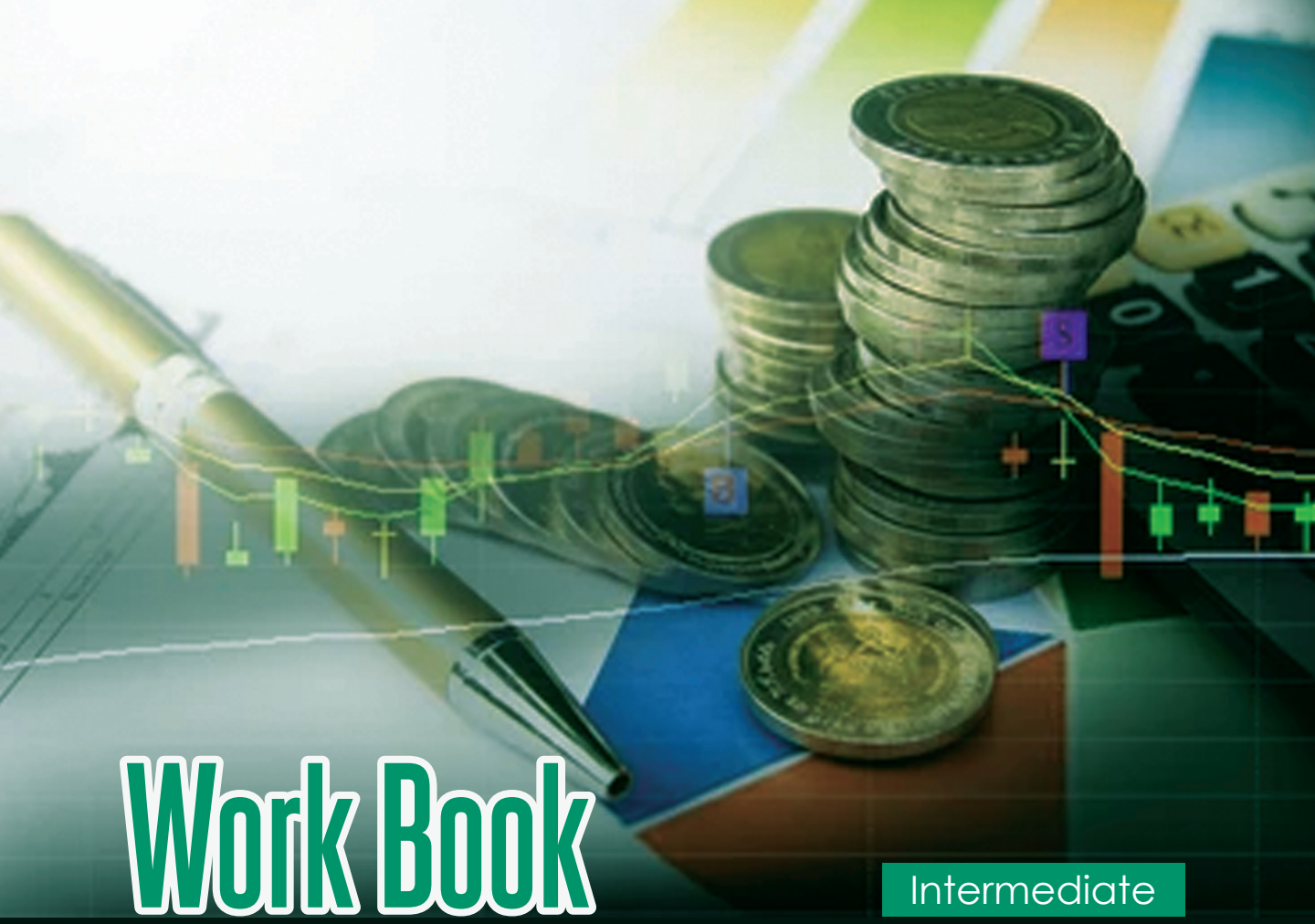

Work Book

Intermediate

Cost Accounting

Paper 8

The Institute of Cost Accountants of India
Statutory Body under an Act of Parliament
www.icmai.in

WORKBOOK

Cost Accounting

INTERMEDIATE

Paper 8

SYLLABUS 2022

The Institute of Cost Accountants of India

CMA Bhawan, 12, Sudder Street, Kolkata - 700 016

www.icmai.in

First Edition : March 2025

Published by :

Directorate of Studies
The Institute of Cost Accountants of India
CMA Bhawan, 12, Sudder Street, Kolkata - 700 016
studies@icmai.in

Preface

The landscape of professional education is undergoing a profound transformation, driven by the evolving demands of a globally integrated economy. In this dynamic environment, it is imperative to equip students not only with technical knowledge but also with the analytical skills and professional acumen essential for success.

Effective learning extends beyond theoretical understanding—it necessitates the development of strong conceptual foundations, critical thinking abilities, and disciplined study habits. These attributes are cultivated through continuous practice and engagement with thought-provoking academic material. To facilitate this process, the curriculum, instructional methods, and assessments must be designed to provide comprehensive, structured, and intellectually stimulating learning experiences.

Building on the success of the previous editions, we are pleased to present the new edition of our 'Workbook' in an e-distributed format. This edition has been meticulously developed to enhance students' comprehension and application of key concepts. Each chapter is structured to offer a seamless learning experience and integrating practical illustrations in a phased manner to align with the evolving regulatory framework.

We are confident that this new edition will continue to serve as a valuable academic resource, empowering students to achieve their professional aspirations with confidence and competence.
The Directorate of Studies, The Institute of Cost Accountants of India

The Directorate of Studies,

The Institute of Cost Accountants of India

INDEX

1 Introduction to Cost Accounting [Study Material - Module 1]

ILLUSTRATION 1:

The manufacturer of Ajanta Pvt. Ltd. has recorded an amount of ₹38,030 in his books of accounts for the year 2024, which includes the following expenses:

Agent's commission	5,500
Trade magazines	4,600
Bank charges	550
Director's remuneration	8,000
Rent, rates, and insurance of warehouse	1,200
Rent, rates, and insurance of office	1,500
Interest on debentures	1,500
Travelling expenses of salesmen	1,360
Cash discount allowed	980
Printing and stationery	1,090
Electricity charges of the warehouse	2,250
Donations	800
Telephone and postage	700
Salesmen's salary	1,500
Manager's salary	6,500
	38,030

Based on the provided information, prepare a statement showing the total of:

(a) Administrative expenses.

(b) Selling expenses.

(c) Distribution expenses.

(d) Expenses not included in costs.

Solution:

Statement showing Classification of costs for the year 2024 of Ajanta Pvt. Ltd.

Classification of costs	Amount (₹)
(a) Administrative expenses:	
Trade magazines	4,600
Director's remuneration	8,000
Rent, rates, and insurance of office	1,500
Printing and stationery	1,090
Telephone and postage	700
Manager's salary	6,500
	22,390
(b) Selling expenses.	
Agent's commission	5,500
Travelling expenses of salesmen	1,360
Salesmen's salary	1,500
	8,360
(c) Distribution expenses.	
Rent, rates, and insurance of warehouse	1,200
Electricity charges of the warehouse	2,250
	3,450
(d) Expenses not included in costs.	
Bank charges	550
Interest on debentures	1,500
Cash discount allowed	980
Donations	800
	3,830

ILLUSTRATION 2:

The following is the manufacturing and Profit and Loss Account of Anu Limited for the year ended 31.3.2024.

Particulars	Amount (₹)	Particulars	Amount (₹)
Opening stock:		Sales	7,50,000
Raw materials	4,500	Closing stock:	
Finished goods	2,000	Raw materials	20,000
Purchases of raw material	2,50,000	Finished goods	9,000
Carriage on material	3,000		
Cost of special design	8,700		
Royalty	4,500		
Direct wages	1,80,000		
Power	70,000		
Gross profit c/d	2,56,300		
	7,79,000		**7,79,000**
Rent and rates of office	5,000	Gross profit b/d	2,56,300
Rent and rates of factory	4,500	Sale of scrap (at works cost)	3,500
Interest on loan	7,000	Discount received	5,000
Electricity	10,800	Dividend received	7,500
Provision for bad debts	600		
Establishment	12,000		
Telephone	2,500		
Advertisement	3,800		
Depreciation of plant & machinery	6,000		
Depreciation of furniture and fixtures of office	5,000		
Depreciation of furniture and fixtures of the factory	3,500		166,100
Depreciation of office appliances	1,500		
Income-tax	15,700		

Particulars	Amount (₹)	Particulars	Amount (₹)
Salaries	98,000		
Director's fees	5,000		
Auditor's fees	4,000		
Bank charges	800		
Cash discount allowed	900		
Donations	8,700		
Rent of warehouse	5,200		
Net profit	71,800		
	2,72,300		**2,72,300**

prepare a statement that classifies the costs into different components based on the information above, taking into account the following factors: -

(a) 50% of telephone expenses relate to the office and 50% to sales department;

(b) 20% of salaries relate to the factory, 60% to the office and 20% to the sales department; and

(c) 75% of the establishment expenses relate to the office and 25% to the sales department.

(d) 65% of the electricity relates to the factory and the remaining to the office.

Solution:

Statement of cost of Anu Ltd. for the year ended 31.3.2024

Particulars	Amount (₹)	Amount (₹)
Opening stock of raw materials	4,500	
Purchases of materials	2,50,000	
Less: Closing stock of raw materials	(20,000)	
Add: Carriage on material	3,000	
Value of raw materials consumed		2,37,500
Add:- Cost of special design		8,700
Direct wages		1,80,000
Royalty		4,500
Prime cost		**4,30,700**
Add:- Factory overhead		

Particulars	Amount (₹)	Amount (₹)
Power		70,000
Rent and rates of factory		4,500
Electricity		7,020
Depreciation of plant & machinery		6,000
Depreciation of furniture and fixtures of the factory		3,500
Salaries		19,600
Less:- Sale of scrap		(3,500)
Works cost		**5,37,820**
Add:- Administration overhead		
Rent and rates of office		5,000
Electricity		3,780
Establishment cost		9,000
Telephone expenses		1,250
Depreciation of furniture and fixtures of office		5,000
Depreciation of office appliances		1,500
Salaries		58,800
Director's fees		5,000
Auditor's fees		4,000
Cost of production		
Add:- Opening stock of finished goods		2,000
Less:- Closing stock of finished goods		(9,000)
Cost of goods sold		**6,24,150**
Add: - Selling & distribution overheads:		
Establishment expenses		3,000
Telephone expenses		1,250
Advertisement		3,800
Salaries		19,600

Particulars	Amount (₹)	Amount (₹)
Rent of warehouse		5,200
Total cost		**6,57,000**
Add:- Profit		93,000
Sales		7,50,000

Note: - Interest on loan, Provision for bad debts, Income Tax, Bank charges, Cash discount allowed, Donations, Discounts received, and Dividends received are not to be considered while preparing the cost sheet.

ILLUSTRATION 3

A factory produces 60,000 units per year at its 100% capacity. The estimated cost of production for the year 2024 is:

Direct Material- ₹3 per unit

Direct Labour- ₹2 per unit

Indirect Expenses include -

Fixed - ₹ 1,20,000 per year

Variable- ₹5 per unit

Semi-variable - ₹40,000 per year up to 60% capacity and an additional ₹10,000 for every 20% Increase in capacity or part thereof.

Calculate the total cost for the year. If the management desires to ensure a Profit of ₹50,000 for the year, what should be the average sale?

The factory runs at a 50% capacity for the first 4 months, 70% capacity for the next 5 months, and for the remaining period it runs at a capacity of 90%.

Solution:

Statement of total cost for the year 2024 **(Amt. in ₹)**

Particulars	4 months (10,000 units)	5 months (17,500 units)	3 months (13,500 units)	Total
Direct Material	30,000	52,500	40,500	1,23,000
Direct Labour	20,000	35,000	27,000	82,000

Particulars	4 months (10,000 units)	5 months (17,500 units)	3 months (13,500 units)	Total
Indirect Expenses:-				
Fixed	40,000	50,000	30,000	1,20,000
Variable	50,000	87,500	67,500	2,05,000
Semi-variable	40,000	50,000	60,000	1,50,000
Estimated Total cost				6,80,000
Add:- desirous Profit				50,000
Estimated sales				7,30,000

ILLUSTRATION 4:

SSK Limited has provided the following details regarding the production of 1,000 Lithium ion batteries manufactured in the year 2023:

Particulars	Amount (₹)
Cost of materials	1,75,000
Direct wages	80,000
Factory indirect wages(60% fixed)	70,000
Electricity (20% fixed)	10,000
Power and fuel (25% fixed)	12,000
Office expenses	9,000
Selling expenses (20% fixed)	15,000
Advertisement (70% fixed)	10,000
Rents, rates, and taxes	12,000
Depreciation of plant (under written down value method)	4,000
	3,82,500

The entire output was sold at ₹500 per unit.

For the year 2024, it is projected that production will increase by 50% by utilizing the available spare capacity. Additionally, the rates for materials and direct wages are expected to rise by 20% and 25%, respectively.

The company's expenses are categorized as either fixed or variable, and it is assumed that the nature of these expenses will remain unchanged in the future. Prepare:

(a) A cost sheet for the year 2023 showing the cost per unit.

(b) A statement showing estimated cost and profit for the year 2024, assuming that all the goods produced will be sold at a price ₹570 per unit.

Solution:

SSK Ltd.

Cost sheet for the year 2023 (1,000 units)

Particulars	Fixed cost (₹)		Variable cost (₹)		Total Cost (₹)	
	Per unit	Total	Per unit	Total	Per unit	Total
Materials			175	1,75,000	175	1,75,000
Direct wages			80	80,000	80	80,000
Prime cost			**255**	**2,55,000**	**255**	**2,55,000**
Factory expenses						
indirect wages	42	42,000	28	28,000	70	70,000
Electricity	2	2,000	8	8,000	10	10,000
Power and fuel	3	3,000	9	9,000	12	12,000
Depreciation of plant	4	4,000			4	4,000
Factory cost	**51**	**51,000**	**300**	**3,00,000**	**351**	**3,51,000**
Administrative expenses						
Office expenses	9	9,000			9	9,000
Rents, rates, and taxes	12	12,000			12	12,000
Cost of production	**72**	**72,000**	**300**	**3,00,000**	**372**	**3,72,000**
Selling and distribution expenses						
Selling expenses	3	3,000	12	12,000	15	15,000
Advertisement	7	7,000	3	3,000	10	10,000
Cost of sales	**82**	**82,000**	**315**	**3,15,000**	**397**	**3,97,000**
Profit					103	1,03,000
Sales					500	5,00,000

Statement of the estimated cost and profit for the year 2024 (1,500 units)

Particulars	Fixed cost (₹)		Variable cost (₹)		Total Cost (₹)	
	Per unit	Total	Per unit	Total	Per unit	Total
Materials			210	3,15,000	210	3,15,000
Direct wages			100	1,50,000	100	1,50,000
Prime cost			**310**	**4,65,000**	**310**	**4,65,000**
Factory expenses						
indirect wages	28	42,000	28	42,000	56	84,000
Electricity	1.33	2,000	8	12,000	9.33	14,000
Power and fuel	2	3,000	9	13,500	11	16,500
Depreciation of plant	2.77	4,000			2.77	4,000
Factory cost	**34**	**51,000**	**355**	**5,32,500**	**389**	**5,83,500**
Administrative expenses						
Office expenses	6	9,000			6	9,000
Rents, rates, and taxes	8	12,000			8	12,000
Cost of production	**48**	**72,000**	**355**	**5,32,500**	**403**	**6,04,500**
Selling and distribution expenses						
Selling expenses	2	3,000	12	18,000	14	21,000
Advertisement	4.67	7,000	3	4,500	7.67	11,500
Cost of sales	**54.67**	**82,000**	**370**	**5,55,000**	**424.67**	**6,37,000**
Profit						2,18,000
Sales					570	8,55,000

ILLUSTRATION 5:

Avni Ltd. manufactures two different types of products, A and B. The total expenses recorded in the books for making 1000 units of A and 800 units of B during the year 2024 are as follows:

Particulars	Amount (₹)
Raw material	1,50,000
Direct wages	65,000

Particulars	Amount (₹)
Depreciation	5,200
Labour amenities	10,500
Stores overhead	12,000
Works general	25,000
Administration & selling expenses	45,500
Running expenses of machines	10,400
	2,99,000

The following additional data is available:

Particulars	A:B
Raw material ratio per unit	2:5
Direct labour ratio per unit	1:5
Machine utilisation ratio per unit	1:2

Determine the per-unit cost of each toy and explain the rationale behind your method of allocating the expenses.

