Paper-10: COST AND MANAGEMENT ACCOUNTANCY

Section – A (Cost And Management Accounting – Methods & Techniques)

Question.1

(a) Jayashree Ltd. manufactures product A to the extent of 70% of total sales revenue and product B to the extent of 30% of the sales revenue. The variable cost of product A is 60% of its selling price and product B is 80% of its selling price. If the total fixed cost of the company is ₹3,06,000, calculate the break-even point of the company.

Answer:

When there is no profit no loss, sales = Variable cost + Fixed cost

Let, the total sales = S.

Therefore, S = ₹3,06,000 + 0.70S (.6) + 0.30S (.8)

S = ₹3,06,000 + 0.42S + 0.24S

S = ₹9,00,000

Alternative solution

Composite P/V ratio = (P/V ratio of A x Weight of A) + (P/V rati of B x Weight of B)

= (100 - 60)% x 70% + (100 – 80)% x 30% = 34%

$$\text{Break-even point} = \frac{\text{Fixed Cost}}{\text{Composite P/V ratio}} = \frac{₹3,06,000}{34\%} = ₹9,00,000$$

(b) A truck carried 45 tons during a six-day week and travelled a total distance of 135 miles as given below:

Day	Distance travelled (miles)	Tons carried
Monday	**10**	**5**
Tuesday	**20**	**10**
Wednesday	**30**	**5**
Thursday	**40**	**10**
Friday	**25**	**10**
Saturday	**10**	**5**
	135	**45**

Calculate ton-miles for the week

Answer:

Day	Distance travelled (miles) (A)	Tons carried (B)	Tonne-miles (C = A x B)
Monday	10	5	50
Tuesday	20	10	200
Wednesday	30	5	150
Thursday	40	10	400
Friday	25	10	250
Saturday	10	5	50
	135	45	1,100

Absolute tonne-km = Distance x Respective weight = 1,100 tonne-miles

Commercial tonne-km = Avg. weight x total distance

$$= \left(\frac{45}{6}\text{ tonnes}\right) \times 135\text{miles}$$

= 1,012.5 tonne-miles

(c) Monthly demand for a component = 400 units
Set up cost per batch = ₹100
Carrying cost per unit per annum = 20%
Cost of production per unit = ₹120
From the data given above, you are required to compute:
(i) Economic Batch Quantity
(ii) Number of batches in a year
(iii) How often does production need to take place? (assume 360 days in a year)

Answer:

(i)

$$EBQ = \sqrt{\frac{2 \times \text{Annual Demand} \times \text{Set up cost per batch}}{\text{Carrying cost per unit per annum}}}$$

$$= \sqrt{\frac{2 \times (400 \times 12) \times 100}{20\% \text{ of } ₹120}}$$

= 200 units

(ii) Number of batches in a year $= \frac{\text{Annual demand}}{EBQ}$

$$= \frac{4{,}800}{200\text{units}} = 24$$

(iii) Frequency of batches or the time period between two batches

$$= \frac{\text{Number of days in a year}}{\text{Number of batches produced in the year}}$$

$$= \frac{360}{24} = 15\text{ days}$$

(d) Consider the following overhead costs of a company for the production of 4,000 units.

Variable overhead costs	**= ₹12,000**
Fixed overhead costs	**= ₹40,000**
Total overhead costs	**= ₹52,000**

Calculate the total overhead costs for 5,000 units.

Answer:

Variable overhead cost per unit $= \frac{\text{Total variable overhead costs}}{\text{Number of units}}$

$$= \frac{₹12{,}000}{4{,}000} = ₹3$$

Total overhead costs of 5,000 units = Total variable overhead costs + Total fixed overhead costs
= 5,000 x ₹3 + ₹40,000

= ₹55,000

(e) State the term Estimated Profit in Contract Costing.

Answer:

Estimated profit is the excess of the contract price over the estimated total cost of the contract.

Estimated profits are calculated by preparing a Memorandum Contract Account. A proforma for the same is given below:

Memorandum Contract A/c

Particulars	₹	Particulars	₹
To Costs already incurred	xxx	To Contract price	xxx
To Future costs expected to be incurred	Xxx		
To Contigencies (if any)	Xxx		
To Net profit (i.e. estimated profit)	xxx		
	xxx		xxx

(f) Whether overall annual Turnover/individual turnover definition will include other operational income like Job work income, scrap sale, trading turnover, export benefits, sales of services etc.?

Answer:

The Turnover shall include other operational income like Job work income, scrap sale, trading turnover, export benefits, sales of services etc.

(g) What is the difference between Cost Accounting policy and Cost Accounting system?

Answer:

Cost Accounting Policy of a company state the policy adopted by the company for treatment of individual cost components in cost determination.

The Cost Accounting system of a company, on the other hand, provides a flow of the cost accounting data/information across the activity flow culminating in arriving at the cost of final product/service.

(h) How is monopoly price related to elasticity of demand?

Answer:

The concept of elasticity of demand is more useful in price determination under Monopoly. The main motive of the Monopolist is to get maximum profits. In order to get maximum profits the Monopolist fixes more price in the case of those goods in which there is in elastic demand and less price in the case of those goods in which the demand is elastic one. Therefore, monopolist generally fixes the price on the basis of elasticity of demand.

(i) XYZ Ltd. is operating in a perfectly competitive market. The price elasticity of demand and supply of the product estimated to be 3 and 2 respectively. The equilibrium price of the product is ₹100. If the government imposes a specific tax of ₹10 per unit, what will be the new equilibrium price?

Answer:

Distribution of tax burden between buyers and sellers is in the ratio of elasticity of demand.

Thus tax burden borne by the buyer= ₹10 × 1/5= ₹4.
If the tax burden borne by buyer is ₹4, new equilibrium price will be 100 + 4= ₹104

(j) Two drivers - Tom and Jerry - each drive up to a gas station. Before looking at the price, each places an order. Tom says, "I'd like 10 gallons of gas." Jerry says, "I'd like ₹10.00 of gas." What is each driver's price elasticity of demand?

Answer

Tom has a perfectly inelastic demand - he is not price sensitive at all because he wants 10 gallons of gas regardless of price. Jerry has a perfectly elastic demand – he wants ₹ 10 dollars worth of gas, and he is completely price sensitive.

Question.2

(a) XYZ Ltd. has prepared a flexible budget for the coming quarter. The following information is provided from the same:

Production capacity	**40%**	**60%**	**90%**	**100%**
Cost	**(₹)**	**(₹)**	**(₹)**	**(₹)**
Direct Labour	**16,000**	**24,000**	**32,000**	**40,000**
Direct Material	**12,000**	**18,000**	**24,000**	**30,000**
Production Overheads	**11,400**	**12,600**	**13,800**	**15,000**
Administrative Overhead	**5,800**	**6,200**	**6,600**	**7,000**
Selling & Distribution Overheads	**6,200**	**6,800**	**7,400**	**8,000**
	51,400	**67,600**	**86,800**	**1,00,000**

However, due to recession the Company will have to operate at 50% capacity in the coming quarter. Selling prices has to be lowered to an uneconomic level and expected sales revenue for the coming quarter, will be ₹49,500. But it is projected that in the next quarter following the coming quarter, the concern will operate at 75% capacity and generates sales revenue of ₹90,000.

The Management is considering a suggestion to keep the operation suspended in the coming quarter and restart operation from the quarter when it is expecting to operate at 75% capacity. If the operation i8s suspended in the next quarter it is estimated that:

(i) The present fixed cost for the quarter would be reduced to ₹11,000.
(ii) There will be cost of ₹7,500 for closing down operations.
(iii) There would be additional maintenance cost of ₹1,000 for quarter.
(iv) There would be an onetime cost of ₹4,000 in re opening the plant.

You are required to advice weather the factory should be kept operational during the coming quarter and also what will be the profit at 75% capacity utilization level.

Solution:

Working Notes:

	40% (₹)	**60% (₹)**	**Diff. 20% (₹)**	**Diff.10% (₹)**	**Fc (₹)**

Direct Labour	16,000	24,000	8,000	4,000	Nil
Material	12,000	18,000	6,000	3,000	Nil
Prodn OHs	11,400	12,600	1,200	600	9,000
Admn. OHs	5,800	6,200	400	200	5,000
Sales OHs	6,200	6,800	600	300	5,000
			Total	8,100	19,000

Evaluation of options for ABC Ltd.:

	Operation at 50%	**Temporary Closure**
	₹	₹
Revenue:	49,500	Nil
Variable Cost (₹8,100×5)	40,500	------
Fixed Cost	19,000	11,000
Closing down cost	------	7,500
Maintenance cost	------	1,000
Reopening cost	-------	4,000
Profit/(Loss)	(10,000)	(23,500)

As temporary closure will increase loss, the Company should remain operational profitability at 75% capacity for ABC Ltd.

	₹	₹
Revenue	90,000	
Costs		
Variable Cost (₹8,100×7.5)	60,750	
Fixed Cost	19,000	79,750
Profit		10,250

(b) What is Inter Firm Comparison? Enumerate some of its advantages.

Answers:

Inter Firm Comparison, as the name indicates, is a technique by which a Company evaluates its performance with those of other firms in the same industry. Uniform Cost accounting is a must for such meaningful comparison. To facilitate such comparison and evaluation, generally a central organization is formed to collect the necessary data periodically in a standard format from all member industries. To safeguard the confidentiality of the individual

firm's performance details, the data are collected as a ratio or percentage by the central organization in the industry. Information collected may relate to costs, capacity utilization, raw material usage, labour productivity, ROI etc.

This Comparison has many advantages which are as follows:

(i) It promotes a sense of cost consciousness among member units and helps to improve their efficiency.

(ii) It throws light on weak-areas and enables member units to take remedial action.

(iii) It prevents unhealthy price cuffing.

(iv) It enables the members to present a united stand before Government and other regulatory bodies.

(v) An overall improvement in the industry will result in higher profit for member, more benefit to labour, lower prices to consumers and high revenue to the government by way of taxes/duties.

Question 3.

(a) Zenith Transport Company has given a route of 40 kilometers long to run bus. The bus costs the company a sum of ₹1,00,000. It has been insured at 3% p.a. and the annual tax will amount to ₹2,000. Garage rent is ₹200 per month. Annul repairs will be ₹2,000 and the bus is likely to last for 5 yea₹ The driver's salary will be ₹300 per month and the conductor's salary will be ₹200 per month in addition to 10% of takings as commission (to be shared by the driver and the conductor equally.)

Cost of stationary will be ₹100 per month. Manager-cum-accountant's salary is ₹700 per month petrol and oil will be ₹50 per 100 kilomete₹ The bus will make 3 up and down trips carrying on an average 40 passengers on each trip.

Assuming 15% profit on takings, calculate the bus fare to be charged from each passenger. The bus will run an average 25 days in a month.

Answer:

Statement showing fare to be charged

Particulars	**Amount p.a. (₹)**	**Amount p.m.(₹)**
(a) Standing charges:		
• Insurance @35 on ₹ 1,00,000	3,000	
• Tax	2,000	
• Garage rent @ ₹200/ month	2,400	
• Driver's salary @₹200/month	3,600	
• Conductor's Salary @₹200/month	2,400	
• Stationary @₹100/month	1,200	
• Manager-cum-accountant's Salary @₹700 month	8,4000	
• **Total standing charges**	**23,000**	**1,916.67**
(b) Running Expenses		
• Depreciation ₹1,00,000/5	20,000	1,666.67
• Repairs	2,000	166.66

• Petrol & oil ₹0.50×[40km×2×3×25]		3,000.00
• Commission		900.00
• Profit		1,350.00
• **Total Taking**		**9,000**
• Fare per passenger kilometer (₹9,000/2,40,000#)	0.0375	0.0375
• Fare passenger (₹9,000/6,000)		₹1.50

*** Computation of commission and profit.**
Less: Total taking be x
Commission @ 10%=x/10, profit is 15% of taking.
* Hence Profit=15x/100=3x/20
* Total cost without commission=₹6,750 (standing charges+ Running charges)
* Hence x=₹6,750+ x/10 =3x/20
Solving the equation for x we get x= ₹9,000, which is total takings.
* Therefore, commission will be 10% of total taking=₹900
* Profit @15% of total taking=₹1,350

 # Total passenger kilometers an computed is shown below:
40 km. ×2(up+ down)×3 trips×25 days×401 passengers
=2,40,000 passenger km/month.

