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) A Contract is estimated to be 80% complete in its first year of construction as certified. The Contractee pays 75% of value of work certified, as and when certified and makes the final payment on the completion of contract. Following information is available for the first year:

	₹
Cost of work-in-progress uncertified	**18,000**
Profit transferred to Profit & Loss A/c at the end of year 1 on incomplete contract	**60,000**
Cost of work to date	**98,000**

Calculate the value of work-in-progress certified and amount of contract price.

Answer:

$$\text{Profit transferred to P \& L A/c} = \frac{2}{3} \times \text{NotionalProfit} \times \frac{\text{CashReceived}}{\text{WorkCertified}}$$

$$₹60{,}000 = \frac{2}{3} \times \text{NotionalProfit} \times \frac{75\% \text{ of workcertified}}{\text{workcertified}}$$

Or, Notional Profit = 1,20,000

Notional Profit = Value of work certified + Cost of uncertified work – Cost of work to date

Therefore, Value of work certified = Notional Profit – Cost of uncertified work + Cost of work to date

= ₹1,20,000 - ₹18,000 + ₹98,000

= ₹2,00,000

Value of work certified = 80% of contract price

Therefore, Contract price = Value of work certified ÷ 80%

= ₹2,50,000

(b) A lorry starts with a load of 25 tonnes of goods from station A. It unloads 5 tonnes at station B and rest of goods at station C. It reaches back directly to station A after getting reloaded with 18 tonnes of goods at station C. The distance between A to B, B to C and then from C to A are 60 kms. 100kms, and 150 kms respectively. Compute 'Absolute tones – kms' and 'Commercial tones – kms'.

Answer:

'**Absolute tones – kms**': It is the sum total of tones – kms. arrived at by multiplying various distances by respective load quantities carried. Mathematically it is:

= 25 tonnes × 60 kms + 20 tonnes × 100 kms + 18 tonnes × 150 kms.

= 6,200 tonnes – kms.

'**Commercial tones – kms**' = Average load × Total kms. travelled.

$$= \left(\frac{25+20+18}{3}\right) \text{tones} \times 310 \text{ kms.}$$

= 6,510 tonnes – kms.

(c) A company is currently operating at 80% capacity level. The production under normal capacity level is 1,50,000 units. The variable cost per unit is ₹14 and the total fixed costs are ₹8,00,000. If the company wants to earn a profit of ₹4,00,000, then calculate the price of the product per unit.

Answer:

Total fixed cost	-	₹8,00,000
Expected profit	-	₹4,00,000
Variable cost at 80% level		
(80% x 1,50,000 units x ₹14)	-	₹16,80,000
Total price	-	₹28,80,000

Per unit price at 80% level = (₹28,80,000 / 1,20,000 units) = ₹24.00.

(d) Distinguish between Indifference Point and Break-Even Point with regard to their definition and purpose.

Answer:

With regard to definition:

The cost in Indifference Point analysis tool determines the point at which there is no difference in cost between two alternative methods.

Whereas, Break-even Point is the level of sales at which total sales revenue is equal to total costs and there is neither profit nor loss to the firm. At Break-even Point, total contribution equals fixed cost.

Purpose:

Indifference Point is used to compare two strategies. This analysis can be used to decide between different cost structures or selling prices.

Whereas, Break-even Point is used for profit planning.

(e) Akash Ltd. is preparing its cash budget for the period. Sales are expected to be ₹1,00,000 in December 2014, ₹2,00,000 in January 2015, ₹3,00,000 in February 2015 and ₹ 1,00,000 in March 2015. Half of all sales are cash sales, and the other half are on credit. Experience indicates that 70% of the credit sales will be collected in the month following the sale, 20% the month after that, and, 10% in the third month after the sale. Calculate the budgeted

collection for the month of March 2015.

Answer.

Collection from	
March 2015 cash sales will be half of total sales or	₹50,000
From December ₹50,000 of credit sales, collection should be 10% or	₹5,000
From January ₹1,00,000 of credit sales, collections should be 20% or	₹20,000
From February ₹1,50,000 of credit sales, collection will be 70% or	₹ 1,05,000

Thus total collections will amount to ₹ 1,80,000

(f) "Turnover". Is gross turnover whether includes excise duty or not – State.

Answer:

As per Rule 2(p), "Turnover" means gross turnover made by the company from the sale or supply of all products or services during the financial year. It includes any turnover from job work or loan license operations but does not include any non-operational income.
The term "Turnover" defined in the Companies (Cost Accounting Records) Rules, 2011 shall exclude taxes & duties. It shall have the same meaning, wherever it appears, in all other orders/rules issued in connection with the cost accounting records and cost audit.