Solution:

Statement of Cost

Particulars	Ratio of apportionment	Total cost (₹)	A (1000 units) (₹)	B (800 units) (₹)
Raw material	1:2	1,50,000	50,000	1,00,000
Direct wages	1:4	65,000	13,000	52,000
Prime cost		**2,15,000**	**63,000**	**1,52,000**
Factory overhead:				
Depreciation	5:8	5,200	2,000	3,200
Labour amenities	1:4	10,500	2,100	8,400
Stores overhead	1:2	12,000	4,000	8,000
Works general	1:4	25,000	5,000	20,000

Particulars	Ratio of apportionment	Total cost (₹)	A (1000 units) (₹)	B (800 units) (₹)
Running expenses of machines	5:8	10,400	4,000	6,400
Cost of production		**2,78,100**	**80,100**	**1,98,000**
Administration & selling expenses	Cost of production	45,500	13,105	32,395
Cost of sales		**3,23,600**	**93,205**	**2,30,395**
Cost per toy			93	288

Working notes:

(1) Apportionment of raw materials

Equivalent units:

Product A: - 1,000 × 2 = 2,000 units

Product B: - 800 × 5 = 4,000 units

The ratio for apportionmentof A: B = 2,000 : 4,000

= 1:2

(2) Apportionment of direct wages

Equivalent units:

Product A: - 1,000 × 1 = 1,000 units

Product B: - 800 × 5 = 4,000 units

Theratio for apportionmentof A: B = 1,000 : 4,000

= 1:4

(3) Apportionment of running expenses and depreciation of machines

Equivalent units:

Product A: - 1,000 × 1 = 1,000 units

Product B: - 800 × 2 = 1,600 units

Theratio for apportionment of A: B = 1,000: 1,600

= 5:8

Note:

1. Stores overhead is allocated based on the ratio of material costs.
2. Labor amenities are distributed according to the ratio of direct wages.
3. Works general expenses are allocated in proportion to direct wages.
4. Administration and selling overheads are considered period costs and allocated based on the cost of production.

ILLUSTRATION 1:

Calculate the unit price of the tobacco product A to be entered in the Stores Ledger based on the supplier's invoice provided below.

Invoice	Amount (₹)
500 units of tobacco product A	5,00,000
Less: 10% trade discount	50,000
	4,50,000
Add: Excise duty @ 25%	1,12,500
	5,62,500
Add: packing charges	20,000
	5,82,500
Add: GST @28%	1,63,100
	7,45,600

Additional information: -

I. A 5% additional discount will be given for payment in 30 days.

II. Documents substantiating payment of excise duty are enclosed for claiming CENVAT credit and input tax credit.

Solution:

Computation of Price to be entered in Stores Ledger

Cost of 500 units less trade discount	4,50,000
Add: Packing charges	20,000
Total	**4,70,000**

Cost per unit: - 4,70,000/500

₹940

Notes:

i. Excise duty is not included in the cost as CENVAT credit can be claimed.

ii. GST is not included in the cost as Input Tax Credit can be claimed.

iii. Cash discounts are not considered part of the cost.

ILLUSTRATION 2:

A manufacturer procured three materials A, B, and C from Patna. The invoice provided the following details:

		(₹)
Material A	8,000 kg @ ₹4 per kg	32,000
Material B	12,000 kg @ ₹2 per kg	24,000
Material C	9,000 kg @ ₹3 per kg	27,000
Carriage inward		5,800

Due to breakages, a shortage of 500 kg of Chemical A, 400 kg of Chemical B, and 300 kg of Chemical C was observed. The manufacturer paid a duty of ₹0.3 paisa per kg of quantity received. Additionally, packing charges of ₹20 for Chemical A, ₹25 for Chemical B, and ₹15 for Chemical C were incurred. Suggest the stock rate for pricing the issuance of these chemicals, factoring in a 5% provision for potential further loss.

Solution:

Calculation of Quantity Available for Use

	Material A	Material B	Material C
Quantity purchased	8,000	12,000	9,000
Less:- breakage	500	400	300
	7,500	11,600	8,700
Less:- loss @ 5%	375	580	435
Material available for use	7,125	11,020	8,265

Calculation of Issue Rate of Chemicals

	Material A	Material B	Material C
Purchase price	32,000	24,000	27,000
Carriage inward(in the ratio of quantity, i.e., (8:12:9)	1,600	2,400	1,800
Duty (@ ₹0.30 paisa per kg of quantity received)	2,250	3,480	2,610
Packing charges	20	25	15
Total cost	35,870	29,905	31,425
Material available for use	7,125	11,020	8,265
Issue rate(total cost/ material available)	5.03	2.71	3.8

ILLUSTRATION 3:

Using the information provided, determine the total monthly earnings for each of the three workers: Gita, Sita, and Rita for December,2024

(a) Standard production per month per worker: 5,000 units

(b) Actual production during the month of December:

Gita: - 3,000 units

Sita: - 4,000 units

Rita: - 4,500 units

(c) Basic Piece work rate per unit of actual production: ₹10

(d) Dearness allowance: - 50% of basic.

(e) House Rent Allowance: - ₹36,000 p.a.

(e) Additional production bonus at the rate of ₹15 for each percentage of actual production exceeding 70% of the standard.

Solution:

Calculation of Monthly Earnings of Workers

	Gita	Sita	Rita
Standard production (in units)	5,000	5,000	5,000
Actual production (in units)	3,000	4,000	4,500

	Gita	Sita	Rita
Efficiency (as a percentage of standard)	60%	80%	90%
Excess over 70% efficiency	-	10%	20%
Bonus (in ₹)		150	300
Basic wage (in ₹)	30,000	40,000	45,000
Dearness Allowance (in ₹)	15,000	20,000	22,500
House Rent Allowance (in ₹)	3,000	3,000	3,000
Total monthly earnings (in ₹)	48,000	63,150	70,800

ILLUSTRATION 4:

In an assembly shop, four workers—A, B, C, and D—collaborate as a team and are compensated based on a group piece-rate system. They also perform individual hourly-rated jobs. During a 48-hour workweek, their time spent on group piece-work is as follows: A - 40 hours, B - 45 hours, C - 35 hours, and D - 20 hours. The remaining hours of the week are allocated by each worker to hourly-rated day jobs. Their respective hourly rates are: A at ₹10, B at ₹12 C at ₹15, and D at ₹20.

The team earns a group piece rate of ₹14 per unit, and they have collectively produced 1,000 units. Determine the gross weekly earnings for each worker, factoring in a Dearness Allowance of ₹500 per month for each individual.

Solution:

Group production: - 1,000 units

Group earnings: - ₹14,000

Workmen	Time spent in group work	Time spent day rate jobs	Total time spent
A	40 hours	8 hours	48 hours
B	45 hours	3 hours	48 hours
C	35 hours	13 hours	48 hours
D	20 hours	28 hours	48 hours

Computation of Earnings **(amount in ₹)**

	Worker A	Worker B	Worker C	Worker D
Wages on day-rate jobs	80	36	195	560

	Worker A	Worker B	Worker C	Worker D
Share in group earnings	4,000	4,500	3,500	2,000
Dearness allowance	125	125	125	125
Total wages	4,205	4,661	3,820	2,685

Group earnings are shared in the ratio of 40:45:35:20

ILLUSTRATION 5:

Under a suggestion box scheme, employees whose proposals are approved receive an award equal to 10 months of savings in labor costs. An employee's recommendation to use a jig for a specific manufacturing operation has been accepted. The jig costs ₹1000, has a lifespan of one year, and is expected to reduce the standard time per component by 6 minutes.

Additional information: -

(a) Number of pieces to be produced in one year: -18,000
(b) Standard time, per piece before use of jig: one and half hour
(c) Raw materials required per piece: 10 kg @ ₹50 per kg
(d) Average wage rate of workmen: ₹10 per day of 8 hours
(e) Average efficiency of workmen: 75%
(f) Overhead charge - ₹8 per actual hour
(g) Store handling expenses - 2% of the value of direct materials

Calculate the following:

i. The amount of the award,
ii. The revised estimated cost to the company per year.
iii. The revised estimated cost of the component.

Solution: -

Actual time per piece before use of the jig: - $\frac{\text{Standard Time}}{\text{Efficiency}} = \frac{90}{0.75}$

= 120 minutes.

Standard time per piece after use of the jig = 90 – 6

= 84 minutes

Actual time per piece after use of the jig - $\frac{\text{Revised Standard Time}}{\text{Efficiency}} = \frac{84}{0.75}$

= 112 minutes.

Savings in actual time per piece = (120-112) minutes = 8 minutes

Time saved per year = Number of pieces to be produced × 8 minutes

$$= \frac{18,000 \times 8}{60}$$

= 2,400 hours.

Saving in labour cost per annum = 2,400 hours' × Average rate per hour

$$= 2,400 \times \frac{10}{8}$$

= ₹3,000

The amount of the award is: - ten month's savings in labour cost

$$= 3,000 \times \frac{10}{12}$$

= ₹2,500

i. Calculation of the estimated savings of the company per year:

Savings in labour cost		3,000
Savings in overhead (saving in actual hour × rate per hour	2,400 hours × 8	19,200
Less: -Cost of the jig	1,000	
- Award to the worker	2,500	(3,500)
Savings of the company per year		18,700

ii. Revised estimate cost of the component: -

	Amount (in ₹)
Material cost (10 kg @ ₹50 per kg)	500
Add: - store handling expenses	10
- Labour cost(112/60 hours × ₹10/8)	2.33
- Overhead (112/60 × 8)	14.93
- Award for suggestion (2,500/18,000)	0.138
- Cost of the jig (1,000/ 18,000)	0.055
Cost per piece	527.46

Total cost for 18,000 unit = 18,000 units × ₹527.46

= ₹94,94,300

Reconciliation: -

Material cost	= 500
Add:	
- store handling expenses	= 10
- Labour cost (120/60 × 10/8)	= 2.5
- Overheads (120/60 × 8)	= 16
Cost per piece	= 528.5
Total cost for 18,000 unit	= 18,000 units × ₹528.5
	= 9,51,300
Less: - savings per year	= (18,700)
Revised estimated cost	= 94,94,300.

ILLUSTRATION 6:

The management of Vina and Vani Ltd. is concerned about the rising labour turnover in their factory. Before analyzing its causes and implementing corrective measures, they aim to estimate the profit lost due to labour turnover in the previous year.

During the last year, the company achieved sales of ₹90,03,000 with a P/V ratio of 30%. The direct labour force worked a total of 5 lakh hours. However, delays by the Personnel Department in filling vacancies caused by labour turnover resulted in a loss of 1,50,000 potentially productive hours. Additionally, the direct labour hours included 1,25,000 hours dedicated to training new recruits, 40 % of which were unproductive.

An analysis of costs incurred due to labour turnover revealed the following:

Settlement cost due to leaving: - ₹50,000

Recruitment costs: - ₹30,500

Selection costs: - 15,000

Training costs: - 38,400

Assuming that the potential production lost due to labour turnover could have been sold at the prevailing prices, calculate the profit lost last year as a result of labour turnover.

Solution:

Statement showing calculation of Contribution Foregone

Particulars	Amount (in ₹)
Actual hours worked	5,00,000
Less:- unproductive training hours (40% of 1,25,000)	50,000
Actual productive hours	4,50,000
Total hours lost	1,50,000
Sales lost (90,03,000 × 1,50,000/ 4,50,000)	30,01,000
Contribution lost (30,01,000 × 30%)	9,00,300

Statement Showing Profit Foregone

Particulars	Amount (in ₹)
Contribution lost	9,00,300
Settlement cost due to leaving	50,000
Recruitment costs	30,500
Selection costs	15,000
Training costs	38,400
Profit Foregone	10,34,200

ILLUSTRATION 7:

A machine shop operates with 5 identical handling machines, managed by 5 operators. Each machine requires a fully dedicated operator to function. The total initial cost of these 5 machines is ₹10 lakh.

Normal available hours per month	208
Absenteeism (without pay)-hours	18
Leave (with pay)-hours	10
Normal idle unavoidable hours	20
Average rate of wages per day of 8 hours	96
Production bonus estimated	10% on wages
The following details are provided for a six-month period:	

Value of power consumed	28,500
Supervision and indirect labour	18,000
Lighting and electricity	12,000
The following particulars are for a year:	
Insurance	24,000
Depreciation	5% on original cost
Other sundry works expenses	10,000
Repairs and maintenance including	3% on value of machines
General management expenses allocated	30,000

Work out a comprehensive machine hour rate for the machine shop.

Solution:

Calculation of total Productive Machine Hours Available

As the machines cannot work without an operator wholly engaged, total productive machine hours available is the total hours worked by 5 operators together.

Normal available hours per operator per month		208
Absenteeism		(18)
Leave		(10)
Normal idle-time		(20)
Effective working hours per operator per month		160
Effective working hours for 5 operators per month	160 × 5	800
Effective productive machine hours per annum	800 × 12	9,600

Calculation of direct Labour Cost Per Hour		**Amount in ₹**
Normal wages per hour	96/8	12
Wages per operator per month	(208 – 18) × 12	2,280
Production bonus estimated	10% of 2,280	228
Effective working hour per month		160
Effective labour cost per hour	(2,280 + 228)/ 160	15.675

Calculation of Machine-Hour Rate **Amount in ₹**

Machine running costs and other costs:	**Per annum**	**Per hour**
Value of power consumed (28,500 × 12/6)	57,000	
Supervision and indirect labour (18,000 × 12/6)	36,000	
Lighting and electricity (12,000 × 12/6)	24,000	
Insurance	24,000	
Depreciation (5% of 10 lakhs)	50,000	
Other sundry expenses	10,000	
Repairs and maintenance (3% of 10 lakhs)	30,000	
General management expenses	30,000	
Total machine running costs and other costs	2,61,000	27.1875
Direct labour cost		15.675
Comprehensive machine hour rate		42.8625

ILLUSTRATION 8:

Ram is a manufacturer of toys. He purchased a new machine in the year 2024.

The following information is provided to you:

i. The cost of the machine used is ₹50,000. Its estimated life is 10 years, the estimated scrap value at the end of its life is ₹5,000 and the estimated working time per year is 50 weeks of 44 hours, of which machine maintenance, etc., is estimated to take up 100 hours.

ii. Setting-up time of 100 hours is estimated.

iii. The machine uses 0.75 units of electricity per hour at a cost of ₹5 per unit during production. No electricity is used during maintenance or setting up.

iv. The machine requires a chemical solution to work efficiently which is replaced at the end of each week at a cost of ₹20 each time.

v. The estimated cost of maintenance for 6 months is ₹1,200.

vi. Two supervisors supervise the operation of the machine together with four other identical machines. Their combined weekly wages, insurance, and the employer's contributions to holidays pay amount to ₹500.

vii. Departmental and general works overheads allocated to this machine for the year 2024 amount to ₹2,000.