(b) Write short note on Cost Plus Contract.
Answer:
CIMA defines Cost plus Contract is one where Contractor is reimbursed allowable or otherwise defined Cost Plus a percentage of these costs or a fixed fee towards profit. The customer has the right to verify the actual costs as these forms the basis for calculation of profit. Cost Plus Contracts are usually entered into during times of emergency such as war when there is no time to go through detailed tender formalities for settlement of a contract. It is also resorted when it is not possible to estimate the cost of the work with any degree of accuracy especially when prices are subject to wide fluctuations.

The advantage to the contractor in such contract is that he is protected from fluctuations in prices of materials, labour and services and he is assured of his profit as per the terms of the agreement. Moreover he need not to go through tender formalities and he can even take up works which cannot be detailed in advance. Further as the customer has the right of conducting cost audit, he cannot be exploited by the contractor and the customer are both benefited by this agreement.
This advantage of such contracts is that the contractor has no motivation to effect cost savings, as it will indirectly bring down his profit also. The customer also has no clear idea of his liability until after completion of the entire work. Unless the contract agreement provides clearly for definition of cost elements, allowable wastage, if any, mode of charging depreciation on assets, settlement of disputes etc. cost plus contracts may lead to dissatisfaction for both the contractor and the customer.

Question 4.
(a) What is meant by 'Relevant Cost,? Explain with the help of illustration.

Answer:

For the purpose of decision making, Costs are classified into two groups, namely relevant Costs and irrelevant Costs. Relevant Costs are taken into consideration while making a particular decision.
Relevant Costs are those which differ from one set of circumstances to another depending upon the nature of decision to be made. This concept is a valuable tool for decision making in a variety of situations. It should be used, however, with care and discretion. Thus the cost of petrol will be relevant if the decision to be made between driving upto a destination or using another mode of transport such as train.
If a special price export order is to be evaluated, relevant costs will be additional variable costs, any overtime or other export related expenses. The relevant benefits will be export subsidies and incentives.

(b) A factory is currently working at 50% capacity and produces 5,000 units at a cost of ₹90 per unit as per details given below:

Materials	**₹50**
Labour	**₹15**
Factory Overhead	**₹15 (₹6 fixed)**
Administration Overhead	**₹10 (₹5 fixed)**

The current selling price ₹100 per unit.
At 60% working, material cost per unit increases by 2% and selling price per unit falls by 2%.
At 80% working, material cost per unit increases by 5% and selling price per unit falls by 5%.
Calculate the current profit at 50% working. Estimate profits of the factory at 60% and 80% working. Which capacity of production would you recommend?

Answer:
Fixed costs are not relevant to the decision since they are not directly related to the export order. They may be considered sunk cost or already incurred cost, whether or not the export order is accepted.

Statement of Comparative Profitability

Capacity	**50%**	**60%**	**80%**
Production/sales (units)	5,000	6,000	8,000
	₹	₹	₹
Material	50.00	51.00	52.50
Labour	15.00	15.00	15.00
Variable O/H	9.00	9.00	9.00
Variable Adm. O/H	5.00	5.00	5.00
	79.00	80.00	81.50
Sales/unit	100.00	98.00	95.00
Contribution/unit	21.00	18.00	13.00
Total Contribution	1,05,000	1,08,000	1,08,000

Fixed O/H (5,000x6+5,000x5)	55,000	55,000	55,000
Profit	50,000	53,000	53,000

It can be observed from above that the profit is the same at 60% and 80% capacity. At 80% capacity more production, more working capacity, more efforts are required to get the profit of ₹53,000 which is the same at 60% capacity. Hence 60% capacity production is recommended to achieve the profit of ₹53,000 which is more than the present profit of ₹50,000. More risk more endeavours are involved for production and sales at higher level of 80% capacity.

Question 5.

(a) An amount of ₹19,80,000 was incurred on a contract work upto 31.03.2013. Certificates have been received to date to the value of ₹24,00,000 against which ₹21,60,000 has been received in cash. The cost of work done but not certified amounted to ₹45,000. It is estimated that by spending an additional amount of ₹1,20,000 (including provision for contingencies) the work can be completed in all respects in another two months. The agreed contract price of the work is ₹25 lakhs. Compute a conservative estimate of the profit to be taken to the profit & Loss Account.

Answer:

COMPUTATION OF ESTIMATED TOTAL PROFIT (N.P)

	₹19,80,000
Expenditure incurred upto 31st March, 2013	1,20,000
Estimated additional expenditure (including provision for contingencies)	21,00,000
Estimated total cost (A)	25,00,000
Contract price (B)	4,00,000
Estimated total profit (B-A)	

COMPUTATION OF CONSERVATIVE ESTIMATE OF THE PROFIT TO BE TAKEN TO PROFIT & LOSS ACCOUNT:

(i) $\text{Estimated Profit} \times \frac{\text{Value of work certified}}{\text{Contract price}} \times \frac{\text{Cash received}}{\text{Value Certified}}$

$= 4,00,000 \times \frac{24,00,000}{25,00,000} \times \frac{21,60,000}{24,00,000}$

=₹3,45,600

Or,

(ii) $\text{Estimated profit} \times \frac{\text{Cost of work to date}}{\text{Estimated Total Cost}} \times \frac{\text{Cash received}}{\text{Value Certified}}$

$= 4,00,000 \times \frac{19,80,000}{21,00,000} \times \frac{21,60,000}{24,00,000}$

=₹3,39,429 i.e., 3,39,430

Or,

(iii) $\text{Estimated profit} \times \frac{\text{Cash received}}{\text{Value Certified}}$

$$= 4,00,000 \times \frac{21,60,000}{24,00,000}$$

=₹3,60,000

Or,

$$= \frac{2}{3} \times \text{NotionalProfit} \times \frac{\text{Cash received}}{\text{Work Certified}}$$

$$= 2/3 \times 4,00,000 \times \frac{21,60,000}{24,00,000}$$

=₹2,40,000

Or,

(iv) $$\text{NotionalProfit} \times \frac{\text{Work Certified}}{\text{Contract Price}}$$

$$= 4,00,000 \times \frac{24,00,000}{25,00,000}$$

=₹3,84,000

(b) ABC Ltd. produces three joint products X,Y and Z. The products are processed further. Pre-separation costs are apportioned on the basis of weight of output of each joint product. The following data are provided for month just concluded:
Cost incurred upto separation point is ₹10,000.

	Product X	**Product Y**	**Product Z**
Output (in litre)	**100**	**70**	**80**
	₹	₹	₹
Cost incurred after separation point	**2,000**	**1,200**	**800**
Selling price per Litre:			
After further processing	**50**	**80**	**60**
At pre separation point (estimated)	**25**	**70**	**45**

You are required to:

(i) Prepare a statement showing profit or loss made by each product using the present method of apportionment of pre-separation cost, and

(ii) Advice the management whether, on purely financial consideration, the three products are to be processed further.

Answer:

Profit Statement for three Joint products:

	Product X	**Product Y**	**Product Z**	**Total**
	₹	₹	₹	₹
Sales	5,000	5,600	4,800	15,400
Less:				
Pre Separation Costs	4,000	2,800	3,200	10,000
Post Separation Cost	2,000	1,200	800	4,000

Profit/(Loss)	(1,000)	1,600	800	1,400

Decision whether to further process the product or not:

Product	Incremental Revenue	Incremental Costs	Incremental Profit/(Loss)
	₹	₹	₹
X (₹25x100)	2,500	2,000	500
Y (₹10x70)	700	1,200	(500)
Z (₹15x80)	1,200	800	400
			400

Product X and Z should be further processed. Y should be sold at point of separation.

Question 6.

(a) ABC Ltd. is manufacturing three products X, Y and Z. All the products use the same raw material which is scarce and availability to the extent of 61,000 kg. only. The following information is available from records of the Company:

Particulars	Product X	Product Y	Product Z
Selling price per unit (₹)	**100**	**140**	**90**
Variable cost per unit (₹)	**75**	**110**	**65**
Raw Material Requirement per unit (kg.)	**5**	**8**	**6**
Market Demand (Units)	**5,000**	**3,000**	**4,000**
Fixed Costs			**₹1,50,000**

Advice the Company about the most profitable product mix. Compute the amount of profit resulting from such product mix.

Answer :

It is given that availability of raw material is limited to the extent of 61,000 kg. only. It can be noticed that if the products are produced to the maximum possible extent according to the market demand, the resultant profit will be highest. However, it is not possible as the raw material is not available to that extent. Therefore it is necessary to find out priority of the product by ranking them on the basis of contribution per kg. of raw material.

Particulars	Product X	Product Y	Product Z
Selling price per unit	₹100	₹140	₹90
Less: Variable cost/unit	75	110	65
Contribution per unit	₹25	30	25
Contribution per constraint	25/5	30/8	25/6
i.e., kg. of raw materials	=5	=3.75	=4.16

Priority Ranking	I	III	II

It is evident that X will be produced 1st to meet total market demand of 5,000 units.

product	No. of units	Raw material consumed	Contribution
X	5,000	25,000 kg.	₹1,25,000
Y	4,000	24,000kg.	1,00,000
Z	1,500	12,000kg.*	45,000
		(Balance to go upto 61,000kg.)	
		61,000kg.	₹2,70,000

Contribution	₹2,70,000
Less: Fixed Cost	₹1,50,000
Profit	1,20,000

This will be the highest profit in the given situation by producing

5,000 units of X
1,500 units of Y and
4,000 units of Z

(b) Monarch Limited undertakes to supply 1,000 units of a component per month for the months of January, Feb. and March 2012. Every month a batch order is opened against which materials and labour cost are booked at actual. Overheads are levied at a rate per labour hour. The selling price is constructed at ₹15 per unit.

From the following data, present the cost and profit per unit of each batch order and the overall position of the order for 3,000 units.

Month	Batch output (Numbers) ₹	Material Cost ₹	Labour Cost ₹
January 2012	**1,250**	**6,250**	**2,500**
February 2012	**1,500**	**9,000**	**3,000**
March 2012	**1,000**	**5,000**	**2,000**

Labour is paid at the rate of ₹2 per hour. The other details are:

Month	Overheads	Total labour Hour
January 2012	**₹12,000**	**4,000**
February 2012	**₹9,000**	**4,500**
March 2012	**15₹000**	**5,000**

Answer :

Statement of Cost and Profit per unit of each Batch

Particulars	January	February	March	Total
A. Batch Output (Number)	1,250	1,500	1,000	3,750
B. Sales Value (Ax₹15)	₹18,750	₹22,500	₹15,000	₹56,250
C. Material	6,250	9,000	5,000	20,250
Wages	2,500	3,000	2,000	7,500
Overheads	3,750	3,000	3,000	9,750
Total Cost	12,500	15,000	10,000	37,500
D. Profit per batch (B-C)	6,250	7,500	5,000	18,750
E. Cost per unit (C/A)	10	10	10	10
F. Profit Per unit (D/A)	5	5	5	5

Working Notes:

Particulars	Jan. 2012	Feb. 2012	March 2012
A. Labour Hours (Labour Cost/Labour rate per hour)	₹2,500/2 =1,250	₹3,000/2 =1,500	₹2,000/2 =1,000
B. Overheads per hour (Total Overheads/Total Labour Hours)	₹12,000/4,000 =₹3	₹9,000/4 =₹2	₹15,000/5,000 =₹3
C. Overheads for the batch (Ax B)	₹3,750	₹3,000	₹3,000

Paticulars	₹
A. Sales Value (3,000 units x ₹15)	45,000
B. Less: total Cost (3,000 units x ₹10)	30,000
Profit (A-B)	15,000

Question 7.

A Company manufacture its sole product by passing the raw material through three distinct process in its factory. During the month of April 2013, the company purchased 96,000 kg of raw material at ₹5 per kg & introduced the same in process 1. Further particulars of manufacture for the month are given below:-

	Process I	Process II	Process III
Material consumed	**₹33,472**	**₹27,483**	**₹47,166**

Direct labour	**80,000**	**72,000**	**56,000**
Overhead	**1,20,000**	**1,08,000**	**84,000**
Normal Waste in process as % of input	**3%**	**1%**	**1%**
Sale value of waste (₹/kg)	**2**	**3**	**5**
Actual output during the month (kg)	**93,000**	**92,200**	**91,500**

Prepare the three process accounts relating to abnormal; loss/gain, if any.