(g) State the term Cost Audit.

Answer:

Cost Audit has been defined as "the verification of cost records and accounts and a check on the adherence to the prescribed cost accounting procedures and the continuing relevance of such procedures".
The Institute of Cost Accountants of India on the other hand, defines cost audit as "a system of audit introduced by the Government of India for the review, examination and appraisal of the cost accounting records and attendant information, required to be maintained by specified industries."

(h) List the determinants of Demand.

Answer:

Determinants of demand are enumerated below:

- Price of the Commodity (P)
- Prices of Substitutes (Ps) [Tea and Coffee]
- Price of Complements (Pc) [Pen and Ink]
- Income of household (I)

(i) The Demand and Supply function under perfect Competition are $y=16-x^2$ and $y=2x^2+4$ respectively. Find the Market Price.

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)

Market Price $y = 16 - x^2$

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

(j) The cost function of a firm is given by $c= x^3 -4x^2 + 9x$, find at what level of output Average Cost is minimum and The Minimum Cost.

Answer: Total cost = $x^3 - 4x^2 + 9x$

Average cost = $x^2 - 4x + 9$

In order that average cost is minimum $\frac{dy}{dx} = 0$ and the value of $\frac{dy^2}{dx^2}$ should be positive

i.e. $\frac{dy}{dx} = 2x - 4 = 0$

$or, x - 2 = 0$

$\therefore x = 2$

$\frac{dy^2}{dx^2} = 2$ which is positive so the function will have minimum values.

Minimum Average cost

$= x^2 - 4x + 9$

$= 4 - (4x2) + 9$

$= 13 - 8 = 5$

2. Answer any two questions. [2x20=40]

(a)

(i) The monthly budgets for manufacturing overhead of SHAHEEN LTD. for two levels of activity were as follows:

Capacity	60%	100%
Budgeted production	600	1,000
	₹	₹
Wages	1,200	2,000
Consumable stores	900	1,500
Maintenance	1,100	1,500
Power & Fuel	1,600	2,000
Depreciation	4,000	4,000
Insurance	1,000	1,000
	9,800	12,000

Required:

I. Indicate which of the items are fixed, variable and semi-variable;

II. Prepare a Budget for 80% capacity; and

III. Find the total cost, both fixed and variable per unit of output at 60%, 80% and 100% capacity.

[$1^1/_2$+$4^1/_2$+3=9]

Answer:

SHAHEEN LTD

I. Fixed -> Depreciation and Insurance

Variable -> Wages and consumable stores

Semi-variable -> Maintenance, and Power & fuel

II. Working Notes:

Segregation of semi-variable costs:

Maintenance = [1,500 - 1,100] / 400 = ₹ 1. Per unit variable and

Fixed cost = 1,100 - 600 = ₹ 500.

Power & Fuel = [2,000 - 1,600] / 400 = ₹ 1. Per unit variable and

Fixed cost = 1,600 - 600 = ₹ 1000.

BUDGET FOR 80% CAPACITY LEVEL

Budgeted Production (80 % Capacity) 800 Units

	₹
Wages @ ₹ 2.00 per unit	1,600
Consumable stores @ ₹ 1.50 per unit	1,200
Maintenance : ₹ 500 + ₹ 1.00 per unit	1,300
Power & Fuel : ₹ 1,000 + ₹ 1.00 per unit	1,800
Depreciation	4,000
Insurance	1,000
Total Cost :	**10,900**

III. To sum up the Variable Cost per unit works out to ₹ 5.50.
(It consists of wages: ₹ 2, Consumables Stores: ₹ 1.50, Maintenance: ₹ 1.00 Power & Fuel : ₹ 1.00)
Total Fixed Cost comes to ₹ 6500;
(Maintenance: ₹ 500 + Power & Fuel : ₹ 1,000 + Depreciation : ₹ 4,000 + Insurance : ₹ 1,000)

COMPUTATION OF TOTAL COST PER UNIT:

Particulars	Capacity		
	60%	80%	100%
Production (Units)	**600**	**800**	**1,000**
Variable cost per unit (₹)	**5.50**	**5.50**	**5.50**
Fixed Cost Per Unit (₹6,500 ÷ Production Units) (₹)	**10.83**	**8.13**	**6.50**
Total Cost Per Unit (₹)	**16.33**	**13.63**	**12.00**