Calculate machine hour rate when-

(a) Setting-up time is unproductive

(b) Setting-up time is productive

Solution:

(a) When setting-up time is unproductive:

Calculation of effective working hours:

Annual working hours (50 × 44)	= 2,200 hours
Less: Maintenance time	= 100 hours
	= 2,100 hours
Less: Set-up time	= 100 hours
Effective working hours	= 2,000 hours

The machine hour rate has been computed on the basis of these 2,000 hours.

Computation of Machine Hour Rated

	Workings	Per annum (₹)	Per hour (₹)
Standing Charges:			
Departmental and general works overhead		2,000	
Wages of attendants	(500×50 weeks) / 5 machines	5,000	
Standing charges per hour	₹7,000 / 2,000 hrs		3.5
Variable Charges:			
Depreciation	(50,000-5,000)/ (2,000 hrs × 10yrs)		2.25
Electricity	(0.75 units × 5 × 2,000) / 2,000 hrs		3.75
Chemical	(₹20 × 50 weeks) / 2,000 hrs		0.5
Maintenance	(₹1,200 × 2) / 2,000 hrs		1.2
Machine Hour Rate			11.2

(b) When setting-up time is to be treated as productive

Effective hours will be 2,000 hrs, i.e. 2,200 hrs less 200 hrs for maintenance.

Computation of Machine Hour Rated

	Workings	Per annum (₹)	Per hour (₹)
Standing Charges:			
Departmental and general works overhead		2,000	
Wages of attendants	(500×50 weeks) / 5 machines	5,000	
Standing charges per hour	₹7,000 / 2,100 hrs		3.5
Variable Charges:			
Depreciation	(50,000-5,000)/ (2,100 hrs × 10yrs)		2.14
Electricity	(0.75 units × 5 × 2,000) / 2,100 hrs		3.57
Chemical	(₹20 × 50 weeks) / 2,100 hrs		0.47
Maintenance	(₹1,200 × 2) / 2,100 hrs		1.14
Machine Hour Rate			10.82

ILLUSTRATION 9:

A company allocates overheads based on predetermined rates. For the financial year ending March 31, 2024, the absorbed factory overheads amounted to ₹3,50,000, while the actual overheads incurred totaled ₹4,00,500 Additionally, the following figures were obtained from the trial balance:

Finished stock: - ₹2,00,000

Work-in-progress: - ₹1,40,000

Cost of goods sold: - ₹6,70,000

How would you dispose of the under/over-absorbed overheads by use of the supplementary rate method?

Solution:

Under-absorbed overheads = Actual overheads - Absorbed overheads

= 4,00,500- 3,50,000

= ₹50,500

Total cost incurred	= 2,00,000 + 1,40,000 + 6,70,000
	= 10,10,000
Supplementary Rate	= Unabsorbed amount / Total cost
	=₹50,500 / 10,10,000
	= 5%

As there is an under-absorption of overheads, it is a plus rate, i.e., the cost of finished goods, work-in-progress and cost of goods sold will be increased by 5% as shown below:

Finished goods	= ₹2,00,000 × 5%	= ₹ 10,000
Work-in-progress	= ₹1,40,000 × 5%	= ₹ 7,000
Cost of goods sold	= ₹6,70,000 × 5%	= ₹ 33,500
Total		= ₹ 50,500

ILLUSTRATION 10:

During the year ending 31st March 2024, the factory overhead costs ofthree production departments of an organization are as under-

X = ₹50,000

Y = ₹45,000

Z = ₹70,000

The basis of absorption of overheads is given below:

Department X = ₹6 per machine hour for 10,000 hours

Y = 37% of direct labour cost of ₹1,00,000

Z = @5 per piece for 15,000 piece

Calculate the department-wise under or over-absorption of overheads and present the data in a tabular form.

Solution:

Amount of cost absorbed factory overheads is calculated as follows:

X@ ₹6 per machine hour for 10,000 hours	= ₹ 60,000
Y@37% of direct labour cost of ₹1,00,000	= ₹ 37,000
Z@5 per piece for 15,000 piece	= ₹ 75,000
Total overheads absorbed	= ₹ 1,72,000

Statement Showing Department-wise Under/Over-absorption Amount in ₹

Department	Actual overhead	Absorbed overhead	Under absorption	Over absorption
X	50,000	60,000		10,000
Y	45,000	37,000	8,000	
Z	70,000	75,000		5,000
Total	1,65,000		8,000	15,000

Net over absorption = 15,000 – 8,000

= ₹7,000

ILLUSTRATION 1:

Purchase of Materials ₹4,00,000 (inclusive of GST of ₹48,000); Fee on Board ₹14,000; Import Duty paid ₹15,000; Freight inward ₹18,000; Insurance paid for import by sea ₹10,000; Rebates allowed ₹6,000; Cash discount ₹5,000; Subsidy received from the Government for importation of these materials ₹35,000. Compute the landed cost of material (i.e. value of receipt of material).

Solution:

(a) Computation of Material Cost Sheet

Particulars		Amount (₹)
	Purchase price of Material	4,00,000
Add:	Fee on Board	14,000
Add:	Import Duties of purchasing the material	15,000
Add:	Freight Inward during the procurement of material	18,000
Add:	Insurance paid	10,000
Total		**4,57,000**
Less:	Rebates	6,000
Less:	GST Input Tax Credit	48,000
Less:	Subsidy received from the Government for importation of materials	35,000
Value of Receipt of Material		**3,68,000**

Note:

(i) Cash discount is not allowed, as it is a financial item.

(ii) Subsidy received, rebates and GST Input Tax Credit are to be deducted for the purpose of computing the material cost.

ILLUSTRATION 2:

A Steel Company which produces Iron Casting Pipes and rod iron is covered under the Cost Audit according to the Companies (Cost Records and Audit) Rules 2014. From the expenditure data relating to 2024-25, determine the employees cost according to CAS -7.

	₹ in Lakh
Salary, wages and other allowances	950
Bonus	125
Contribution to Providend Fund	85
Wages to contractors employees	150
Employees welfare	50
Abnormal cost due to strike	95
VRS payment for closure of Rod Iron section of the plant	78
Arear Salary (2016-2017)	215
Compensation paid against the past periods against Court order	47

Solution:

The following items will not be included according to CAS-7:

(i) VRS paid for closure of a unit

(ii) Abnormal cost charges to Profit and Loss A/c

(iii) Area salary not related to the current year

(iv) Compensation paid against past periods

(v) Wages paid to contractor employees.

[As per explanation (1) of CAS-7 under para-4.7: Contract employees include employees directly engaged by the employer on contract basis but does not include employees of any contractor engaged in the organisation.]

Thus, employees cost:

	₹ lakh
Salary and wages	950
Contribution to PF	85
Employees welfare	50

Bonus	125
Total	**1,210**

ILLUSTRATION 3:

An amount of ₹13,000/- for raw materials and ₹1,50,000/- for finished goods has been written off due to obsolescence. How should these be accounted for in Cost Accounts?

Solution:

The cost of obsolete raw materials and finished goods should be directly written off to the Profit & Loss Account, without being charged to the cost of production. An amount of ₹1,63,000 (₹13,000 + ₹1,50,000) should be written off to the Profit & Loss Account.

ILLUSTRATION 4:

In a certain melting process, a material called 'crude oil' is added to the furnace along with other materials. Additionally, crude oil is used as fuel to heat the furnace. How should its cost be treated in the final product according to Cost Accounting Standards?

Solution:

The cost of crude oil added to the furnace should be considered as raw material cost under Cost Accounting Standards (CAS), provided it is significant in value compared to other raw materials and is measurable. However, if its quantity or value is insignificant, it should be classified as production overhead. The quantity and value of crude oil used as fuel should be treated as indirect material and recorded as production overhead.

ILLUSTRATION 5:

Purchase of Materials $80,000 [Forward contract rate $ = ₹80.40 but $ = ₹80.60 on the date of importation], Import Duty paid ₹7,15,000; Freight inward ₹1,92,000; Insurance paid for import by road ₹88,000; Cash discount ₹53,000; Payment made to the foreign vendor after a month, on that date the rate of exchange was $ = ₹82,20. Compute the landed cost of material.

Solution:

Computation of Landed Cost of Material

	Particulars	**Amount (₹)**
	Purchase price of Material [80,000 × 80.60]	64,48,000
Add	Import duties of purchasing the material	7,15,000

Add	Any taxes paid during the purchase of material	1,92,000
Add	Freight Inward during the procurement of material	88,000
	Value of Receipt of Material	74,43,000

(i) Excess payment made to the vendor due to exchange fluctuation is not an includible cost, hence not considered.

(ii) Though the forward contract rate was $ = ₹80.40, but the exchange rate on the date of importation is considered. Hence, included in the cost of materials. Accordingly, the purchase cost is computed considering the $ = ₹80.60.

ILLUSTRATION 1:

The profit and loss statement of Kalyan Pvt. Ltd. for the financial year ending on March 31, 2025, is as follows.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Materials	5,00,000	By Sales	11,00,000
To Wages	3,80,000	By Closing stock	1,50,000
To Direct expenses	2,50,000	By Work -in-progress	
		Materials 40,000	
		Wages18,000	
To Gross profit	1,90,000	Direct expenses12,000	70,000
	13,20,000		13,20,000
To Administration expenses	80,000	By Gross profit	1,90,000
To Net profit	1,10,000		
	1,90,000		**1,90,000**

According to the cost records, direct expenses have been estimated at ₹40 per kg, while administration expenses are ₹20 per kg. During the year, 6,000 kg were produced, and 5,000 kg were sold. Prepare a costing profit and loss statement and reconcile the profit with the financial records.

Solution:

Statement Showing Profit as per Cost Accounts

Particulars		Amount (₹)
Material: Purchased	5,00,000	
Less: Material content in W.I.P.	40,000	4,60,000

Particulars		Amount (₹)
Wages:	3,80,000	
Less: Wages content in W.I.P.	18,000	3,62,000
Direct expenses: (6,000 × ₹ 40)		2,40,000
Administration expenses: (6,000 × ₹ 20)		1,20,000
Cost of production of 6,000 kg		11,82,000
Less: Value of closing stock: (6,000 – 5,000) kg × $\frac{11,82,000}{6,000}$		1,97,000
Cost of goods sold		9,85,000
Profit (balancing figure)		1,15,000
Sales		11,00,000

Reconciliation Statement

Particulars	Amount (₹)
Profit as per cost accounts	1,15,000
Add: Over-absorption of direct expenses	2,000
Over-absorption of administration expenses	40,000
Less: Difference inclosing stock	(47,000)
Profit as per profit & loss account	1,10,000

ILLUSTRATION 2:

The following details are available from the financial records of a Parmahans Ltd. with a normal production capacity of 1,00,000 units for the financial year ending March 31, 2025:

(a) Sales revenue: ₹20,00,000 (90,000 units sold).

(b) There was no opening or closing stock of finished goods.

(c) Direct material and direct wages costs amounted to ₹7,00,000 and ₹4,50,000, respectively.

(d) Actual factory expenses totaled ₹3,50,000, with 60% being variable.

(e) Actual administrative expenses were ₹95,000, which were entirely fixed.

(f) Actual selling and distribution expenses amounted to ₹40,000, with 40% classified as fixed.

(g) Interest and dividends received were ₹45,000.

Requirements:

(a) Determine the profit as per the financial books for the year ending March 31, 2025.

(b) Prepare a cost sheet and calculate the profit as per cost accounts for the same period, assuming that indirect expenses are absorbed based on normal production capacity.

(c) Prepare a reconciliation statement to match the profits reported in the financial and cost records.

Solution:

Financial Books Profit & Loss Account for the Year Ended March 31, 2025

Particulars	Amount (₹)	Particulars	Amount (₹)
To Direct material	7,00,000	By Sales (90,000 units)	20,00,000
To Direct wages	4,50,000	By Interest and dividend	45,000
To Factory expenses (actual)	3,50,000		
To Admin. Expenses	95,000		
To Selling & dist. Expenses	40,000		
To Profit	4,10,000		
	20,45,000		**20,45,000**

Cost Sheet for the Year Ended March 31, 2025

Particulars	Amount (₹)
Direct material	7,00,000
Direct wages	4,50,000
Prime cost	11,50,000
Factory overhead: Variable	2,10,000
Fixed	3,15,000
Works cost	16,75,000
Administrative expenses: 95,000 × (90,000/1,00,000)	85,500
Cost of production	17,60,500
Selling and distribution expenses: Variable	24,000
Fixed: 40,000 (90,000/1,00,000)	36,000
Cost of sales	18,20,500

Particulars	Amount (₹)
Profit (balancing figure)	1,79,500
Sales	20,00,000

Reconciliation Statement

Particulars	Amount (₹)
Profit as per cost accounts	1,79,500
Less: under absorption of administrative expenses	9,500
Add:over absorption of factory overhead	1,75,000
over absorption of selling and distribution expenses	20,000
Income from dividend	45,000
Profit as per financial accounts	4,10,000

ILLUSTRATION 3:

Journalise the following transactions assuming that Cost and Financial Accounts are integrated

Particulars	Amount (₹)
Raw materials purchased	2,00,000
Direct materials issued to production	1,80,000
Wages paid (20% Indirect)	80,000
wages charged to production	75,000
Manufacturing expenses incurred	45,000
Manufacturing overhead charged to production	54,000
selling and distribution costs	28,000
Finished product at cost	1,85,000
Sales	2,84,000
Receipts from customers	74,000
Paid to creditors	92,000
Closing stock	

Solution:

Sl. No.	Particulars	Debit (₹)	Credit (₹)
1.	Stores ledger control A/c To Bought ledger control A/c (Being raw materials bought)	2,00,000	 2,00,000
2.	Work-in-progress ledger control A/c To Stores ledger control A/c (Being materials issued for production)	1,80,000	 1,80,000
3.	Wages control A/c Factory overhead control A/c To Bank A/c (Being wages paid)	64,000 16,000	 80,000
4.	Work-in-progress ledger control A/c To Wages control A/c To Factory overhead control A/c (Being the wages allocated to production)	75,000	 52,500 22,500
5.	Factory overhead control A/c To Bank A/c (Being the manufacturing expenses incurred)	45,000	 45,000
6.	Work-in-progress ledger control A/c To Factory overhead control A/c (Being overheads charged to production)	54,000	 54,000
7.	Selling and distribution overhead control A/c To Bank A/c (Being selling and distribution cost incurred)	28,000	 28,000
8.	Finished stores ledger control A/c To Work-in-progress ledger control A/c (Being cost of production of completed jobs)	1,85,000	 1,85,000
9.	Cost of sales A/c To Finished stock ledger control A/c To selling and distribution overhead control A/c (Being the cost of products sold)	2,13,000	 1,85,000 28,000

Sl. No.	Particulars	Debit (₹)	Credit (₹)
10.	Sales ledger control A/c To Sales (Being the amount of sales)	2,84,000	 2,84,000
11	Bank A/c To Sales ledger control A/c (Being amount received from customers)	74,000	 74,000
12.	Bought ledger control A/c To Bank A/c (Being amount paid to creditors)	92,000	 92,000

ILLUSTRATION 4:

During the month of March 2025 the following transactions took place in A Co Ltd. :

	Amount (₹)
Materials purchased:	
Credit purchases	12,000
Cash purchases	5,000
Credit purchases for special job	1,000
Returns to suppliers	800
Direct materials issued to production	10,000
Indirect materials issued	800
Materials returned from production to stores	650
Materials transferred from Job No . 1001 to Job No. 1002	500

You are required to enter the transactions in the financial and cost books.

