

PAPER 10- COST & MANAGEMENT ACCOUNTANCY

Paper 10- Cost & Management Accountancy

Full Marks: 100

Time allowed: 3 Hours

Section - A

1. Answer Question No.1 which is compulsory carrying 25 Marks

(a) Answer the following

[5 x 2 = 10]

- (i) The standard wage rate is ₹40 per hour; Actual wage rate is ₹45 per hour, standard time is 500 hours and actual hours worked is 480 hours. If wages paid for 505 hours then what will be the labour idle time variance?
- (ii) Sales during the following months
 2015-Oct ₹ 12,00,000
 2015-Nov ₹ 14,00,000
 2015-Dec ₹ 16,00,000
 60% of sales are collected in the month after sales, 30% in the second month and 10% in the third month. What is the Budgeted collection from Debtors for the month of Jan '2016?
- (iii) The profit volume ratio of X Ltd. is 50% and the margin of safety is 40%. You are required to calculate the net profit if the sales volume is ₹1,00,000.
- (iv) Cash Received from Contracted is ₹ 12,80,000 which is 80% of work certification, So What is the amount of work Certified?
- (v) Company has invested ₹ 5,00,000 in machinery for manufacturing a Product in Division X. Cost of Capital is 20%. The Profit from division X is ₹ 1,20,000 for the year, Compute the Residual Income from Division X?

(b) Match the following

[5 x 1 = 5]

	Column 'A'		Column 'B'
1	Uniform Costing	A	Measures divisional performance
2	Escalation Clause	B	Contract Costing
3	Residual Income	C	Technique to assist inter-firm comparison.
4	Form - CRA - 2	D	Form for filing Cost Audit Report with the Central Government
5	Form - CRA - 4	E	Form of intimation of appointment of cost auditor by the company to Central Government

(c) List out the any five objectives of Cost Audit.

[5]

(d) The total cost function of a firm $C = \left(\frac{x^3}{3}\right) - 5x^2 + 28x + 10$, where C is total cost and 'x'

is the output. A tax @ ₹2/- per unit of output is imposed and the producer adds it to his cost. If the demand function is given by $P = 2530 - 5x$, where ₹ 'P' is the price per unit of output, Find the profit maximising output and the price at the level. [5]

Answer:

1. (a) (i) Idle Time Variance = Idle Hours x standard Hourly wage Rate
 = (505 - 480) x ₹40
 = ₹1000 (A)

(ii) Collection from Debtors: - Jan -2016
 = 10% of 12,00,000 + 30% of 14,00,000 + 60% of 16,00,000
 = ₹15,00,000

(iii) Margin of Safety Ratio = $\frac{\text{Margin of Safety in ₹}}{\text{Actual Sales}} \times 100$
 $40 = \frac{\text{Margin of Safety in ₹}}{₹1,00,000} \times 100$
 Margin of Safety in ₹ = 40,000

Margin of Safety = $\frac{\text{Profit}}{\text{P/V Ratio}}$
 $₹ 40,000 = \frac{\text{Profit}}{50\%}$
 Profit = ₹ 40,000 × 50% = ₹ 20,000.

(iv) Work Certified = $\frac{12,80,000}{80\%} = 16,00,000$

(v) Residual Income = $1,20,000 - (5,00,000 \times \frac{20}{100}) = 20,000$

(b)

	Column 'A'		Column 'B'
1	Uniform Costing	C	Technique to assist inter-firm comparison.
2	Escalation Clause	B	Contract Costing
3	Residual Income	A	Measures divisional performance
4	Form – CRA – 2	E	Form of intimation of appointment of cost auditor by the company to Central Government
5	Form – CRA – 4	D	Form for filing Cost Audit Report with the Central Government

(c) 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.

(d) Given (C) = $(\frac{x^3}{3}) - 5x^2 + 28x + 10 + 2x$

P = 2530 – 5x

Revenue = xp = 2530x – 5x²

Profit = 2530x – 5x² + 5x² – 28x – 10 – $(\frac{x^3}{3}) - 2x$

= - $(\frac{x^3}{3}) - 2502x - 10 - 2x$

$\frac{dp}{dx} = - \frac{3x^2}{3} - 2500$

$$X^2 = 2500$$

$$x = \sqrt{2500} = 50$$

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

∴ Maximum profit is at $x = 50$ units

$$\text{Price } 2530 - 5 \times 50 = 2280.$$

Section - B

(Cost & Management Accounting – Methods & Techniques and Cost Records and Cost Audit)

Answer any three questions from the following Each question carries 17 marks

2. (a) From the following particulars furnished by M/s. Starlight Co. Ltd. Find out (i) Material cost variance; (ii) Material usage variance and (iii) Material price variance.