Answer :

-----Company
Three Process Accounts are given below:
Process-1 Account

	Quantity (kg.)	Rate (₹)	Amount (₹)		Quantity (kg.)	Rate (₹)	Amount (₹)
To Input of R.M.	96,000	5.00	4,80,000	By Process-II A/C (Transferred to)	93,000	7.60	7,06,800
To Other materials			33,472	By Normal Waste A/C (3% of 96,000)	2,880	2.00	5,760
To Direct labour			80,000	By Abnormal Loss A/C	120	7.60	912
To Overheads			1,20,000				
	96,000		7,13,472		96,000		7,13,472

Process-II Account

	Quantity (kg.)	Rate (₹)	Amount (₹)		Quantity (kg.)	Rate (₹)	Amount (₹)
To Process-I A/C (Transferred from)	93,000	7.60	7,06,800	By Process-III A/C (Transferred to)	92,200	9.90	9,12,780
To Materials			27,483	By Normal Waste A/C (1% of 93,000)	930	3.00	2,790
To Direct labour			72,000				
To Overheads			1,08,000				
To Abnormal gain	130	9.90	1,287				
	93,130		9,15,570		93,130		9,15,570

Process-III Account

	Quantity (kg.)	Rate (₹)	Amount (₹)		Quantity (kg.)	Rate (₹)	Amount (₹)
To Process-II A/C (Transferred from)	92,200	9.90	9,12,780	By Finished Goods Stock	91,500	12.00	10,98,000
To Materials			47,166	By Normal waste (1% of 92,200)	922	5.00	4,610
To Direct labour			56,000				
To Overheads			84,000				
To Abnormal gain	222	12.00	2,664				
	92,422		11,02,610		92,422		11,02,610

Accounts relating to Abnormal Loss/Gains are as under:-

Abnormal Loss Account

	Quantity (kg.)	Amount (₹)		Quantity (kg.)	Amount (₹)
To Process-I Account	120	912	By Cash @ ₹2 (normal waste)	120	240
			By Profit & Loss Account	------	672
	120	912		120	912

Abnormal Gain Account

	Quantity (kg.)	Amount (₹)		Quantity (kg.)	Amount (₹)
To Process-II A/C (normal waste) @₹3	130	390	By Process-II A/c	120	1,287
To Process-III A/c (Normal waste)	222	1,110	By Process-III A/c	222	2,664
To Profit & Loss A/C	-----	2,451			
	352	3,951		352	3,951

Working Notes:-

Valuations of output, abnormal loss/Gain are worked out below:

$$= \frac{\text{Total Cost of Input - Sale Value of Normal Waste}}{(\text{Input quantity - Qty of Normal Waste})}$$

$$\text{Process-I}: \frac{7,13,472 - 5,760}{96,000 - 2,880}$$

$$= \frac{7,07,712}{93,120}$$

$$= ₹7.60$$

$$\text{Process-II}: \frac{9,14,283 - 2,790}{(93,000 - 930)}$$

$$= \frac{9,11,493}{92,070}$$

$$= ₹9.90$$

$$\text{Process-III}: \frac{10,99,946 - 4,610}{92,200 - 922}$$

$$= \frac{10,95,336}{91,278}$$

$$= ₹12.00$$

Question 8.

(a) The Profit & Loss A/c. of XYZ Ltd., for the year ended 31st March 2012 was as follows:

Dr. Profit & Loss a/c. for the year ended 31st March 2012 Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Materials	4,80,000	By Sales	9,60,000
To Wages	3,60,000	By Work-in progress:	
To Direct Expenses	2,40,000	Material	30,000
To Gross Profit	1,20,000	Wages	18,000
		Direct Expenses	12,000
		By Closing stock	1,80,000
Total	12,00,000	Total	12,00,000
To Administration Expenses	60,000	By Gross Profit	1,20,000
To Net Profit	66,000	By Dividend received	6,000
Total	1,26,000	Total	1,26,000

As per the cost records, the direct expenses have been estimated at a cost of ₹30 per kg. and administration expenses at ₹15 per kg. During the year production was 6,000 kgs. And sales were ₹9,60,000.

Prepare a statement of costing Profit & Loss A/c. and reconcile the profit with financial profit.

Answer:

A. Statement Showing Profit as per Cost Accounts

Particulars	Amount (₹)	Amount (₹)
Purchase of Materials':	4,80,000	
Less: work-in-progress	30,000	4,50,000
Wages	3,60,000	
Less: Work-in-progress	18,000	3,42,000
Direct Expenses: ₹30/kg.x6,000 kg		1,80,000
Administration Expenses: ₹15/kg.x6,000		90,000
Cost of production of 6,000 units		10,62,000
Less: Closing Stock-1,200 units		2,12,400
Cost of Goods Sold-4,800 units		8,49,600
Sales	9,60,000	
Profit as per cost accounts		1,10,400

Value of Closing Stock is computed as shown below:
For 6,000 units, the cost of price is ₹10,62,000. So for 1,200 units, the cost of production will be ₹10,62,000/6,000x1,200=₹2,12,400

B. Reconciliation Statement:

Particulars	Amount (₹)
Profit as per Cost Accounts	1,10,400
Add: Over absorption of administration Overhead in cost accounts only (₹90,000-₹60,000)	30,000
Add: Dividends received recorded in financial accounts only	6,000
Total	1,46,400
Less: Over-valuation of Closing Stock: (₹1,80,000-2,12,400)	32,400
Under absorption of directly expenses in cost accounts: (₹1,80,000-₹2,28,000)	48,000
Total	80,400
Profit as per financial accounts:	66,000

- Administration overhead incurred on ₹601,000 as per the financial accounts. However in cost accounts, the amount charged I ₹90,000, (as the per unit administrative overheads are ₹15/kg. and the total production during the year was 6,000kgs., which

means, the administrative overheads recovered in cost accounts are ₹90,000) thus resulting in over absorption of ₹30,000.

- Closing Stock as per Financial accounts is ₹1,80,000 while as per cost accounts, the value comes as ₹2,12,400. Hence over valuation of ₹32,400 in cost
- Direct Expenses as per Financial accounts as ₹2,28,000 [₹2,40,000 -₹12,000 WIP] while in cost accounts, the amount recovered is ₹1,80,000.

(b) Write short notes on Zero-Base Budgeting (ZBB).

Answer:

Zero Base Budgeting is a method of budgeting starting from scratch or zero level. Proposals for the coming period should be based on merit and not related to past performance. Budgets prepared by conventional methods are the incremental type of budget based on actual performance in the past periods. In the zero base budget, the results of the past year is not accepted as a basis, since the past may conceal inefficiencies.

Zero Base Budget is mainly prepared by taking the following steps.

(i) Identification of decision units

(ii) Preparation of decision packages.

(iii) Ranking of decision packages using cost benefit analysis.

(iv) Allotment of available funds according to the priority determined by ranking each decision package is a self contained module explaining the need for a certain activity, its costs, its benefits consequences if the packages is not accepted etc. The ranking of package based on cost benefit analysis by the difficult levels of management starring from the bottom upward ensures allotment of funds to relatively more important and essential activities.

Question 9.

(a) A factory has a key resource (bottleneck) of Facility A which is available for 31,300 minutes per week. Budgeted factory costs and data on two products, A and B, are shown below:

Product	Selling price/Units	Material cost/Unit	Time in Facility A
A	₹40	₹20.00	5 minutes
B	₹40	₹17.50	10 minutes

Budgeted factory cost per week:

	₹
Direct labour	25,000
Indirect labour	12,500
Power	1,750
Depreciation	22,500
Space Costs	8,000
Engineering	3,500
Administration	5,000

Actual production during the last week is 4,750 units of product A and 650 units of product B. Actual factory cost was ₹78,250.

Calculate:

(i) Total factory costs (TFC)
(ii) Cost per factory minute
(iii) Return per factory minute for both products
(iv) TA ratios for both product
(v) Throughput cost per the week
(vi) Efficiency ratio

Answer:

(i) Total factory cost= Total of all costs except materials.
= ₹25,000+₹12,500+₹1,750+₹22,500+₹8,000+₹3,500+₹5,000
=₹78,250

(ii) Cost per Factory Minute=Total Factory Cost÷ Minutes available
= ₹78,250÷ 31,300
=₹2.50

(iii)

(a) Return per bottleneck minute for the product A= $\frac{\text{Selling Price} - \text{Material Cost}}{\text{Minutes in bottleneck}}$
= (40-20)/5
=₹4

(b) Return per bottleneck minute for the product Y= $\frac{\text{Selling price} - \text{Material Cost}}{\text{Minutes in bottleneck}}$
= (40-17.5)/10
=₹2.25

(iv) Throughput Accounting (TA) Ratio for the product X= $\frac{\text{Return per Minute}}{\text{Cost per Minute}}$
= (4/2.5)
=₹1.6

Throughput Accounting (TA) Ratio for the product Y= $\frac{\text{Return per Minute}}{\text{Cost per Minute}}$
= (2.25/2.5
=₹0.9

Based on the review of the TA ratios relating to two products, it is apparent that if we only made product B, the enterprise would suffer a loss, as its TA ratio is less than 1. Advantage will be achieved, when product A is made.

(v) Standard minutes of throughput for the week:
= [4,750×5] + [650×10]
= 23,750+6,500
=30,250 minutes

Throughput Cost per week:
=30,250×₹2.5 per minutes
=₹75,625

(vi) Efficiency % =(Throughput Cost/ Actual TFC) %
= (₹75,625/₹78,250) ×100
=96.6%

The bottleneck resource of facility A is advisable for 31,300 minutes per week but produced only 30,250 standard minutes. This could be due to:

(a) The process of a 'wandering' bottleneck causing facility A to be underutilized.
(b) Inefficiency in facility A.

(b) Starlight Co. and Jupiter Co. Ltd. sell the same type of product. Budgeted Profit & Loss A/c. of these companies for the year ended 31st march 2012 given below.

	Starlight Co. (₹000)		Jupiter Co. (₹000)	
Sales		**300**		**300**
Less: Variable Cost:				
Material	**100**		**80**	
Labour	**110**		**100**	
Overhead	**30**	**240**	**20**	**200**
Fixed Cost		**30**		**70**
		30		**30**

You are required to find out the break-even point of each Company. Also state clearly which Company is likely to earn greater profit if there is (i) heavy demand; and (ii) poor demand for its product.

Answer:

Statement of BEP

	Starlight Co. (₹000)	Jupiter Co. (₹000)
Sales	300	300
Variable Cost	240	200
Contribution	60	100
Fixed Cost	30	70
Budgeted Profit	30	30
P/V Ratio x100	60/300 x100=20%	100/300 x100=33.33%
BEP= F/P.V Ratio	30,000/20%=₹1,50,000	70,000/33.33%= ₹2,10,000
Margin of Safety (Sales-BE=P)	₹3,00,000-1,50,000 =₹1,50,000	3,00,000-2,10,000 =₹90,000

(i) In case of high demand, Jupiter co. is more profitable as its PV ratio is higher at 33.33%. After meeting its fixed cost of ₹70,000 the profit in Jupiter co. will be 33.33% of sales, whereas, it will be 20% of sales in case of Starlight Co. after meeting its fixed cost of ₹30,000.

(ii) In case of low demand, Starlight Co. is more profitable as its fixed cost and BEP are very low. After meeting fixed cost of ₹30,000 it will earn profit. Margin of safety is also higher in case of Starlight Co. Even if the sale is reduced to 50%.

Question 10.

(a) A Product is manufactured by mixing and processing three raw materials X, Y and Z as per standard data given below:

Raw material	Percentage of input	Cost per kg.
X	**40%**	**₹40**
Y	**40%**	**₹60**
Z	**20%**	**₹85**

Note: Loss during processing is 5% of input and this has no realizable value.
During a certain period 5,80,000 kg of finished product was obtained from inputs as per details given below:

Raw material	Quantity consumed	Cost per kg.
X	**240000 kg**	**₹38**
Y	**250000 kg**	**₹59**
Z	**110000 kg**	**₹88**

Calculate the total material cost variance with details of sub- variances relating to Price, Mix, Yield and Usage.

