

**PAPER – 10: COST & MANAGEMENT ACCOUNTANCY**

### Paper – 10: Cost & Management Accountancy

Time Allowed: 3 Hours

Full Marks: 100

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.

#### Section – A

1. Answer the following question which is compulsory

(a) Answer the following

$$\begin{aligned} \text{(i) BEP (Sales)} &= \frac{\text{Fixed Cost}}{\text{Profit Volume Ratio}} \\ &= \frac{3,00,000}{33\frac{1}{3}\%} \\ &= ₹9,00,000 \end{aligned}$$

Total sales to have a margin of safety of 10%

$$\begin{aligned} &= 9,00,000 \times \frac{10}{9} \\ &= 10,00,000 \end{aligned}$$

$$\begin{aligned} \text{(ii) Volume Variance} &= [\text{budgeted production} - \text{Actual Production}] \text{ Std. Rate} \\ &= [10,000 - 11,000] \frac{20,000}{10,000 \text{ units}} = 2,000 \text{ (A)} \end{aligned}$$

$$\begin{aligned} \text{(iii) Variable Cost per hour (or) Indifference Level} &= \frac{\text{Difference in Cost}}{\text{Difference in hour}} \\ &= \frac{17,500 - 15,400}{7,500 - 5,400} = ₹1 \text{ per hour.} \end{aligned}$$

Fixed cost = Total cost – variable Cost = 17,500 – (7,500 × 1) = 10,000

Cost of repairs and maintenance for Dec- 2004 for 6,200 hours

$$= \text{Fixed Cost} + \text{Variable Cost} = 10,000 + (6,200 \times 1) = ₹16,200$$

$$\text{(iv) Cost per unit} = ₹160$$

$$\text{Variable cost} = 160 \times \frac{75}{100} = ₹120 \text{ per unit}$$

$$\text{Fixed Cost} = 10,000 \times ₹40 = 4,00,000$$

$$[\text{Fixed Cost per unit} = 160 - 120 = ₹40]$$

## MTP\_Intermediate\_Syllabus 2012\_Jun2016\_Set 2

Given Production = 10,000

If product increased by 25% =  $10,000 \times \frac{25}{100} = 2,500 = 10,000 + 2,500 = 12,500$

Variable Cost =  $12,500 \times 120 = 15,00,000$

Fixed Cost = 4,00,000

Total Cost 19,00,000

Cost per unit =  $\frac{19,00,000}{12,500} = ₹152$

(v) Main Product:  $(2,000 \times \frac{75}{100}) = 1,500$

By Product =  $(2,000 \times 20) / 100 = 400$

Wastage =  $(2,000 \times 5) / 100 = 100$

Total  $(1,500 + 400 + 100) = 2,000$  units

Direct Labour Ratio:

Main Product : By Product

2 × 1,500 : 1 × 400

3,000 : 400

30 : 4

15 : 2

Statement showing apportionment of joint expenses

Element	Basis of Apportionment	Total	Main product	By – Product
Material	80: 20	10,000	8,000	2,000
Direct – labour	15 : 2	8,500	7,500	1,000
OHs.	200% of wages	17,000	15,000	2,000
		35,500	30,500	5,000

**(b) Match the following**

	Column 'A'		Column 'B'
1.	Uniform Costing	E	Technique to assist inter-firm comparison
2.	Value engineering	A	Design of the product
3.	Variance analysis	D	Management by Exception
4.	Escalation Clause	C	Contract Costing
5.	Residual Income	B	Measures divisional performance

- (c) (i)** EVERY COST Auditor appointed as per rule 6(1) (2) shall continue in such capacity till the expiry of 180 days from the closure of the financial year (or) till he submits the cost audit report, for the financial year for which he has been appointed.

## MTP\_ Intermediate\_Syllabus 2012\_Jun2016\_Set 2

- (ii) As per Rule – 4 with Rule – 3 of the companies (cost records & Audit) rules 2014, cost audit is only applicable to Goods specifically in list (A) & (B) i. e. Cost Audit is applicable to products covered under regulatory and non regulatory sector mentioned in Rule – 3.