Value of Material purchased	₹ 9,000 units
Quantity of Material purchased	3000 units
Standard quantity of materials required per tonne of Finished product	25 units
Standard rate of material	₹ 2 per units
Opening Stock	Nil
Closing Stock of material	500 units
Finished production during the period	80 tonnes

[12]

- (b) Write any three reasons for disagreement of Financial Profits with Cost Profits? [5]

Answer:

2. (a) Material consumed = Quantity of material purchased - Closing stock of materials
= 3000 units - 500 units
= 2500 units

$$\begin{aligned} \text{Actual rate of material} &= \frac{\text{Value of material purchased}}{\text{Quantity of material purchased}} \\ &= \frac{\text{₹ 9,000}}{3,000} \\ &= \text{₹ 3 per unit} \end{aligned}$$

$$\begin{aligned} \text{Standard Quantity for actual output} &= 25 \text{ units} \times 80 \text{ tonnes} \\ &= 2000 \text{ units} \end{aligned}$$

(i) Material Cost Variance

$$\begin{aligned} &= \text{Standard Cost} - \text{Actual Cost} \\ &= (\text{Standard Price} \times \text{Standard Quantity}) - (\text{Actual Price} \times \text{Actual Quantity}) \\ &= (\text{₹ 2} \times 2000 \text{ units}) - (\text{₹ 3} \times 2500 \text{ units}) \\ &= \text{₹ 4,000} - \text{₹ 7,500} \\ &= \text{₹ 3,500 (A)} \end{aligned}$$

(ii) Material Usage Variance

$$\begin{aligned} &= \text{Standard Price} (\text{Standard Quantity} - \text{Actual Quantity}) \\ &= \text{₹ 2} (2000 \text{ units} - 2500 \text{ units}) \\ &= \text{₹ 2} (-500 \text{ units}) \\ &= \text{₹ 1,000 (A)} \end{aligned}$$

(iii) Material Price Variance

- = Actual Quantity x (Standard Price - Actual Price)
- = 2500 x (₹ 2 - ₹ 3)
- = 2500 x (- ₹ 1)
- = ₹ 2,500 (A)

(b) Reasons for difference in profits of cost and financial accounts:

- (i) Items shown in Financial Accounts: There are a number of items which are included in financial accounts but do not find place in cost accounts. They may be items of income or expenses, the former increases the profit and latter reduces the profit.
 - A. Purely Financial Charges
 - (a) Loss arising from the sale of fixed assets.
 - (b) Loss on sale of investments, discount on debentures, etc.
 - (c) Interest on bank loan, mortgage and debentures.
 - (d) Expenses of companies 'Share Transfer Office'.
 - B. Appropriation of Profits
 - (a) Donations and Charities
 - (b) Income Tax
 - (c) Dividend Paid
 - (d) Transfer to Reserves
 - C. Writing off Intangible and Fictitious Assets
 - (a) Goodwill
 - (b) Patents & Copyrights
 - (c) Advertisement
 - (d) Preliminary Expenses
 - D. Pure Financial Incomes
 - (a) Rent received or Profit on Sale of Fixed Assets
 - (b) Share transfer fee received
 - (c) Interest received on Bank Deposits
 - (d) Dividend received etc.
- (ii) Items shown only in Cost Accounts: There are certain items which are included in cost accounts and not in financial accounts. Such items are very few. E.g. Interest on capital employed, rent for own premises etc.
- (iii) Over or Under Absorption of Overheads. Overheads are absorbed in Cost Accounts on a certain predetermined estimated basis and in Financial Accounts, actual amounts incurred are recorded. If there is any over or under absorption it leads to difference in the profits of both sets of books.

3. (a) A manufacturer with overall (interchangeable among the products) capacity of 1,00,000 machine hours has been so far producing a standard mix of 15,000 units of product A, 10,000 units of product B and C each. On experience, the total expenditure exclusive of his fixed charges is found to be ₹ 2.09 lakhs and the cost ratio among the product approximately 1, 1.5, 1.75 respectively per unit.