Answer:

Standard cost of the finished product:

Raw material	Percentage of % Input	Quantity (kg)	Cost per Kg. (₹)	Total (₹)
X	40%	40	40	1600
Y	40%	40	60	2400
Z	20%	20	85	1700
	Total Input	100		5700
	Less: Loss in processing	5		
	Output @5%	95		5700

Standard cost per Kg $\frac{5700}{95} = ₹60$

COMPUTATION OF VARIANCES:

Total material cost variance: Std cost of Actual Production (Output) – actual material cost for production

$$580000 \times ₹60 - \begin{cases} 240000X₹38=₹34800000 \\ 250000X₹59 \\ 11000X₹88 \end{cases} - ₹33550000$$

= ₹ 1250000 (FAV)

Material Price Variance: (Std Price – actual Price) x Actual qty consumed

X: (40-38) x 240000 = ₹480000 (FAV)

Y: (60- 59) x 250000 = ₹250000 (FAV)
Z: (85 – 88) X 110000 = ₹330000 (ADV)
₹400000(FAV)

Material Mix variance: (Input in Std proportion – actual input) x Std cost of input/kg

X (240000 – 240000) x ₹40 = Nil
Y (240000 – 250000) x ₹60 = ₹600000(ADV)
Z (12000 - 110000) x ₹85 = ₹850000 (FAV)
600000 600000 ₹250000 (FAV)

Yield variance = (Std yield from actual input – actual input) x std cost of finished product

$= (600000 \times \frac{95}{100} - 580000) \times ₹60$

= 10000 x ₹60 ₹ 600000(EAV)

Usage Variance: Standard cost (output) of Actual production/ (output) – Standard Cost of Actual quantity Consumed.

580000 x 60 – X: 240000 x 40
Y: 250000 x 60
Z: 110000 x 85
₹34800000 – ₹33950000 = ₹850000 (FAV)

Mix variance + Yield variance
₹250000 (FAV) + ₹600000(FAV)
₹850000(FAV)

(b) Explain the meaning of Uniform Costing. Write down the features of Uniform Costing.

Answer:

Uniform Costing is the use by several undertaking of the same costing principles and practices. The goal is set with Uniformity of principles and similarity of methods with the understanding that in a particular undertaking there may exist conditions which require variations in some respects from absolute uniformity.

Features of Uniform Costing are as follows:

- **(i)** Common bases for the apportionment and allocation of overhead to be followed by all units in the same industry.
- **(ii)** The departments sections or production centre's to be used for analysis and comparison of costs to be determined
- **(iii)** What items shall be regarded as factory or distinct from administration expenses to be clearly indicated
- **(iv)** Common basis for recovery of overheads.
- **(v)** Common rates of depreciation should be applied to plant & machinery.
- **(vi)** Uniform method of arriving service departments cost.
- **(vii)**To set up an organization to prepare comparative statistics for the use of those adopting the uniform system. Privacy of Individual data and confidence in the coordinating office Are essential facto₹

There may be some operational problems in this system. The main point is the mutual understanding and belief if that is built in good sense it certainly brings all benefits to the concerned parties.

Question.11

(a) A manufacturing Company having a capacity of 6 lakh units has prepared the following cost sheet:

	Per unit
Direct materials	**₹2.50**
Direct wages	**1.00**
Factory overheads	**2.00 (50% fixed)**

Selling & admn. Overheads	**1.50 (one- third variable)**
Selling price	**9.00**

During the year 2015, the sales volume achieved by the company was 5 lakh units. The company has launched an expansion programme. The details of which are as under:

- **The capacity will be increased to 10 lakh units.**
- **The additional fixed overheads will amount to ₹4 lakhs up to 8 lakh units and will increase by ₹2 lakhs more beyond 8 lakh units.**
- **The cost of investment on expansion is ₹ 8 lakhs which is proposed to be financed through bank borrowings carrying interest at 15% per annum.**
- **The average depreciation rate on the new investment is 10% based on straight line method.**

Assume that the company's profits are taxed at the rate of 50%.

After the expansion is put through, the company has two alternatives for operating the expanded plant as under:

a. Sales can be increased upto 8 units by spending ₹1,00,000 on special advertisement campaign to explore new market, or

b. Sales can be increased to 10 lakh units subject to the following:

- **By an overall price reduction of Re. 1 per unit on all the units sold.**
- **By increasing the variable selling and administration expenses by 5%.**
- **The direct material costs would go down by 1% due to discounts on bulk buying.**

Required:

Construct a flexible budget at the level of 5 lakhs, 8 lakhs and 10 lakhs units of production and advice which level of output should be chosen for operation.

Answer

Flexible Budget

Output levels (units)	5 lakhs	8 lakhs	10 lakhs
Sales	45.00	72.00	80.00
Direct materials @ ₹2.50 per unit, but at a level of 10 lakhs discount of 1% is to allowed)	12.50	20.00	24.75
Direct wages	5.00	8.00	10.00
Factory overhead (V)	5.00	8.00	10.00
Selling & administration overhead – (V) (at level of 10 lakhs S & Adm. Increase by 5%)	2.50	4.00	5.25
Total Variable cost	25.00	40.00	50.00
Contribution	20.00	32.00	30.00
Fixed Expenses:			
Fixed factory overhead	6.00	6.00	6.00
Selling & Admn.	6.00	6.00	6.00
Increase due to expansion	-	4.00	6.00
Interest @ 15% on 8 lakhs	-	1.20	1.20
Dep[recitation @ 10% on 8 lakhs	-	0.80	0.80
Special advertisement	-	1.00	-
Total fixed expenditure	12.00	19.00	20.00
Profit	8.00	13.00	10.00
Therefore, activity to be chosen is 8 lakhs			

(b) Following information is available regarding process A for the month of February-

1. Production

Units in process as on 1st Feb. (All material used, 25% complete for Labour and Overhead)	**4,000**
New units introduced	**16,000**
Units completed	**14,000**
Units in process as on 28th Feb (All materials used, 33-1/3% complete for Labour and OH)	**6,000**

2. Cost Records

Work-in-process as on 1st Feb (Materials ₹6,000 + Labour ₹1,000 + ₹1,000) = 8,000
Cost incurred during the month – Material ₹25,600 + Labour ₹15,000 + OH ₹15,000 = 55,600

Presuming that average method of inventory is used, prepare-

(i) Statement of Equivalent Production
(ii) Statement showing cost for each element.
(iii) Statement of apportionment of cost.
(iv) Process Cost Account for Process A.

Answer:

(i) Statement of Equivalent Production

Particulars	Input	Particulars	Output	Materials		Labour		Overhead	
				%	E.U	%	E.U	%	E.U
Opg. WIP	4,000	Transfer to Pr-B	14,000	100%	14,000	100%	14,000	100%	14,000
Fresh units	16,000	Closing WIP	6,000	100%	6,000	1/3rd	2,000	1/3rd	2,000
Total	20,000	Total	20,000		20,000		16,000		16,000

(ii) Statement of Cost per Equivalent Unit

Cost Element	Prev. Period (Opg. WIP)	Current Cost	Total Cost	E.U	Cost Per E.U
Materials	6,000	25,600	31,600	20,000	₹1.58
Labour	1,000	15,000	16,000	16,000	₹1.00
Overheads	1,000	15,000	16,000	16,000	₹1.00
Total	8,000	55,600	63,600		

(iii) Statement of Cost Apportionment

Particulars	Matls at ₹1.58/eu	Lab. At Re. 1/eu	OH at Re.1/eu	Total
Transfer to Pr. B	14,000x1.58=22,120	14,000x1=14,000	14,000x1=14,000	50,120
Closing WIP	6,000x1.58=9,480	2,000x1=2,000	2,000x1=2,000	13,480
Total	31,600	16,000	16,000	63,600

(iv) Process "A" Account

Particulars	Quantity	₹	Particulars	Quantity	₹
To Opn. WIP	4,000	8,000	By Process B-transfer	14,000	50,120
To Materials	16,000	25,600	By Closing WIP	6,000	13,480

To Labour		15,000			
To Overheads		15,000			
Total	20,000	63,600	Total	20,000	63,600

Note: Since the cost per e.u. has been calculated including opg WIP cost, cost of transfer is directly valued at the WAC per unit.

Question.12

(a) Explain the methods of Transfer Pricing.

Answer:

Methods of Transfer Pricing

(i) Cost based pricing where cost may be actual cost of production, full cost, standard cost, and marginal cost.

(ii) Market based pricing where transfer price will be determined according to price prevailing in the market.

(iii) Negotiating pricing where price may be fixed through negotiation between two divisions.

(iv) Opportunity cost pricing.

The fixation of transfer price is a very delicate decision and there is likely to be clash of interest. As such, Goal Congruence should be given highest importance.

(b) The Best Industries Ltd has two divisions, A and B. Division A manufactures product X which it sells in outside market as well as to division B which processes it to manufacture Z. The manager of division B has expressed the opinion that the transfer price is too high. The two divisional managers are about to enter into discussions to resolve the conflict, and the manager of division to supply him with some information prior to the discussions. Division A has been selling 40,000 units to outsiders and 10,000 units to division B, all at `20 per unit. It is not anticipated that these demand will change. The variable cost is `12 per unit and the fixed costs are `2 lakh.

The manager of division A anticipates that division B will want a transfer price of ` 18. If he does not sell to division B `30,000 of fixed costs and `1,75,000 of assets can be avoided.

The manager of division A would have no control over the proceeds from the sale of the assets and is judged primarily on his rate of return.

(i) Should the manager of division A transfer its products at ` 18 to division B?

(ii) What is the lowest price that the division A should accept? Support your decision.

Answer:

(i) Comparative Statement of Profits of Division A

Particulars	Alternative Situation		
	Sell at ₹20	Transfer at ₹18	Do not Transfer
Sales Revenue:			
Market Sales (40,000 x ₹20)	8,00,000	8,00,000	8,00,000
Transfer to Division B	2,00,000	1,80,000	-
Total (A)	10,00,000	9,80,000	8,00,000
Variable Cost ₹12 per unit	6,00,000	6,00,000	4,80,000
Fixed Cost	2,00,000	2,00,000	1,70,000

Total (B)	8,00,000	8,00,000	6,50,000
Total Profit (A-B)	2,00,000	1,80,000	1,50,000
Total Assets	8,00,000	8,00,000	6,25,000
ROI (%)	25%	22.5%	24%

The manager of division A should not agree to sell at ₹18 per unit as it lowers down its rate of return.

(ii) The lowest transfer price acceptable to division A is one, which maintains its rate of return of 24% (the ROI without selling to division B):
= (Total sales revenue – Total cost)/ Total assets
= (8,00,000 + 10,000 TP – 8,00,000)/8,00,000 = 0.24
Where TP is transfer price per unit
10,000 TP = 1,92,000
TP = ₹19.20
The lowest transfer price acceptable to division A is ₹19.20 per unit.

(c) List out the limitation of Standard Costing.

Answer:

Limitations of standard costing:

- Establishment of standard costs is difficult in practice.
- In course of time, sometimes even in a short period the standards become rigid.
- Inaccurate, unreliable and out of date standards do more harm than benefit.
- Sometimes, standards create adverse psychological effects. If the standard is set at high level, its non achievement would result in frustration and build-up of resistance.
- Due to the play of random factors, variances cannot sometimes be properly explained, and it is difficult to distinguish between controllable and non-controllable expenses.
- Standard costing may not sometimes be suitable for some small concerns. Where production cannot be carefully scheduled, frequent changes in production conditions result in variances. Detailed analysis of all of which would be meaningless, superfluous and costly.
- Standard costing may not, sometimes, be suitable and costly in the case of industries dealing with non-standardized products and for repair jobs which keep on changing in accordance with customer's specifications.
- Lack of interest in standard costing on the part of the management makes the system practically ineffective. This limitation, of course, applies equally in the case of any other system which the management does not accept wholeheartedly.

Question.13

(a) SCI-FI Co. sells two products – A and B. In addition to direct costs, indirect S and D Costs to be apportioned between the two products are as follows:-

Insurance Charges for Inventory	**₹39,000**
Storage costs	**₹70,000**
Packing and Forwarding Charges	**₹3,60,000**
Salesmen's Salaries and Commission	**₹4,25,000**
Invoicing Costs	**₹2,25,000**

Other details are:

Particulars	Product A	Product B
Selling price per unit	**₹250**	**₹500**
Cost per unit (excluding indirect S & D costs)	**₹150**	**₹300**
Annual Sales in units	**5,000**	**4,000**
Average Inventory (units)	**500**	**400**
Number of Invoices	**2,500**	**2,000**

One unit of A requires storage space twice as much as product B. The cost to pack and forward one unit is the same for both the products. Salesmen are paid salaries plus commission at 5% on sales and equal amount of efforts are put forth on the sales of each of the products.

