75,000

4. Cash and Cash Equivalent

Opening balance + Short term investment = 1,00,000 + 50,000 = ₹1,50,000.

Closing balance = Closing cash + Short term investment + Foreign exchange loss
 = 80,000 + 84,000 + 1,600 = ₹1,65,600

E-mail: advstudies@icmai.in
Toll Free: 1800 345 0092/1800 110 910

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HEADQUARTERS

CMA BHAWAN, 12 Sudder Street, Kolkata - 700016
Tel: +91-33-2252 1031/1034/1035/1492/1602/1619/7373/7143
Fax: +91-33-2252 7993/1026/1723

DELHI OFFICE

CMA BHAWAN, 3 Institutional Area, Lodhi Road, New Delhi - 110003
Tel: +91-11-24666100/24666124/24666129
Fax: +91-11-4358 3642

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