The fixed charges comes to ₹ 2 per unit. When the unit selling prices are ₹ 6.25 for A, ₹ 7.5 for B and ₹ 10.5 for C. He incurs a loss.

	Mix-I	Mix-II	Mix-III
A	18,000	15,000	22,000
B	12,000	6,000	8,000
C	7,000	13,000	8,000

As a management accountant what mix will you recommend?

[12]

- (b) Vishnu Ltd. manufactures and sells product 'PT'. The company estimates the following demand for product 'PT' for the year 2014-2015:

Quarter	Units
I	20,000
II	22,000
III	25,000
IV	33,000

The production department will manufacture 80% of the current quarter's sales and 20% of the following quarter's sales. The anticipated and desired stock position for the year 2014- 2015 is as follows:

Anticipated stock as on April 1, 2014	4,000 units
Desired stock as on March 31, 2015	5,000 units

The standard cost per unit of the product based on a budgeted production volume of 3,00,000 hrs is as follows:

Direct materials	2 kgs @ ₹20	₹40
Direct labour	3 hrs @ ₹20	₹60
Variable overhead	3 hrs @ ₹10	₹30
Fixed overhead	3 hrs @ ₹12	₹36

Expected selling price of the product is ₹210. You are required to prepare a quarter-wise production budget for 2014-2015, showing the number of units to be produced and total cost of direct materials, direct labour, variable overheads and fixed overheads. [5]

Answer:

3. (a) Let variable cost per unit of A, B, C be ₹ X, ₹ 1.5X and ₹1.75X respectively.

A = 15,000 x X	15,000 X
B = 10,000 x 1.5 X	15,000 X
C = 10,000 x 1.75 X	17,500 X
Total variable cost	47,500 X

So, we can say,

$$47,500 X = 2,09,000$$

$$\text{or, } X = 4.4$$

$$\text{Variable cost per unit of A} = X = ₹ 4.4$$

$$\text{Variable cost per unit of B} = 1.5 (4.4) = ₹ 6.6$$

$$\text{Variable cost per unit of C} = 1.75 (4.4) = ₹ 7.7$$

Statement showing computation of loss at present mix

	Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
I.	Selling price	6.25	7.50	10.50	
II.	Variable cost	4.40	6.60	7.70	
III.	Contribution	1.85	0.90	2.80	
IV.	No. of units at present mix	15,000	10,000	10,000	
V.	Total contribution	27,750	9,000	28,000	64,750
VI.	Fixed cost				70,000
VII.	Loss				5,250

Computation of Profit/ (loss) at Mix I:

	Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
I.	No. of units	18,000	12,000	7,000	
II.	Contribution per unit	1.85	0.90	2.80	
III.	Total contribution	33,300	10,800	19,600	63,700
IV.	Fixed cost				70,000
V.	Loss				6,300

Computation of Profit/ (loss) at Mix II:

	Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
I.	No. of units	15,000	6,000	13,000	
II.	Contribution per unit	1.85	0.90	2.80	
III.	Total contribution	27,750	5,400	36,400	69,550
IV.	Fixed cost				70,000
V.	Loss				450

Computation of Profit/ (loss) at Mix II:

	Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
I.	No. of units	22,000	8,000	8,000	
II.	Contribution per unit	1.85	0.90	2.80	
III.	Total contribution	40,700	7,200	22,400	70,300
IV.	Fixed cost				70,000
V.	Loss				300

As management accountant, one should recommend Mix III because there is profit of ₹300 against loss at other mixes including present mix.

(b) Production Budget for 2014-2015

Particulars	Q-I	Q-II	Q-III	Q-IV	Total
80% of current quartersales demand (units)	16,000	17,600	20,000	26,400	80,000
20% of the following quarter (units)	4,400	5,000	6,600	5,000	21,000
	20,400	22,600	26,600	31,400	1,01,000