Solution:

Financial books:

Particulars	Debit (₹)	Credit (₹)
Purchases account Cost ledger control account (memorandum) To Creditors account (Being the amount of credit purchases)	12,000	 12,000

Particulars	Debit (₹)	Credit (₹)
Purchases account Cost ledger control account (memorandum) To Creditors account (Being the amount of special purchases)	1,000	 1,000
Purchases account Cost ledger control account (memorandum) To Cash (Being the amount of cash purchases)	5,000	 5,000
Creditors account Purchases returns To Cost ledger control account (memorandum) (Being the return of materials)	800	 800

No further entries are required in the financial books. From the above entries in the cost ledger control account the cost department makes corresponding entries in the cost books as follows:

Cost books:

Particulars	Debit (₹)	Credit (₹)
Stores ledger control account To General ledger adjustment account (Being the credit purchases)	12,000	 12,000
Work-in-progress ledger control account To General ledger adjustment account (Being the amount of special purchases)	1,000	 1,000
Stores ledger control account To General ledger adjustment account (Being the amount of purchases chases in cash)	5,000	 5,000
General ledger adjustment account To Stores ledger control account (Being the return of materials to suppliers)	800	 800

The following entries do not affect the general ledger adjustment account and as such they are called "Internal transactions in books.

Particulars	Debit (₹)	Credit (₹)
Work-in-progress ledger control account To Stores ledger control account (Being the issues of direct materials to production)	10,000	 10,000
Production overhead account To Stores ledger control account (Being the issue of indirect materials)	800	 800
Stores ledger control account To Work-in-progress ledger control account (Being the return of materials from production to stores)	650	 650
Job No. 11 account. To Job No. 10 account (Being the transfer of materials from Job No. 1001 to Job No. 1002)	500	 500

Only the job account 1001 and 1002 are affected in the work-in-progress ledger, but the work-in-progress ledger control account remains unaffected.

ILLUSTRATION 5:

Enter the following transactions in financial and cost books:

	Amount (₹)
(1) Gross wages	40,500
Less: Deductions -	
Employees' State insurance	1,200
Employees' provident fund	1,500
Income-tax	800
Net cash	36,500

Provide employer's contribution to ESI is 1,300 and provident fund is 1,500.

The following particulars are obtained from the wages analysis book

	Amount (₹)
Wages paid to direct labour	20,000

	Amount (₹)
Salaries paid to production staff	8,000
Salaries paid to administration staff	11,000
Salaries paid to selling and distribution staff	7,500

Solution:

Financial books

Particulars	Debit (₹)	Credit (₹)
Wages account (including employer's contribution)	42,800	
Cost ledger control account (memorandum)		
To Employees' state insurance a/c (including employer's)		2,500
To Employees' provident fund a/c (including employer's)		3,000
To Income-tax account		800
To Cash		36,500
(Being the wages amounting to ₹42,800; deductions bothemployer's and employees are effected)		

Cost books:

Particulars	Debit (₹)	Credit (₹)
Wages control account	42,800	
To General ledger adjustment account		42,800
(Being the amount of gross wages brought into the cost books)		
Work-in-progress ledger control account	20,000	
To Wages control account		20,000
(Being the amount of direct wages transferred to individual job accounts and the total to work-in-progress ledger control account)		
Production overhead account	8,000	
Administration overhead account	11,000	
Selling and distribution overhead account	7,500	
To Wages control account		26,500
(Being the transfer of indirect wages)		

ILLUSTRATION 6:

The following figures have been extracted from the cost records of a manufacturing unit:

		Amount (₹)
Stores:	Opening balance	30,000
	Purchases	1,60,000
	Transfers from work-in-progress	80,000
	Issues to work-in-progress	1,60,000
	Issues to repairs and maintenance	20,000
	Deficiencies found in stocktaking	6,000
Work-in-progress:	Opening balance	60,000
	Direct wages applied	60,000
	Overheads applied	2,40,000
	Closing balance	40,000

Finished products: Entire output is sold at a profit of 10% on actual cost from work-in progress.

Others: Wages incurred ₹70,000; overheads incurred ₹2,50,000.

Items not included in cost records: Income from investments ₹10,000: loss on sale of capital assets ₹20,000.

Draw up stores control A/c, work-in-progress control A/c, costing profit and loss A/c, profit and loss A/c, and reconciliation statement.

Solution:

(a) COST LEDGER

Stores Ledger Control A/c

Dr. **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	30,000	By Work-in-progress ledger control A/c	1,60,000
To General ledger adjustment A/c(purchases)	1,60,000	By Production overhead A/c (Repairs and maintenance)	20,000

Particulars	Amount (₹)	Particulars	Amount (₹)
To Work-in-progress ledger control A/c	80,000	By Stores shortage A/c	6,000
		Balance c/d (balancing figure)	84,000
	2,70,000		2,70,000

Work-in-progress Ledger Control A/c

Dr. **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	60,000	By Stores ledger control A/c	80,000
To Production overhead A/c	2,40,000	By Costing profit & loss a/c Cost of sales (balancing figure)	4,00,000
To Stores ledger control A/c	1,60,000		
To Wages control A/c	60,000	By Balance c/d	40,000
	5,20,000		**5,20,000**

Production Overhead Alc

Dr. **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Stores-ledger control A/c	20,000	By Work-in-progress ledger control A/c	2,40,000
To General ledger adjustment A/c (Overhead incurred)	2,50,000	By Balance c/d	30,000
	2,70,000		**2,70,000**

Store Shortage A/c

Dr. **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Stores-ledger control A/c	6,000	By Costing profit & loss A/c	6,000
	6,000		**6,000**

Wages Control A/c

Dr. **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To General ledger adjustment A/c (Wages incurred)	70,000	By Work-in-progress ledger control A/c	60,000
		By Balance c/d (Balancing figure)	10,000
	70,000		**70,000**

Costing Profit & Loss A/c

Dr. **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Work-in-progress ledger control A/c	4,00,000	By General ledger adjustment A/c-Sales (4,00,000+10% of 4,00,000)	4,40,000
To Stores shortage A/c	6,000		
To General ledger Adjustment a/c (profit)	34,000		
	4,40,000		**4,40,000**

(b) FINANCIAL PROFIT & LOSS ACCOUNT

Particulars	Amount (₹)	Particulars	Amount (₹)
To Opening stock: Stores 30,000		By Sales	4,40,000
Work-in-progress 60,000	90,000	By Closing stock: Stores 84,000	
To Purchase	1,60,000	Work-in-progress40,000	1,24,000
To Wages	70,000	By Income from investment	10,000
To Overheads	2,50,000	By Loss	16,000
To Loss on sale of capital asset	20,000		
	5,90,000		**5,90,000**

Reconciliation of profit as per cost accounts and the profit as per financial accounts

Particulars	Amount (₹)
Profit as per cost accounts	34,000
Add : Income from investment not included in cost accounts	10,000
Less:-	
Under absorbed overhead (2,70,000-2,40,000)	30,000
Under absorbed wages (70,000-60,000)	10,000
Loss on sales of capital assets not included cost accounts	20,000
Loss as per financial accounts	16,000

ILLUSTRATION 7:

The financial records of Modern Manufacturers Ltd reveals the following for the year ending 31-3-2025

	₹ in thousand
Sales (20,000 units)	4,000
Materials	1,600
Wages	800
Factory overheads	720
Work-in-progress: Materials 48	
Labour 32	
Overheads (factory) 32	112
Finished goods (1.230 units)	240
Selling and distribution overheads	288
Office and administrative overheads	416
Goodwill written off	320
Interest on capital	32

In the costing records, factory overhead is charged at 100% of wages, administration overhead at 10% of factory cost and selling and distribution overhead at the rate of ₹16 per unit sold.

Prepare a statement reconciling the profit as per cost records with the profit as per fin records of the company.

Solution:

(a) Profit & Loss Account for the Year Ended 31st March 2025

Particulars	Amount (₹)	Particulars	Amount (₹)
To Materials	1,600	By Sales	4,000
To Wages	800	By Closing stock:	
To Factory overheads	720	Finished goods	240
To Office & administration overheads	416	Work-in-progress	112
To Selling and distribution overheads	288		
To Goodwill written off	320		
To Interest on capital	32		
To Net profit	176		
	4,352		**4,352**

Profit as per Cost Account

	₹ in '000
Material	1,600
Wages	800
Prime cost	2,400
Factory overhead (100% of wages)	800
Factory cost (gross)	3,200
Closing W.I.P	112
Factory cost (net)	3,088
Office and administratin overheads (10 % of Factory cost)	308.8
Total cost of production	3,396.8
Closing stock of finished goods	(196.8)
Cost of production of units sold	3,200
Selling and distribution overhead (₹16 × 20,000)	320
Cost of sales	3,520

	₹ in '000
Profit (balancing figure)	480
Sales	4,000

Note: Value of closing stock of finished goods:

Number of units sold - 20,000

Closing stock of finished goods - 1,230

Number of units produced - 21,230

Total cost of production - 3,396.8

Value of closing stock of finished goods $= \frac{3,396.8}{21,230} \times 1,230$

= ₹196.8

Statement Reconciling the Profit as per Cost Accounts and the Profit as per Financial Accounts

	₹ in '000
Profit as per cost accounts	480
Add:	
Over-absorbed overhead: Factory overhead (800-720)	80
Selling and distribution overhead (320-288)	32
Over-valuation of closing stock in financial accounts (240.00-196.80)	43.2
Less:	
Under-absorbed overhead: Office and administration (416.00-308.80)	107.2
Goodwill written off in financial accounts	320
Interest on capital in financial accounts	32
Profit as per financial accounts	176

ILLUSTRATION 8:

A firm of sports equipment commenced business on 1.4.2024 for manufacturing two varieties of bat: senior' and 'sub-junior'. The following information has been extracted from the accounts records for the half-year ended 30.9.2024:

Particulars	Amount (₹)
Average material cost per piece of senior bat	80
Average material cost per piece of sub - junior bat	60
Average cost of labour per piece of senior bat	140
Average cost of labour per piece of sub-junior" bat	110
Finished goods sold	
Senior 300 pieces	
Sub-junior 700 pieces	
Sale price	
per piece of senior bat	500
per piece of sub-junior bat	390
Work expenses incurred during the period	1,20,000
Office expenses	68,000

You are required to

(a) The profit per each brand-piece of bat; charge labour and material at actual average cost, works on-cost at 100% of labour, cost and office cost at 25% of works cost.

(b) Financial profit for the half-year ending 30.9.2024,

(c) Reconciliation between profit as shown by cost accounts and financial accounts

Solution:

Statement of Cost and Profit (as Per Cost Records)

	Senior bat		Sub junior bat		Total
	Per unit	Total	Per unit	Total	
Material cost	80	24,000	60	42,000	66,000
Labour cost	140	42,000	110	77,000	1,19,000
Prime cost	220	66,000	170	1,19,000	1,85,000
Works on-cost (100% of labour cost)	140	42,000	110	77,000	1,19,000
Works cost	360	1,08,000	280	1,96,000	3,04,000

	Senior bat		Sub junior bat		Total
	Per unit	Total	Per unit	Total	
Office cost (25% of works cost)	90	27,000	70	49,000	76,000
Total cost	450	1,35,000	350	2,45,000	3,80,000
Sales	500	1,50,000	390	2,73,000	4,23,000
Profit	50	15,000	40	28,000	43,000

Financial Profit and Loss Account for Half-year Ended on 30.9.2024

Particulars		Amount (₹)	Particulars		Amount (₹)
To Material			By sales		
Senior bat	24,000		Senior bat	1,50,000	
Sub-junior bat	42,000	66,000	Sub-junior bat	2,73,000	4,23,000
To Labour:					
Senior bat	42,000				
Sub-junior bat	77,000	1,19,000			
To Works expenses		1,20,000			
To Office expenses		68,000			
To Profit		50,000			
		4,23,000			4,23,000

Reconciliation

Particulars	Amount (₹)
Profit as per cost records	43,000
Less - works overhead less charged (₹1,20,000 - ₹1,19,000)	1,000
Add - office expenses overhead charged (₹76,000 - ₹68,000)	8,000
Profit as per financial records	50,000

ILLUSTRATION 9:

From the following data write up the various accounts as you envisage in the cost ledger and prepare a Trial Balance as on 31st March, 2025.

Balances as on 1st april, 2024

Particulars	(₹ in '000)
Material control	1,240
Work-in progress	625
Finished goods	1,240
Production overhead	84
Administration overhead	120 (Cr.)
selling and distribution overheads	65
general Ledger Control	3,134

Transactions for the year ended 31st march, 2025

Particulars	Amount (₹)
Materials: Purchases	4,801
Issued to: Jobs	4,774
Maintenance works	412
Administration offices	34
selling department	72
direct wages	1,493
Indirect wages	650
Carriage inward	84
Production overhead: Incurred	2,423
Absorbed	3,591
Administration overheads: Incurred	740
Allocation to production	529
Allocated to sales	148
Sales overheads: Incurred	642
Absorbed	820
Finished goods produced	9,584
Finished goods sold	9,773
sales realisation	12,430

Solution:

Dr. **Material Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Balance b/d	1,240	By, Work-in-Progress Control A/c	5,292
To, general Ledger Adjustment A/c	4,801	By, Balance c/d	749
	6,041		**6,041**
To balance b/d	749		

Dr. **Work-in-Progress Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Balance b/d	625	By Finished Goods Control A/c	9,584
To, Material Control A/c	4,774	By Balance c/d	1,428
To, Wages Control A/c	1,493		
To, Production overhead Control A/c	3,591		
To, Administrative overhead Control A/c	529		
	11,012		**11,012**
To, balance b/d	1,428		

Dr. **Finished goods Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Balance b/d	1,240	By, Cost of Sales	9,773
To, Work-in-progress Control A/c	9,584	By, Balance c/d	1,051
	10,824		**10,824**
To balance b/d	1,051		

Dr. **(Factory) Production Overhead Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Balance b/d	84	By, Work-in-progress Control A/c	3,591
To, Material Control A/c	412	By, Balance c/d	62
To, Wages Control A/c	650		
To, general Ledger Adjustment A/c	84		
To, general Ledger Adjustment A/c	2,423		
	3,653		**3,653**
To Balance b/d	62		

Dr. **Administration Overhead Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Material Control A/c	34	By, Balance c/d	120
To, general Ledger Adjustment A/c	740	By, Work-in-progress Control A/c	529
To, Balance c/d	23	By, Cost of Sales A/c	148
	797		**797**
		By, balance b/d	23

Dr. **Selling and Distribution Overhead Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Balance b/d	65	By, Cost of Sales A/c	820
To, Material Control A/c	72		
To, general Ledger Adjustment A/c	642		
To, Balance c/d	41		
	820		**820**
		By, Balance b/d	41

Dr. **General Ledger Adjustment Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Costing P & LA/c	12,430	By, Balance b/d	3,134
To, Balance c/d	3,226	By, Material Control A/c	4,801
		By, Wages Control A/c	2,143
		By, Production Overhead Control A/c	84
		By, Production Overhead Control A/c	2,423
		By, Administration Overhead Control A/c	740
		By, Selling and Distribution Overhead Control A/c	642
		By, Costing Profit & Loss A/c	1,689
	15,656		**15,656**
		By Balance b/d	3,226

Dr. **Wages Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, general Ledger Adjustment A/c	2,143	By, Work-in-Progress Control A/c	1,493
		By, Production Overhead Control A/c	650
	2,143		**2,143**

Dr. **Cost of Sales Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Administration overhead Control A/c	148	By, Costing Profit & Loss A/c	10,741
To, Selling & Distribution Control A/c	820		
To, Finished goods Control A/c	9,773		
	10,741		**10,741**

Dr. **Costing Profit & Loss Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Cost of sales A/c	10,741	By, General Ledger Adjustment Control A/c (sales)	12,430
To, general Ledger Adjustment Control A/c (profit)	1,689		
	12,430		**12,430**

Trial Balance

Particulars	Debit (₹)	Credit (₹)
Material Control	749	
Work-in-Progress Control	1,428	
Finished goods Control	1,051	
Production overhead Control	62	
Administration overhead Control		23
selling and distribution overhead Control		41
general Ledger Adjustment		3,226
	3,290	3,290

ILLUSTRATION 10:

The following balances are shown in the Cost Ledger of Vinak Ltd. as on 1st October, 2011:

Particulars	Debit (₹)	Credit (₹)
Work in progress Account	7,056	
Factory overheads suspense Account	360	
Finished stock Account	5,274	
stores Ledger Control Account	9,450	
Administration overheads suspense A/C	180	
general Ledger Adjustment Account		22,320

Transactions for the year ended 30th september, 2012

Particulars	Amount (₹)
stores issued to production	45,370
stores purchased	52,400
Material purchased for direct issued to production	1,135
Wages paid (including indirect labour ₹ 2,520)	57,600
Finished goods sold	1,18,800
Administration expenses	5,400
selling expenses	6,000
Factory overheads	15,600
Store issued for Capital work-in-Progress	1,500
Finished goods transferred to warehouse	1,08,000
store issued for factory repairs	2,000
Factory overheads recovered to production	16,830
Administration overheads charged to production	4,580
Factory overheads applicable unfinished work	3,080
selling overheads allocated to sales	5,500
Stores lost due to fire in store (not insured)	150
Administration expenses on unfinished work	850
Finished goods stock on 30.9.1989	14,274

You are required to record the entries in the cost ledger for the year ended 30th september, 2012 and prepare a Trial Balance as on that date.