(ii) The following information provides details of costs, volumes and cost drivers for a particular period in respect of AKASH INDUSTRIES LTD. for the products X, Y and Z:

	Product X	Product Y	Product Z	Total
Production and Sales (Units)	**30,000**	**20,000**	**8,000**	
Raw material usage (Units)	**5**	**5**	**11**	
Direct material cost (₹)	**25**	**20**	**11**	**12,38,000**
Direct Labour hours	**4/3**	**2**	**1**	**88,000**
Machine hours	**4/3**	**1**	**2**	**76,000**
Direct Labour Cost (₹) per unit	**8**	**12**	**6**	
Number of production runs	**3**	**7**	**20**	**30**
Number of deliveries	**9**	**3**	**20**	**32**
Number of receipts (2x7)*	**15**	**35**	**220**	**270**
Number of production orders	**15**	**10**	**25**	**50**

Overhead Costs (₹):		
Setup	**30,000**	
Machines	**7,60,000**	
Receiving	**4,35,000**	
Packing	**2,50,000**	
Engineering	**3,73,000**	
	18,48,000	

*** The company operates a just-in-time inventory policy and receives each component once per production run.**

In the past, the company has allocated overheads to products on the basis of direct labour hours. However, the majority of overheads are related to machine hours rather than direct labour hours. The company has recently redesigned its costing system by recovering overheads using two volume-related bases: machine hours and a materials handling overhead rate for recovering overheads of the receiving department.

Both the current and the previous cost systems reported low profit margins for Product X, which is the company's highest-selling product.

The cost accountant has recently attended a seminar/workshop on Activity Based Costing and the overhead costs for the last period have been analysed by the major activities in order to compute activity-based costs.

Required:

I. Compute the product costs using a traditional volume-related costing system based on the assumption that:

(A) all overheads are recovered on the basis of direct labour hours (i.e. the company's past product costing system); and

(B) the overheads of the receiving department are recovered by a materials handling overhead rate and the remaining overheads are recovered using a machine hour rate (i.e. the company' s current costing system). [3+3]

Answer:

AKASH INDUSTRIES LTD

I. COMPUTATION OF PRODUCT COSTS USING TRADITIONAL COSTING SYSTEM (based on assumption that all overheads are recovered on the basis of Direct Labour hours)

(A)

Products	X	y	Z
	₹	₹	₹
Direct Labour	8	12	6
Direct Materials	25	20	11
Over head [4/3 x 21, 2 x 21; 1 x 21]	28	42	21
TOTAL	61	74	38

Direct labour hour rate = 18,48,000 / 88,000 = ₹ 21 per hour.

(B) The overheads of the receiving deptt. are recovered by a material handling overhead rate the remaining overheads are recovered by using a machine hour rate:

Products	X	Y	Z
	₹	₹	₹
Direct Labour	8	12	6
Direct Materials	25	20	11
Material handling overhead [25 x 35.14%, 20 x 35.14%, 11 x 35.14%]	8.78	7.03	3.87
Other overheads [4/3 x 18.59, 1 x 18.59, 2 x 18.59]	24.79	18.59	37.18
TOTAL Cost	66.57	57.62	58.05

Material handling rate = 4,35,000 / 12,38,000 = 35.14% and M/C hr. rate = 14,13,000 / 76,000 = ₹ 18.59.

(iii) Following data is available for T.T.D & Co.:

Standard working hours 8 hours per day 5 days per week

Maximum capacity	**50 employees**
Actual working	**40 employees**
Actual hours expected to be worked per four weeks	**6,400 hours**
Standard hours expected to be earned per four weeks	**8,000 hours**
Actual hours worked in the four-week period	**6,000 hours**
Standard hours earned in the four week period	**7,000 hours**

The related period is of 4 weeks. In this period there was a special one day holiday due to national event. Calculate the following ratios:

(I) Efficiency ratio,(II) Activity ratio, (III) Calendar ratio, (IV) Standard capacity usage ratio, (V) Actual capacity usage ratio. [5]

Answer:

I. $$\text{Efficiency ratio} = \frac{\text{Output expressed in terms of standard hours}}{\text{Actual hours spent for producing that output}}$$

$$= \frac{7{,}000 \text{ hours}}{6{,}000 \text{ hours}} \times 100 \text{ or } 116.7\%$$

II. $$\text{Activity ratio} = = \frac{\text{Actual output in standard hours}}{\text{Budgeted output in standard hours}}$$

$$= \frac{7{,}000 \text{ hours}}{6{,}400 \text{ hours}} \times 100 \text{ or } 109.4\%$$