Production Cost

Particulars	Q-I	Q-II	Q-III	Q-IV	Total
Units to be produced	10,400	22,600	26,600	31,400	1,01,000
	(₹)	(₹)	(₹)	(₹)	(₹)
Material - ₹40	8,16,000	9,04,000	10,64,000	12,56,000	40,40,000
Labour - ₹60	12,24,000	13,56,000	15,96,000	18,84,000	60,60,000
Variable Overhead - ₹30	6,12,000	6,78,000	7,98,000	9,42,000	30,30,000
Fixed overhead [Note # 1]	9,00,000	9,00,000	9,00,000	9,00,000	36,00,000
	35,52,000	38,38,000	43,58,000	49,82,000	1,67,30,000

Working # 1 : Fixed overhead

Fixed Overhead = 3,00,000 hrs x ₹12 = ₹36,00,000

Therefore, fixed overhead per quarter = ₹36,00,000/ 4 = ₹9,00,000

4. (a) M/s Mysore Petro Ltd. showed a net loss of ₹ 2,08,000 as per their financial accounts for the year ended 31st March, 2012. The Cost accounts, however, disclosed a net loss of ₹ 1,64,000 for the same period. The following information was revealed as a result of the scrutiny of the figures of both the sets of books.

1) Factory overhead under recovered	3,000
2) Administration overhead over recovered	2,000
3) Depreciation charged in financial books	60,000
4) Depreciation recovered in costs	65,000
5) Interest on investment not included in costs	10,000
6) Income-tax provided	60,000
7) Transfer fee (in financial Books)	1,000
8) Stores adjustment (credit in financial books)	1,000

Prepare Reconciliation Statement.

[7]

- (b) A product goes through three processes from a single input material. At the end of the process I, an intermediate A, which cannot be further processed, also emerges. At the end of process II, another intermediate product, B, also emerges, which cannot be processed further. The main product results at the end of process III. The prices of these products have been frozen by the Government, subject to escalation only for raw material price and labour rate variations. During a period, while the price control was in force, the material cost had gone up by ₹ 15 per kg. and the labour rates increased by Re. 0.80 per labour hour. Given the following information, on inputs and related outputs, you are required to determine the amount of claim for price escalation, for each of the intermediary products A and B and the product and the total claim-

Process	Input (kg.)	Output (kg.)	Labour hours
Process I	2,000	1,600	16,000
Process II	1,440	1,200	18,000
Process III	880	800	16,000

[10]

Answer:

4. (a) Statement Showing Reconciliation of Profit Shown by Cost and Financial Accounts

Particulars	Amount (₹)	Amount (₹)
Profit as per Financial Accounts		(2,08,000)
Add: Under recovery of factory overheads	3,000	
Income tax	60,000	63,000
		(1,45,000)
Less: Over recovery of Administration OH	2,000	
Over recovery of depreciation	5,000	
Interest on investments considered in Financial A/c	10,000	
Transfer fee	1,000	
Stores adjustment	1,000	19,000
Loss as per Cost Accounts		1,64,000

(b) (i) Computation of material input at different stages of Process

(1) Input required for Main Product at different stages of process

$$\begin{aligned}
 \text{Input in Process III} &= 880 \text{ Kg.} \\
 \text{Input in Process II} &= \left[\frac{880 \times 1,440}{1,200} \right] = 1,056 \text{ Kg.} \\
 \text{Input in Process I} &= \left[\frac{1,056 \times 2,000}{1,600} \right] = 1,320 \text{ Kg.}
 \end{aligned}$$

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(2) Input required for Intermediate Product 'A'

$$\begin{aligned} \text{Output of A from Process I} &= 1,600 - 1,440 &&= 160 \text{ Kgs.} \\ \text{Input required for this output} &= \left[\frac{160 \times 2,000}{1,600} \right] &&= 200 \text{ Kg.} \end{aligned}$$

(3) Input required for Intermediate Product

$$\begin{aligned} \text{Output of B from Process II} &= 1,200 - 880 &&= 320 \text{ Kgs.} \\ \text{Input required for this output in Process II} &= \left[\frac{320 \times 1,440}{1,200} \right] &&= 384 \text{ Kg.} \\ \text{Input required for this output in Process I} &= \left[\frac{384 \times 2,000}{1,600} \right] &&= 480 \text{ Kg.} \end{aligned}$$

(ii) Computation of labour hours required to process each of products at different stages of process Labour hours per Kg. of output in each process (₹)

Process I	(16,000/1,600)	10
Process II	(18,000/1,200)	15
Process III	(16,000/800)	20

Labour hours required:

(hours)