Solution:

Dr. **Work-in-Progress Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Balance b/d	7,056	By, Finished Goods Control A/c	1,08,000
To, Material Control A/c	45,370	By, Balance c/d	

Particulars	Amount (₹)	Particulars		Amount (₹)
To, general Ledger Adjustment A/c	1,135	Factory overhead	3,080	
To, Wages control A/c	55,080	Admn. O.H.	850	
To, Factory overhead control A/c	16,830	Material & Wages	22,051	25,981
To, Administrative overhead Control A/c	4,580			
To, Factory overhead Control A/c	3080			
To, Administrative overhead Control A/c	850			
	1,33,981			**1,33,981**
To Balance b/d	25,981			

Dr. **Factory Overhead Suspense Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Balance b/d	360	By, Work-in-Progress Control A/c	3,080
To, Wages Control A/c	2,520	By, Work-in-Progress Control A/c	16,830
To, general Ledger Adjustment A/c	15,600	By, Balance c/d	570
To, Material Control A/c	2,000		
	20,480		**20,480**
To, Balance b/d	570		

Dr. **Finished Goods Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Balance b/d	5,274	By, Cost of Sales A/c	99,000
To, Work-in-progress Control A/c	1,08,000	By, Balance c/d	14,274
	1,13,274		**1,13,274**
To, Balance b/d	14,274		

Dr. **Material Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Balance b/d	9,450	By, Work-in-Progress Control A/c	45,370
To, general Ledger Adjustment A/c	52,400	By, Capital Work-in-Progress Control A/c	1,500
		By, Factory Overhead Suspense A/c	2,000
		By, Costing Profit & Loss A/c	150
		By, Balance c/d	12,830
	61,850		**61,850**
To, Balance b/d	12,830		

Dr. **Administrative Overhead Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Balance c/d	180	By, Work-in-Progress Control A/c	4,580
To, general Ledger Adjustment A/c	5,400	By, Work-in-Progress Control A/c	850
		By, Balance c/d	150
	5,580		**5,580**
To, balance b/d	150		

General Ledger Adjustment (GLA) Account

Dr. **(or) Cost Ledger Control (CLC) Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Costing Profit & Loss A/c	1,18,800	By, Balance b/d	22,320
To, Balance c/d	55,805	By, Material Control A/c	52,400
		By, Work-in-Progress Control A/c	1,135
		By, Wages Control A/c	57,600

Particulars	Amount (₹)	Particulars	Amount (₹)
		By, Administrative Overhead Control A/c	5,400
		By, Factory Overhead Control A/c	15,600
		By, Selling and Distribution Overhead Control A/c	6,000
		By, Costing Profit & Loss A/c	14,150
	1,74,605		**1,74,605**
		By Balance b/d	55,805

Dr. **Wages Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, general Ledger Adjustment A/c	57,600	By, Work-in-Progress Control A/c	55,080
		By, Factory Overhead Control A/c	2,520
	57,600		**57,600**

Dr. **Costing Profit & Loss Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Material Control A/c	150	By, General Ledger Adjustment Control A/c (sales)	1,18,800
To, Cost of sales	1,04,500		
To, general Ledger Adjustment Control A/c (profit)	14,150		
	1,18,800		1,18,800

Dr. **Selling and Distribution Overhead Control Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, general Ledger Adjustment A/c	6,000	By, Cost of Sales A/c	5,500

Particulars	Amount (₹)	Particulars	Amount (₹)
		By, Balance c/d	500
	6,000		**6,000**
To Balance b/d	500		

Dr. **Capital Work-in-progress Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Material Control A/c	1,500	By, Balance c/d	1,500
	1,500		1,500
To, balance b/d	1,500		

Dr. **Cost of Sales Account** **Cr.**

Particulars	Amount (₹)	Particulars	Amount (₹)
To, Selling & Distribution Control A/c	5,500	By, Costing Profit & Loss A/c	1,04,500
To, Finished goods Control A/c	99,000		
	1,04,500		**1,04,500**

Trial Balance

Particulars	Debit (₹)	Credit (₹)
Work-in-Progress Control	25,981	
Factory overhead suspense	570	
Finished goods Control	14,274	
Material Control	12,830	
Administrative overhead Control	150	
General Ledger Adjustment		55,805
Selling and distribution overhead Control	500	
Capital Work-in-Progress	1,500	

ILLUSTRATION 1:

A company specializing in manufacturing toys,has two production departments, A and B. It uses a job-costing system to allocate costs directly to specific jobs whenever feasible and practical. Overheads are assigned to jobs based on an actual rate per direct labor hour, calculated separately for each department at the end of each month.

The following details pertain to Job No. 1005, completed on April 2024:

Material Usage:

Department A used 400 kg of material Y.

Department B used 300 kg of material Z, with 30 kg returned to stores as surplus.

Labor Hours:

Department A recorded 76 direct labor hours, including 6 overtime hours.

Department B recorded 110 direct labor hours, with 30 of these being overtime.

The basic wage rate in Department A was ₹22.50 per hour, and in Department B, it was ₹20.00 per hour. Overtime pay was 50% higher than the basic wage rate. The overtime in Department B was for expedited completion of another customer-requested job.

Defect Rectification:

An additional 3 labor hours were worked in Department A to rectify defects, which are considered routine department activities.

Material Loss:

5 kg of material Z was damaged in Department B and disposed of. Such losses are not typically anticipated.

The total costs incurred in April 2024 across all jobs in both departments are as follows.

	Department - A	Department - B
Direct material issued from stores	32,500	68,650
Direct material returned to stores	675	1,375
Direct labour at basic wage rate	45,450	56,000
Indirect labour at basic wage rate	12,100	14,800
Overtime premium	2,250	600
Consumable	2,500	4,500
Maintenance	3,800	6,500
Others	5,000	12,000

Direct material issued from stores includes the scrapped material Z in department B, and was the only material scrapped in the month.

Direct labour in department A, includes a total of 20 hours spent on rectification work. Materials are priced on a monthly weighted average basis.

Relevant stock movements during April 2024 were as follows:

	Material Y	Material Z
Opening stock	1,050 kg (Value ₹2,648.75)	6,970 kg (Value ₹49,732.50)
Purchase	600 kg at ₹2.50 per kg	16,000 kg at ₹7.30 per kg
	500 kg at ₹2.50 per kg	
	400 kg at ₹2.60 per kg	
Issue from stores	1,430 kg	8,100 kg
Returns to stores		30 kg

Prepare a cost statement for Job No. 1005, along with detailed working notes of how each cost component has been treated.

Solution:

Statement of cost for Job No. 1005

	Amount (in ₹)
Direct materials	
Material-Y: 400 kg at ₹2.525	1,010
Material Z: 265 kg at ₹7.250	1,921.25

	Amount (in ₹)
Labour:	
Department-A: 76 hours at ₹22.50 per hour	1,710
Department-B 110 hours at ₹20.00 per hour	2,200
Overhead	
Department-A: 76 hours at ₹13.05 per hour	991.8
Department-B: 110 hours at ₹13.5 per hour	1,485
Total	**9,318.05**

Working notes:

1. Material costs

(a) Weighted average cost of Y

$$Y = \frac{₹\ 2,648.75 + (2.50 \times 600) + (2.50 \times 500) + (2.60 \times 400)}{1,500 + 600 + 500 + 400}$$

= ₹2.525 per kg

(b) Weighted average cost of Z

$$Z = \frac{49,732.50 + (7.39 \times 16,000)}{6,970 + 16,000}$$

= ₹7.250 per kg

(c) Consumption of material Y: The 400 kg are directly attributable to job no. 1005

(d) Consumption of material Z:

Material issued from stores	300 kg
Material returned to stores	(30kg)
Material damaged in Department B	(5 kg)
Consumption directly attributable to the job 1505	265 kg

The treatment of material wastage depends on the specific circumstances that caused it:

(a) If the damage is directly attributable to the job, the cost should be charged to that job. In this case, there is no indication that the damage is directly related to the job.

(b) If the wastage is normal for the cost center and not job-specific, it should be included

in overheads. However, the question specifies that the wastage is abnormal, so it should not be treated as overhead.

(c) Abnormal wastage should be charged to the profit and loss account. Therefore, the value of the 5 kg of material Z should be directly recorded in the costing profit and loss account.

2. Direct labour cost:

It is assumed that the basic wage rates of ₹22.50 per hour for Department A and ₹20.00 per hour for Department B are the standard rates for these departments.

The direct labor costs are treated as follows:

(a) Department A:-

Direct Labor Hours:

A total of 76 hours are directly attributable to Job No. 1005.

Wages: 76 hours × ₹22.50 = ₹1,710.00

Overtime Premium:

The overtime premium for 6 hours should be included in overheads. Since the question does not indicate that the overtime was specifically related to Job No. 1005, it is assumed to be part of general departmental overtime.

Rectification Work:

The question specifies that rectification work is a routine activity in the department and is not specific to Job No. 1005. Therefore, the wages for the 3 hours spent on rectification should be included in overheads. If it had been job-specific, the wages for these 3 hours would have been charged directly to the job.

(b) Department B

Direct Labor Hours:

A total of 110 hours were worked on Job No. 1005.

Wages: 110 hours × ₹20.00 = ₹2,200.00

Overtime Premium:

The question indicates that the overtime in Department B was incurred to expedite the completion of another job at a customer's request. Therefore, no portion of the overtime premium should be charged to Job No. 1005. Additionally, it should not be treated as overhead since doing so would lead to the premium being absorbed across all jobs processed during the period.

3. Overheads.

Overhead rates for department-A and department-B are calculated as follows:

	Department A	Department B
Wages for rectification works: 20 hours × ₹22.50	450	
Indirect labour	12,100	14,800
Overtime premium	2,250	
Consumables	2,500	4,500
Maintenance	3,800	6,500
Others	5,000	12,000
Total for the month	26,100	37,800

Calculation of normal hours worked:

Department-A: Hours worked $= \frac{\text{Wages at Basic Rate}}{\text{Basic Rate per hour}}$

= (₹45,450/ ₹22.50) - 20 (rectification hrs)

= 2,000 hours.

Department-B: Hours worked = ₹56,000/ ₹20.00

= 2,800 hrs

Recovery rate:

Department-A:- ₹26,100/2,000 = ₹13.05 per direct labour hour

Department-B:- ₹37,800/2,800 = ₹13.5 per direct labour hour

Note:- Only overtime premium (the difference between the normal basic rate and overtime rate) and not total wages for overtime hours need special consideration.

ILLUSTRATION 2:

The following information for the year ended 31st December 2024, is obtained from the books and records of ABC Ltd.:

	Completed jobs (₹)	Work-in-progress (₹)
Raw materials supplied from stores	1,40,000	30,000
Wages	1,40,000	50,000

	Completed jobs (₹)	Work-in-progress (₹)
Chargeable expenses	30,000	12,000
Materials transferred to work-in-progress	5,000	5,000
Materials returned to stores	2,000	

Factory overhead cost is 40% of prime cost and office overhead cost is 25% of factory cost

The price of the executed contracts during 2024 was ₹6,00,000.

Prepare

(i) Consolidated Completed Jobs Account showing the profit made orloss incurred,

(ii) Consolidated Work-in-progress Account.

Solution:

Consolidated Completed Jobs Account

	(₹)	(₹)	(₹)		(₹)
To Materials	1,40,000			By sales	6,00,000
Less: Transfer	(5,000)				
Less: Return	(2,000)	1,33,000			
To Wages		1,40,000			
To Chargeable expenses		30,000			
Prime Cost			3,03,000		
To Factory overhead (40% of Prime Cost)		1,21,200			
Works Cost			4,24,200		
To Office overheads (25% of works cost)			1,06,050		
To Net Profit			69,750		
			6,00,000		**6,00,000**

Consolidated Work-in-progress Account

	Amount (₹)		Amount (₹)
To Materials	30,000	By balance c/d	1,52,250

	Amount (₹)		Amount (₹)
Less: Transfer	(5,000)		
To Wages	50,000		
To Chargeable expenses	12,000		
Prime Cost	87,000		
To Factory overhead (40% of Prime Cost)	34,800		
Works Cost	1,21,800		
To Office overheads (25% of works cost)	30,450		
	1,52,250		**1,52,250**
To balance b/d	1,52,250		

ILLUSTRATION 3:

A factory has committed to supplying 200 pieces of a component each month for the next six months. A new batch order is initiated each month, and the monthly rent is charged based on actual usage. Overheads are applied at a specific rate per labourhour. The agreed selling price is ₹7 per unit. Based on the given data, calculate the cost and profit for an individual batch as well as for the entire order of 1,200 pieces.

Month	Batch output	Material cost (₹)	Direct wages (₹)	Direct labour hours
January	200	500	150	280
February	150	420	130	240
March	170	480	140	260
April	220	550	180	300
May	190	490	160	270
June	270	580	220	320

Additional information:

Month	Chargeable expenses (₹)	Direct labour hours
January	12,500	5,000
February	10,800	4,500

Month	Chargeable expenses (₹)	Direct labour hours
March	11,000	4,400
April	13,000	5,000
May	11,500	4,600
June	13,800	4,600

Solution:

Cost Sheet for Six Months Ending 30th June 2024

Particulars	January	February	March	April	May	June	Total
Material cost (₹)	500	420	480	550	490	580	**3,020**
Direct wages (₹)	150	130	140	180	160	220	**980**
Chargeable expenses (₹)	700	576	650	780	675	960	**4,341**
Aggregate cost	1,350	1,126	1,270	1,510	1,325	1,760	**8,341**
Batch output (units)	200	150	170	220	190	270	**1,200**
Cost per piece (₹)	6.75	7.5	7.47	6.86	6.97	6.52	**6.96**
Selling price per piece (₹)	7	7	7	7	7	7	**7**
Profit/ loss per piece (₹)	0.25	(0.5)	(0.47)	0.14	0.03	0.48	**0.04**

Overall Position of the Order for 1200 Pieces

	Per piece (₹)	**Total** (₹)
Sales value	7	8,400
Cost	6.96	8,352
Profit	0.04	48

Working note:

Month	Chargeable expenses (₹)	Direct labour hours	Rate per hour (₹)	Labour hour for the component	Chargeable expenses for the component (₹)
January	12,500	5,000	2.5	280	700
February	10,800	4,500	2.4	240	576

Month	Chargeable expenses (₹)	Direct labour hours	Rate per hour (₹)	Labour hour for the component	Chargeable expenses for the component (₹)
March	11,000	4,400	2.5	260	650
April	13,000	5,000	2.6	300	780
May	11,500	4,600	2.5	270	675
June	13,800	4,600	3	320	960

ILLUSTRATION 4:

Aashi Pvt. Ltd. assembles electronic units for a customer who requires an equal number of various unit types, amounting to 45,000 units annually. The customer stipulates that batch sizes for any type must be at least 1,000 units and should be in multiples of 500 units. The customer is willing to accept the entire production of a unit type as soon as a batch is completed and does not require specific timing for the delivery of different unit types within the year.

