PAPER – 10: COST & MANAGEMENT ACCOUNTANCY

The following table lists the learning objectives and the verbs that appear in the syllabus learning aims and examination questions:

	Learning objectives	Verbs used	Definition
LEVEL B	KNOWLEDGE What you are expected to know	List	Make a list of
		State	Express, fully or clearly, the details/facts
		Define	Give the exact meaning of
	COMPREHENSION What you are expected to understand	Describe	Communicate the key features of
		Distinguish	Highlight the differences between
		Explain	Make clear or intelligible/ state the meaning or purpose of
		Identity	Recognize, establish or select after consideration
		Illustrate	Use an example to describe or explain something
	APPLICATION How you are expected to apply your knowledge	Apply	Put to practical use
		Calculate	Ascertain or reckon mathematically
		Demonstrate	Prove with certainty or exhibit by practical means
		Prepare	Make or get ready for use
		Reconcile	Make or prove consistent/ compatible
		Solve	Find an answer to
		Tabulate	Arrange in a table
	ANALYSIS How you are expected to analyse the detail of what you have learned	Analyse	Examine in detail the structure of
		Categorise	Place into a defined class or division
		Compare and contrast	Show the similarities and/or differences between
		Construct	Build up or compile
		Prioritise	Place in order of priority or sequence for action
		Produce	Create or bring into existence

Paper – 10: Cost & Management Accountancy

Time Allowed: 3 Hours **Full Marks: 100**

This paper contains 4 questions. All questions are compulsory, subject to instruction provided against each question. All workings must form part of your answer. Assumptions, if any, must be clearly indicated.

1. Answer all questions [2x10=20]

(a) Selling price of a product is ₹10 per unit, variable cost is ₹6 per unit and fixed cost is ₹12,000. Then what will be the break-even point in unit?

Answer:

Contribution = Sales - Variable Cost
=₹10 - 6
=₹ 4

Break-even Point = Fixed Cost/Contribution per unit
= ₹12,000/₹4
= 3,000 units

(b) State the two objectives of Cost Accounting.

Answer:

The main two objectives of Cost accounting are as follows:

(i) To ascertain the costs under different situations using different techniques and system of costing.
(ii) To determine the value of closing inventory for preparing financial statements of the concern.

(c) A television Company manufactures several component in batches.
The following data relate to one component:

Annual demand	**32,000 units**
Set up cost/batch	**₹120**
Annual rate of interest	**12%**
Cost of production per unit	**₹16**

Calculate the Economic Batch Quantity (EBQ).

Answer:

$$E.B.Q = \sqrt{\frac{2AS}{C}}$$

Where, A= Annual demand,
S=Set up cost per batch,
C=carrying cost per unit per year,

$$E.B.Q = \sqrt{\frac{2\times 32,000\times 120}{16\times 0.12}}$$

=2,000 units

(d) A transport service company is running 4 buses between two towns which are 50 miles apart. Seating capacity of each bus is 40 passengers. The following particulars were obtained from their books for April, 2015.

	₹
Wages of Drivers, Conductors and Cleaners	**5,200**
Salaries of Office and Supervisory Staff	**1,600**
Diesel oil and other oil	**7,600**
Repairs and Maintenance	**2,000**
Taxation, Insurance etc	**3,200**
Depreciation	**5,200**
Interest and Other Charges	**2,000**
	26,800

Actual passengers carried were 75% of the seating capacity. All the four buses ran on all days of the month. Each bus made one round trip per day. Find out the cost per passenger mile.

Answer:

Computation of Cost per Passenger Mile:

Passenger miles =

No. of buses x Distance x Round trip x No. of Passengers x No. of days in month x Capacity.

= 4 x 50 x 2 x 40 x 30 x 75%

= 3,60,000 miles

Cost per passenger mile = 26,800 / 3,60,000

= ₹ 0.074

(e) The output of three different products A, B, and C in a factory are 15,000 kg, 15,000 kg and 20,000 kg respectively. If the costs totals to ₹ 13,75,000 and are in the proportion of 4:6:7 then what will be the cost per equivalent unit in ₹?

Answer:

Products	Units	Cost Ratio	Equivalent units
A	15,000	7	1,05,000
B	15,000	6	90,000
C	20,000	4	80,000
			2,75,000

Cost per equivalent unit=₹ 13,75,000 / ₹ 2,75,000 = ₹ 5.

(f) Revised Form CRA-2 has been made available by the Ministry of Corporate Affairs conforming to the Companies (Cost Records and Audit) Rules, 2014 on 31st December, 2014. What are the required attachments to Form CRA-2?

Answer:

The Form has provided an attachment button for attachment of certified copy of the Board Resolution appointing the cost auditor. The consent letter of the cost auditor should be attached as optional attachment.

(g) Whether figures are to be provided for Rupees per Unit or Amount in Rupees in the Product and Service Profitability Statement [CRA-3, Part D, Para 1]?

