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.

1. Answer the following question which is compulsory

(a) Answer the following

(i) Given: FC = 110 lakhs PVR = 0.40

$$BEP = \frac{FC}{Profit\ Volume\ Ratio}$$

$$BEP(S) = \frac{110\ Lakhs}{0.40}$$

BEP(S) = 275 lakhs

Margin of Safety = Total Sales – BEP Sales

0.25 = Total sales (S) – 275 lakhs

275 lakhs = S – 0.25(S)

$\frac{275}{0.75}$ = 367 lakhs.

(ii) Variable Cost Per Hour = $\frac{Difference\ in\ Cost}{Difference\ in\ Hours} = \frac{2,02,500 - 1,70,000}{18,500 - 11,000}$ = 4.33 per hours.

Fixed Cost = 1,70,000 – (11,000 × 4.33) = 1,70,000 – 47,667 = 1,22,333

Cost of Maintenance for 14,000 hrs. = FC + VC

= ₹1,22,333 + (14,000 × 4.33)

= ₹1,22,333 + ₹60,667

= ₹1,83,000.

(iii) Material Price Variance = 4,800 (A)

Material Usage Variance = 4,000 (F)

Material Cost Variance = Material Usage Variance + Material Price Variance

= 4,000 (F) + 4,800 (A)

= 800 (A)

Actual cost for Actual Production = 9,600 Kgs × 10.50 per kgs = 1,00,800

Standard Cost for Standard Production = 1,00,000

(iv) Contributions = FC + Profit = 90,000 + 60,000 = 1,50,000

$$\text{PV Ratio} = \frac{\text{Contributions}}{\text{Sales}} \times 100 = \frac{1,50,000}{3,00,000} \times 100 = 50\%$$

$$\text{Required Sales at desired Profit} = \frac{\text{Fixed Cost} + \text{(loss)}}{\text{Profit Volume Ratio}} = \frac{90,000 + (20,000)}{50\%} = 1,40,000$$

(v) Statement showing Apportionment of Joint Expenses.

	Products			
	A	B	C	Total
I. Sales	6,000	4,000	2,500	12,500
II. Profit	(2,000)	(1,000)	(375)	(3,375)
III. Total Cost Cost (I + II)	4,000	3,000	2,125	9,125
IV. Separations Cost	(450)	(325)	(150)	(925)
V. Joint Expenses (III – IV)	3,550	2,675	1,975	8,200

(b) Match the following

	Column 'A'		Column 'B'
1.	Relevant Cost	C	Future costs affected by decisions taken
2.	Standard Costing	A	Cost Control
3.	Flexible Budget	B	Decision taking
4.	Differential Cost Analysis	E	Budgetary Control
5.	Angle of Incidence	D	Profitability rate

(c) (i) No person in employment can be appointed as a cost auditor.

(ii) As rule 6(5) – every cost auditor shall forward his report to the board of directors of company within a period of 180 days from the closure of the financial year to which the report relates.

(d)

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

That is TC = $300x - 10x^2 + \frac{1}{3}x^3$

$MC = \frac{dTC}{dx} = 300 - 20x + \frac{1}{\cancel{3}}\cancel{3}x^2 = 300 - 20x + x^2$

MC is minimum when

$\frac{d(MC)}{dx} = 0$

$MC = 300 - 20x + x^2$

$\frac{d(MC)}{dx} = -20 + 2x = 0$ or,

$2x - 20 = 0$

$x = 10$ units

That is when x = 10, MC is minimum.

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

$AC = \frac{TC}{x} = 300x - 10x + \frac{1}{3}x^2$

$\frac{d(AC)}{dx} = -10 + \frac{2}{3}x$

AC is minimum

When $\frac{d(AC)}{dx} = 0$

Or, $\frac{2}{3}x = 10$

$2x = 30$

$x = 15$ units

when x = 15 units, AC is minimum

(iii) Output at which MC = MC.

$300 - 20x + x^2 = 300 - 10x + \frac{1}{3}x^2 - 20x + 10x$

$= \frac{1}{3}x^2 - x^2$

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

$10x = \frac{2}{3}x^2$

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

At x = 15 units, MC = AC

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 showing comparative cost of different alternatives.

	Taxi	New Small Car	Old bigger Car
Fixed Cost: -			
Depreciation	-	3,200	1,600
Repairs & Services	-	1,000	1,200
Taxes & insurance	-	1,700	700
	-	5,900	3,500

Variable Cost per Km. Cost at 10,000 Km.	0.90 9,000	0.35 0.35 × 10,000 = 3,500 (5900 + 3,500)	0.50 0.50 × 10,000 = 5,000 (5,000 + 3,500)
		9,400	8,500

Costs at 19,000 Km.	17,100	0.35 × 19,000 = 6,650 5,900	0.50 × 19,000 = 9,500 3,500
		12,550	13,000

From the above computations it was found that

1. At 10,000 kms. Old bigger car is cheaper
2. At 19,000 kms. New small car is cheaper

Indifference Level between new small car and old Big car = $\frac{\text{Difference in Fixed cost}}{\text{Difference in VC P.U}}$

$= \frac{5,900 - 3,500}{0.50 - 0.35}$ = 16,000 kms.