(a)	Main Product		
	Process III	(800 x 20)	16,000
	Process II	(880 x 15)	13,200
	Process I	(1,056 x 10)	10,560
		Total	39,760
(b)	Product 'A' (intermediate)		
	Process I	(160 x 10)	1,600
(c)	Product 'B' (intermediate)		
	Process II	(320 x 15)	4,800
	Process I	(384 x 10)	3,840
			8,640

Statement of claim for escalation for increase in material and labour

Product	Material		Labour		Total Escalation Claim (₹)
	Qty/Kg.	Escalation @ ₹ 15/Kg.(₹)	Hours	Escalation @ ₹ 0.80/ hr. (₹)	
Main Product	1,320	19,800	39,760	31,808	51,608
Product A (Intermediate)	200	3,000	1,600	1,280	4,280
Product B (Intermediate)	480	7,200	8,640	6,912	14,112
Total	2,000	30,000	50,000	40,000	70,000

The total escalation claim of ₹ 70,000 can be made on the Government for increase in rates of material and labour used in the production process

5. (a) Trimake Limited makes three main products, using broadly the same production methods and equipment for each. A conventional product costing system is used at present, although an Activity Based Costing (ABC) system is being considered. Details of the three products, for typical period are:

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	Labour Hours Per unit	Machine Hours per unit	Material Per unit	Volumes Units
Product X	½	1 ½	₹ 20	750
Product Y	1 ½	1	₹ 12	1,250
Product Z	1	3	₹ 25	7,000

Direct labour costs ₹6 per hour and production overheads are absorbed on a machine hour basis. The rate for the period is ₹ 28 per machine hour.

You are required:

- (i) to calculate the cost per unit for each product using conventional methods.

Further analysis shows that the total of production overheads can be divided as follows:

	%
Costs relating to set-ups	35
Costs relating to machinery	20
Costs relating to materials handling	15
Costs relating to inspection	30
Total production overhead	100%

The following activity volumes are associated with the product line for the period as a whole.

Total activities for the period

	Number of Set-ups	Number of movements of materials	Number of Inspections
Product X	75	12	150
Product Y	115	21	180
Product Z	480	87	670
	670	120	1,000

You are required:

- ii) To calculate the cost per unit for each product using ABC principles [12]

- (b) XYZ Ltd which has a system of assessment of Divisional Performance on the basis of residual income has two Divisions, Alfa and Beta. Alfa has annual capacity to manufacture 15,00,000 numbers of a special component that it sells to outside customers, but has idle capacity. The budgeted residual income of Beta is ₹ 1,20,00,000 while that of Alfa is ₹ 1,00,00,000. Other relevant details extracted from the budget of Alfa for the current years were as follows.

Particulars	
Sale (outside customers)	12,00,000 units @ ₹ 180 per unit
Variable cost per unit	₹ 160
Divisional fixed cost	₹ 80,00,000
Capital employed	₹7,50,00,000
Cost of Capital	12%

Beta has just received a special order for which it requires components similar to the ones made by Alfa. Fully aware of the idle capacity of Alfa, beta has asked Alfa to quote for manufacture and supply of 3,00,000 numbers of the components with a slight modification during final processing. Alfa and Beta agree that this will involve an extra variable cost of ₹ 5 per unit.

You are required to calculate,

- I. Calculate the transfer price which Alfa should quote to Beta to achieve its budgeted residual income.

- II. Also indicate the circumstances in which the proposed transfer price may result in a sub optimal decision for the Company as a whole. [5]

Answer:

5. (a)

- (i) **Computation of cost per unit using Conventional Methods:**

Total Overheads	₹
X = 750 × 1.5 × 28	31,500
Y = 1250 × 1 × 28	35,000
Z = 7000 × 3 × 28	5,88,000
	6,54,500

Computation of cost

Particulars	X	Y	Z
	₹	₹	₹
Materials	20	12	25
Labour	3	9	6
Overheads	42	28	84
Factory Cost	65	49	115

- (ii) **Under ABC Costing**

	Setup Cost	Machine Cost	Machine Handling Cost	Inspection Expenses	Total
Costs (₹)	2,29,075	1,30,900	98,175	1,96,350	6,54,500
Cost Driver	No. of setups	Machine hours	No. of movement of materials	No. of Inspections	
Cost driver rates (₹)	341.90 (229075/670)	5.6 (130900/23375)	818.125 (98,175/120)	196.35 (196350/1000)	