The assembly machinery requires a setup before producing each type of electronic unit, with a setup cost of ₹50 per batch. Holding costs are fixed and unavoidable, except for an interest charge of 20% per annum applied to capital tied up in inventory. The variable cost per unit, regardless of type, is ₹20.

Required:

(a) Calculate Total Annual Costs: - Determine the total annual cost for batch sizes of 500, 1,000, 1,500, and 2,000 units. Identify the batch size that minimizes the total cost.

(b) Economic Batch Size Calculation: - Using the economic batch size formula, calculate the optimal batch size to minimize costs if batch sizes are not restricted to multiples of 500 units.

Solution:

(a)

Production batch size Units	Setup cost per annum (₹)	Holding cost per annum (₹)	Total costs per annum (₹)
500	4,500	1,000	5,500
1,000	2,250	2,000	4,250
1,500	1,500	3,000	4,500
2,000	1,125	4,000	5,125

Calculation for a production batch of 1,000 units: -

Number of setups per annum = 45,000/1,000 = 45

Annual setup costs = 45 × ₹50 = ₹2,250

Holding cost per unit = 20% of ₹20= ₹4

Average quantity in stock per annum = 1,000/2 = 500 units.

Assuming a constant rate of production, Holding cost = 500 units × ₹4 = ₹2,000

From the above table, the minimum batch size where total cost is minimum is 1,000 units and the total cost is ₹4,250

(b) Calculation of economic batch size: -

$$E = \sqrt{\frac{2 \times A \times S}{C}}$$

$$= \sqrt{\frac{2 \times 40,000 \times 50}{20\% \times 20}}$$

= 1,000

ILLUSTRATION 5:

A contractor has undertaken a long-term contract at an agreed price of ₹1,70,000, subject to an escalation clause for materials and wages as specified in the contract. The corresponding actual costs are as follows:

Particulars	Standard	Actual
Materials:		
A	5,000 kg @ ₹5	5,050 kg @ ₹4.8
B	3,500 kg @ ₹8	3,450 kg @ ₹7.9
C	2,500 kg @ ₹6	2,600 kg @ ₹6.6
Wages: -		
X	2,000 hr. @ ₹7	2,100 hr. @ ₹7.2
Y	2,500 hr. @ ₹7.5	2,450 hr.@ ₹7.5
Z	3,000 hr. @ ₹6.5	3,100 hr. @ ₹6.6

Reckoning the full actual consumption of materials and wages, the company has claimed a final price of ₹1,72,360. Give your analysis of the admissible escalation claim and indicatethe final price payable.

Solution:

(a) Increase (Decrease) in Materials Cost due to Variation in Prices

Materials	Standard price (₹)	Actual price (₹)	Difference (₹)	Standard quantity	Increase/ decrease (₹)
A	5.00	4.80	0.20 (F)	5,000 kgs	(1.000)
B	8.00	7.90	0.10 (F)	3,500 kgs	(350)
C	6.00	6.60	0.60 (A)	2,500 Itrs	1,500
					150

(b) Increase/(Decrease) in Wages due to Variations in Rates

Workers	Std. rate (₹)	Actual rate (₹)	Difference (₹)	Std. hours	Increase/ Decrease (₹)
X	7.00	7.20	0.20 (A)	2,000	400
Y	7.50	7.50	Nil	2,500	Nil
Z	6.50	6.60	0.10 (A)	3,000	300
					700

(c) Final Price Payable:

Agreed price		₹1,70,000
Agreed escalation:		
Material cost	₹150	
Wages	₹700	₹800
Final Price Payable		₹1,70,800

The claim of ₹1,72,360 is based on the total increase in cost. This can be verified in shown below:

(a) Material Cost

Materials	Standard cost (₹)	Actual cost (₹)	Increase/decrease (₹)
A	5,000 × ₹5 = 25,000	5,050 × ₹4.8 = 24,240	(760)
B	3,500 × ₹8 = 28,000	3,450 × ₹7.9 = 27,255	(745)
C	2,500 × ₹6 = 15,000	2,600 × ₹6.6 = 17,160	2,160
	68,000	**68,655**	**655**

(b) Wages: -

Materials	Standard cost (₹)	Actual cost (₹)	Increase/decrease (₹)
X	2,000 × ₹7 = 14,000	2,100 × ₹7.2 = 15,120	1,120
Y	2,500 × ₹7.5 = 18,750	2,450 × ₹7.5 = 18,375	(375)
Z	3,000 × ₹6.5 = 19,500	3,100 × ₹6.6 = 20,460	960
	52,250	**53,955**	**1,705**

(c) Total increase: -

Material cost = 655

Wages = 1,705

Total = 2,360

(d) Reconciliation of claims already preferred:

Agreed price = 1,70,000

Increase in cost = 2,360

= ₹ 1,72,360

This claim is not admissible because the escalation clause covers only that part of the increase in cost which has been caused by inflation.

ILLUSTRATION 6:

Vansh Ltd. Is engaged in two contracts M and N during the year. The following particulars are provided for the year end 2024.

Date of commencement	Contract M April 1 (₹)	Contract N September 1 (₹)
Contract price	6,00,000	5,00,000
Materials delivered direct to site	1,20,000	50,000
Materials returned to store	40,000	10,000
Materials on site December 31	22,000	8,000
Direct labour payments	1,40,000	35,000
Direct expenses	50,000	20,000
Architect's fees	5,000	4,000

Date of commencement	Contract M April 1 (₹)	Contract N September 1 (₹)
Establishment charges	32,000	14,000
Plant installed at cost	80,000	70,000
Value of plant December 31	65,000	64,000
Accrued wages December 31	10,000	5,000
Accrued expenses December 31	6,000	7,000
Cost of contract not yet certified	23,000	10,000
Value of contract certified by architect	4,20,000	1,35,000
Cash received from contractor	3,78,000	1,25,000

During the period, materials amounting to ₹9,000 have been transferred from contract A to contract B.

You are required to prepare -

(a) Contract accounts, contractee's account; and

(b) Extract from the balance sheet as at December 31 also show the calculation of WIP.

Solution:

Contract M a/c

Particulars	Amount (₹)	Particulars	Amount (₹)
Materials, direct	1,20,000	Materials returned to stores	4,000
Materials, exstore	40,000	Materials transferred to contract N	9,000
Wages paid	1,40,000	Stock of materials c/d	22,000
Direct expenses	50,000	Cost of contract c/d	3,83,000
Plant depreciation	15,000		
Architect's fees	5,000		
Establishment charges	32,000		
Wages accrued c/d	11,000		
Direct expenses accrued c/d	5,000		
	4,18,000		4,18,000

Particulars	Amount (₹)	Particulars	Amount (₹)
Cost of contract b/d	3,83,000	Value of contract certified	4,20,000
Profit and loss a/c - profit taken	36,000		
Profit in suspense account c/d	24,000	Cost of contract not yet certified c/d	23,000
	4,43,000		4,43,000
Stock of materials b/d	22,000	Wages accrued b/d	11,000
Cost of contract not yet certified b/d	23,000	Direct expenses accrued b/d	5,000
		Profit in suspense account b/d	24,000

Contractee a/c (M)

Value of work	4,20,000	Cash	3,78,000
		Balance c/d	42,000
	4,20,000		4,20,000

Contract N a/c

Particulars	Amount (₹)	Particulars	Amount (₹)
Materials, direct	50,000	Materials returned to stores	2,000
Materials, exstore	10,000	Stock of materials c/d	8,000
Materials from contract M	9,000	Cost of contract c/d	1,50,000
Wages paid	35,000		
Direct expenses	20,000		
Plant depreciation	6,000		
Architect's fees	4,000		
Establishment charges	14,000		
Wages accrued c/d	5,000		
Direct expenses accrued c/d	7,000		
	1,60,000		1,60,000

Particulars	Amount (₹)	Particulars	Amount (₹)
Cost of contract b/d	1,50,000	Value of contract certified	1,35,000
		Cost of contract not yet certified c/d	10,000
		Profit and loss a/c -loss taken	5,000
	1,50,000		**1,50,000**
Stock of materials b/d	8,000	Wages accrued b/d	5,000
Cost of contract not yet certified b/d	10,000	Direct expenses accrued b/d	7,000

Contractee a/c (N)

Value of work	1,35,000	Cash	1,25,000
		Balance c/d	10,000
	1,35,000		1,35,000

Extract of Balance Sheet as at December 31, 2024

Liabilities	(₹)	(₹)	Assets	(₹)	(₹)
Profit and loss			Fixed assets:-		
Profit of M	36,000		Plant at cost	1,50,000	
Loss of N	5,000	31,000	Less:- depreciation	21,000	1,29,000
Sundry Creditors:-			Current assets:-		
Accrued Wages	15,000		Stock of materials	30,000	
Accrued Direct expenses	13,000	28,000	Work in progress	61,000	91,000

Calculation of Work in progress:

	(₹)	(₹)
Contract M:-		
Cost of contract to date	3,83,000	
Add: Profit taken	36,000	
Less: Cash received	3,78,000	41,000

Contract N:-		
Cost of contract to date	1,50,000	
Less:- loss incurred	5,000	
Less: Cash received	1,25,000	20,000
Total work in progress		61,000

Note: -

Calculation of profit of contract M $= 2/3 \times \text{notional profit} \times \frac{\text{Cash received}}{\text{Work received}}$

$= 2/3 \times 60,000 \times \frac{3,78,000}{4,20,000}$

$= 36,000$

ILLUSTRATION 7:

Using the same figures as provided for Contract M in Illustration 6, prepare the contract accounts to reflect the position as on December 31, 2024. Ensure an adequate provision is retained to account for potential losses before the final acceptance of the contract.

Solution:

Contract M a/c

Particulars	Amount (₹)	Particulars	Amount (₹)
Materials, direct	1,20,000	Materials returned to stores	4,000
Materials, exstore	40,000	Materials transferred to contract N	9,000
Wages paid	1,40,000	Stock of materials c/d	22,000
Direct expenses	50,000	Cost of contract not certified c/d	23,000
Plant depreciation	15,000	Cost of contract certified up to date c/d	3,60,000
Architect's fees	5,000		
Establishment charges	32,000		
Wages accrued c/d	11,000		
Direct expenses accrued c/d	5,000		

Particulars	Amount (₹)	Particulars	Amount (₹)
	4,18,000		4,18,000
Cost of contractcerified b/d	3,60,000	Direct expenses accrued b/d	5,000
Stock of materials b/d	22,000	Wages accrued b/d	11,000
Cost of contract not yet certified b/d	23,000		

Contract M certificate a/c

Balance c/d	4,20,000	Certified up to date	4,20,000
	4,20,000		4,20,000

Contract M retention a/c

certificate a/c	42,000	Certified up to date	42,000
	42,000		42,000

Contractee a/c M

certificate a/c	3,78,000	Certified up to date	3,78,000
	3,78,000		3,78,000

Contract M profit provision a/c

Transfer to profit and loss a/c	36,000	Certified up to date	36,000
	36,000		36,000
Balance c/d	36,000		

ILLUSTRATION 8:

The yield of a certain process is distributed as follows: 70% for the main product, 20% for the by-product, and the remaining is normal losses. 5,000 units of material are processed at a cost of ₹20 per unit, with additional charges amounting to ₹15,000. Of these charges, 30% is attributed to power, which is allocated between the main product and the by-product in a 1:5 ratio. Prepare a statement to determine the cost of the by-product.

Solution:

Statement of Cost of By-product

Particulars	(₹)
Material cost (1,35,000 × 1,000/4,500)	30,000

Particulars	(₹)
Power (30% of 15,000) × 5/6	3,750
Other charges (70% of 15,000) × 1,000/4,500	2,333
Total cost of the by-product	36,083

Working note:

1. Cost of material = 5,000 units × ₹27 = 1,35,000
2. Yield of main product = 70% of 5,000 units = 3,500 units

   Yield of By-product = 20% of 5,000 units = 1,000 units

   Normal loss = 10% of 5,000 units = 500 units

   Output = 4,500 units

ILLUSTRATION 9:

Three joint products are obtained by processing chemicals through two sequential stages. The output from Process 1 is transferred to Process 2, where the three joint products are produced and sold immediately. The data for the processes for the month of December 2024 is as follows:

Amt. in ₹

	Process 1	Process 2
Direct materials (2,000 kilograms at ₹6 per kilogram)	12,000	
Direct labour	5,500	6,500
Overheads	7,000	5,400
Normal loss	10% of input	nil
Scrap value of loss	3	nil
Output	1,900	Joint products P, Q, and R in the ratio of 3:3:4

There were no opening or closing stocks in either process and the selling price of the output from process 2 were:

Joint product A = ₹25 per kg

Joint product B = ₹20 per kg

Joint product C = ₹12 per kg

Prepare an account for process 1and any loss or gain accounts necessary to record the month's activities. Also Calculate the profit for each joint product by allocating the total costs from process 2 based on: the weight of output and the market value of production.

Solution:

Process 1 Account

Particulars	kgs	Rate per kg (₹)	Amount (₹)	Particulars	Kgs	Rate per kg (₹)	Amount (₹)
To Direct material	2,000	6	12,000	By normal loss (10% of 2,000)	200	1	200
To Overhead			7,000	By process 2	1,900	13.5	25,650
To Direct labour			5,500				
To Abnormal gain	100	13.5	1,350				
			25,850				25,850

$$\text{Normal cost per unit} = \frac{\text{Total Cost} - \text{Scrap Sales}}{\text{Normal Output}}$$

$$= \frac{12,000 + 7,000 + 5,500 - 200}{2,000 - 200 \text{ kgs}}$$

$$= 13.5$$

Abnormal gain Account

Particulars	kgs	Rate per kg (₹)	Amount (₹)	Particulars	Kgs	Rate per kg (₹)	Amount (₹)
To normal loss	100	1	100	By process 1 a/c	100	13.5	1,350
To costing p&l a/c			1,250				
			1,350				1,350

Normal loss Account

Particulars	kgs	Rate per kg (₹)	Amount (₹)	Particulars	Kgs	Rate per kg (₹)	Amount (₹)
To process 1 a/c	200	1	200	By sales	100	1	100
				By abnormal gain a/c	100	1	100
			200				200

Statement of profit

Apportionment of joint cost based on the weight of output and market value:

Joint products	Output Kgs	Sales price	Sales value (₹)	Joint cost apportionment based on the weight of output (₹)	Profit/ loss	Joint cost apportionment based on the market value of production	Profit/ loss
A	570	25	14,250	11,250	3,000	13,855	395
B	570	20	11,400	11,250	150	11,084	316
C	760	17	12,920	15,000	(2,080)	12,561	359
	1,900		38,570	37,500	1,070	37,500	1,070

Working note:

Calculation of joint cost:

Transfer of material from process 1 = 25,650

Direct labour = 6,500

Overheads = 5,400

Total = 37,500

ILLUSTRATION 10:

Sanjiv Ltd. is evaluating three alternative proposals for providing conveyance facilities to its sales personnel, who need to travel 50,000 kilometers annually. The options are as follows:

i. Purchase and maintain a fleet of cars: The average cost of the car is ₹4,00,000.

ii. Reimburse personal car usage: Allow the executives to use their car, reimbursing expenses at ₹3.5 per kilometer and covering insurance costs.

iii. Hire cars from an agency: Rent cars at ₹90,000 per year, with the company covering the costs of petrol and taxes.