Answer:

Amount in Rupees are required to be provided under this Para. The number of products or services will be equal to the number of products and services covered under cost audit and for which Abridged Cost Statement has been provided.

(h) Find the Elasticity of Demand for

$$P = \frac{4}{(2x+1)^2}$$

Answer:

$$P = \frac{4}{(2x+1)^2} = 4\,(2x+1)^{-2}$$

$$\frac{dp}{dx} = 4 \times -2 \times (2x+1)^{-3} = -8\,(2x+1)^{-3}$$

$$\frac{dx}{dp} = -\frac{1}{8(2x+1)^{-3}}$$

$$= -\frac{1}{8}(2x+1)^3 = -\frac{(2x+1)^3}{8}$$

$$\frac{P}{x} = \frac{4}{x(2x+1)^2}$$

Elasticity of demand (E_p) =

$$\frac{(2x+1)^3}{8} \times \frac{4}{x(2x+1)^2} = \frac{2x+1}{2x}$$

(i) 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.

(j) 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

2. Answer any two questions from a, b and c. [2x20=40]

2(a) (i) PQR Ltd. manufactures four products, namely A, B, C and D using the same plant and process. The following information relates to production period October. 2015:

Product	A	B	C	D
Output in units	1,440	1,200	960	1,008
Cost per unit:				
Direct Materials	₹ 42	₹ 45	₹ 40	₹ 48
Direct Labour	₹ 10	₹ 9	₹ 7	₹ 8
Machine hours per unit	4	3	2	1

The four products are similar and are usually produced in production runs of 48 units per batch and are sold in batches of 24 units. Currently, the production overheads are absorbed using machine hour rate. The production overheads incurred by the company for the period October, 2015 are as follows:

	₹
Machine department costs (rent, depreciation and supervision)	1,26,000
Set-up Costs	40,000
Store receiving costs	30,000
Inspection	20,000
Material handling and despatch	5,184

During the period October, 2015, the following cost drivers are to be used for allocation of overheads cost:

Cost	Cost driver
Set-up Costs	Number of production runs (batches)
Stores receiving	Requisition raised
Inspection	Number of production runs (batches)
Material handling and dispatch	Orders executed

It is also determined that:

(i) Machine department costs should be apportioned among set-up, stores receiving and inspection activities in proportion of 4:3:2.

(ii) The number of requisitions raised on stores are 50 for each product. The total number of material handling and despatch orders executed during the period are 192 and each order being for a batch size of 24 units of product.

Required:

(i) Calculate the total cost of each product, if all overheads costs are absorbed on machine-hour rate basis,

(ii) Calculate the total cost of each product using activity-based costing,

(iii) Comment briefly on as to how an activity-based costing might benefit PQR Ltd.

[3+6+1]

Answer:

(i) Absorption of overheads on Machine hour basis.

Step I: Overhead Rate = $\frac{\text{Total Overhead Cost}}{\text{Total Machine Hours}} = \frac{₹2,21,184}{12,288} = ₹18$ per Machine hr.

Step II: Statement of Total Cost assuming absorption of overheads on Machine Hour Rate Basis

Particulars	A	B	C	D
A. Output (Units)	1,440	1,200	960	1008
B. Direct Material (₹)	42	45	40	48
C Direct Labour (₹)	10	9	7	8
D. Machine Hours	4	3	2	1
E. Overheads @ ₹18 per Hour (D x ₹18)	72	54	36	18
F. Total Cost per unit (₹) [B + C + E]	124	108	83	74
G. Total Cost (₹) [A x F]	1,78,560	1,29,600	79,680	74,592

(ii) Absorption of Overheads using Activity Base Costing (ABC)

Step I: Calculation of Cost Driver Rate

Setup Cost = $\frac{\text{Total Setup Cost (Refer Working Note)}}{\text{Total No. of Production Runs}} = \frac{₹96,000}{96} = ₹\ 1,000$

Stores Receiving Cost = $\frac{\text{Store Receiving Cost (Refer W. Note)}}{\text{Total No. of Store Requisitions}} = \frac{₹72,000}{200} = ₹\ 360$

Inspection Cost = $\frac{\text{Inspection Cost (Refer Working Note)}}{\text{Total No. of Production runs}} = \frac{₹48,000}{96} = ₹\ 500$

Material Handling Dispatch Cost = $\frac{\text{Material Handling and Dispatch Cost}}{\text{No. of orders executed}} = \frac{₹5,184}{192} = ₹\ 27$

Step II: Calculation of Total Overheads of each products using Activity Based Costing

Particulars	A	B	C	D	Total
A. Output (Units)	1440	1200	960	1008	4608
B. No. of Production runs	30	25	20	21	96
C. No. of Stores Requisitions	50	50	50	50	200
D. No. of Orders Executed	60	50	40	42	192
E. Total Setup Cost @ ₹ 1000	30,000	25,000	20,000	21,000	96,000
F. Total Store Receiving Cost @ ₹ 360	18,000	18,000	18,000	18,000	72,000
G. Total Inspection Cost @ ₹ 500	15,000	12,500	10,000	10,500	48,000
G. Total Material handling & Dispatch Cost @ ₹ 27	1,620	1,350	1,080	1,134	5,184