Cost per unit under ABC costing

Particulars	X		Y		Z	
	₹	₹	₹	₹	₹	₹
Materials		20.00		12.00		25.00
Labour		3.00		9.00		6.00
Overheads						
Setup Cost	34.19		31.45		23.44	
Machine cost	8.40		5.60		16.80	
Machine Handling Cost	13.09		13.74		10.17	
Inspection Cost	39.27	94.95	28.27	79.06	18.79	69.20
Total Cost		117.95		100.06		100.20

(b)

- I. **Contribution required at Budgeted Residual Income**

	₹
Fixed cost	80,00,000
Profit on 7,50,00,000 x 12 %	90,00,000
Residual Income	1,00,00,000
Total Contribution required.	2,70,00,000

Contribution derived from existing units = 12,00,000 x 20 = ₹ 2,40,00,000

Contribution required on 3,00,000 units = 2,70,00,000 – 2,40,00,000 = ₹ 30,00,000

Contribution per unit = 30,00,000 / 3,00,000 = ₹ 10

Increase in Variable cost = ₹ 5

$$\begin{aligned} \therefore \text{Transfer price} &= \text{V.C} + \text{Desired Residual Income} + \text{Increase in VC} \\ &= 160 + 10 + 5 \\ &= ₹ 175 \end{aligned}$$

II. If Beta can buy from outside at less than the Variable cost of manufacture, i.e. ₹ 165, then only the decision to transfer price of ₹ 175, will be sub-optimal for the group as whole.

6. (a) As per Cost Audit Record Rules, state the functions of the following industries.

i) Telecommunication Industry

ii) Pharmaceuticals Industry

iii) Petroleum Industry

iv) Electricity Industry

[8]

(b) List out Annexure required to be attached along with Form CRA-3 by the Cost Auditors? [9]

Answer:

6. (a) (i) **Telecommunication Industry:**

"Telecommunication Activities" means any act, process procedure, function, operation, technique, treatment or method employed in relation to telecasting, broadcasting, telecommunicating voice, text, picture, information, data or knowledge through any mode or medium and includes intermediate and allied activities thereof and these activities would, inter alia, include the following services or activities, including such services that required license or registration with the Ministry of Communications and information Technology, Government of India, namely :-

- (1) Basic Telephone Services;
- (2) National Long Distance Services;
- (3) International Long Distance Services;
- (4) Cellular Mobile Telephone Services;
- (5) Wireless Local Loop (WLL) (Fixed or Mobile) Telephone Services;
- (6) Very Small Aperture Terminal Services;
- (7) Public Mobile Radio Trunk Services;
- (8) Global Mobile Personal Communication Services;
- (9) Internet or Broadband or Wireless Access service;
- (10) Infrastructure Provider (IP- 1);
- (11) Passive Telecom Infrastructure including Telecom Tower Facilities;
- (12) Cable Landing Stations; and
- (13) Any other related, allied, intermediate or support services in relation to telecommunication activities not indicated above.

(ii) **Pharmaceuticals Industry:**

"Pharmaceutical Activities" means production, processing, or manufacturing of bulk drugs of formulations and includes the meaning assigned to them under the Drugs (Prices Control) Order 1995 as amended from time to time, or included under Chapters 29 and 30 of the Central Excise Tariff Act, 1985 (5 of 1986), and further includes the intermediate products and articles or allied products thereof.

- (1) "**Bulk drugs**" means any pharmaceutical, chemical, biological or plant product including its salts, esters, stereoisomers and derivatives, which are used as such or as an ingredient in any formulation and shall include any bulk drug included in any bona fide Allopathic, Ayurvedic, Homeopathic, Sidha or Unani (Tibb) systems of medicine;

(2) **"Formulations"** means any medicine processed out of or containing one or more bulk drugs with or without the use of any pharmaceutical aids for internal or external use of or in the diagnosis, treatment, mitigation or prevention of disease in human beings or animals and shall include any medicine included in any bona fide Allopathic, Ayurvedic, Homeopathic, Sidha or Unani (Tibb) systems of medicine;

(iii) Petroleum Industry:

"Petroleum Activities" means production, processing manufacturing or mining of crude oil, gases [including Natural Gas, Compressed Natural Gas, Liquefied Petroleum Gas and regasified gases, etc. as defined in the Petroleum and Natural Gas Regulatory Board Act, 2006 (19 of 2006)] or Biogas or any other petroleum products, or included under Chapter 27 of the Central Excise Tariff Act, 1985 (5 of 1986), including the intermediate products and articles or allied products or activities thereof and includes storage, transportation or distribution of crude oil or gases or biogas or any or all of the petroleum products.