III. $$\text{Calendar ratio} = \frac{\text{Actual No. of working days in a period}}{\text{No. of working days in related budgeted period}}$$

$$= \frac{(5 \text{ days} \times 4 \text{ weeks}) - 1^*}{5 \text{ days} \times 4 \text{ weeks}} \times 100 = \frac{19}{20} \times 100 \text{ or } 95.0\%$$

IV. $$\text{Standard Capacity usage ratio} = \frac{\text{Budgeted Hours}}{\text{Maximum possible no. of working hrs of budgeted period}}$$

$$= \frac{6{,}400 \text{hours}}{8{,}000 \text{hours}} \times 100 = 80.0\%$$

* Due to National Holiday

V. Actual usage of budgeted Capacity ratio = $\frac{\text{Actual hours}}{\text{Budgeted hours}} \times 100$

$$= \frac{6{,}000 \text{hours}}{6{,}400 \text{hours}} \times 100 = 93.75\%$$

(b)

(i) In its budget for the period ahead 'M' Ltd. is considering two possible sales forecasts for the three products as follows:

	Product		
Forecast	**X**	**Y**	**Z**
I. Sales (Units)	**22,000**	**40,000**	**6,000**
Selling price per unit	**₹ 10**	**₹ 6**	**₹ 7.50**
II. Sales (Units)	**30,000**	**50,000**	**7,000**
Selling price per unit	**₹ 9**	**₹ 5.50**	**₹ 7.50**

Variable costs per unit are expected to be the same at the different levels of possible sales. The variable costs per unit are as follows:

	Product		
Particulars	**X**	**Y**	**Z**
Direct material	**3.00**	**2.00**	**4.00**
Direct labour	**2.00**	**1.50**	**1.00**
Variable overheads	**1.00**	**0.50**	**1.00**

Fixed overheads are expected to total ₹ 1,00,000. These are expected to be unaffected by the possible changes in activity which are being considered. Due to recent high labour turnover problems, direct labour will be restricted to a maximum of ₹ 1,30,000 in the period. It can be assumed that all labour is of the same grade and is freely transferable between products. Other resources are expected to be generally available.

You are required to:

Taking each of the possible sales forecasts in turn

I. Say what the principal budget factor is for each of the forecasts.

II. For each forecast calculate the sales budget that you would recommend to maximize profits.

III. What profit would you expected from each sales budget?

Assume that the products will be sold according to the selling price estimated as per the forecast and no interchange of the forecast is allowed. [3+3+6=12]

Answer.

I. Determination of Principal Budget Factor :

Particulars	Products			Total
	X	Y	Z	
Forecast I				
Sales (units)	22,000	40,000	6,000	
Labour cost (₹ Per unit)	2.00	1.50	1.00	
Total labour cost (₹)	44,000	60,000	6,000	1,10,000
Direct labour available (₹)				1,30,000
Forecast II				
Sales (units)	30,000	50,000	7,000	
Labour cost (₹ Per unit)	2.00	1.50	1.00	
Total labour cost (₹)	60,000	75,000	7,000	1,42,000
Direct labour available (₹)				1,30,000

Sales is the principal budget factor in Forecast I, and labour is the principal budget factor in Forecast II.

II. Sales budget – Forecast I (Sales – principal budget factor)

Product	Sales (units)	Selling price p.u. ₹	Amount ₹
X	22,000	10.00	2,20,000
Y	40,000	6.00	2,40,000
Z	6,000	7.50	45,000
Total			5,05,000

Sales budget – Forecast II (Labour - principal budget factor)

Product	Sales (units)	Selling price p.u. ₹	Amount ₹
X	30,000	9.00	2,70,000
Y	42,000	5.50	2,31,000
Z	7,000	7.50	52,500
Total			5,53,500

III. Budgeted sales and profit – Forecast I

Particulars	Products			Total
	X	Y	Z	
Sales (units) (i)	22,000	40,000	6,000	
Selling price p.u.	10.00	6.00	7.50	
Variable cost p.u.	6.00	4.00	6.00	
Contribution p.u. (ii)	4.00	2.00	1.50	
Total contribution (i) x (ii)	88,000	80,000	9,000	1,77,000
Less : Fixed cost				1,00,000
Profit				77,000

Working notes:

In case of Forecast II, since labour is the principal budget factor, in order to maximize profit, the product which gives highest contribution per rupee of direct labour should be given priority in production and sales.