Prepare a schedule showing the apportionment of the indirect Selling & Distribution Costs to the two products.

Answer:

Statement of Apportionment of Selling & Distribution Overheads

Particulars	Basis	Ratio	Total	A	B
Insurance	Cost of average inventory	75:120	39,000	15,000	24,000
Storage Costs	Storage space of avg. inventory	5:2	70,000	50,000	20,000
Packing & Forwarding	Quantity sold	5:4	3,60,000	2,00,000	1,60,000
Salesmen's Salary & Commission	As per working note below		4,25,000	1,93,750	2,31,250
Invoicing Commission	Number of invoices	25:20	2,25,000	1,25,000	1,00,000
Total			11,19,000	5,83,750	5,35,250

Working Notes:

Particulars	A	B	Total
Cost of Average Inventory	150 x 500= 75,000	300 x 400= 1,20,000	Ratio=75:120
Storage Space	500 x 200%=1,000	400 x 100%=400	5:2
Quantity Sold	5,000	4,000	5:4
Sales Turnover	500 x 250= 12.50 lakhs	400 x 500= 20 lakhs	
Salesmen Remuneration:			
Comm. at 5% on sales	62,500	1,00,000	1,62,500
Salary, bal. fig, divided equally	1,31,250	1,31,250	2,62,500
Total Remuneration (given)	1,93,750	2,31,250	4,25,000

(b) Superglow Ltd. is a trader in four major varieties of paints. All varieties are equally popular and the monthly sales of each are 500 tins. The following information is presented for a month.

Variety	Ruby Red	Marvel Green	Silver White	Regular Blue
Selling price per tin	**₹150**	**₹125**	**₹250**	**₹500**
Purchase price per tin	**₹90**	**₹80**	**₹180**	**₹400**

Warehouse area occupied	50 cu.cm	75 cu.cm	125 cu.cm	200 cu.cm
Financing cost per unit per day	₹2	₹2	₹2.5	₹3
Average stay in stores	3 days	3 days	3 days	3 days

The varieties' Direct Costs are:-

(i) Transportation – 2% of purchase price

(ii) Incentive to staff – 1% of sale price

(iii) Warehouse rent - ₹9,000 (Based on area occupied)

(iv) Financing cost – Based on average stay in stores

Indirect costs and establishment expenses work out to ₹71,625

You are required to prepare a statement showing direct product profit per unit for each variety. Also compute the profit for the month.

Answer:

Direct Product Profitability Statement

Product	Ruby Red	Marvel Green	Silver White	Regal Blue
Sale price per tin	150.00	125.00	250.00	500.00
Less: Purchase price per tin	90.00	80.00	180.00	400.00
Transportation at 2%	1.80	1.60	3.60	8.00
Incentive on sales	1.50	1.25	2.50	5.00
Warehouse rent (see note)	2.00	3.00	5.00	8.00
Financing cost	6.00	6.00	7.50	9.00
Direct product profit per unit	48.70	33.15	51.40	70.00
Quantity sold	500 units	500 units	500 units	500 units
Total direct product profit	24,350	16,575	25,700	35,000

Total direct product profit = 24,350 + 16,575 + 25,700 + 35,000 = ₹1,01,625

Less: General indirect costs and establishment expenses (given) = ₹71,625

Hence, Net Profit = ₹30,000

Note: Warehouse rent = ₹9,000, apportioned based on area occupied as ₹1,000, ₹1,500, ₹2,500 and ₹4,000 respectively. Cost per tin is calculated.

(c) Explain the steps to be followed to increase the throughput.

Answer:

The steps are as follows:

- Identify the bottle neck in the system i.e., identification of the limiting factor of the production (or) process such as installing capacity or hours etc.
- Decide how to exploit the systems bottleneck that means bottleneck resource should be actively and effectively used as much as possible to produce as many goods as possible.

- Subordinate everything else to the decision made in step (ii). The production capacity of the bottleneck resource should determined production schedule.
- Augment the capacity of the bottleneck resource with the minimum capital input.
- Identify the new bottlenecks in the process and repeat the same above steps to address the bottlenecks

Question.14

(a) Marlson Chair Company received an offer in October 2014 to sell 25,000 outdoor patro chairs to Easy Life Corporation. Easy Life will like Marlson & Co. to bid for the proposed sales order and indicates that this is a one-time order.

Marlson Company produces 4,00,000 chairs annually by operating at 80% of full capacity. Regular selling price for the type of chairs is ₹33. The chairs required are similar to those currently being produced by Marlson & Co. Budgeted annual production costs and other expenses for 2014 are as follows:

Volume of 4,00,000 chairs	Total	Per unit
Raw Material	₹17,00,000	₹4.25
Direct Labour	23,00,000	5.75
Variable factory overhead	31,00,000	7.75
Fixed factory overhead	25,00,000	
Variable selling costs	5% of selling price	
Fixed selling & Administration overhead	₹14,50,000	

Marlson Company wants to earn a minimum profit of Re.1 per chair and no selling expenses will be incurred for special order transactions. Assume that normal operations will not be affected by the special order and that regular sales volume for 2014 is 4,00,000 chairs as initially planned.

Required:

(i) What should be minimum price to be quoted by Marlson & Co.?

(ii) Prepare an income statement analysis showing the position of Marlson & Co. Without special order, for special order and with special order.

Answer:

(i)

Variable cost to be incurred	(Per unit)
Raw Material	₹4.25
Direct Labour	5.75
Variable Overhead	7.75
Total Variable cost per unit	17.75
Total incremental cost for 25,000 units (25,000 × ₹17.75)	₹4,43,750
Desired Profit (25,000 × Re.1.00)	25,000
	4,68,750
Units selling price to be quoted by Marlson & Co. (4,68,750 ÷ 25,000)	₹18.75

(ii) Income Statement Analysis

Details	Without special order	For special order	With special order
Sales	₹1,32,00,000	₹4,68,750	₹1,36,68,750
Less: Variable costs:			
Raw Material	₹17,00,000	₹1,06,250	₹18,06,250

Direct Labour	23,00,000	1,43,750	24,43,750
Variable Factory Overhead	31,00,000	1,93,750	32,93,750
Variable Selling Costs	6,60,00	-	6,60,000
Total Variable Costs	77,60,000	4,43,750	82,03,750
Total Contribution	54,40,000	25,000	54,65,000
Fixed Factory Overhead	25,00,000	-	25,00,000
Fixed Selling & Adm. Overhead	14,50,000	-	14,50,000
Total Fixed Overhead	39,50,000	-	39,50,000
Profit	14,90,000	25,000	15,15,000

In short run, as long as relevant revenues are in excess of relevant costs for each decision, profit will be increased or losses decreased. A policy of minimizing losses can also be continued for short period, as in the long term, a company must generate profits, if it is to stay in business.

(b) Write short notes on Uniform Cost Manual.

Answer:

Uniform Cost Manual is written document, in the form of a booklet or bulletin, containing the principles, methods and procedures for the ascertainment and control of cost in uniform costing. It provides guidelines to the participating firms to organize their cost accounting system on a uniform basis. Its contents include –

- Statement of objectives and purpose of the system, scope of the system, advantages and extent of cooperation necessary.
- General principles of accounting, nature of coding, terminology to be followed, classification and description of accounts.
- Details of stock, Labour, OH – methods of cost collection and procedures of cost control are contained.
- Essential cost data and various ratios to be computed for comparison of performance and efficiency in the operation of the participating units.
- Mode, format and time for presenting cost and reports to the Management.
- Guidelines on the treatment of depreciation, interest on capital, wastage, scrap, by-product etc.

Question.15

(a) Budgeted and actual sales for the month of December 2014 of two products A and B of Messers XY Ltd. were as follows:

Budgeted			Actual	
Product	**Units**	**Price/unit**	**Units**	**Price/unit**
A	**6,000**	**5.00**	**5,000**	**5.00**
			1,500	**4.75**
B	**10,000**	**2.00**	**7,500**	**2.00**
			1,750	**1.90**

Budgeted costs for the products A and B were ₹4.00 and ₹1.50 per unit respectively. Work out from the above data the following variances:

(i) Sales Value Variance

(ii) Sales Volume Variance

(iii) Sales Price Variance

(iv) Sales Mixture Variance

(v) Sales Quantity Variance.

Answer:

For Sales Value Variances		
SV_1 – Actual sales value realized:		
A - (5,000x ₹5) + (1,500 x ₹4.75)	₹32,125	
B – (7,500 x ₹2) + (1,750 x ₹1.90)	₹18,325	₹50,450
SV_2 – Std. sales value of actual sales:		
A – (6,500 x ₹5.00)	₹32,500	
B – (9,250 x ₹2.00)	₹18,500	51,000
SV_3 – Std. value of actual sales if it had been in the ratio of standard mix		
A – 15,750 x (6,000 ÷ 16,000) x ₹5	₹29,531	
B – 15,750 x (10,000 ÷ 16,000) x ₹2	19,688	₹49,219
SV_4 – Std. value of sales as per Budget		
(6,000 x ₹5) + (10,000 x ₹2.00)	50,000	

Sales Value Price Variance: ($SV_1 – SV_2$)	₹50,450 - 51,000	₹550(A)
Sales Mix Variance: ($SV_2 – SV_3$)	₹51,000 – 49,219	₹1,781 (F)
Sales Quantity Variance: ($SV_3 – SV_4$)	₹49,219 – 50,000	₹781 (A)
Sales Volume Variance: ($SV_2 – SV_4$)	₹51,000 - ₹50,000	₹1,000 (F)
Sales Value Variance: ($SV_1 – SV_4$)	₹50,450 – 50,000	₹450 (F)

(b) The profit of X Ltd. for the year 2014 has been worked out to 12.5% on the capital employed and the relevant figures are under:

Sales	**₹5,00,000**
Variable Overheads	**₹40,000**
Direct materials	**₹2,50,000**
Capital employed	**₹4,00,000**
Direct labour	**₹1,00,000**

The new sales manager who has joined the company recently has estimated a profit of about 23% on the capital employed for the next year, provided the volume of sales increases by 10%, the selling price increases by 4% and there is an overall cost reduction (for all the cost element) by 2%.

You are required to find out (by given details of computation) the cost and profit figures for the next year and make comments on the estimates of the sales manager.

Answer:

Proft @12.5% on capital employed = 4,00,000 x 0.125 = ₹50,000

As per the estimate of the new sales manager, the profit for the next year would be ₹92,000, i.e., 23% of ₹4,00,000 provided certain change take place.

Comparative Statement of Profitability

Particulars	As per the estimate of the new manager		
	Present level	Increase in sales volume by 10%	Effect of change*
Sales	₹5,00,000	₹5,50,000	5,72,000 i.e., ₹5,50,000 x 1.04
Direct material	2,50,000	2,75,000	2,69,500 i.e., ₹2,75,000 x 0.98
Direct Labour	1,00,000	1,10,000	1,07,800 I.e., ₹1,10,000 x 0.98

Variable overhead	40,000	44,000	43,120 i.e., ₹44,000 x 0.98
Fixed overhead (Balancing figure)	60,000	60,000	58,800 i.e., ₹60,000 x 0.98
Total cost	4,50,000	4,89,000	4,79,200
Profit	50,000	61,000	92,780
% of profit on capital employed	12.5%	15.25%	23.195%

The estimates made by the new sales manager are quite rational because the change would result in a profit of slightly more than 23% on capital employed of ₹4,00,000.

(c) List the limitation of Inter-firm Comparison.

Answer:

Limitations of Inter-firm Comparison:

The practical difficulties that are likely to arise in the implementation of a scheme of inter-firm comparison are:

- The top management may not be convinced of the utility of inter-firm comparison.
- Reluctance to disclose data which a concern considers to be confidential.
- A sense of complacence on the part of the management who may be satisfied with the present level of profits.
- Absence of a proper system of Cost Accounting so that the costing figures supplied may not be relied upon for comparison purposes.
- Non-availability of a suitable base for comparison.