(b) Statement showing apportionment of Joint Expenses.

	Main product	By Products		Total
	A	A	B	
I. Sales	90,000	60,000	40,000	1,90,000
II. Profit	22,500	12,000	6,000	40,500
III. Total Cost (I + II)	67,500	48,000	34,000	1,49,500
IV. Selling Expenses (10% on Total Cost 20: 40: 40)	2,990	5,980	5,980	14,950
V. Cost of Production (III – IV)	64,510	42,020	28,020	1,34,550
VI. Separate expenses	6,000	5,000	4,000	15,000
VII. Joint Exp. (V – VI)	58,510	37,020	24,020	1,19,550

Profit when by – product is sold at split – off point is ₹21,480 (i. e. 58,500 – 37,020).
It would be advisable to sell By – Product A without further processing because it gives profit of ₹21,480. Which is more than the profit after further processing of ₹12,000.

3. (a) Cash Budget for the Six months ending on 30th June…….

	January	Feb.	March	Apr.	May	June
Op. balance	10,000	18,000	29,800	27,000	24,700	33,100
Receipts						
Cash Sales	10,000	11,000	14,000	18,000	15,000	20,000
Collections from Debtors	-	10,000	11,000	14,000	18,000	15,000
Share Capital including Premium	-	-	12,000	-	-	-
A -	20,000	39,000	66,800	59,000	57,700	68,100
Payments						
Paid to Creditors	-	-	20,000	14,000	14,000	22,000
Payments to Wages	2,000	4,200	4,500	4,600	4,300	4,500
Payments for OHs.	-	4,000	4,200	4,300	4,500	4,100
Sales Commission	-	1,000	1,100	1,400	1,800	1,500
Payment for new Machinery	-	-	10,000	10,000	-	-

B -	2,000	9,200	39,800	34,400	24,600	32,100
Closing (A – B)	18,000	29,800	27,000	24,700	33,100	36,000

(b) 1. A system of budgetary control may be operated even it no standard costing system is in the concern. From this Budgetary control is wider than standard costing.

2. While standard is a unit concept budget is a total concept.

3. Budgets are the ceilings or limits of expenses above which the actual expenditure should not normal rise. Standards are minimum targets to be attained by actual performance at specified efficiency.

4. A more searching analysis of the variances from standards is necessary then in the case of valiances from the budget.

5. Budgets are indices, adherence to which keeps a business out of difficulties. Standards are points to future possible impairments.

4. (a) Costing P & L A/c

	₹		₹
To Direct Materials	7,08,000	By Sales	15,00,000
To Direct Wages	3,71,000		
Prime Cost	10,79,000		
To Fact others. $\frac{10,79,000 \times 20}{100}$	2,15,800		
	12,94,800		
Less: Closing WIP	(30,000)		
To Add: Admn. Overheads (31,000 × 3)	93,000		
Cost of production	13,57,800		
Less: Closing Finished Goods	(43,800)		
Cost of Goods sold	13,14,000		
To Selling & Dist. OHs. (30,000 ₹4)	1,20,000		
Total Cost	14,34,000		
To Net profit	66,000		
	15,00,000		15,00,000

Reconciliation of cost profits with Financial Profits.

Profit as per cost Books		66,000
Add: Over recovery of factory OHs.	28,000	
Over recovery of S & D OHs.	6,500	9,300
		75,300
Less: under recovery of Admn. OHs.	(2,500)	
Over valuations of closing Stock in cost books	(3,800)	(6,300)
Profit as per Financial Books		66,000

(b)

Volume Variance = SR × SH – SR × BH

(- 1,000) = SR × SH – 6,000

6,000 – 1,000	=	SR × SH
5,000	=	SR SH
Cost Valiance	=	SR × SH – AR × AH
-14,000	=	5,000 – AR ×AH
6,400	=	AR AH

$$\text{Standard Rate} = \frac{\text{Budgeted OHs}}{\text{Budgeted Hours}} = \frac{₹6,000}{1,200 \text{ hrs}} = ₹5 \text{ per hrs.}$$

SR × SH	SR × AH	SR × BH	AR × AH
5 × 1,000	5 × 800	5 × 1,200	8 × 800
5,000	4,000	6,000	6,400

1. SR SH = Standard cost of Standard Fixed OH = 5,000
2. SR AH = Standard cost of actual Fixed OH = 4,000
3. SR BH = Fixed OHs Budgeted = 6,000
4. AR AH = Actual Fixed OHs = 6,400

1. Over head expenditure variance = 400(A)
2. Actual OH incurred (AR AH) = 6,400
3. Actual Hours for Actual Production (AH) = 800
4. Overheads capacity Variance = 2,000 (A)
5. Overhead efficiency Variance = 1,000 (F)
6. Standard hours for actual Productions (SH) = 1,000

5. (a) Statement showing computation of Effective Cost and Profit for the year.