Ranking of products based on contribution per rupee of direct labour :

Particulars	Products		
	X	Y	Z
Selling price (a)	9.00	5.50	7.50
Variable cost			
Direct material	3.00	2.00	4.00
Direct labour	2.00	1.50	1.00
Variable overheads	1.00	0.50	1.00
Total Cost (b)	6.00	4.00	6.00
(i) Contribution (a) – (b)	3.00	1.50	1.50
(ii) Labour cost	2.00	1.50	1.00
Contribution per rupee of direct labour (i)/(ii)	1.50	1.00	1.50
Ranking	I	III	II

Manufacturing budget based on ranking

Product	Units	Labour cost per unit ₹	Total labour cost ₹
X	30,000	2.00	60,000
Z	7,000	1.00	7,000
Y	42,000#	1.50	63,000*
		Total	1,30,000

*Balancing figure # ₹ 63,000/₹ 1.50 = 42,000 units

Budgeted sales and profit – Forecast II

Particulars	Products			Total
	X	Y	Z	
Sales (units) (i)	30,000	42,000	7,000	
Selling price p.u.	9.00	5.50	7.50	
Less : Variable cost p.u.	6.00	4.00	6.00	
Contribution p.u. (ii)	3.00	1.50	1.50	
Total contribution (i) x (ii)	90,000	63,000	10,500	1,63,500
Less : Fixed cost				1,00,000
Profit				63,500

(ii) Monarch Limited undertakes to supply 1,000 units of a component per month for the months of January, Feb. and March 2015. 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 2015	1,250	6,250	2,500
February 2015	1,500	9,000	3,000
March 2015	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 2015	₹12,000	4,000
February 2015	₹9,000	4,500
March 2015	15₹000	5,000

[5+3]

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
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
C. 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. 2015	Feb. 2015	March 2015
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	₹9,000/4500 =₹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

(c)

(i) A manufacturing concern, engaged in mass production produces standardized electric motors in one of its departments. From the following particulars of a job of 50 motors you are required to value the work-in-progress and finished goods. [5+4]

I. Costs incurred as per job card:

Particulars	₹
Direct Material	**75,000**
Direct Labour	**20,000**
Overheads	**60,000**

II. Selling price per motor: ₹4,500

III. Selling and distribution expenses are at 30% of sales value.

IV. 25 Motors are completed and transferred to finished goods.

V. Completion stage of work-in-progress:

Particulars	
Direct Material	**100%**
Direct Labour & Overheads	**60%**

Answer:

Statement of equivalent production and cost

Particulars	Direct Material		Labour & Overheads		Total
	%	Quantity	%	Quantity	
Transferred to Finished Goods	100	25	100	25	
Work-in-progress	100	25	60	15	
Equivalent Units		50	40		
Total Cost (₹)		75,000	80,000		1,55,000
Cost per Equivalent Unit (₹)		1,500	2,000		3,500

Actual Cost of Production per Unit of Finished Goods

Particulars	₹
Direct Material	1,500
Labour & Overheads	2,000
Total	**3,500**

Market Value per Unit of Finished Goods

Particulars	₹
Selling price	4,500
Less: Selling & Distribution Overheads @ 30% of ₹4,500	1,350
Total	**3,150**

Stocks should be at the lower of the cost (i.e., ₹3,500) or market value (i.e., ₹3,150). Hence, basis of valuation will be market value in this case.

Value of Work-in-progress

Particulars	₹
Direct Material: ₹1,500 x 25 units	37,500
Labour & Overheads: ₹(3,150 – 1,500) × 15 units	24,750
Total	**62,250**

Value of Finished Goods Stock

25 units × ₹3,150	₹78,750
Total Value of Inventory = ₹78,750 + ₹62,250	1,41,000

(ii) P Ltd. has two divisions; S and T. S transfer all its output to T, which finishes the work. Costs and revenues at various levels of capacity are as follows:

Output	S. cost	T Net revenues (i.e. revenue minus costs incurred in T)	Profit
Units	**₹**	**₹**	**₹**
600	**600**	**2,950**	**2,350**
700	**700**	**3,250**	**2,550**
800	**840**	**3,530**	**2,690**
900	**1,000**	**3,780**	**2,780**
1,000	**1,200**	**4,000**	**2,800**
1,100	**1,450**	**4,200**	**2,750**
1,200	**1,800**	**4,350**	**2,550**

Company profits are maximized at ₹2,800 with output of 1,000 units. If P Ltd. wish to select a transfer price in order to establish S and T as profit centres, what transfer price would motivate the managers of S and T together to produce 1,000 units, no more and no less?