Section – B (Cost Records And Cost Audit)

Question.16

(a) The Rules state that cost records are to be maintained in Form CRA-1. However, CRA-1 does not prescribe any format but only provides principles to be followed for different cost elements. What are the role and status of Cost Accounting Standards/GACAP and its applicability vis-à-vis CRA-1?

Answer:

The principles of maintenance of cost accounting records have been notified in the Rules in CRA-1. The principles are in sync with the cost accounting standards. The Rules are principle based and no formats have been prescribed for maintenance of cost accounting records like pre-2011 industry specific rules. No separate format based records maintenance has been prescribed even for the Regulated Industry and the prescription has left it open for industry to maintain cost accounting records according to its size and nature of business so long as it determines a true and fair view of the cost of production, cost of sales and margin of the products/services. The cost audit report is required to be in conformity with the "cost auditing standards" as referred to in Section 148 of the Companies Act, 2013.

It is also to be noted that the Council of the Institute of Cost Accountants of India has made it mandatory for cost accountants in practice to follow and conform to the Cost Accounting Standards issued by it and it is incumbent on the cost auditors to report any deviations from cost accounting standards.

(b) Is maintenance of cost accounting records mandatory for a multi-product company where all the products are not covered under the Rules even if the Turnover of the individual product/s that are covered under the Rules is less than rupees thirty five crores?

Answer:

The Rules provide threshold limits for the company as a whole irrespective of whether all its products are as per the prescribed industry/sector provided under Table A or Table B. The Rules do not provide any minimum product specific threshold limits for maintenance of cost accounting records and consequently the company would be required to maintain cost accounting records for the products covered under Table-A or Table-B or both even if the turnover of such products is below rupees thirty five crores.

Question.17

(a) A company meets the threshold limits for both maintenance of cost records and cost audit in Year-0 (previous year) and consequently comes under the purview of the Rules in Year-1 (current year). If the turnover of company gets reduced to lower than the prescribed threshold limit in Year-1 (current year), whether Cost Records and Cost Audit will be applicable for Year-2 (next year).

Answer

Rule 3 of the Companies (Cost Records and Audit) Rules, 2014 states that a company engaged in the production of the goods or providing of services as prescribed having an overall turnover from all its products and services of rupees thirty five crore or more during the immediately preceding financial year, shall include cost records for such products or services in their books of account. Since the threshold limit for applicability of maintenance of cost accounting records is met in Year-0, the cost records are required to be maintained from Year-1. Once the maintenance of cost records becomes applicable, it would be maintained on a continuous basis in the subsequent years also. In the same line, cost audit will be applicable from Year-1 and for every year thereafter.

(b) The Rules prescribed in 2011 had introduced the concept of reporting under "Product Group". The present Rules are silent about Product Group. What is the requirement of preparation of cost statements of products/services so far as maintenance of cost accounting records is concerned and reporting thereof in the cost audit report?

Answer:

The concept of "Product Group" has been dispensed with in the present Rules. The cost records referred to in sub-rule (1) of Rule 5 is required to be maintained on regular basis in such manner as to facilitate calculation of per unit cost of production or cost of operations, cost of sales and margin for each of its products and activities. Hence, it is imperative that the cost accounting records are required to be maintained and cost statements prepared for each and every product/service/activity that the company is engaged in.

So far as reporting is concerned, Abridged Cost Statement for every product identified with the CETA Code is required to be provided. For activities/services for which CETA Code is not applicable, the Abridged Cost Statement shall be for each service/activity.

(c) Whether separate Form CRA-2 is required to be filed by a company having two or more different types of products covered under cost audit?

Answer:

CRA-2 Form (intimation for appointment of cost auditor to Central Government) has replaced the earlier Form 23C (application seeking approval for appointment of cost auditor). A single Form CRA-2 is required to be filed providing details of the sectors/industries covered under cost audit and details of cost auditor. For Companies appointing multiple cost auditors, only one single Form CRA-2 is required to be filed. Provision has been made in the Form to accommodate details of multiple cost auditors.

Question.18

(a) What types of Health Services are covered under the Companies (Cost Records and Audit) Rules 2014?

Answer:

The Companies (Cost Records and Audit) Rules 2014 covers **"Health services, namely functioning as or running hospitals, diagnostic centres, clinical centres or test laboratories".**

Any company engaged in providing Health services through functioning as or running hospitals, diagnostic centres, clinical centres, test laboratories, physiotherapy centres and post-operative/treatment centres are covered within the ambit of the Companies (Cost Records and Audit) Rules 2014. Further, companies running hospitals exclusively for its own employees are excluded from the ambit of these Rules, provided however, if such hospitals are providing health services to outsiders also in addition to its own employees on chargeable basis, then such hospitals are covered within the ambit of these Rules.

It is clarified that companies engaged in running of Beauty parlours / beauty treatment are not covered under these Rules.

(b) A cost auditor is required to certify under Para 1(vii) of the Cost Audit Report – "Detailed unit-wise and product/service-wise cost statements and schedules thereto in respect of the product/service under reference of the company duly audited and certified by me/us are/are not kept in the company". Whether product Cost Sheet prepared SKU wise/ type-wise/ size-wise/ specification-wise by the company is required to be certified by the cost auditor and kept in the company?

Answer:

Rule 5(2) of the Companies (Cost Records and Audit) Rules 2014 requires that "the cost records referred to in sub-rule (1) shall be maintained on regular basis in such manner as to facilitate calculation of per unit cost of production or cost of operations, cost of sales and margin for each of its products and activities".

The Rules have identified products as per CETA heading as defined in Rule 2(aa) which states "Central Excise Tariff Act Heading means the heading as referred to in the Additional Notes in the First Schedule to the Central Excise Tariff Act, 1985[5 of 1986]".

First Schedule to the Central Excise Tariff Act, 1985 states – "heading" in respect of goods, means a description in list of tariff provisions accompanied by a four-digit number and includes all sub-headings of tariff items the first four-digits of which correspond to that number.

The above definitions make it clear that maintenance of cost accounting records should conform to the CETA Heading and detailed unit-wise and product/service-wise cost statements and schedules thereto are required to be certified by the cost auditor.

(c) In the abridged cost statement, what are Industry specific operating expenses? When should this be used?

Answer:

Industry Specific operating expenses are those which are peculiar to a particular industry such as Telecommunication Industry which shows expenses such as Network Operating cost, License fee, Radio Spectrum charges, Microwave charges etc. which are peculiar to this Industry and should be disclosed separately in the cost statement. The Industry Specific operating expenses will vary from industry to industry depending upon the nature of operations. The industry specific operating expenses shall have to be identified and reported upon in the abridged cost statement.

Question.19

(a) The Companies (Cost Records and Audit) Rules, 2014 requires submission of a single cost audit report at company level. What is the procedure of certifying and submission of cost audit report of a company where more than one cost auditor is appointed?

Answer:

In case of a company having more than one cost auditor, it would be necessary for the company to appoint/designate one cost auditor as the lead cost auditor for consolidation of the report.

The individual cost auditors appointed for specific units/products would be required to audit and provide Para numbers A-4, B-1, B-2, B-2A, B-2B, B-2C, C-1, C-2, C-2A, C-2B, C-2C (as applicable), D-1 in respect of the products/services coming under the purview of their respective audits. The individual auditors would also be required to submit to the Board of Directors the individual cost audit report as per Form of the Cost Audit Report given in CRA-3.

The lead auditor would be responsible for preparing the Para numbers A-3, D-2, D-3, D-4, D-5, D-6 and consolidate Para numbers A-4, B-1, B-2, B-2A, B-2B, B-2C, C-1, C-2, C-2A, C-2B, C-2C (as applicable), D-1 received from the individual cost auditors.

The consolidated report should contain the reports of all the individual cost auditors including the report of the Lead Cost Auditor. In case individual cost auditors have any observations or suggestions or qualifications, they would be required to mention the same under Para 2 of the cost audit report and the lead auditor would have to mention the specific observations and/or qualifications of all the individual cost auditors in the place provided for the same in the under Para A-1.

The consolidated report so prepared would be converted to XBRL and submitted to the Central Government by the Company in Form CRA-4.

(b) Whether maintenance of cost accounting records and cost audit thereof, subject to threshold limits prescribed, is applicable to products which are for 100% captive consumption?

Answer:

The Companies (Cost Records and Audit) Rules, 2014 has specified different products and services for which maintenance of cost accounting records and cost audit thereof, subject to threshold limits prescribed, is mandatory.

In case a product is manufactured and 100% captively consumed for production of some other product which is also covered under these Rules and is subject to cost audit, then the cost of such captively consumed product would form part of the final product

which is also under cost audit and as such a separate cost audit report for the captively consumed product will not be necessary.

However, if the product is partly for captive consumption and partly sold, or if the product is 100% captively consumed for production of some other product which is not covered under these Rules, then cost audit would be applicable for such captively consumed product(s).

Question.20

(a) Is CRA-3 applicable for companies whose financial year commenced prior to April 1, 2014? Which Rules are applicable to companies whose financial year commenced on January 1, 2014?

Answer:

The Section 148 of the Companies Act, 2013 and Companies (Cost Records and Audit) Rules, 2014 are applicable from April 1, 2014. Companies that were covered under the erstwhile Companies (Cost Accounting Records) Rules, 2011 and met the threshold limits prescribed therein are required to get the cost audit of their companies audited for the financial year 01/01/2014 to 31/12/2014 under the 2011 Rules and submit their respective reports under Companies (Cost Audit Report) Rules, 2011.

Companies (Cost Records and Audit) Rules, 2014 is applicable to companies maintaining calendar financial year from 01/01/2015 onwards subject to the products/services being covered under Table-A or Table-B of Rule 3 and meeting the prescribed threshold limits.

(b) What is the procedure to be followed for fixing the remuneration of a cost auditor?

Answer:

Rule 14 of the Companies (Audit and Auditors) Rules, 2014 has laid down the procedure of appointment and fixing the remuneration of a cost auditor. It states as follows:

Remuneration of the Cost Auditor: For the purpose of sub-section (3) of section 148,**—**

(a) in the case of companies which are required to constitute an audit committee**—**

(i) the Board shall appoint an individual, who is a cost accountant in practice, or a firm of cost accountants in practice, as cost auditor on the recommendations of the Audit committee, which shall also recommend remuneration for such cost auditor;

(ii) the remuneration recommended by the Audit Committee under (i) shall be considered and approved by the Board of Directors and ratified subsequently by the shareholders;

(b) in the case of other companies which are not required to constitute an audit committee, the Board shall appoint an individual who is a cost accountant in practice or a firm of cost accountants in practice as cost auditor and the remuneration of such cost auditor shall be ratified by shareholders subsequently.

Question.21

(a) What is the procedure for appointment of cost auditor under the Companies Act, 2013?

Answer:

The cost auditor is to be appointed by the Board of Directors on the recommendation of the Audit Committee, where the company is required to have an Audit Committee. The cost auditor proposed to be appointed is required to give a letter of consent to the Board of Directors. The company shall inform the cost auditor concerned of his or its appointment as such and file a notice of such appointment with the Central

Government within a period of thirty days of the Board meeting in which such appointment is made or within a period of one hundred and eighty days of the commencement of the financial year, whichever is earlier, through electronic mode, in **form CRA-2**, along with the fee as specified in Companies (Registration Offices and Fees) Rules, 2014.

Any casual vacancy in the office of a cost auditor, whether due to resignation, death or removal, shall be filled by the Board of Directors within thirty days of occurrence of such vacancy and the company shall inform the Central Government in Form CRA-2 within thirty days of such appointment of cost auditor.

(b) Who can be appointed as a cost auditor?

Answer:

Only a Cost Accountant, as defined under section 2(28) of the Companies Act, 2013, can be appointed as a cost auditor.

Clause (b) of sub-section (1) of section 2 of the Cost and Works Accountants Act, 1959 defines "Cost Accountant". It means a Cost Accountant who holds a valid certificate of practice under sub-section (1) of section 6 of the Cost and Works Accountants Act, 1959 and is in whole-time practice. Cost Accountant includes a Firm of Cost Accountants and a LLP of cost accountants.

(c) What constitutes the cost records under Rule 2(e)?

Answer:

As per Rule 2(e) the Companies (Cost Records and Audit) Rules, 2014, "cost records" means 'books of account relating to utilization of materials, labour and other items of cost as applicable to the production of goods or provision of services as provided in section 148 of the Act and these Rules'. There cannot be any exhaustive list of cost accounting records. Any transaction - statistical, quantitative or other details - that has a bearing on the cost of the product/activity is important and form part of the cost accounting records.