Step III: Statement showing Total Cost of each product using Activity Based Costing

Particulars	A		B		C		D	
	Total (₹)	Per unit (₹)	Total (₹)	Per unit (₹)	Total (₹)	Per unit (₹)	Total (₹)	Per unit (₹)

A. Direct Material	60,480	42	54,000	45	38,400	40	48,384	48
B. Direct Labour	14,400	10	10,800	9	6,720	7	8,064	8
C. Set up Cost	30,000	20.83	25,000	20.83	20,000	20.83	21,000	20.83
D. Store Receiving	18,000	12.50	18,000	15	18,000	18.75	18,000	17.86
E Inspection Cost	15,000	10.42	12,500	10.42	10,000	10.42	10,500	10.42
F. Material Handling & Dispatch Cost	1,620	1.13	1,350	1.13	1,080	1.13	1,134	1.13
G. Total Cost	1,39,500	96.88	1,21,650	101.38	94,200	98.13	1,07,082	106.24

Working Note:

Apportionment of Machine Department Cost in Ratio (4 : 3 : 2)

	Machine Department Costs	Setup Costs	Store Receiving Cost	Inspection	Material handling and dispatch
Costs (₹)	1,26,000	40,000	30,000	20,000	5,184
Apportionment of Machine Dept Cost	(1,26,000)	56,000	42,000	28,000	–
Total	–	96,000	72,000	48,000	5,184

(iii) **Comment:** The use of activity based costing gives, different product costs than what were arrived by utilizing traditional costing. It can be argued that product costs using ABC are more precise as overheads have been identified with specific activities.

2(a) (ii) Q Limited operates a system of standard costing and in respect of one of its products which is manufactured within a single cost centre, the following information is given:
For one unit of product the standard material input is 16 litres at a standard price of ₹2.50 per litre. The standard wage rate is ₹5 per hour and 1 unit is produced in 6 hours. Fixed production overhead is absorbed at the rate of 120% of direct wages cost.
During the last four-week accounting period the material price variance was extracted on purchase and the actual price was ₹ 2.45 per litre. Total direct wages cost was ₹ 1,21,500. Fixed production overhead incurred was 1,50,000.

Variances:	Favourable	Adverse
Direct material price	**₹8,000**	
Direct material usage		**₹6,000**
Direct labour rate		**₹4,500**
Direct labour efficiency	**3,600**	
Fixed production overhead expenditure		**6,000**

Required: Calculate for the four-week period : (i) Budgeted output in units (ii) Number of litres Purchased (iii) Number of litres used above standard allowed, (iv) Actual units produced
[1 ½ x 4 =6]

Answer:

Basic Calculations:

Standard Product Cost per unit	₹
Material [16 Litres @ ₹2.50]	40
Labour [6 Hours @ ₹ 5.00]	30
Fixed production overheads @ ₹120% of labour cost	36

(i) Budgeted output (in units) = $\frac{\text{Budgeted Overhead}}{\text{Budgeted Overhead per unit}}$

$= \frac{₹1,50,000 - ₹6,000}{₹36} = 4,000$ units

(ii) B Number of litres purchased = $\frac{\text{Total Direct Material Price Variance}}{\text{Direct Material Price Variance per litre}}$

$= \frac{8,000}{₹2.50 - ₹2.45} = 1,60,000$ units

(iii) Number of litres used above standard allowed = $\frac{\text{Total Direct Material Usage Variance}}{\text{Standard Rate per litre}}$

$= \frac{6,000}{₹2.50} = 2,400$ litres

(iv) Actual units Produced = $\frac{\text{Total Standard Labour Cost of output}}{\text{Standard Labour cost per unit}}$

$= \frac{₹1,21,500 + 3,600 - 4,500}{₹30}$

= 4,020 units

2(a) (iii) Discuss the essential pre-requisites for Integrated Accounts. [4]

Answer:

The essential pre-requisites for integrated accounts include the following steps

- The managements decision about the extent of integration of the two sets of books, some concerns find it useful to integrate upto the stage of primary cost or factory cost, while others prefer full integration of the entire accounting records.
- A suitable coding system must be made available so as to serve the accounting purposes of financial and cost accounts.
- An agreed routine, with regard to the treatment of provision for accruals, prepaid expenses, and other adjustment is necessary for preparation of interim accounts.
- Perfect coordination should exist between the staff responsible for the financial and cost aspects of the accounts and an efficient processing of accounting documents should be ensured.