(iv) Electricity Industry:

"Electricity Activities" means any act, process, procedure, function, operation, technique, treatment or method employed in relation to generation of electricity from any source of energy and includes transformation, transmission, distribution or supply of electricity by any mode, or medium and further includes intermediate and allied activities thereof.

(b) List of the annexure need to be furnished along with Form CRA - 3:

Annexure has been reclassified into four parts as under:

Part-A

General Information,
General Details of Cost Auditors
Cost Accounting Policy
Product/Service Details -for the company as a whole

Part-B For Manufacturing Sector

Quantitative Information
Abridged Cost Statement
Details of Materials Consumed
Details of Utilities Consumed
Details of Industry Specific Operating Expenses

Part-C For Service Sector

Quantitative Information
Abridged Cost Statement
Details of Materials Consumed
Details of Utilities Consumed
Details of Industry Specific Operating Expenses

Part-D

Product and Service Profitability Statement
Profit Reconciliation
Value Addition and Distribution of Earnings
Financial Position and Ratio Analysis
Related Party Transactions
Reconciliation of Indirect taxes.

Section - C

(Economics for managerial decision making)

Answer any two from the following each question carries 12 marks

7. (a) What are factors influencing price of a product? [6]
- (b) Cost = $400x - 10x^2 + \frac{1}{3}x^3$, Calculate
- (i) Output at which Marginal Cost is minimum
 - (ii) Output at which Average Cost is minimum
 - (iii) Output at which Marginal Cost = Average Cost. [6]

Answer:

7. (a) Companies develop pricing strategies after considering a variety of factors. Your product or service prices impact your profitability as well as the perception of your brand in the marketplace. Setting prices that are too high can prevent customers from buying your products. If you set prices too low, you could miss out on additional profits.

Value

The value customers perceive in your product is an important factor. If you charge ₹10 for a product that customers generally feel is worth ₹5 or ₹6, you may not get enough volume to generate suitable profits. In the same way, if customers see more value than what you charge, you could miss out. However, giving customers a good deal means having them feel like they go more than they paid for.

Profit Margin Goals

Some companies simply determine how much profit they want to make on products. If the norm in an industry is a 30 percent mark-up, you might set prices that give you a 30 percent profit. A challenge with this approach is that if your costs increase, you would have to increase the prices you charge to customers to maintain your profit margin goals.

Competitors

In highly competitive industries, it is common to study the price points of competitors. You can set prices that are relatively in line with competitors — with flexibility to go higher or lower, as needed. If you want to attract customers and undercut the competition, setting prices 5 to 10 percent below competing companies makes sense.

Quality

Customers typically perceive that your price says something about the quality of your products. If you market your brand and products as top quality, a higher price point that matches adds consistency. Promoting a premium product at a low-end price may confuse customers, and more importantly, it is impractical to have the top product or service without paying to get it. If you produce or acquire a great product, you would need a higher market price to cover its costs.

Financial Objectives

In general, your emphasis on revenue or profits impacts your approach to pricing. If you are trying to generate revenue and cash in the short-run, discounted prices is common. To achieve long-term profits by optimizing margins, you need higher price points and customers that become loyalty to your business.

(b) (i) Marginal Cost = $\frac{dc}{dx} = 400 - 20x + x^2$ (say, y)

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

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

$$x = 10$$

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

(ii) Average Cost = $400 - 10x + \frac{1}{3}x^2$ (y say)

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

$$\Rightarrow x = \frac{30}{2} = 15$$

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

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

(iii) Output at which Marginal Cost = Average Cost $400 - 20x + x^2 = 400 - 10x + \frac{1}{3}x^2$

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

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

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

$$\text{Or, } 2x^2 - 30x = 0$$

$$\text{Or, } 2x(x - 15) = 0$$

$$\text{Or, } x - 15 = 0$$

$$\therefore x = 15$$

8. (a) Calculate the trend values by the method of least squares from the data given below and estimate the sales for the year 2014.