Cost records are to be kept on regular basis to make it possible to "calculate per unit cost of production/operations, cost of sales and margin for each of its products for every financial year on monthly/quarterly/half-yearly/annual basis". What is required is to maintain such records and details in a structured manner on a regular basis so that accumulation is possible on a periodical basis.

Section – C (Economics For Managerial Decision Making)

Question.22

(a) Fit straight line by the least square method to the following figures of production of Sugar Factory. Estimate the production for the year 2016.

Year	2009	2010	2011	2012	2013	2014	2015
Production(in Lakh tons)	76	87	95	81	91	96	90

Answer:

Analysis of Trend by Least square Method

Year	x	Y (production)	xy	x^2

2009	-3	76	-228	9
20010	-2	87	-174	4
2011	-1	95	-95	1
2012	0	81	0	0
2013	1	91	91	1
2014	2	96	192	4
2015	3	90	270	9
Total	$\sum x = 0$	$\sum y = 616$	$\sum xy = 56$	$\sum x^2 = 28$

The two normal equations are as under:

Equation 1	**Equation** 2
$\sum y = na + b\sum x$	$\sum xy = a\sum x + b\sum x^2$
So, 616=7a+ b (0)	56=88 (0)+b (28)
So, 7a= 616	56=28b
a=616÷ 7=88	b=56÷28=2

The first degree polynomial trend equation (straight line trend) is Y=a+ bx
So, Y=88+2x (where original year is 2012, x=1 year unit)
Estimated production for the year 2016: Here, x=4 (i.e. from 2012 to 2016)
So, Y=88+2(4); 88+8=96.

Hence, production for the year 2016= 96 lakh tons.

(b) List out the factors involved in Demand Forecasting.

Answer:

Factors involved in Demand Forecasting:

(i) Time factor: Forecasting may be done for short-term or long-term. Short-term forecasting is generally taken for one year while long-term forecasting covering a period of more than 1 year.

(ii) Level factor: Demand forecasting may be undertaken at three different levels.
- Macro level: It is concerned with business conditions over the whole economy.
- Industry level: Prepared by different industries.
- Firm-level: Firm-level forecasting is the most important from managerial view point.

(iii) General or specific purpose factor: The firm may find either general or specific forecasting or both useful according to its requirement.

(iv) Product: Forecasting varies type of product i.e., new product or existing product or well established product.

(v) Nature of the product: Goods can be classified into
(i) consumer goods and (ii) producer goods.
Demand for a product will be mainly dependent on nature of the product. Forecasting methods for producer goods and consume/ goods will be different accordingly.

(vi) Competition: While making forecasting, market situation and the product position in particular market should be analyzed.

(vii) Consumer Behavior: What people think about the future, their own personal prospects and about products and brands are vital factors for firm and industry.

(c) What are the limitations of Regression Analysis?

Answer:

The limitation of Regression Analysis

- It is difficult to find out inter-dependence relationship between the variables.
- Sometimes it may be difficult to identify dependent and independent variables.
- Indicators are based on historical data. But the relationship cannot be established for the future.

Question.23

(a) The cost function 'c' for the commodity 'q' is given by $C = q^3 – 4q^2 + 16q$ find Average Variable Cost and also find the value of q for which average variable cost is minimum.

Answer:

$C = q^3 – 4q^2 + 16q$

Average Variable Cost = $q^2 – 4q + 16 – (\text{'y' say})$

$$\Rightarrow \frac{d}{dp}\left(q^2 - 4q + 16\right) = 0$$

$\Rightarrow 2q – 4 = 0$

$$\Rightarrow q = \frac{4}{2} = 2$$

$$\Rightarrow \frac{d^2y}{dx^2} = 2 > 0, \text{positive}$$

Average Cost is minimum at q = 2

(b) State the features of Price Determination under Monopoly Market.

Answer:

Features of Price Determination under Monopoly Market:

- **Single producer:** Under monopoly there is only one producer or seller. He controls the entire supply of the commodities. Monopoly may be an individual or a partnership or a joint stock company or a state. There is no competition in monopoly market
- **No close substitutes:** there are "no close substitutes" in monopoly market. There are no other firms produce the similar and nearer commodities for the product of monopoly.
- **No difference between Firm and Industry:** Under Monopoly market there is "no difference between firm and industry". There is only one firm and other firms should not produce the similar products which are produced by the monopoly firm. Therefore the firm and industry both are same under monopoly market.
- **No free entry:** The monopoly firm can get abnormal profits in the short run as well as in the long run because of strong restrictions on the entry of new firms. If the new firms have freedom to enter the market then the abnormal profits will disappear but in monopoly there is no free entry and therefore the Monopoly firm may get abnormal profits in long run also.
- **Monopolist controls only price (or) output:** Under monopoly the producer has controlling power on only price or output. He has no controlling power on both price and output simultaneously.

- **Revenue curve falls down from left to right:** In monopoly market the revenue curves are falling down from left to right. If the monopolist wants to sell more he must reduce the price level and if he wants to fix more price he must reduce the output.

(c) Cost Function $C = \frac{6}{10}x + \frac{30}{8}$**, find**

(i) Cost when output is 2 units

(ii) Average Cost of 5 units

(iii) Marginal Cost

Answer:

(i) Cost when output is 2 units

$$= \frac{6}{10} \times 2 + \frac{30}{8}$$

$$= \frac{6}{5} + \frac{15}{4}$$

$$= 8.7$$

(ii) Average cost of 5 units

Average cost =

$$= \frac{6}{10} + \frac{30}{8x}$$

$$= \frac{6}{10} + \frac{30}{8 \times 5}$$

$$= \frac{6}{10} + \frac{30}{40}$$

$$= 1.35$$

(iii) $Marginal Cost = \frac{dc}{dx}$

= 6/ 10

= 0.6

Question.24

(a) What are the Causes of downward slope of demand curve?

Answer:

Causes of downward slope of demand curve

- **Law of Diminishing Marginal Utility**: This law states that when a consumer buys more units of same commodity, the marginal utility of that commodity continues to decline. This means that the consumer will buy more of that commodity when price falls and when less units are available, utility will be high and consumer will prefer to pay more for that commodity. This proves that the demand would be more at lower prices and less at a higher price and so the demand curve is downward sloping.
- **Income effect:** As the price of the commodity falls, the consumer can increase his consumption since his real income is increased. Hence he will spend less to buy the same quantity of goods. On the other hand, with a rise in price of the commodities the real income of the consumer will fall and will induce them to buy less of that good.

- **Substitution effect:** When the price of a commodity falls, the price of its substitutes remaining the same, the consumer will buy more of that commodity and this is called the substitution effect. The consumer will like to substitute cheaper one for the relatively expensive one on the other hand, with a rise in price the demand fall due to unfavorable substitution effect. It is because the commodity has now become relatively expensive which forces the consumer's to buy less.
- **Goods having multipurpose use:** Goods which can be put to a number of uses like coal, aluminum, electricity, etc. are eg. of such commodities. When the price of such commodity is higher, it will not used for a variety of purpose but for use purposes only. On the other hand, when price falls of the commodity will be used for a variety of purpose leading to a rise in demand. For eg : if the price of electricity is high, it will be mainly used for lighting purposes, and when its price falls, it will be needed for cooking.
- Change in number of buyers: Lower the price, will attract new buyers and raising of price will reduce the number of buyers. These buyers are known as marginal buyers. Owing to such reason the demand falls when price rises and so the demand curve is downward sloping.

(b) Given $C = x^3 – 5x^2 + 9x$; $R= 6x^2 + 6x – 2$. Find the total profit and hence marginal profits.

Answer:

$C = x^3 – 5x^2 + 9x$

$R= 6x^2 + 6x – 2$

Total Profit = R – C

$= 6x^2 + 6x – 2 - x^3 + 5x^2 - 9x$

$= -x^3 + 11x^2 -3x – 2$

$= -(x^3 – 11x^2 + 3x + 2)$

$Marginal Profit = \frac{dc}{dx} = (3x2 – 22x + 3)$

(c) Katherine advertises to sell cookies for ₹4 a dozen. She sells 50 dozen, and decides that she can charge more. She raises the price to ₹6 a dozen and sells 40 dozen. What is the elasticity of demand? Assuming that the elasticity of demand is constant, how many would she sell if the price were ₹10 a box?

Answer:

To find the elasticity of demand, we need to divide the percent change in quantity by the percent change in price.

% Change in Quantity = (40 - 50)/(50) = -0.20 = -20%

% Change in Price = (6.00 - 4.00)/(4.00) = 0.50 = 50%

Elasticity = |(-20%)/(50%)| = |-0.4| = 0.4

The elasticity of demand is 0.4

To find the quantity when the price is ₹10 a box, we use the same formula:

Elasticity = 0.4 = |(% Change in Quantity)/(% Change in Price)|

% Change in Price = (10.00 - 4.00)/(4.00) = 1.5 = 150%

-0.4 = |(% Change in Quantity)/(150%)|

|(%Change in Quantity)| = -60% = -0.6

-0.6 = (X - 50)/50
X = 20
The new demand at ₹10 a dozen will be 20 dozen cookies.

Question.25
What are the pricing policies for introduction stage of a new product?

Answer.

There are two alternative price strategies which a firm introducing a new product can adopt, viz., skimming price policy and penetration pricing policy.

(a) Skimming Price Policy: When the product is new but with a high degree of consumer acceptability, the firm may decide to charge a high mark up and, therefore, charge a high price. The system of charging high prices for new products is known as price skimming for the object is to "skim the cream" from the market. There are many reasons for adopting a high mark-up and, therefore, high initial price:

(i) The demand for the new product is relatively inelastic. The high prices will not stop the new consumers from demanding the product. The new product, novelty, commands a better price.

Above all, in the initial stage, there is hence cross elasticity of demand is low.

(ii) If life of the product promises to be a short one, the management may fix a high price so that it can get as much profit as possible and, in as short a period as possible.

(iii)Such an initially high price is also suitable if the firm can divide the market into different segments based on different elasticity' s. The firm can introduce a cheaper model in the market with lower elasticity.

(iv)High initial price may also be needed in those cases where there is heavy investment of capital and when the costs of introducing a new product are high. The initial price of a transistor radio was ₹500 or more (now 50 or even less); electronic calculators used to cost ₹1,000 or more, they are now available for ₹100 or so.

(b)Penetration Price Policy: Instead of setting a high price, the firm may set a low price for a new product by adding a low mark-up to the full cost. This is done to penetrate the market as quickly as possible. The assumptions behind the low penetration price policy are:

(i)The new product is being introduced in a market which is already served by well-known brands. A low price is necessary to attract gradually consumers who are already accustomed to other brands.

(ii)The low price will help to maximize the sales of the product even in the short period.

(iii)The low price is set in the market to prevent the entry of new products. Penetration price policy is preferred to skimming price under three conditions: In the first place, skimming price offering a high margin will attract many rivals to enter the market. With the entry of powerful rivals into the market, competition will be intensified, price will fall and profits will be competed away in the long run. A firm will prefer a low penetration price if it fears the entry of powerful rivals with plenty of capital and new technology. For a low penetration price, based on extremely low mark-up will be least profitable and potential competitors will not be induced to enter the market.

Secondly, a firm will prefer low penetration price strategy if product differentiation is low and if rival firms can easily imitate the product. In such a case, the objective of the firm to fix low price is to establish a strong market based and build goodwill among consumers and strong consumer loyalty.

Finally, a firm may anticipate that its main product may generate continuing demand for the complementary items. In such a case, the firm will follow penetration pricing for its new product, so that the product as well as its complements will get a wider market.

Question.26

(a) The efficiency (E) of a small manufacturing concern depends on the number of workers (W) and is given by: $10E = \frac{-W^3}{40} + 30W - 392$. Find the strength of the workers, which give maximum efficiency.

Answer:

Given $10\,E = \frac{-w^3}{40} + 30W - 392$

Efficiency $(E) = \frac{-W^3}{400} + 3W - 39.2$

$\frac{dE}{dW} = -\frac{1}{400} \times 3W^2 + 3 = 0$

$\Rightarrow 3W^2 = 1200 \qquad \Rightarrow W = 20$

$\frac{d^2E}{dW^2} = -\frac{6W}{400}$

$\therefore \frac{d^2E}{dW^2}$ at $W = 20 = \frac{-6(20)}{400} = \frac{-3}{10} < 0$

Maximum Efficiency at W = 20

Hence the Strength of Workers = 20

(b) Why are AVC and ATC curves U-shaped?