2(b) (i) A company which manufactures and sells three products, furnishes following details for a month:

Product	A	B	C
No. of units budgeted	1,00,000	38,000	46,000
Selling price per unit (₹)	50	80	60
Variable costs per unit (₹)	34	52	24

It has been proposed that an intensive advertisement campaign involving an expenditure of ₹ 1,20,000 per month and reduction of selling prices will increase the sales of the product C as under:

(i) If selling price is reduced to ₹ 55 per unit, the sales will increase to 59,000 per month.

(ii) If selling price is reduced to ₹ 51 per unit, the sales will increase to 65,000 units per month.

The fixed cost of the company amount to ₹ 34,20,000 per month.

(i) Calculate the current monthly brake even sales value of the company.

(ii) Evaluate the two proposals and advise which of the proposals should be implemented.

(iii) Calculate the sales units required per month of product C to justify the expenditure in respect of your decision in (ii) above. [4+3+1]

Answer:

(i) Current monthly break even sales value of the company:

Product	**A**	**B**	**C**
No. of units budgeted	1,00,000	38,000	46,000
Selling price per unit (₹)	50	80	60
Variable costs per unit (₹)	34	52	24
Contribution per unit (₹)	16	28	36
∴ P/V ratio [contribution ÷ sales]	32%	35%	60%

Budgeted sales value of A	= ₹ 50 p.u. × 1,00,000 units	= ₹ 50,00,000
Budgeted sales value of B	= ₹ 80 p.u. × 38,000 units	= ₹ 30,40,000
Budgeted sales value of C	= ₹ 60 p.u. × 46,000 units	= ₹ 27,60,000
Total budgeted sales		= ₹ 1,08,00,000

∴ Current sales mix of the products = 500 : 304 : 276

∴ Composite P/V ratio $= \frac{500}{1080} \times 32\% + \frac{304}{1080} \times 35\% + \frac{276}{1080} \times 60\%$ = 40%

∴ Break even sales value $= \frac{\text{Fixed cost}}{\text{Composite P/V ratio}} = \frac{₹34,20,000}{40\%}$ = ₹ 85,50,000

∴ At BEP, sales of A $= \frac{500}{1080} \times$ ₹ 85,50,000 = ₹ 39,58,333

∴ At BEP, sales of B $= \frac{304}{1080} \times$ ₹ 85,50,000 = ₹ 24,06,667

∴ At BEP, sales of C $= \frac{276}{1080} \times$ ₹ 85,50,000 = ₹ 21,85,000

= ₹ 85,50,000

(ii) Evaluation of the two proposals to increase sales of product C:

Particulars	**Current**	**Proposal 1**	**Proposal 2**
a. Selling price p.u. (₹)	60	55	51
b. Variable cost p.u. (₹)	24	24	24
c. Contribution p.u. (₹) [a-b]	36	31	27
d. Units sold (units)	46,000	59,000	65,000
e. Total contribution (₹) [c×d]	16,56,000	18,29,000	17,55,000
f. Extra Fixed cost (₹)	-	1,20,000	1,20,000
g. Profit (₹) [e-f]	16,55,000	17,09,000	16,35,000

Since the profit is maximum under proposal 1, the same should be implemented.

(iii) Sales units required per month of product C to justify advertisement expenditure in respect of decision taken above:

In (ii) above, it is suggested that proposal 1 should be implemented. The minimum number of additional units to be sold p.m. to justify the extra expenditure of ₹1,20,000 under this proposal

$= \frac{\text{Additional fixed cost}}{\text{Contribution p.u.}} = \frac{₹1,20,000}{₹31 \text{ p.u.}} = 3,871$ units.

∴ Total number of units sold of product C should be = 46,000 + 3,871 = 49,871 units.

2(b) (ii) SUNMOON Ltd. produces 2,00,000; 30,000; 25,000; 20,000 and 75,000 units of its five products A, B, C, D and E respectively in a manufacturing process and sells them at ₹ 17, ₹ 13, ₹ 8, ₹ 10 and ₹ 14 per unit. Except product D remaining products can be further processed and then can be sold at ₹ 25, ₹ 17, ₹ 12 and ₹ 20 per unit in case of A, B, C and E respectively.

Raw material costs ₹ 35,90,000 and other manufacturing expenses cost ₹ 5,47,000 in the manufacturing process which are absorbed on the products on the basis of their 'Net realizable value'. The further processing costs of A, B, C and E are ₹ 12,50,000; ₹ 1,50,000; ₹ 50,000 and ₹ 1,50,000 respectively. Fixed costs are ₹ 4,73,000.