(d) Given Cost function  $c = \frac{3}{5}X + \frac{15}{4}$

- (i) When  $x = 5$  units

$$\text{Cost (c)} = \frac{3}{5}(5) + \frac{15}{4} = 3 + \frac{15}{4} = \frac{27}{4} = 6.75$$

(ii) Average Cost (AC) =  $\frac{c}{x} = \frac{1}{x} \left[ \frac{3}{5}x + \frac{15}{4} \right] = \frac{3}{5} + \frac{15}{4x}$

When  $x = 10$  units.

$$AC = \frac{3}{5} + \frac{15}{4(10)} = \frac{3}{5} + \frac{3}{8} = \frac{24 + 15}{40} = \frac{39}{40} = 0.975$$

(iii) Marginal cost (MC) =  $\frac{dc}{dx} = \frac{3}{5} + 0 = \frac{3}{5} = 0.6$

### 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) Statement of Profit and Loss

	₹	₹	₹
Standard Market cost [14,400 × 4.5]			64,800
(+) Price variance			4,250
(-) usage variance			(1,050)
			68,000
Standard wage 14,400 × 3 =		43,200	
(+) Rate variance		4,000	
(-) Efficiency Variance		(3,200)	44,000
Standard and Actual Direct expenses [14,400 × 0.05]			7,200
Prime Cost			1,19,200
Factory Overheads			
a) Variable 14,400 × 0.25	3,600		
(-) expenses variance	400	3,200	
b) Fixed: 14,400 × 0.30	4,320		
(-) Expenditure Variance	(400)		
(+) Volume variance	1,680	5,600	8,800
Works Cost			1,28,000
Administration over heads [14,400 × 0.3]		4,320	
(+) Expenditure Variance		400	
(+) Volume variance		1,680	6,400
Total Cost			1,34,400
Profit (b/f)			9,600
Sales			1,44,000

## MTP\_ Intermediate\_Syllabus 2012\_Jun2016\_Set 2

2. (b) **Workings: -**

Cost of material and wages incurred		
= Material = 1,00,000 – 25,000		75,000
Wages = 45,000 + 5,000		<u>50,000</u>
		<u>1,25,000</u>

Cost of Material & wages before increase in prices	$= 1,25,000 \times \frac{100}{125}$ $= 1,00,000$
Increase in contract Price = $[125,000 - (1,00,000 \times \frac{105}{100})] \times \frac{25}{100} = ₹5,000$	

Contract Account

	₹		₹
To Materials	1,00,000	By WIP	
To Wages	50,000	Work certified – 2,05,000	
		Work Uncertified - 15000	2,20,000
To Gen. Expenses	10,000		
To Depreciation on plant	5,000	By Bal/ cd	
		Material an hand	25,000
To Profit & Loss a/c	19,512		
To WIP (Reserve)	60,488		
	<u>2,45,000</u>		<u>2,45,000</u>

3. (a) Computation of cost driver rates

1. Material Procurement =  $\frac{5,80,000}{1,100} = 527$  per order
2. Material handling =  $\frac{2,50,000}{680} = 368$  per movement
3. Setup Cost =  $\frac{4,15,000}{520} = 798$  per set up
4. Maintenance =  $\frac{9,70,000}{8,400} = 115$  per Maintenance hour
5. Quality Control =  $\frac{1,76,000}{900} = 196$  per inspection
6. Machinery =  $\frac{7,20,000}{24,000} = 30$  per machine hour

Computation of Total Cost of 2,600 units of AX – 15

Material Cost	1,30,000	
Labour Cost	2,45,000	
Prime cost		3,75,000

## MTP\_Intermediate\_Syllabus 2012\_Jun2016\_Set 2

Add: Over heads		
Material Procurement (26 × 527)	13,702	
Material handling (18 × 368)	6,624	
Setup Cost (25 × 798)	19,950	
Maintenance (690 × 15)	79,350	
Quality Control (28 × 196)	5,488	
Machinery (180 × 30)	54,000	1,79,114
Total Cost for job		5,54,114

### 3. (b) Statement of equivalent Production

Input	Output	Units	Material		Labour		Overheads	
			%	U	%	U	%	U
10,000	Normal Loss	100	-	-	-	-	-	-
	Finished goods	9,500	100	9,500	100	9,500	100	9,500
	Closing stock	350	100	350	50	175	50	175
	Abnormal Loss	50	100	50	80	40	80	40
10,000		10,000		9,900		9,715		9,715

#### Statement of cost

Cost incurred (30,000 + 14,650)

= 44,650

(-) Scarp	100	44,550	21,148	42,000
-----------	-----	--------	--------	--------

Cost per unit		4.5	2.1768	4.3232
---------------	--	-----	--------	--------

#### Value of closing Stock

Material	350 × 4.5 =	1575
Labour	175 × 2.1766 =	380.94
OH	175 × 4.3232	756.56
		2,712.5

#### Value of abnormal loss

Material	50 × 4.5 =	225
Labour	40 × 2.1766 =	87.072
OHS	40 × 4.3232	172.928
		485

#### Process B A/c

Particulars	Units	Value	Particulars	Units	Value
To Materials	1,00,000	30,000	By Normal Loss	100	100
To Additional material		14,650	By Abnormal loss	50	485
To labour		21,148	By Closing stock	350	2,713
To Over heads		42,000	By transfer to next process @ ₹11	9,500	1,04,500
	10,000	1,07,798		10,000	1,07,798

## MTP\_Intermediate\_Syllabus 2012\_Jun2016\_Set 2

4. (a) Computation of contribution per labour hour from external sales.