P Ltd. wants that the transfer price should be set at ₹2.10 per unit. Comment on this proposal. [6+(4+1)]

Answer:

The transfer price will be notional revenue to S and notional cost to T.

(a) S will continue to produce more output until the costs of further production exceed the transfer price revenue.

(b) T will continue to want to receive more output from S until its net revenue from further processing is not sufficient to cover the incremental transfer price costs.

Output	Division S Incremental Costs	Division T Incremental Costs
Units	₹	₹
600	-	-
700	100	300
800	140	280
900	160	250
1,000	200	220
1,100	250	200
1,200	350	150

Since S will continue to produce more output if the transfer price exceeds the incremental costs of production, a price of at least ₹ 200 per 100 units (₹2 per unit) is required to 'persuade' the manager of S to produce as many as 1,000 units, but a price in excess of ₹ 250 per 100 units would motivate the manager of S to produce 1,100 units (or more).

By a similar argument, T will continue to want more output from S if the incremental revenue exceed the transfer costs from S. If T wants 1,000 units the transfer price must be less than ₹ 220 per 100 units. However, if the transfer price is lower than ₹ 200 per 100 units, T will ask for 1,100 units from S in order to improve its divisional profit further.

In summary
(a) The total company profit is maximized at 1,000 units of output.
(b) Division S will, want to produce 1,000 units, no more and no less, if the transfer price is between ₹ 2 and ₹ 2.50 (₹200 to ₹ 250 per 100 units).
(c) Division T will want to receive and process 1,000 units, no more and no less, if the transfer price is between ₹2 and ₹2.20
(d) A transfer price must therefore be selected in the range ₹2.00 to ₹2.20 per unit (exclusive).

If a price of ₹2.10 per unit is selected, profits at 1,000 units of output would be:

₹2.10			
Particulars	Division S	Division T	Total
Sales/net revenue	2,100	4,000	4,000
Costs	1,200	2,100	1,200
Profit	900	1,900	2,800

At a transfer price of ₹2.10 any increase in output above 1,000 units, or shortfall in output below this amount, would reduce the profits of the company as a whole, but also the divisional profits of S and T.

3. Answer any two questions. [2x8=16]

(a) List out the objectives of Cost Audit. [8]

Answer:

Cost Audit has both general and social objectives. The general objectives can be described to include the following:

- Verification of cost accounts with a view to ascertaining that these have been properly maintained and compiled according to the cost accounting system followed by the enterprise.
- Ensuring that the prescribed procedures of cost accounting records rules are duly adhered to Detection of errors and fraud.
- Verification of the cost of each "cost unit" and "cost center" to ensure that these have been properly ascertained.
- Determination of inventory valuation.
- Facilitating the fixation of prices of goods and services.
- Periodical reconciliation between cost accounts and financial accounts.

- ❖ Ensuring optimum utilization of human, physical and financial resources of the enterprise.
- ❖ Detection and correction of abnormal loss of material and time.
- ❖ Inculcation of cost consciousness.
- ❖ Advising management, on the basis of inter-firm comparison of cost records, as regards the areas where performance calls for improvement.
- ❖ Promoting corporate governance through various operational disclosures to the directors.
- ❖ Among the social objectives of cost audit, the following deserve special mention:
- ❖ Facilitation in fixation of reasonable prices of goods and services produced by the enterprise. Improvement in productivity of human, physical and financial resources of the enterprise.
- ❖ Channelising of the enterprise resources to most optimum, productive and profitable areas.
- ❖ Availability of audited cost data as regards contracts containing escalation clauses.
- ❖ Facilitation in settlement of bills in the case of cost-plus contracts entered into by the Government.
- ❖ Pinpointing areas of inefficiency and mismanagement, if any for the benefit of shareholders, consumers, etc., such that necessary corrective action could be taken in time.

(b)

(i) What is meant by Telecommunication Services and what is its coverage? [6]

Answer:

The Companies (Cost Records and Audit) Rules, 2014 has covered "Telecommunication services made available to users by means of any transmission or reception of signs, signals, writing, images and sounds or intelligence of any nature (other than broadcasting services) and regulated by the Telecom Regulatory Authority of India under the Telecom Regulatory Authority of India Act, 1997 (24 of 1997)". The Telecom Regulatory Authority of India Act, 1997 defines "telecommunication service" as "service of any description (including electronic mail, voice mail, data services, audio text service, video text services, radio paging and cellular mobile telephone services) which is made available to users by means of any transmission or reception of signs, signals, writing, images and sounds or intelligence of any nature, by wire, radio, visual or other electro-magnetic means but shall not include broadcasting services".