You are required to prepare the following in respect of the coming year:

A. Statement showing income forecast of the company assuming that none of its products are to be further processed.

B. Statement showing income forecast of the company assuming that products A, B, C and E are to be processed further.

C. Can you suggest any other production plan whereby the company can maximize its profits? If yes, then submit a statement showing income forecast arising out of adoption of that plan. [4+4]

Answer:

A. Income forecast when all the products are sold at split off point :

Particulars	A	B	c	D	E	Total
i. Production (units)	2,00,000	30,000	25,000	20,000	75,000	-
ii. Share of joint cost (₹) [# 1]	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
iii. Selling price at split off point (₹)	17	13	8	10	14	-
iv. Sales at split off point (₹)[(i)×(viii)]	34,00,000	3,90,000	2,00,000	2,00,000	10,50,000	52,40,000
v. Gross Profit (₹) [(viii) - (vi)]	7,75,000	1,38,000	25,000	60,000	1,05,000	11,03,000

∴ Profit of the company = Gross profit - fixed cost = ₹ (11,03,000 - 4,73,000) = **₹ 6,30,000**

B. Income forecast when the products are sold after further processing :

Particulars	A	B	c	D	E	Total
i. Sales after further processing (₹)[# 1]	50,00,000	5,10,000	3,00,000	2,00,000	15.00,00	75,10,000
ii. Share of joint cost (₹) [# 1]	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
iii. Further processing costs (₹)	12,50,000	1,50,000	50,000	-	1,50,000	16,00,000
iv. Total cost (₹) [(ii) + (iii))						
v. Gross Profit (₹) [(i) - (ii)]	38,75,000	4,02,000	2,25,000	1,40,000	10,95,000	57,37,000
	11,25,000	1,08,000	75,000	60,000	4,05,000	17,73,000

∴ Profit of the company = Gross profit - fixed cost = ₹ (17,73,000 - 4,73,000) = **₹ 13,00,000**

C. Suggestions:

The company is losing ₹ 30,000 on selling product B after further processing, hence it is advisable that, in order to maximize its profits the company should sell products B and D at the split off point. Products A, C and E are giving more profit after being further processed; hence they should be sold later.

Working note: Allocation of joint costs using NRV method:

Particulars	A	B	c	D	E	Total
i. Production (units)	2.00,000	30,000	25.000	20,000	75,000	-
ii. SP after further processing (₹)	25	17	12	10	20	-
iii. Sales after further processing (₹)	50,00,000	5,10,000	3,00,000	2,00,000	15,00,000	-
iv. [(i)x(ii)]						

v. Further processing costs (₹)	12,50,000	1,50.000	50.000	-	1,50,000	-
vi. Net Realisable Value (₹) [(iii) - (iv)]	37,50,000	3,60,000	2,50,000	2,00,000	13,50,000	59,10,000
vii. Share of joint cost (₹) $\left[\frac{₹35,90,000+₹5,47,000}{₹59,10,000}\times(v)\right]$	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000

2(b) (iii) List the benefits of Inter- firm comparison. [4]

Answer:

The benefits which are derived from Inter-firm Comparison are appended below:

- Inter-firm Comparison makes the management of the organisation aware of strengths and weakness in relation to other organisations in same industry.
- As only the significant items are reported to the Management time and efforts are not unnecessary wasted.
- The management is able to keep up to data information of the trends and ratios and it becomes easier for them to take the necessary steps for improvement.
- It develops cost consciousness among the members of the industry.
- Information about the organisation is made available freely without the fear of disclosure of confidential data to outside market or public.
- Specialized knowledge and experience of professionally run and successful organisations are made available to smaller units who can take the advantages.
- The industry as a whole benefits from the process due to increased productivity, standardization of products, elimination of unfair comparison and the trade practices.
- Reliable and collective data enhance the organising power in dealing with various authorities and Government bodies.
- Inter firm comparison assists in a big way in identifying industry sickness and gives a timely warning so that effective remedial steps can be taken to save the organisation

(Student may answer any 4 points)

2(c) (i) The cost sheet for a company based on budgeted volume of sales of 3,00,000 units per quarter is as under:

Particulars	₹ per unit
Direct Materials	**5.00**
Direct wages	**2.00**
Factory overheads (50% fixed)	**6.00**
S/ Adm overheads (1/3 variable)	**3.00**
Selling Price	**18.00**

When the budget was discussed, it was felt that the company would be able to achieve only a volume of 2,50,000 units of production and sales per quarter. The company therefore decided that an aggressive sales promotion campaign should be launched to achieve the following improved operations:

Proposal I:

- **Sell 4,00,000 units per quarter by spending ₹ 2,00,000 on special advertising**
- **The factory fixed costs will increase by ₹ 4,00,000 per quarter.**

Proposal II:
- **Sell 5,00,000 units per quarter subject to the following conditions.**
- **An overall price reduction of ₹ 2 per unit is allowed on all sales.**
- **Variable selling and Administration costs will increase by 5%**
- **Direct Material costs will be reduced by 1% due to purchase price discounts.**
- **The fixed factory costs will increase by ₹ 2,00,000 more.**

You are required to prepare a flexible budget at 2,50,000 , 4,00,000 and 5,00,000 units of output per quarter and calculate the profit at each of the above levels of output. [7]

Answer:

Flexible budget for the quarter at various capacity levels

Production (units)	**2,50,000 (₹)**	**4,00,000 (₹)**	**5,00,000 (₹)**
Direct material (per unit)	5.00	5.00	99% of 5 = 4.95
Direct Wages (per unit)	2.00	2.00	2.00
Variable factory overheads (p.u.) [50% of ₹ 6]	3.00	3.00	3.00
Variable S/ Admn overheads (p.u.) [1/3rd of ₹ 3]	1.00	1.00	105% of 1=1.05
Total Variable cost per unit	11.00	11.00	11.00
Total Variable cost [Total Variable cost per unit × production] [A]	**27,50,000**	**44,00,000**	**55,00,000**
Fixed Overheads:			
Factory OH [50% of ₹ 6 p.u. × 3,00,000 unit]	9,00,000	9,00,000	9,00,000
Increase in factory overheads as per proposal	-	4,00,000	2,00,000
S/Admn OH [2/3rd of ₹ 3 p.u. × 3,00,000 units]	6,00,000	6,00,000	6,00,000
Increase in S/ Admn overheads as per proposal	-	2,00,000	-
Total Fixed Cost [B]	**15,00,000**	**21,00,000**	**17,00,000**
Selling Price per unit	18.00	18.00	=18-2= 16.00
Sales Value [Sales × Production] [c]	45,00,000	72,00,000	80,00,000
Profit [C - (A+B)]	2,50,000	7,00,000	8,00,000

2(c) (ii) Z Ltd. has two autonomous divisions: A and B with objective to maximize divisional profits. Divn. A produces X and transfer to Divn. B. B sells X in the external market after incurring processing cost (variable) of ₹ 8 per unit.

The demand of X in the external market varies with the selling price as given below:

Demands in units in a month	**Selling price per unit**
2,000	**50**
3,000	**45**
4,000	**40**

A incurs variable cost of ₹ 20 per unit of X and fixes Transfer price at ₹ 30 per unit.
- **Find divisional contributions and contribution of z Ltd. at the Transfer price of ₹ 30 per unit.**
- **Examine how the company's profits would change if the Transfer price is changed to ₹ 25 per unit. [3+3]**

Answer:

At transfer price of ₹ 30: Cost to B is (₹ 30 + 8 = 38)

Units	Selling Price (₹)	Cost (₹)	Contribution per unit (₹)	Total Contribution (₹)
2,000	50	38	12	24,000 (Max)
3,000	45	38	7	21,000
4,000	40	38	2	8,000

B will sell 2,000 units and makes total contribution (₹)	24,000
A makes total contribution on transfer of 2,000 units = 2,000 × (30-20)	20,000
Z Ltd. makes total contribution (₹) = 24,000 + 20,000	44,000

At transfer price of ₹ 25: Cost to B is (₹ 25 + 8 = 38)

Units	Selling Price (₹)	Cost (₹)	Contribution per unit (₹)	Total Contribution (₹)
2,000	50	33	17	34,000
3,000	45	33	12	36,000 (Max)
4,000	40	33	7	28,000

B will sell 3000 units and makes total contribution (₹) = 36,000.
A makes total contribution on transfer of 3,000 units = 3,000 × (25 – 20) = 15,000
Z Ltd. makes total contribution (₹) = 36,000 + 15,000 = 51,000. The company's total profit will increase by ₹7,000 (=51,000 – 44,000) for change of transfer price from ₹30 to ₹ 25.

(iii) Mention the prerequisites for implementation of Budgetary Control System [7]

Answer:

Following are the pre - requisite of Budgetary Control System:

- Fixation of objective and goal in clear terms.
- Sound organization structure.
- Full co - operation from all employees.
- Proper education of employees.
- Efficient accounting system.
- Formation of a budget committee.
- Positive attitude of all employees to accept changes whenever necessary.
- Setting Standard Cost.
- Top Management support
- Proper organizational structure
- Clear and realistic goals
- Flexibility
- Participative process
- Conducive environment

3. Answer any two questions from a, b and c. [2x8=16]

(a)

(i) A company is engaged in construction of residential housing, offices, industrial units, Roads, Bridges, Marine facilities etc. having sites in India and abroad. The company also has Joint venture projects in India and abroad. Whether Companies (Cost Records and Audit) Rules 2014 would be applicable to the company? [5]

Answer:

All companies engaged in construction business either as contractors or as sub-contractors, who meet with the threshold limits laid down in the Companies (Cost Records and Audit) Rules, 2014 and undertake jobs with the use of own materials [whether self-manufactured/produced or procured from outside] shall be required to maintain cost records and get cost audit conducted as per the provisions of the Companies (Cost Records and Audit) Rules, 2014.

The provisions of the Companies (Cost Records and Audit) Rules, 2014 would also apply for construction activities undertaken under BOT/BOOT mode, or the projects undertaken as EPC contractor or the projects undertaken abroad by a company incorporated in India.