	X	Y	Z
Market Price	48	46	40
Variable cost	33	24	28
Contribution	15	22	12
Labour hours Required	3	4	2
Contribution per Labour hour	5	5.50	6
Priority	III	II	I

- a) Computation of transfer price when the capacity is 3,800 hours: -

Hours required for:

I	: Z	: 300 × 2	= 600
II	: Y	: 500 × 4	= 2,000
III	: X	: 800 × 3	= 2,400
			5,000

The existing capacity is not sufficient to produce the units to meet the external sales. In order to transfer 300 units of y, 1,200 hours are required in which division A will give up the production of X to this extent.

Variable cost of y	24
(+) Contribution lost by giving up production of x to the extent of 1,200 hours = 1,200 × 5 = 6,000	
Opportunity cost per unit $\frac{6,000}{300}$	20
<b>Required Transfer Price</b>	<b>44</b>

If the capacity is 5,600 hours

Variable cost	24
Contribution lost by giving up x to the extent of 600 hours = 600 × 5 = 3,000 (being opportunity cost)	
Opportunity cost per unit $\frac{3,000}{300}$	10
<b>Required Transfer Price</b>	<b>34</b>

4. (b) Limitations of Break Even Point

- (i) That the behavior of both costs and revenue is not entirely related to change in volume.
- (ii) That fixed costs remain constant and variable costs vary in proportion to the volume.
- (iii) That sales mix is constant or only is product in manufacture a combined analysis taking all the product of the mix does not reflect the correct position regarding individual products.
- (iv) That production and sale figures are identical or the change in opening and closing stocks of the finished product is not significant.
- (v) That the units of production on the various product range are identical, otherwise, it is difficult to find a homogenous factor to represent volume.
- (vi) That the activities and productivity of the concern remain unchanged during the period of study.

## MTP\_ Intermediate\_Syllabus 2012\_Jun2016\_Set 2

5. (a) Statement showing computation of break even before and after merged plant up the capacity utilization to get the profit of 20 lakhs of the plant.

	Plant – A		Plant – B		Total (100%)
	Before (100%)	After (100%)	Before (100%)	After (100%)	
I. Sales	200	200	210	300	500
II. Variable cost	150	150	140	200	350
III. Contribution	50	50	70	100	150
IV. Fixed Cost	40	40	60	60	100
V. Profit	10	10	10	40	50

$$\begin{aligned}
 \text{a) Break even of the merged plant} &\rightarrow \frac{F \times S}{s - V} = \frac{100 \times 500}{500 - 350} = \frac{50,000}{150} = 333.33 \\
 &= \frac{333.33}{500} \times 100
 \end{aligned}$$

$$\text{Capacity required} = 66.67\%$$

$$\text{b) P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} = \frac{150}{500} = 30\% \text{ or } 0.3$$

$$\begin{aligned}
 \text{Required sales to earn a desired profit of 20 lakhs} &= \frac{\text{FC} + \text{desired profit}}{\text{P/v Ratio}} = \frac{100 + 20}{0.3} \\
 &= 400 \text{ lakhs.}
 \end{aligned}$$

5. (b) (i) Scrap                      (ii) Spoilage.

(i) Scrap: This is also in the form of incidental material coming out of certain types of manufacturing processes but it is usually in small amounts and has low measurable utility or market value, recoverable without for thee processing. It should always be physically available unlike waste which may or may not be present in the form of residue. Accounting treatment of scrap is as follows: a. sales credited to revenue b. credit to overhead C. credit to jobs d. transfer to other jobs.

(ii) Spoilage: when production does not come up to the standard specifications or quality it has to be rejected outright. The components or materials are so damaged in the manufacturing process that they cannot be brought back to the normal specification by repairs or reconditioning. Some spoiled work may be sold as seconds but in most cases the entire production is sold for small value in the form of scraped or treated as waste if it has no market value. Spoilage involves not only loss of materials but also of labour and manufacturing over head incurred upto the stage when the spoilage incurred.

6. (a) Procedure for appointment of cost Auditor of the Company.