Subsequently, the Central Government has included broadcasting services within the ambit of telecommunication services by notifying "broadcasting services and cable services to be telecommunication service". [Notification No. 39 issued by Ministry of Communication and Information Technology dated 9 January 2004, S.O. No. 44(E) issued by TRAI, vide F. No. 13-1/2004].

In view of the above, Telecommunication Services made available to users and regulated by the Telecom Regulatory Authority of India under the Telecom Regulatory Authority of India Act, 1997 would include all such services being regulated by TRAI including broadcasting services.

(ii) What is the time limit within which the central government can seek clarification from the Cost Auditor? [2]

Answer:

There is no time limit within which the Central Government can seek clarification from the cost auditor. The Rules have now specified that the Company would be required to maintain the cost accounting records for the preceding eight financial years in good order. The cost auditor is required to provide reply to any clarification sought for by the Central Government from the cost auditor in writing within 30 days of the receipt of the communication addressed to him calling for such clarifications.

(c)

(i) Difference between Cost Accounting Policy and Cost Accounting system. [3]

Answer:

Cost Accounting Policy of a company should 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, would provide a flow of the cost accounting data/ information across the activity flow culminating in arriving at the cost of final product/ activity.

(ii) How will you treat the following items in Cost Accounting Records?

I. Interest received on security deposit with the Electricity Board.

II. Voluntary Retirement Compensation paid to workers, included under wages

III. Profit on sale of fertilizers to cane-growers by a sugar company. [3]

Answer.

I. This cannot be considered as an investment outside the business. Deposit with Electricity Board is made for obtaining power connection and is based on estimated monthly bill for power consumption. It is part of the Working Capital (Current Assets), interest on such deposits can therefore be set off against interest paid or alternatively taken as a credit against overhead. However, the amount involved may not be very significant.

II. This is a one-time non-recurring expenditure. Even if it is included under salaries and wages in Financial A/c., it should be excluded for Cost Accounts purposes. This item is also an item of reconciliation.

III. Some sugar factories supply fertilizers to cane growers to ensure quality of suppliers, and as an incentive for regular supply. Although it helps sugar production, this activity is not directly related to sugar production and is purely a trading activity. The profit from such activity should be shown as an item of reconciliation between Financial and Cost Accounts.

(iii) Variance Accounting is also part of a system of Cost Records. Explain [2]

Answer.

The company may maintain Cost Records on any basis other than actual, i.e., Standard Costing System. In such case, the Cost Records should revel the following:

- Particulars of norms and standards established – both physical and financial
- Details of variances recognized and accounted by the Costing System.
- Time of recognition of variances and the method of accounting – either single plan or partial plan.
- Method of disposition of variances at the end of the period.

4. Answer any three questions. [3x8=24]

(a) List the factors involved in Demand Forecasting. Name the methods of demand forecasting. [7+1]

Answer:

Factors involved in Demand Forecasting:

- 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.
- 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.
- General or specific purpose factor: The firm may find either general or specific forecasting or both useful according to its requirement.
- Product: Forecasting varies type of product i.e., new product or existing product or well established product.
- 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.

- Competition: While making forecasting, market situation and the product position in particular market should be analyzed
- Consumer Behavior: What people think about the future, their own personal prospects and about products and brands are vital factors for firm and industry.

Demand Forecasting Methods can be categorized into two types:

- Opinion Survey method or Qualitative Techniques
- Statistical Method or Quantitative Techniques.

(b)

(i) NANDINI ELECTRICALS an electronics firm assumes a cost function $C(x)=x\left(\frac{x^2}{10}+200\right)$, **where 'x' is a monthly output in thousands of units. Its revenue function is given by R(x) = x(1100-1.5x).**

Find:

I. the output required per month to make the Marginal Profit = 0; and

II. the Profit of this level of output **[3+1]**

Answer:

I. Profit = $R(x)-C(x)=1100x-1.5x^2\ \frac{x^3}{10}-200x$

$$= -\frac{x^3}{10}-1.5x^2+900x(\text{say}P)$$

Marginal Profit (MP) = $\frac{dp}{dx}=-\frac{3x^2}{10}-3x+900$

Pr Marginal Profit (MP) = O (given)

$$-\frac{3x^2}{10}-3x+900=0$$

=> $-3x^2 - 30x + 9000 = 0$

$x^2 + 10x - 3000 = 0$

$x^2 + 60x - 50x - 3000 = 0$

or, $x(x + 60) - 50(x + 60) = 0$

or, $(x - 50)(x + 60) = 0$

Either x = 50 or x = -60

[Since units cannot be negative rejecting the negative value (- 60)]

The required output level = 50 (thousand) units.