The Companies (Cost Records and Audit) Rules, 2014, do not make any distinction between the Contractor and Sub-Contractor and accordingly all such companies will be included within the ambit of the Rules.

(ii) Who can be appointed as a cost auditor? [3]

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.

(b)

(i) What types of Health Services are covered under the Companies (Cost Records and Audit) Rules 2014? [5]

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.

(ii) 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? [3]

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.

(c)

(i) Is there any obligation on the part of cost auditor to report offence of fraud being or has been committed in the Company by its officers or employees? [5]

Answer:

Sub-rule (7) of Rule 6 of the Companies (Cost Records and Audit) Rules 2014 states that "the provisions of sub-section (12) of section 143 of the Act and the relevant rules made thereunder shall apply mutatis mutandis to a cost auditor during performance of his functions under section 148 of the Act and these rules".

As per sub-section (12) of section 143 of the Companies Act 2013, extract of which is given above, it is obligatory on the part of cost auditor to report offence of fraud which is being or has been committed in the company by its officers or employees, to the Central Government as per the prescribed procedure under the Rules.

As per the proviso to above sub-section, it has been stated that in case of a fraud involving lesser than the specified amount, the auditor shall report the matter to the audit committee constituted under section 177 or to the Board in other cases within such time and in such manner as may be prescribed.

(ii) 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? [3]

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.

4. Answer any three questions from a, b, c and d. [3x8=24]

(a)

(i) Fit straight line by the least square method to the following figures of production of Sugar Factory. Estimate the production for the year 2015.

Year	2008	2009	2010	2011	2012	2013	2014
Production(in Lakh tons)	76	87	95	81	91	96	90

[5]

Answer:

Analysis of Trend by Least square Method

Year	x	Y (production)	xy	x^2
2008	-3	76	-228	9

2009	-2	87	-174	4
2010	-1	95	-95	1
2011	0	81	0	0
2012	1	91	91	1
2013	2	96	192	4
2014	3	90	270	9
Total	0	$\sum y = 616$	$\sum xy = 56$	

The two normal equations are as under:

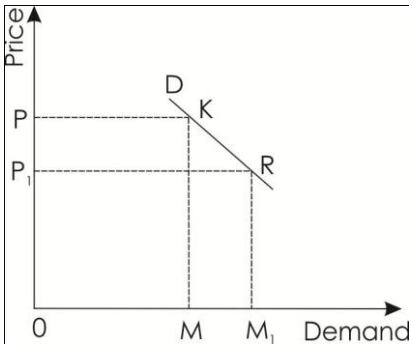
Equation 1	**Equation** 2
$\sum y = na + b\sum x$	$\sum xy = a\sum x + b\sum x^2$
So, 616=7a+ b (0)	56=88 (0)+b (28)
So, 7a= 616	56=28b
a=616÷ 7=88	b=56÷28=2

The first degree polynomial trend equation (straight line trend) is Y=a+ bx
So, Y=88+2x (where original year is 2011, x=1 year unit)
Estimated production for the year 2015: Here, x=4 (i.e. from 2011 to 2015)
So, Y=88+2(4); 88+8=96.
Hence, production for the year 2015= 96 lakh tons.

(ii) State the term Arc Elasticity. [3]

Answer:

Arc Elasticity: In arc elasticity we calculate the elasticity of demand between two points on the demand curve.



In the diagram on X-axis the demand and on Y-axis the price are taken. K and R are the two points on the demand curve. We can measure the elasticity of demand between these points by using the following formula.

$$\text{Arc Elasticity of demand} = \frac{\text{Change in Demand}}{\text{1st demand} + \text{2nd demand}} \times \frac{\text{Change in price}}{\text{1st Price} + \text{2nd price}}$$

$$\text{In diagram Arc elasticity of demand} = \frac{MM_1}{OM + OM_1} \times \frac{PP_1}{OP + OP_1}$$

$$E_d = \left[\frac{\Delta q}{\Delta p}\right] \times \left[\frac{p_1 + P_2}{Q_1 + Q_2}\right]$$

After application of the above formula if we get result more than one then it is elastic demand, if the result is less than one then it is inelastic demand and if the result is equal to one then it is unitary demand.

(b)

(i) If 'n' be the no. of workers employed the average cost of production is given by C = 24n + $\left[\frac{3}{2(n-4)}\right]$ Show that n = 4¼ will make C minimum. [4]

Answer:

$C = 24n + \left[\frac{3}{2(n-4)}\right] = 24n + (n-4)^{-1}$

$\frac{dc}{dn} = 24 + \frac{3}{2} \times -1 \times (n-4)^{-2} = 0$

$24 - \frac{3}{2}(n-4)^{-2} = 0$

$(n-4)^{-2} = 16$

$\frac{1}{(n-4)^2} = 16$

$(n-4)^2\ 16 = 1$

$(n-4)^2 = \frac{1}{16}$

$n - 4 = \frac{1}{4}$

$n = \frac{1}{4} + 4 = 4\frac{1}{4}$

$\frac{d^2c}{dx^2} = 0 + \frac{-3}{2} \times -2\ (n-4)^{-3}$

$= 3\ (n-4)^{-3}$

$= 3\ (\frac{17}{4} - 4)^{-3}$

$= \frac{1}{\left(\frac{1}{4}\right)^3}$ Which is Positive

Hence condition is satisfied and cost will be minimum at n = 4¼.