The Board of Directors of the Companies as specified in rule 3 and the thresholds limits laid down in rule 4, shall within 180 days of the commencement of every financial year (i. e. on a before 30<sup>th</sup> Sept.) appoint a cost auditor 9 Rule 6(ii)

Every Company referred in rule 6(i) shall inform the cost auditor concern of his or it's appointment as such and five a notice of such appointment with the central Government within a period of thirty days of the Board meeting in which such



## MTP\_Intermediate\_Syllabus 2012\_Jun2016\_Set 2

appointment is made or within a period of 180 days of the commencement of the financial year (i. e. as or before 30<sup>th</sup> Sept.), whichever is earlier, through electronic mode, in from CRA-2, along with the fee as specified in companies (registration offices and fee) rule, 2014 [Rule 60]

Any casual vacancy in the office of a cost auditor, whether due to resignation, death or removal, shall be filled by the Board of directors within thirty duets of occurrence of such vacancy and the company shall inform the central government in from CRA – 2 within thirty days of such appointment of cost auditor.

6. (b) Computation of landed cost of material

Particulars	Amount (₹)
Purchase price of material	5,00,000
Add: Import Duties of purchasing the Material	45,000
Freight Inured during the procurement of material	62,000
Rescivance paid for fright	28,000
Price variance due to computation of cost under standard rates	1,500
Total	6,36,500
Less: Trade discount	8,000
Abnormal loss of materials	14,000
Rebates	10,000
CENVAT credit refundable	7,000
Value of receipt of material	5,97,500

Note:

- (i) Normal loss is not deducted.
- (ii) Price variance is allowable inclusion as the cost was maintained on standard cost

**Section C**  
**(Economics for managerial decision making)**  
**Answer any two from the following**  
**Each question carries 12 marks**

7. (a) Features of the monopolistic competition Markets.
- ❖ Prof. E. H chambeline of Harvard University is the founder and the builder of monopolist competition.
  - ❖ Monopolistic competition is the midway of perfect competition and monopoly.

There are some elements of competition and monopoly in this monopolistic competition.

Features:

1. Existence of large number of firms:  
In monopolist competitions there are large number of firms in the market. The output of each firm is very much less in the total output.

## MTP\_Intermediate\_Syllabus 2012\_Jun2016\_Set 2

---

2. Product differentiation:

Product differentiation is another feature of monopolistic competition. Under this monopolist competition product are not homogeneous like in perfect competition and they are not remote substitutes as in monopoly. These products may be close substitutes. For example Colgate tooth paste, Close-Up etc.

3. Free entry and Exit:

There is a free entry and exit of the firms in monopolistic competition. The new firms may enter the market of the existence firms may leave the market.

4. Excess capacity:

Under monopolistic competition the firms produce the goods upto that level where the average cost is at falling stage. The firms do not produce the output upto that level where the long run avg. Cost is at minimum level. In monopolist competition the amount of output that is produced by the firm is less than the ideal output. This is called excess capacity.

5. Selling Cost:

The costs on advertisement are commonly called selling costs. Through publicity and propoganda the firm will popularize the quality of the products. With the help of advertisement the firms may change the tastes of the customs. In a real since the selling costs will not promote the welfare of the customers.

7. (b) Given revenue function (R) = 10Q where Q being units

$$\text{Given cost function (c)} = 20,000 + 50 \left( \frac{Q}{800} \right)^2$$

$$\therefore \text{Profit (P)} = R - C = 10Q - 20,000 - 50 \left( \frac{Q}{500} \right)^2$$

In order to that the profit is to be maximum its derivatives is zero and second derivative must be negative.

$$\therefore \frac{dp}{dQ} = 0$$

$$= 10 - 0 - \frac{50}{6,40,000} (2Q) = 0$$

$$= \frac{100 Q}{6,40,000} = 10$$

$$\Rightarrow Q = 64,000 \text{ units.}$$

$$\text{Again } \frac{d^2P}{dQ^2} = \frac{-100}{6,40,000} = \frac{-1}{6,400} < 0 \text{ (which is - ve)}$$

$\therefore$  Profit is maximum at

$$Q = 64,000 \text{ units.}$$

8. (a) Given demand functions

$$X = 3 (P^{-2})$$

Differentiate w. r. to x we get

$$| = 3[-2 P^{-3}] \frac{dP}{dx}$$

$$\Rightarrow | = \frac{-6}{P^3} \frac{dP}{dx}$$

$$\Rightarrow \frac{dP}{dx} = \frac{-6}{P^3} \text{-----(1)}$$

$$\text{Now } \frac{x}{P} = \frac{3P^{-2}}{P} = \frac{3}{P^3}$$

$$\therefore \frac{P}{x} = \frac{P^3}{3} \text{-----(2)}$$

From equation (1) , (2)

Price elasticity of demand

$$E_p = \left| \frac{P}{x} \times \frac{dx}{dp} \right|$$

$$= \left| \frac{P^3}{3} \times \frac{-6}{P^3} \right|$$

$$= \left| \frac{-6}{3} \right| = |-2| = 2$$

$\therefore E_p = 2$  is a constant

Hence proved.