Additional details are provided below:

Petrol =₹1 per km

Repairs and maintenance =₹0.50 per km

Tyres = ₹0.15 per km

Insurance = ₹2,000 per annum

Taxes = ₹1,500 per annum

Life of the car = 5 years with an annual mileage of 50,000 kms

Resale value is ₹50,000 at the end of the fifth year

Calculate the cost of the three proposals and rank them.

Solution:

Particulars	Use of co. car (₹)	Use of sales person car (₹)	Use of hired car (₹)
Variable costs:			
Petrol	50,000	-	50,000
Repairs and maintenance	25,000	-	-
Tyres	7,500	-	-
Fixed cost:			
Insurance	2,000	2,000	2,000
Taxes	1,500	-	1,500
Depreciation	90,000	-	-
Reimbursement/ hire charges	-	1,75,000	90,000
Total cost	1,76,000	1,77,000	1,43,500
Rank	2nd	3rd	1st

Sanjiv Ltd. Should hire a car for the sales personnel.

ILLUSTRATION 1:

Pretty Doll Ltd. manufactures various products, all with a consistent P/V ratio of 15%. The current monthly sales stand at ₹80,000, while the annual fixed costs amount to ₹94,000. The following additional details are derived from the budgeted forecasts for the upcoming year:

Volume of sales = no change

Increase in variable cost = 5%

Estimated fixed cost = ₹1,00,000 p.a.

Determining the following:

(a) The current annual profit

(b) The percentage increase in selling prices needed in the upcoming budget year to sustain the current profit level, Assuming no increase in sales volume.

Solution:

The current annual profit:

	Amount (₹)
Sales for the current year ₹80,000 × 12	9,60,000
Variable cost (85% of sales)	(8,16,000)
Contribution	1,44,000
Fixed cost	(94,000)
Present yearly profit	50,000

Percentage increase required in selling price:

	Amount (₹)
Budgeted fixed cost	1,00,000

	Amount (₹)
Required profit	50,000
Required contribution	1,50,000
Variable cost (8,16,000 +5%)	8,56,800
Required revenue	10,06,800

$$\text{Increase in price} = \frac{10,06,800 - 9,60,000}{9,60,000}$$

$$= 4.87\%$$

Note:

There is no increase in sales volume. Therefore, budgeted variable cost is estimated by increasing current variable costs by 5%.

ILLUSTRATION 2:

A manufacturing company concentrates its resources upon one single produce, which it sells to wholesale merchants at ₹6 per unit.

Output (Units)	70,000	80,000	1,00,000 (Maximum limit output)
Variable production overhead (₹)	45,000	50,000	58,000
Variable selling and administration overhead (₹)	12,000	15,000	20,000

The material cost is ₹2 per unit, with quantity rebates of 10% and 15% applicable for purchase contracts of equals to or above 80,000 and 1,00,000 units respectively. The average wage cost is ₹1 per unit. Fixed overheads amount to ₹65,000 for production and ₹35,000 for selling and administration.

To sell the entire output, selling price reductions of 5% and 10% are being considered for production levels of upto 80,000 and 1,00,000 units, respectively on total. Additionally, an overseas offer to purchase 10,000 units at ₹6 per unit has been received.

Required:

(a) Create a table showing the marginal cost and increase in sales value for three output levels, and identify the most profitable option.

(b) Prepare a statement analyzing the impact on net income if the overseas offer is accepted, assuming that other prices remain unchanged and 1,00,000 output level is adopted.

Solution:

Marginal Cost Statement **Amount in ₹**

Particulars	70,000 units	80,000 units	1,00,000 units
Sale value	4,20,000	4,56,000	5,40,000
Materials	(1,40,000)	(1,44,000)	(1,70,000)
Wages	(7 0,000)	(80,000)	(1,00,000)
Variable production overhead	(45,000)	(50,000)	(58,000)
Variable selling & administrationoverheads	(12,000)	(15,000)	(20,000)
Contribution margin	1,53,000	1,67,000	1,92,000
P/V Ratio	36.43%	36.62%	35.56%
Fixed overhead:			
Production	(65,000)	(65,000)	(65,000)
Selling and administration	(35,000)	(35,000)	(35,000)
Profit	53,000	67,000	92,000

P/V Ratio is maximum at 70,000 units.

1. Profit is maximum at 1,00,000 units. So it would be better for the company to produce and sale at this level.

Statement Showing Effect on Net Income on Acceptance of Export Order

Particulars	Normal production at 1,00,000 units	Export order (10,000 units)	Total
Sale value	6,00,000	60,000	6,60,000
Materials	(1,70,000)	(17,000)	(1,87,000)
Wages	(1,00,000)	(10,000)	(1,10,000)
Variable production overhead	(58,000)	(5,800)	(63,800)
Variable selling & administration overheads	(20,000)	(2,000)	(22,000)
Contribution margin	2,52,000	25,200	2,77,200

Particulars	Normal production at 1,00,000 units	Export order (10,000 units)	Total
Fixed overhead:			
Production			(65,000)
Selling and administration			(35,000)
Profit			1,77,200

The total profit obtained is ₹1,77,200.

ILLUSTRATION 3:

Smart University offers a special month-long summer course on "Artificial intelligence." This program is open to graduates, and participants are selected through an entrance test. The test spans four days, featuring four objective examinations, one per day. Candidates are required to pay a fee of ₹100 to participate in the test. Based on the test results, a final selection of 100 candidates is made. Data from the past two years related to this entrance test process is available for analysis.

Smart University

Statement of Net Revenue from the Entrance Test

	2023	2024
Gross revenue (Fees collected)	2,00,000	3,00,000
Costs:		
Valuation	60,000	90,000
Question booklets	40,000	60,000
Hall rent @ ₹3,000 per day	12,000	12,000
Honorarium to Chief Administrator	6,000	6,000
Supervision charges (One supervisor for every 100 candidates @ ₹50 per day)	4,000	6,000
General Administration expenses	10,000	11,000
Total cost	1,32,000	1,85,000
Net revenue	68,000	1,15,000

General administrative expenses and hall rent are expected to increase by 10% in the coming year.

Calculate:

(a) The budgeted net revenue, if 5,000 candidates take the entrance test in 2025.

(b) The break-even number of the candidates.

(c) The number of candidates to be enrolled if the net income desired is ₹3,00,000.

Solution:

Statement showing budgeted net revenue for the entrance test in 2025

	Amount (in ₹)	Amount (in ₹)
Gross revenue (5,000 candidates @ ₹100)		5,00,000
Variable costs:		
Valuation @ ₹30	1,50,000	
Question booklets @ ₹20	1,00,000	
Supervision charges @ ₹2	10,000	2,60,000
Contribution @ ₹48		2,40,000
Fixed costs:		
Hall rent	13,200	
Honorarium to Chief Administrator	6,000	
General Administration expenses	12,100	31,300
Budgeted net revenue		2,08,700

Supervision charges is a step cost, for every hundred candidates @ of ₹50 per day. 5000 candidates for 2025, being a multiple of 100 (i.e. 50 hundreds) supervision charges have been considered a variable cost.

$$\text{Break-even number of candidates} = \frac{\text{Fixed Cost}}{\text{contribution per candidate}}$$

$$= \frac{31,300}{48}$$

$$= 652 \text{ candidate}$$

Contribution of ₹48 has been arrived at on the assumption that supervision charge is ₹2 per unit. Thus, for 652 candidates, supervision charges are assumed at ₹1304. Actual supervision charges would be:

$$\text{Number of candidates in terms of hundreds: } \frac{652}{100} = 6.52$$

Supervision charges would be for 7 hundreds, i.e. 7 × ₹50 or ₹350 per day and for four days ₹1,400.

Thus, there is a difference of ₹96 (1,400 - 1,304) between assumed supervision charges and estimated supervision charges.

The additional number of candidates required to meet this difference of ₹96 is:

$$= \frac{178}{\text{revised contribution per candidate}}$$

$$= \frac{178}{50}$$

= 3.56 = 4 candidates

Thus, break-even number is 656 (652 + 4).

Note:

Calculation of Revised contribution:

Gross margin from 5,000 candidates = 5,00,000

Variable cost (without supervision charges) = (2,50,000)

Revised contribution = 2,50,000

Revised contribution per candidate =2,50,000/5,000

= ₹50

(C) Number of candidates to be enrolled if the net income desired is ₹3,00,000

Total contribution required:

	Amount (in ₹)
Fixed cost	31,300
Desired profit	3,00,000
Total contribution required	3,31,300

$$\text{Number of candidates required} = \frac{\text{Total contribution required}}{\text{Contribution per candidate}}$$

$$= \frac{3,31,300}{48}$$

= 6,903 candidates

Difference between assumed supervision charges and estimated supervision charges:

Estimated supervision charges 70 × ₹50 × 4 = 14,000

Assumed supervision charges 6,903 × 2 = 13,806

Difference = ₹194

Additional number of candidates required to meet this difference:

$$= \frac{194}{\text{revised contribution per candidate}}$$

$$= \frac{194}{50}$$

= 3.88 = 4 candidates

Thus total number of candidates required to earn a profit of ₹3,00,000 is 6,907 (6,903 + 4) candidates.

ILLUSTRATION 4:

The following data of MNP Ltd. has been gathered from the cost records of a unit to compute various fixed overhead variances for a specific period:

Number of budgeted working days	25
Budgeted man-hours per day	6000
Output (budgeted) per man-hour (in units)	1
Fixed overhead cost as budgeted	150,000
Actual number of working days	27
Actual man-hours per day	6300
Actual output per man-hour (in units)	0.9
Actual fixed overhead incurred	1,56,000

Calculate Fixed Overhead Variances:

(a) Expenditure variance

(b) Calendar variance

(c) Capacity variance

(d) Efficiency variance

(e) Volume variance

(f) Fixed cost variance

Solution :

Computation of Fixed Overhead Variances

(a) Fixed Overhead Expenditure Variatice

Actual fixed overhead - Budgeted fixed overhead

=₹1,56,000 - ₹1,50.000 = 6000(A)

(b) Fixed Overhead Calendar Variance

Budgeted fixed overhead – $\{\frac{\text{Budgeted Fixed Overhead}}{\text{Budgeted Working Days}} \times \text{Actual working days}\}$

$= ₹1,50,000 – \{\frac{₹\ 1,50,000}{25\ \text{Days}} \times 27\ \text{days}\}$

= ₹1,50,000 – ₹1,62,000 = 12,000(F)

(c) Fixed Overhead Capacity Variance

$\{\frac{\text{Budgeted Fixed Overhead}}{\text{Budgeted Working Days}} \times$ Actual working days} – Actual fixed overhead for actual production

= ₹1,62.000 - (6,300 × 27 × ₹1)

= ₹1,62,000 - ₹1,70,100

= 8,100(F)

(d) Fixed Overhead Efficiency Variance

{Actual hours worked × Std. fixed overhead rate p.h.} – std. fixed overhead for actual production

= (6,300 × 27 × ₹1) - (6,300×27×0.90× ₹1)

= ₹1,70,100 - ₹1,53,090

=17,010(A)

(e) Fixed Overhead Volume Variance

Calendar + Capacity + Efficiency

= ₹12,000 (F) + 8,100 (F) + ₹17,010 (A)

=3090(F)

(f) Total Fixed Cost Variance

Expenditure variance + Volume variance

= ₹6,000 (A) + ₹3,090 (F)

= 2910(A)

Working Notes:

$$\text{Std. fixed overhead rate} = \frac{₹\ 1,50,000}{6,000 \times 25 \text{ hrs.}}$$

$$= ₹1$$

ILLUSTRATION 5:

Aparna Ltd. has provided the following details for the month ending March 31, 2024.

Particulars	Master Budget	Actual
Units produced and sold	1,00,000 units	90,000 units
Sales	4,00,000	380,000
Direct material	80,000	75,000
Direct labour	1,00,000	1,20,000
Variable overhead	70,000	80,000
Fixed overhead	50,000	40,000
Total cost	3,00,000	3,15,000

The actual results for the month indicate that 79,000 kgs of material were consumed, and 80,400 labour hours were recorded.

Prepare a flexible budget for the month and compare it with the actual results.

Solution:

Statement showing Flexible Budget and its comparison with actual

Particulars	Master Budget (1,00,000 units)	Flexible budget at standard cost		Actual (90,000 units)	Variance
		Per unit	90,000 units		
Sales	4,00,000	4	360,000	380,000	20,000 (F)
Direct material	80,000	0.8	72,000	75,000	3,000 (A)
Direct labour	1,00,000	1	90,000	1,20,000	30,000 (A)
Variable overhead	70,000	0.7	63,000	80,000	17,000 (A)
Total variable cost	250,000	2.5	225,000	275,000	50,000 (A)
Contribution	150,000	1.5	135,000	105,000	

Particulars	Master Budget (1,00,000 units)	Flexible budget at standard cost		Actual (90,000 units)	Variance
		Per unit	90,000 units		
Fixed overhead	50,000	0.5	45,000	40,000	5,000 (F)
Net profit	100,000	1	90,000	65,000	25,000 (A)

ILLUSTRATION 6:

In January 2025, the standard costs applied are as follows. At the start of the month, a material G shortage required a modification in the product mix, shifting the ratio from 3:2 to 2:3.

Material	Standard mix			Revised Standard mix			Actual Mix		
	Qty. (units)	Price (₹)	Amt. (₹)	Qty. (units)	Price (₹)	Amt. (₹)	Qty. (units)	Price (₹)	Amt. (₹)
A	120	0.25	30	80	0.25	20	90	0.20	18
B	80	0.50	40	120	0.50	60	125	0.55	68.75
	200		70	200		80	215		86.75
Loss	60			60			65		
	140		70	140		80	150		86.75

Calculate Revised Variance.

Solution:

Direct Materials Revision Variance

= Standard price (Standard Quantity - Revised Standard Quantity)

Material A = ₹0.25 (120-80) = ₹10 (F)

Material B = ₹0.50 (80-120) = ₹20 (A)

Here the revision variance could be called a mix variance', but as it is a deliberate policy decision to change the he mix, and it is preferable to refer to it as a revision variance. Once the revision variance has been calculated, the new revised standard mix would become, in effect, the standard mix of the product, and variations would be calculated there from to show the direct material price variance and the direct materials usage variance.

- Direct Materials Price Variance

  = AQ (SP-AP)

  Material A = 90 (0.25 – 0.20) = ₹4.5 (F)

  Material B = 125 (0.50 – 055) = ₹6.25 (A)

- Direct Materials Usage Variance

  = SP (RSQ-AQ)

  Material A = 0.25 (80-90) = ₹ 2.5 (A)

  Material B = 0.50 (120-125) = ₹2.5 (A)

- Direct Materials Total Variance

  = SC – AC

  = 70 - 86.75

  = ₹16.75 (A)

ILLUSTRATION 7:

Vidya Ltd. produces two products, A and B, and distributes them through its two divisions: East and West. The following information is provided for the preparation of the sales budget, which will be submitted to the budget committee.