Year	2010	2011	2012	2013	2014
Sales(₹ Lakhs)	70	74	80	86	90

[8]

- (b) The Average Cost function (AC) for a certain commodity is given by $AC = 2x - 1 + \frac{50}{x}$ in terms of output x, find the output for which (i) Average cost is increasing (ii) Average cost is decreasing (iii) Find the total cost (iv) Marginal Cost. [4]

Answer:

8. (a)

Calculation of Trend values by Least Squares Method

Year (t)	Sales Y	Time deviation (X)	XY	X ²	Trend values Yc
2010	70	-2	-140	4	69.6
2011	74	-1	-74	1	74.8
2012	80	0	0	0	80.0
2013	86	+1	+86	1	85.2
2014	90	+2	+180	4	90.4
N = 5	ΣY = 400	ΣX = 0	ΣXY = 52	ΣX² = 10	ΣYc = 400

Equation of Trend line = $Y_c = a + bX \Rightarrow Y_c = a + (t - 2012)$

Since $X = 0$, $a = \Sigma Y/N = 80$

$b = \Sigma XY / \Sigma X^2 = 5.2$

The equation of Straight line would be $Y = 80 + 5.2X$. The value of Y when $X = 2014$ or in terms of deviation $X = +5$

$Y_{2014} = 80 + (5.2 \times 5) = 80 + 26 = 106$

Trend value for 2010 = $80 + (2010 - 2011) \times 5.2 = 69.6$

Similarly trend values for 2011, 2012 etc have been calculated.

- (b) In order to a function is said to be increasing (or) decreasing its derivation must be zero.

$$\frac{dy}{dx} = 2 - 50x^2 = 0$$

$$\Rightarrow 2 - \left(\frac{50}{2x^2}\right) = 0$$

$$\Rightarrow 2x^2 - 50 = 0$$

$$\Rightarrow x^2 - 25 = 0$$

$$\therefore x = \pm 5$$

When $x > 5$ it is increasing

When $x < 5$ it is decreasing

$$\text{Total Cost} = \left(2x - 1 + \frac{50}{x}\right) x = 2x^2 - x + 50$$

$$\text{Marginal Cost} = \frac{dy}{dx} (2x^2 - x + 50) = 4x - 1$$

9. (a) A manufacturer can sell "x" items per month, at price $P=200 - 2x$. Manufacturer's cost of production ₹ Y of 'X' items is given by $Y= 2x + 2000$. Find no. of items to be produced to yield maximum profit p.m. [7]
- (b) A manufacturer can sell "x" items ($x > 0$) at a price of $(330 - x)$ each; the cost of producing 'x' items is ₹ $x^2 + 10x + 12$. How many items should he sell to make the maximum profit? Also determine the maximum profit. [5]

Answer:

9. (a) Units = x
Price = $200 - 2x$
Revenue (R) = $Px = 200x - 2x^2$

Cost (C) = $2x + 2000$
Profit (z) = $200x - 2x^2 - 2x - 2000$
 $-2x^2 + 198x - 2000$
 $\frac{dz}{dx} = -4x + 198 = 0$
 $-4x = -198$
 $X = 198/4 = 49.5$
 $\frac{d^2z}{dx^2} = -4$ which is Positive
 $\frac{d^2z}{dx^2} = < 0$
Profit is maximum at $x = 49.5$ units

- (b) Given price (P) = $330 - x$
Cost (C) = $x^2 + 10x + 12$
Output = $x \geq 0$
Revenue (R) = $P_x = 330x - x^2$
Profit = $R - C = 330x - x^2 - x^2 + 10x - 12$
 $= 320x - 2x^2 - 12$ (say y)

In order that maximum profit is attained

$$\frac{dy}{dx} = 0, \text{ and}$$

$$\frac{d^2y}{dx^2} = \text{Positive}$$

$$\frac{dy}{dx} = 320 - 4x = 0$$

$$\Rightarrow -4x = -320$$

$$x = 80$$

$$\frac{d^2y}{dx^2} = -4, \text{ which is negative.}$$

Therefore profit is maximum at $x = 80$ units

$$\begin{aligned} \text{Maximum profit} &= 320(80) - 2(80)^2 - 12 \\ &= 12,788. \end{aligned}$$