8. (b) let  $X_1$  be the no of liters of super

Let  $X_2$  be the no. of Kilograms of Deluxe

Objective function

$$\text{Min. } Z = 3x_1 + 4x_2$$

Subject to Constraints.

$$2x_1 + 3x_2 \geq 90$$

$$4x_1 + 3x_2 \geq 120$$

$$\text{And } x_1, x_2 \geq 0$$

$$2x_1 + 3x_2 - x_3 + A_1 = 90$$

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

9. (a) Given cost function is  $\frac{x^3}{3} - 5x^2 - 28x + 10$

After tax @ ₹2 per unit then

$$\text{Total cost function (c)} = \frac{x^3}{3} - 5x^2 - 28x + 10 + 2x$$

## MTP\_Intermediate\_Syllabus 2012\_Jun2016\_Set 2

---

$$C = \frac{x^3}{3} - 5x^2 + 30x + 10$$

Given demand function is  $P = 2530 - 5x$ , Where ₹ P is the price per unit of output.

$$\begin{aligned}\text{Total revenue (R)} &= Px \\ &= (2530 - 5x)x \\ &= 2530x - 5x^2\end{aligned}$$

$$\begin{aligned}\therefore \text{Total profit (P)} &= R - C \\ &= 2530x - 5x^2 - \left[ \frac{x^3}{3} - 5x^2 + 30x + 10 \right] \\ &= 2530x - 5x^2 - \frac{x^3}{3} + 5x^2 - 30x - 10 \\ &= \frac{-x^3}{3} + 2500x - 10\end{aligned}$$

In order to that the profit is to maximum its derivative is zero and 2<sup>nd</sup> derivative less than zero.

$$\therefore \frac{dp}{dx} = 0$$

$$\Rightarrow -\frac{1}{3}(3x^2) + 2500 = 0$$

$$\Rightarrow -x^2 + 2500$$

$$\Rightarrow x^2 = 2500$$

$$x = \sqrt{2500}$$

$$= 50 \text{ units.}$$

$$\text{Again } \frac{d^2P}{dx^2} = -2x$$

$$\text{Now } \frac{d^2P}{dx^2} \text{ at } x=50$$

$$= -2(50) = -100 < 0 \text{ (which is -ve)}$$

$\therefore$  Profit is maximum at  $x = 50$  units

When  $x = 50$  units

$$\begin{aligned}\text{Price (P)} &= 2530 - 5(50) \\ &= 2530 - 250\end{aligned}$$

$$P = ₹2280$$

9. (b) Given demand functions

$$(i) P = \frac{10}{(x+2)^2} = 10(x+2)^{-2}$$

Differentiate w. r. to x we get

$$\frac{dP}{dx} = 10(-2)(x+2)^{-3} = \frac{-20}{(x+2)^3}$$

$$\frac{P}{x} = \frac{10}{x(x+2)^2}$$

∴ Price elasticity of demand

$$\begin{aligned} EP &= \left| \frac{P}{x} \times \frac{dx}{dp} \right| \\ &= \left| \frac{10}{x(x+2)^2} \times \frac{-(x+2)^3}{20} \right| \\ &= \left| \frac{-(x+2)}{x} \right| \quad EP = \frac{x+2}{x} \end{aligned}$$

(ii) Given demand function

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

Differential w. r. to x we get

$$\frac{dp}{dx} = (4)(-2)(2x+1)^{-3} \cdot 2 = \frac{-16}{(2x+1)^3}$$

$$\therefore \frac{dx}{dp} = \frac{-(2x+1)^3}{16}$$

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

∴ Price elasticity of demand

$$\begin{aligned} EP &= \left| \frac{P}{x} \times \frac{dx}{dp} \right| \\ &= \left| \frac{4}{x(2x+1)^2} \times \frac{-(2x+1)^3}{16} \right| \\ &= \left| \frac{-(2x+1)}{4x} \right| \\ EP &= \frac{2x+1}{4x} \end{aligned}$$