Budgeted sales for the current year were:

Product	East	West
A	7000 for ₹ 15	14000 for ₹ 15
B	8000 for ₹ 24	12000 for ₹ 24

Actual sales for the current year were:

Product	East	West
A	8000 for ₹ 15	15000 for ₹ 15
B	7000 for ₹ 24	11000 for ₹ 24

Thorough market studies indicate that Product A is well-liked but priced low. Analysis suggests that increasing its price by ₹2 would not significantly impact demand. Conversely, Product B is considered overpriced, and lowering its price by ₹1 could boost sales. The management has decided to implement these pricing adjustments.

Based on these changes and feedback from sales representatives, divisional managers have prepared the following estimates:

Percentage increase in sales over current budget is:-

Product	East	West
A	20%	10%
B	15%	5%

Through an intensive advertising campaign, the following additional sales beyond the divisional managers' estimated figures can be achieved:

Additional sales exceeding the divisional managers' projections:

Product	East	West
A	600	600
B	800	400

You are tasked with preparing a sales budget that incorporates the above estimates, along with a comparison of budgeted and actual sales for the current year.

Solution:

Sales budget

Vidya Ltd.

		Budget for future period			Budget for current period			Actual sales for current period		
Division	**Product**	**Quantity**	**Price (₹)**	**Value (₹)**	**Quantity**	**Price (₹)**	**Value (₹)**	**Quantity**	**Price (₹)**	**Value (₹)**
East	A	9,000	17	153,000	7,000	15	105,000	8,000	15	120,000
	B	10,000	23	230,000	8,000	24	192,000	7,000	24	168,000
Total		**19,000**		**383,000**	**15,000**		**297,000**			**288,000**
West	A	16,000	17	272,000	14,000	15	210,000	15,000	15	225,000
	B	13,000	23	299,000	12,000	24	288,000	11,000	24	264,000

		Budget for future period			Budget for current period			Actual sales for current period		
Division	**Product**	**Quantity**	**Price (₹)**	**Value (₹)**	**Quantity**	**Price (₹)**	**Value (₹)**	**Quantity**	**Price (₹)**	**Value (₹)**
Total		29,000		571,000	26,000		498,000	26,000		489,000
Total	A	25,000	17	425,000	21,000	15	315,000	23,000	15	345,000
	B	23,000	23	529,000	20,000	24	480,000	18,000	24	432,000
Total		48,000		954,000	41,000		795,000	41,000		777,000

ILLUSTRATION 8:

Gayatri Manufacturing Co. prepares an annual budget and conducts monthly comparisons between the budgeted and actual results. These comparisons are analyzed by functions and sections, with sectional managers held accountable for any variances. They are expected to implement corrective actions as needed. The following data pertains to the first month of the budget period:

	Budgeted cost (₹)	**Actual cost (₹)**
Raw materials used in production department A	25,00,000	28,00,000
Direct labour in production department B	30,00,000	29,00,000
Direct labour in production department C	20,50,000	21,00,000
Factory lighting and heating	15,00,000	15,80,000
Rent and rates	12,00,000	10,00,000
Total cost of machine maintenance and repairs	10,00,000	8,50,000

The following conclusions have been drawn based on the variance analysis:

(a) The increase of ₹300,000 in raw material costs in Department A was partly due to excess wastage amounting to ₹240,000. The remaining ₹60,000 was attributed to a price increase caused by an agreement among all material suppliers, which is expected to persist for the rest of the year.

(b) The reduction of ₹1,00,000 in labor costs in Production Department B was partly due to a lower wage settlement agreed upon by unions and employees, resulting in savings of ₹58,000. The remaining ₹42,000 savings resulted from improved efficiency within the department.

(c) The increase of ₹50,000 in direct labor costs in Production Department C was partly due to an overtime premium of ₹30,000. The remaining ₹20,000 resulted from lower efficiency

compared to the budget. The overtime costs arose due to a major machinery breakdown during the month. During discussions, managers indicated that the efficiency target set in the budget was unrealistic.

(d) The factory lighting and other related expenses for the month were unexpectedly higher than the budgeted figure due to seasonal factors, specifically winter. However, the total expenses for the year are still expected to align with the budgeted amount.

(e) The favorable variance of ₹2,00,000 in rent and rates was due to an incorrect budget estimate rather than an actual cost-saving measure.

(f) The favorable variance of ₹1,50,000 in machine maintenance and repair costs resulted from lower-than-expected demand from user departments. However, a higher demand is anticipated in the coming months.

For each expenditure category, consider whether the original budget should be revised for the remainder of the period from the following perspectives:

i. Variance Reporting to Top-Level Management

ii. Variance Reporting to Sectional Managers

For each cost item, determine whether variances should be adjusted in future budgets or presented separately to provide a clearer picture of departmental performance.

Should the budget be adjusted to reflect ongoing trends and expected variances?

Should the variance be excluded or highlighted separately in responsibility reports to section heads?

Solution:

(a) Variance in Raw Material Cost – Department A

Variance due to Excess Wastage (₹2,40,000):

This is a controllable variance, and the budget should not be revised. Instead, further investigation is required to determine the causes of the excess wastage and take corrective actions. Revising the budget would prevent future variance reports from reflecting this issue.

Variance due to Price Increase (₹60,000):

Since this is an uncontrollable variance and the price increase is expected to continue, the budget should be revised. Keeping this variance in monthly reports would be meaningless. Additionally, the budgeted income statement and cash budget should be adjusted accordingly. A separate report detailing the full-year impact of the price increase on income and cash flow should be submitted to top management.

(b) Variance in Labour Cost – Department B

Favorable Variance due to Lower Wage Settlement (₹58,000):

Since this variance will persist for the rest of the year, there is no need to report it monthly. The budget should be revised accordingly, including adjustments to the budgeted income statement and cash flow. A separate report summarizing the total annual savings should be provided to top management.

Favorable Variance due to Increased Efficiency (₹42,000):

The original budget should not be revised unless it is confirmed that the efficiency level considered in the budget was set too low.

(c) Variance in Direct Labour Cost – Production Department C

Adverse Variance due to Overtime Premium (₹30,000):

The budget should not be revised. This variance is abnormal and requires corrective action. It should be reported separately in both sectional and top-management reports.

Adverse Variance due to Budgeting Error (₹20,000):

Since this variance resulted from an error in the budget, the budget should be adjusted accordingly. The budgeted income statement and cash flow should also be revised.

(d) Variance in Factory Lighting and Heating Expenses (₹80,000)

The budgeted annual expense for factory lighting and heating should not have been evenly distributed across all 12 months, as seasonal factors were overlooked. However, there is no need to revise the original budget. Variance reports should clearly highlight the reason for this fluctuation. This type of variance is similar to uncontrollable variances.

(e) Variance in Rent and Rates (₹2,00,000)

Since this variance arose from an estimation error, the budget should be revised. Although this revision is not relevant for sectional heads (as rent and rates are uncontrollable expenses for them), the sectional budgets should still be adjusted as each section shares this expense. Additionally, the budgeted income statement and cash flow should be updated for top-management reporting.

(f) Variance in Machine Maintenance and Repair Costs (₹1,50,000)

This variance is due to fluctuating demand over the year (a calendar variance), so the budget should not be revised. However, as such variances do not require corrective action, they should be distinguished from controllable variances in variance reports.

The following variances are beyond the control of section heads and should either be excluded from responsibility reports or highlighted separately:

- Material Price Variance (₹60,000)
- Labour Cost Variance (₹58,000) – Due to acceptance of a lower wage award
- Overtime Payment Variance (₹30,000) – Should be excluded from the production section's report unless it is established that the production department was responsible for the machine breakdown. The primary responsibility for the breakdown and subsequent production disruption likely falls on the maintenance department.
- Factory Lighting and Heating Variance (₹80,000) – As it is irrelevant to sectional heads
- Rent and Rates Variance (₹2,00,000) – For the same reason as above
- Machine Maintenance and Repair Variance (₹1,50,000) – As it does not fall under sectional control.

ILLUSTRATION 9:

Vidyadei School has a total of 200 students from 5 different sections with 40 students per section. The school is planning a weekend picnic around the city, visiting places such as an amusement park, the planetarium, and other attractions.

A private transport operator has offered to lease buses for the trip. Each bus has a maximum capacity of 50 students, with 2 additional seats reserved for the teachers accompanying them. The school will assign two teachers per bus and will provide an allowance of ₹100 per teacher.

The required number of buses will be arranged based on these conditions. Below are the estimated costs for the trip:

	Cost per student (₹)
Breakfast	10
Tea	6
Lunch	20
Entrance fee at zoo	4

Rent - ₹1,300 per bus

Special permit fee - ₹100 per bus

Block Entrance fee at the planetarium - ₹ 500

Prizes to students for games - ₹ 1,500

No cost will be incurred in respect of the accompanying teachers (except the allowance of ₹ 100 per teacher).

You are required to prepare

(a) A flexible budget estimating the total cost for the levels of 40, 80, 120, 160 and 200 students. Each item of cost is to be indicated separately.

(b) Compare the average cost per student at these levels.

(c) What will be your conclusions regarding the break-even level of students if the school proposes to collect ₹100 per student?

Solution:

(a) Flexible budget for different levels:

	40 students	80 students	120 students	160 students	200 students
Variable costs:					
Breakfast	400	800	1200	1600	2000
Tea	240	480	720	960	1200
Lunch	800	1600	2400	3200	4000
Entrance fee at zoo	160	320	480	640	800
Total	1,600	3,200	4,800	6,400	8,000
Semi fixed costs					
Bus rent	1,300	2,600	3,900	5,200	5,200
Special permit fee	100	200	300	400	400
Allowance for teachers	200	400	600	800	800
Total	1,600	3,200	4,800	6,400	6,400
Fixed cost:					
Block entrance fee	500	500	500	500	500
Prize distributed to students	1,500	1,500	1,500	1,500	1,500
Total	2,000	2,000	2,000	2,000	2,000
Total costs	5,200	8,400	11,600	14,800	16,400
Average cost per student	130	105	96.67	92.5	82

Notes:

i. Semi-variable cost relates to the number of buses to be hired which is determined below:

For 40 students 40/50, i.e. 0.80, therefore 1 bus

For 80 students 80/50, ie. 1.60, therefore 2 buses

For 120 students 120/50, ie 2.40, therefore 3 buses

For 160 students 160/50, i.e. 3.20, therefore 4 buses

For 200 students 200/50, i.e. 4.00, therefore 4 buses

ii. Two teachers should be employed per bus. Therefore, allowance for teachers per bus would be = ₹100 × 2 = ₹ 200

iii. Break-even point

Realisation per student = ₹100

Variable cost per student = ₹40

Contribution per student = ₹60

Since semi-fixed costs relate to a block of 50 students, semi-fixed costs, fixed costs and break even points for three levels will be as follows:

	Upto 50 students	**51-100 students**	**101-150 students**	**151-200 students**
Fixed cost	2,000	2,000	2,000	2,000
Semi fixed cost	1,600	3,200	4,800	6,400
Total	3,600	5,200	6,800	8,400
Break even level	3,600	5,200	6,800	8,400
Contribution per student	60	60	60	60
	60 students	87 students	114 students	140 students

To prevent a loss, a minimum of 87 students is required. However, if the number of students exceeds 100, the break-even point shifts to 114 students. If the total exceeds 150 students, the break-even point further increases to 140 students.

ILLUSTRATION 10:

Aakriti Ltd. produces a diverse range of products and allocates production overhead costs at a rate of 400% of direct wages. This rate is derived from the following budgeted cost estimates:

	(₹)
Variable production overhead	12,00,000
Fixed production overhead	28,00,000

	(₹)
	40,00,000
Direct labour costs	10,00,000

One of the company's products, P has the normal selling price of ₹400 and unit production cost of –

	(₹)
Direct material cost	150
Direct labour cost	50
Total production over head	150
Factory cost	350

A customer has proposed purchasing 500 units of Product M at a price of ₹300 per unit. If the order is accepted, regular sales will not be impacted, and the company has sufficient capacity to produce the additional units. Should the company proceed with accepting the order?

Solution:

Here, variable overhead rate is ₹12,00,000 /₹10,00,000 = 120% of direct wages.

	(₹)
Direct material cost	150
Direct labour cost	50
Variable production overhead (120% of ₹50)	60
	260

Thus, if special order of 500 units is undertaken, the total increase in contribution will be:

500(₹300 - ₹260) = ₹20,000

Hence, the order may be accepted unless a more profitable use of existing spare resources is found out.

ILLUSTRATION 11

ABC Ltd. manufactures a single product, which is sold at ₹130 per unit. The variable cost per unit is as follows:

	(₹)
Direct material cost	30

	(₹)
Direct wages (4 hours)	40
Variable overhead	20
	90

There is a high demand for the product, and the labor force is already operating at full capacity, with no possibility of overtime.

A customer has offered ₹32,000 for a special order, which would require ₹9,000 in direct material costs and 800 hours of direct labor.

Advise R. Ltd. on whether accepting this special order would be beneficial.

Solution:

In this case, labor is a limiting factor. Accepting the special order would result in a loss of contribution for 800 hours from the production of the standard product.

Contribution per direct labour hour = contribution per unit/labour hours

= (₹130 - ₹90)/4

= ₹10

Loss of contribution (or opportunity cost for 800 hours) is ₹8,000

	(₹)
Relevant revenue for special order	32,000
Relevant cost	
Direct materials	9,000
Direct wages (800 hours × ₹10)	8,000
Variable overhead (800 hours × ₹5)	4,000
Opportunity cost	8,000
Total cost	29,000
Profit in accepting the special order	3,000

R. Ltd. may be advised to accept the offer of special order.

ILLUSTRATION 12:

XYZ Ltd. currently runs a single operational shift, with the following associated costs and revenue details:

	(₹)
Sales (20,000 units)	12,00,000
Direct materials	3,00,000
Direct labour	4,00,000
Variable overhead	80,000
Contribution	4,20,000
Fixed overhead	1,20,000
Profit	3,00,000

There is a sales demand for an additional 30,000 units at the current selling price, which could be produced by operating a second shift.

Running the second shift would incur additional fixed overheads of ₹40,000. However, a 4% bulk purchase discount would apply to all material purchases. Direct labor costs for the second shift would remain the same as in the first shift, with an additional second-shift allowance of 10% of wages.

Advise whether the company should proceed with opening the second shift.

Solution:

		(₹)
Relevant revenue (30,000 × ₹60)		18,00,000
Relevant costs-		
Current cost of materials	3,00,000	
Total cost of materials including 2nd shift (50,000 × 15 × 0.96)	7,20,000	
Incremental materials cost		4,20,000
Incremental labour cost (4,00,000 × 110%)		4,40,000
Incremental variable overhead (30,000 × 4)		1,20,000
Additional fixed overhead		40,000
Increase in profit from second shift		7,80,000

The additional shift would be profitable and can be recommended, provided there is sufficient sales demand.

The Institute of Cost Accountants of India

Statutory Body under an Act of Parliament

www.icmai.in

Headquarters:
CMA Bhawan; 12, Sudder Street; Kolkata - 700016
Ph: +91-33-2252-1031/34/35/1602/1492/1619/7373/7143

Delhi Office:
CMA Bhawan; 3, Institutional Area; Lodhi Road; New Delhi - 110003
Ph: +91-11-24666100/24622156/57/58; 24666124/129

E-mail: studies@icmai.in

Follow us on

Behind Every Successful Business Decision, there is always a CMA