(ii) How is the price determined by a firm under Oligopoly? [4]

Answer:

PRICE DETERMINATION UNDER OLIGOPOLY:

Price can be determined in three ways under oligopoly:

1. Independent pricing;
2. Pricing under collusion;
3. Price Leadership

1. **Independent pricing:** If there is a product differentiation under oligopoly each firm can act as a monopoly and fixes the price independently. Therefore the firm may determine its price in that way where it gets maximum profits. If there is no product differentiation, it is difficult to know the price determination in accurate manner the firm may compete each other and finally they may fix the common reasonable price which cannot be changed.

2. **Pricing under collusion:** Most of the firms have the opinion that independent price determination leads to uncertainly. To avoid this defect there is a tendency among the oligopoly firm to act collectively by collusion. In this method these firms may make

cartle arrangement. The centralized cartle determines the output produce by different firms and the price is also determined which is the most acceptable by all firms.

3. **Price leadership:** If the other firms follow the price which is determined by one firm in oligopoly then we can say that there is a dominant firm or the firm with low costs or well established old firm- may take this leadership and fixes the price.

(c) List the factors to be considered while setting the price of a PRODUCT. [8]

Answer:

The factors to be considered while setting the price of a product are enumerated below:

- **Target customers:** Price of product is depend on the capacity of buyers to buy at various prices, in other words, influence of price elasticity of demand will be examined.
- **Cost of the product:** Pricing is primarily based on how much it costs to produce and market the product, i.e., both production and distribution cost.
- **Competition:** Severe competition may indicate a lower price than when there is monopoly or little competition.
- **The law:** Government authorities place numerous restrictions on pricing activities.
- **Social responsibility:** Pricing affects many parties, including employees, shareholders and the public at large. These should be considered in pricing.
- **Market position of the firm:** The position of the market may also influence the pricing decision of the firm. It is only why the different producers of identical products sell their products at different prices.
- **Distribution channel policy:** The prices of products will also depend upon the policy regarding distribution channel. The longer the channel, the higher would be the distribution costs and consequently higher the prices.
- **Price elasticity of Demand:** Price elasticity refers to consequential change in demand due to change in price of the commodity. It is the relative responsiveness to the changes in price. As there is an inverse relationship between price and demand for product, the demand will increase with fall in price.
- **Economic environment:** In recession, prices are reduced to a sizeable extend to maintained the level of turnover. On the other hand, prices are charged higher in boom period to cover the increasing cost of production and distribution.

(d)

(i) 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 worker, which give maximum efficiency. [3]

Answer:

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

Efficiency (E) $= \frac{-W^3}{400} + 3W - \frac{392}{10}$

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

$3W^2 = 1200$

$W^2 = 400$

$W = 20$

$$\frac{d^2E}{dw^2} = -\frac{6w}{400}$$

$$\therefore \frac{d^2e}{dw^2} \text{ at } w = 20 = \frac{-6(20)}{400} = \frac{-6}{20} < 0$$

$\therefore$ Maximum efficiency at w = 20.

(ii) Cost = $300x - 10x^2 + \frac{1}{3}x^3$, Calculate

- **Output at which Marginal Cost is minimum**
- **Output at which Average Cost is minimum**
- **Output at which Marginal Cost = Average Cost.** **[1+2+2=5]**

Answer:

- Marginal Cost = $\frac{dc}{dx} = 300 - 20x + x^2$ (say, y)

In order that MC is minimum first derivate must be equal to zero and 2nd derivate must be positive.

$\therefore \frac{dy}{dx} = 2x - 20 \Rightarrow 2x = 20$

$x = 10$

$\frac{dy^2}{dx^2} = 2$, which is positive. It is minimum at x = 10.

- Average Cost = $300 - 10x + \frac{1}{3}x^2$ (y say)

$\frac{dy}{dx} = -10 + \frac{2}{3}x = 0$

$\Rightarrow x = 30/2 = 15$

$\frac{d^2y}{dx^2} = \frac{2}{3} > 0,$

$\therefore$ Average Cost is minimum of output at x = 15.

- Output at which marginal Cost = Average cost

$-20x + 10x + x^2 - \frac{1}{3}x^2 = 0$

$-10x + \frac{2}{3}x^2 = 0$

$\frac{-30x + 2x^2}{3} = 0$

$2x^2 - 30x = 0$

$2x(x - 15) = 0$

$x - 15 = 0$

$\therefore x = 15$