II. Total Profit at output x = 50 (thousand) units.

$$-\frac{x^3}{10}-1.5x^2+900x$$

$$=-\frac{1,25,000}{10}-3,750+45,000=₹28,750\text{thousand}$$

(ii) State the main features of Perfect Competition Market. **[4]**

Answer:

The following are the features of perfect competition market:

- There must be large number of Buyers and sellers.
- In perfect competition, the goods produced by different firms are homogeneous or identical.
- In perfect competition there is free entry and exit of the firms into the industry.

- The buyers and the sellers must have the knowledge with regard to the prices of various commodities at different supply and demand forces.
- The factors must be mobilized from those places where they are getting less remuneration to those places where they will get maximum remuneration.
- All commodities are identical in perfect competition. So the prices of the commodities are also uniform.
- In order to maintain the uniform price level in perfect, competition we should not include the transport cost in the price level.
- There is a difference between firm & industry under perfect competition. Firm is a production unit and where as industry is a group of firms

(c)

(i) State the term Law of Demand. List the exceptions to the law of demand. [1+2]

Answer:

The Law of Demand simply expresses the relation between quantity of a commodity demanded and its price. The law states that "demand varies inversely with price, not necessarily proportionately". If the price falls, demand will extend, and vice versa. The law of demand indicates this inverse relationship between price and quantity demanded. "Other things remaining same higher will be demanded at a lower price and lower will be demanded at a higher price".

The law of demand does not apply in every case and situation. The circumstances when the law of demand becomes ineffective are known as exceptions of the law. Some of these important exceptions are as under.

- ❖ Giffen goods:
- ❖ Conspicuous Consumption:
- ❖ Conspicuous necessities:
- ❖ Ignorance:
- ❖ Emergencies:
- ❖ Future changes in prices:
- ❖ Change in fashion:

(ii) The price of desktop computers was slashed from ₹50,000 to ₹25,000, and it was observed that the sale of printers went up from 50 printers per month to 150 printers per month. Determine the cross price elasticity between desktop and printers. [3]

Answer:

The cross price elasticity is as follows:

$$\frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x}$$

First, we will compute ΔQ_x and ΔP_y as proportions of the average of the two data points. So,

$Q_x = \frac{50+150}{2} = 100$

$P_y = 37,500$

$\Delta Q_x = 100$ and $\Delta P_y = 25,000$

So,

$\frac{100}{-25,000} \times \frac{37,500}{100} = -1.5$

The answer indicates that x and y are compliments.

(iii) When the income increases from ₹80,000 to ₹81,000, the quantity demanded of good Y increases from 3,000 unit to 3,050 unit. Compute the income elasticity of demand? [2]

Answer:

Since the change in income is small, we will use the point elasticity measure.

$\left(\frac{\Delta Q}{\Delta I}\right) \times \frac{I}{Q}$

$\left(\frac{50}{1,000}\right) x \frac{80,000}{3,000} = 1.33$

(d)

(i) HITACHI LTD. an air conditioner manufacturer, produces 'x' sets per week at a total cost of $x^2+780x+25000$. The firm is a monopolist and the demand function for its product is x = (15000 - $\frac{p}{4}$), where the price is 'p' per set.

I. Determine the number of AC sets to be produced per week at which the firm will earn maximum net revenue; and

II. Decide the monopoly price. [3+1=4]

Answer:

I. Cost (c) = $x^2 + 780x + 25000$

Demand (D) $x = \left(15000 - \frac{P}{4}\right) = \frac{60000 - P}{4}$

Or, $4x = 60000 – P$

$\Rightarrow P = 60000 – 4x$

So total Revenue per x sets, $R = 60000x – 4x^2$

Maximum Revenue is obtained at MC = MR

$MR = \frac{dR}{dx} = 60000 - 8x$ (Marginal Revenue)

MC (Marginal Cost) $= \frac{dC}{dx} = 2x + 780$

or, $2x + 780 = 60000 – 8x$

or, $10x = 59220$

or, $x = 5922$ Sets

II. Monopoly Price = 60000 – 4x
= 60000 – 4 x 5922 = ₹ 36312

(ii) 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. [4]

Answer:

Given 10 E = $\frac{-w^3}{40}$ + 30W – 39.2

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

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

=> $3W^2 = 1200$ => 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