Answer:

- The shapes of AVC and ATC curves are influenced by the shape of MC curve in the short-run.
- The shape of MC curve is U-shaped because of the operation of the law of variable proportions.
- Consequently, AVC and ATC curves are also U-shaped.
- Initially, in the stage of increasing returns when marginal cost curve falls, the AVC and ATC curves also fall.
- After a certain level of output in the stage of diminishing returns when marginal cost curve rises, the AVC and ATC curves also rise.
- Thus, because of the operation of law of variable proportions as output rises, the AVC and ATC curves first fall, reach their minimum and the begin to rise.
- So, in the short-run, MC curve, AVC curve and ATC curve all are U-shaped

Question.27

(a) Find an expression for price elasticity in the case of following demand functions and evaluate it at the price P = 20

(i) $Q = 1250 - 4P - P^2$

(ii) $\mathbf{Q = \frac{84}{P^6}}$

Answer:

(i) $Q = 1250 - 4P - P^2$

$\frac{dq}{dp} \text{ at } P = 20 = -4 - 2\ p = -44$

$\frac{q}{p} = \frac{1250}{p} - 4 - p$

= $62.5 - 4 - 20 = 38.5$

$\frac{q}{p} = \frac{1}{38.5}$

$E_p = 44 \times \frac{1}{38.5} = 1.143$

(ii)

$Q = \frac{84}{p^6}$

$\frac{dq}{dp} = \frac{84 \times (-6)}{p^7}$

$\frac{Q}{p} = \frac{84}{p^7} = \frac{p}{Q} = \frac{p^7}{84}$

$E_p = \frac{84 \times 6}{p^7} \times \frac{p^7}{84} = 6$

(b) A company is planning to market a new model of a doll. Rather than setting the selling price of the doll based only on production cost estimation management polls the retailers of the doll to see how many dolls they will buy for various prices. From this survey, it is determined at the unit demand function (the relationship between the amount 'x' each retailer would buy and the price he would pay) is x= 30,000 + 1500P. The fixed cost of the production of the dolls are found to be ₹28,000/- and cost of Material & labour to produce each doll is estimated to be ₹8/-per unit. What price should the company charge retailer in order to obtain a maximum profit? Also find the maximum profit.

Answer:

$x = 30000 + 1500P$

$x - 30000 = 1500P$

$\Rightarrow P = \frac{30000 - x}{1500}$

$\text{Revenue} = \frac{30000x - x^2}{1500}$

$C = 8x + 28000$

$\text{Profit} = \frac{30000x - x^2}{1500} - 8x - 28000$

$$\frac{dc}{dx} = \frac{1}{1500}(30000 - 2x) - 8 + 0$$

$= 30000 - 2x - 12000 = 0$

$-2x = -18000$

$x = 18000/2$

$= 9000$

$$\frac{d^2p}{dp^2} = -2, \text{which is Negative}$$

$$= \frac{30000 \times 9000 - 9000^2}{1500} - 72{,}000 - 28000$$

$$180000 - \frac{810000}{15} - 72{,}000 - 28000$$

$= 26{,}000$

Question.28

(a) State the term market and explain its elements?

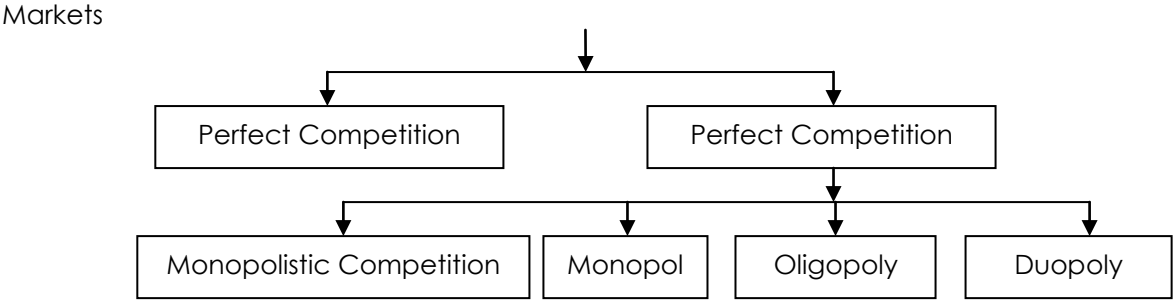
Answer:

In common parlance 'Market' refers to a place or locality where commodities are bought and sold. In an economic sense, a market is a system by which buyers and sellers bargain for the price of a product and transactions will take place in that system. Market does not limited to a particular place and personal contact between buyers and sellers is also not necessary. Market for a commodity may be local, regional, national or international.

"Market means the whole of any region which buyers and sellers are in such free intercourse with each other, that the price of the same goods tend to equally easily and quickly" as per Prof. Cournot.

As per Jevons, "The word market has been generalized so as to mean any body of persons who are in intimate business relations and carry on extensive transactions in any commodity".

Markets can be classified into two broad categories:



Elements of Markets:

- Sellers and buyer agree to transaction of a particular price of a product.
- Nature of the commodity is known to both parties.
- Price of the product is determined under conditions of the market.
- Competition is depend on the increase in the buyers and seller
- If there is increase in number buyers, price will increase and it is treated as Seller's market.
- If there is increase in number sellers, price will decrease, it is treated as buyer's market.
- Free communication between the buyers and sellers.

- Size of the market is not restricted; it may certain city, a region a country or even the entire world.
- Product is homogenous in case of perfect competition, and the product may be differentiated in case of other markets.

(b) The Demand and Supply function under perfect Competition are $y=16-x^2$ and $y=2x^2+4$ respectively.

Find:

(i) the Market Price

(ii) Consumer's Surplus

Answer:

Under Perfect Competition Market Price is : Demand = Supply i.e.

$16 - x^2 = 2x^2 + 4$

Or $16 - x^2 - 2x^2 - 4 = 0$

Or $-3x^2 + 12 = 0$

Or $-3x^2 = -12$

$$\therefore x^2 = \frac{12}{3} = 4$$

$x = \sqrt{4} = \pm 2$ i.e. 2 or -2 (since Quantity / units cannot be negative, rejecting the negative value (-2)

(i) Market Price $y = 16 - x^2$

$= 16 - 2^2 = 16 - 4 = 12$ (when $x = +2$)

(ii) Consumer's Surplus:

$$\int_0^2 \left(16 - x^2\right) dx - 2 \times 12$$

$$= \left[16x - \frac{x^3}{3}\right]_0^2 - 24$$

$$= 32 - \frac{8}{3} - 24 = \frac{16}{3}$$

(c) What are the components of time series?

Answer.

A typical time services has the following four major components:

- **A Secular trend**: representing the long-term direction, or average movement in the time series.
- **Cyclical fluctuations:** which usually follow variations in the growth of the economy in general, around a long-term, secular trend
- **Seasonal variations**: caused by changes in weather conditions and social habits, such as the need to buy X-mas cards in December and dresses during the festival season (Dewali or Durga Puja).
- **Random or unsystematic variations**: such as wars, revolutions, crop failures, natural calamities, and changes in tastes and preferences of buyers

Question.29

(a) Describe the criteria of a good forecasting method.

Answer.

Criteria of a good forecasting method are:

- **Accuracy -** It is essential to check the accuracy of the past forecasts against present performance and of present forecast against future performance.
- **Simplicity and Ease of comprehension-**Management must be able to understand the method of demand forecasting used and must have confidence in it. Too much of mathematical and econometric procedures may not find favour with the management.
- **Economy-** A good demand forecasting method is one which is highly economical. Thus it is necessary to compare the cost of the forecasting method against its likely benefits. It is desirable so to undertake cost benefit analysis.
- **Durability-** The technique of demand forecasting must be durable.
- **Effective-** The technique used for demand forecasting should be able to give meaningful result as early as possible. So the technique must be effective and productive.
- **Flexibility-** The forecasting procedure should permit changes to be made in the relationship between different variables as & when needed. It must be not rigid.
- **Maintenance of timeliness-** It must be in up to date basis. There must be continuous alterations & addition involving latest information and data.
- Longer the lead time the forecast has before the event, the greater will be its usefulness.

(b) A company sells two types of products, one is Super and the other is Delux. The Super contains 2 units of chemical M and 4 units of chemical N per jar and the Delux contains 3 units of each of the chemicals M and N per carton. The super is sold for ₹3 per jar and the Delux is sold for ₹4 per carton. A customer requires at least 90 units of chemical M and at least 120 units of the chemical N for his business. How many of each type of Super should the customer purchase to minimize the cost while meeting his requirements? Formulate the Linear Programming model for the above problem, need not to solve.

Answer:

	Products		Required Units
	Super	Delux	
Chemical M	2	3	90
Chemical N	4	3	120
Cost	3/-	4/-	

Let x_1 be the no. of litres of Super
Let x_2 be the no. of kilograms of Delux.

Objective Function:
Min. $Z = 3x_1+4x_2$

Subject to constraints:
$2x_1+3x_2 \geq 90$
$4x_1+3x_2 \geq 120$

And $x_1, x_2 \geq 0$

$2x_1+3x_2-x3+A1 = 90$

$4x_1+3x_2-x_4+A_2 = 120$

Question.30

(a) K ltd. sells output in a perfectly competive market. The average variable cost function K ltd. is

$AVC = 400 – 40Q + 2Q^2$

K ltd has an obligation to pay ₹500 irrespective of the output produced. What is the price below which K ltd. has to shut down its operation in the short run?

Answer:

A firm has to shut down its operation, if the price is less than average variable cost .under perfect competition

P = MR

i.e. Price is equal to marginal revenue. The firm will continue its operation under the short run so long as price is at least equal to average variable cost.

Thus the equilibrium price which the firm will shut down is the minimum AVC i.e. the average variable cost.

$AVC = 400 – 40Q + 2Q^2$

AVC is minimum where $\frac{d(AVC)}{dq} = 0$

$$\text{i.e.} \frac{d(AVC)}{dq} = 40 + 4Q = 0$$

i.e. Q = 10 units.

When the firm is producing 10 units,

$AVC = 400 – 40Q + 2Q^2$

$= 400 – 40(10) + 2 (10)^2$

$= 400 – 400 + 200$

$= 200$

If the price falls before ₹200 the firm has to shut down its operation under short run.

(b) The total cost function for a monopolist is given by

$TC = 900 + 40 Q^2$

The demand function for the good produced by the monopolist is given by

$2Q = 48 – 0.08 P$

What will be the profit maximising price?

Answer:

Demand function is given by

$2Q = 48 – 0.08 P$

or, $2Q – 48 = – 0.08 P$

or, $48 – 2Q = 0.08 P$

or, $P = 600 – 25Q$

$TR = PQ$

$= 600Q – 25Q^2$

TC is gven by,

$TC = 900 + 40Q^2$

The first order condition for profit maximization is MR = MC

$TR = 600Q - 25Q^2$

$$MR = \frac{dTR}{dQ} = 600 - 50Q$$

$$MC = \frac{d(TC)}{dQ} = 80Q$$

For maximizing profit

MR = MC

i.e. 600 – 50Q = 80Q

Q = 600/ 130 = 4.6 units

Equilibrium Price

=> P = 600 – 25Q = 600 – 25 (4.6)

= 600 – 115

= ₹485

i.e. profit maximizing price is ₹485

(c) Write the criticism of managerial use of production function.

Answer:

Criticisms:

- Cobb-Douglas production function is criticized because it shows a constant return to scale. But constant returns to scale are not actuality. Industry is either subject to increasing returns or diminishing returns. Due to scarcity and indivisibility of some factors it is not possible to make a proportionate change of all factors. So constant returns are not possible.
- No entrepreneur will like to increase the inputs to have constant returns only. His aim will be to get increasing returns but not constant returns.
- Problems arise when this production function is applied to each firm in the industry and to the industry as a whole. This function as applied to each firm may not give the same result as that of the industry.
- It is based on the assumption that factors of production are substitutable and excludes complementary of factors. But, in the short non-complementary of factors is possible. Therefore, it applies more to the long run than the short run.