	Amount	Per Km.
Fixed Expenses:		
Salary of Staff	1,500	
Salary of garage supervisor	2,000	
Rent of garage	1,000	
Drivers salary (10 × 400)	4,000	
Road tax & repairs $\frac{2,160}{12} \times 10$	1,800	
Insurance Premium $\left(75,000 \times \frac{4}{10} \times \frac{10}{12}\right)$	2,500	
Fixed cost of 10 taxi's per month	12,800	
Cost per taxi = $\frac{12,800}{10}$	1,280	
Cost per Km = $\frac{1,280}{4,000}$ km		0.32

Running Cost:		
Depreciation: $\frac{75,000 - 5,000}{3,00,000}$		0.20
Petrol: $\frac{6.30}{9\text{ km}}$		0.70
Oil & Sundry Expenses $\frac{10}{100}$		0.10
		1.32

Effective cost per Km = $\frac{1.32 \times 100}{80}$ = 1.65 per km.

Profit per km. and total = [1.80 – 1.65) × 10 × 3,200 × 12 = ₹57,600

(b) For the purpose of finding out the portion of the profit out of notional profit to be transferred to profit & Loss account., the control are divided in the following manner.

(A) Contracts which have just commenced:

In this case o portion of the notional profit shall be transferred to profit & loss account and the entire amount is kept as reserve.

(B) Contracts which have reasonably advanced:

(i) If the degree of the completion of the contract is less than or equal to ¼ then no portion of the notional profit shall be transferred to P & L a/c and the entire amount would be kept as reserve.

(ii) If degree of the completion of work > ¼ and < ½ → 1/3 rd of national profit shall be transferred to P & L a/c and remaining amount would be kept as reserve.

(iii) It degree of completions is more than or equal to ½ → 2/3 rd of Notional profit shall be transferred to P & L a/c and remaining amount would be kept as reserve.

(C) Contracts which are almost complete:

In this case the portion of the profit to be transferred to Profit & Loss account is calculated by using the estimated profit.

1. Estimated Profit × $\frac{\text{Work certified}}{\text{Contract Price}}$
2. Estimated Profit × $\frac{\text{Work certified}}{\text{Contract Price}} \times \frac{\text{Cash received}}{\text{Work certified}}$
3. Estimated Profit × $\frac{\text{Total cost to Date}}{\text{Total Cost}} \times \frac{\text{Cash received}}{\text{Work certified}}$

6. (a) Objectives of Cost Audit: -

1. Verification of cost accounts with a view to ascertain that these have been properly maintained and compiled according to the cost accounting system followed by the enterprise.
2. Ensuring that prescribed procedures of cost accounting record rules are duly adhered to
3. Detection of errors and fraud.
4. Verification of each 'cost unit' and 'cost centre' to ensure that these have been properly ascertained.

5. Determinations of inventory valuation
6. Facilitating the fixation of prices of goods and services.
7. Periodical reconciliation between cost accounts and financial accounts.
8. Ensuring optimum utilization of human, physical and financial resources of the enterprise.
9. Detection and correction of abnormal loss of material and time.
10. Inculcation of cost consciousness.
11. Promoting corporate governance through various operational disclosures to the directors.

(b) As per section 141(3) qualifications and disqualification of Auditor are-

The following personal shall not be eligible for appointment as on auditor of a company, namely : -

(i) A body corporate other than a limited liability partnership register under the limited liability partnership Act, 2008:

(ii) An officer or employee of the company

(iii) A person who is a partner, or who is in the employment of an officer or employee of the company.

(iv) A person who or his relative or partner –

a) Is holding any security of or estimate in the company or it's subsidiary , or of it's holding or associate company or a subsidiary of such holding company.

Provided that the relative may hold security a interest in the company of face value not exceeding one thousand rupees a such sum as may be prescribed:

b) Is indebted to the to the company, or it's statutory, or it's holding or associate company or a subsidiary of such holding company, in excel of such amount as may be prescribed or

c) Has given a Guarantee or provided any security in correction with the indebtedness of any third person to the company or it's subsidiary, or its holding or associate company or a subsidiary of such holding company, for such amount as may be prescribed.

(v) A person or a firm who, whether directly or indirectly, has business relationship with the company or its subsidiary or its holding or associate company or subsidiary of such holding company or associate company of such nature as may be prescribed.

(vi) A person who's relative in a director or is in the employment of the company as a director or key managerial personnel.

(vii) A person who is in full time employment elsewhere or a person or a partner of a firm holding appointment as its auditor, if personal or partner in at the date of such appointment holding appointment as auditor of more than twenty companies.

(viii) A person who has been convicted by a cart of an offence involving fraud and a period of ten years has not elapsed from the date of such conviction.

(ix) Any person whose subsidiary or associate company or any other form of entity, is engaged as an the date of appointments in consulting and specialized on provided in section 144.

Where a person appointed as an auditor of a company in any of the disqualification mentioned in sub-section (3) after his appointment, he shall vacate his office as such auditor and such vacation shall be deemed to be a casual vacancy in the office of the auditor.

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

1. (a) Types of price elasticity of demand:

- ❖ The quantitative responsiveness of demand to the change in the price is called Elasticity of Demand.
- ❖ The rate of change in demand to a change in price is called elasticity of Demand.

Definition:

i. "The elasticity of demand in a market is great or small according to the amount demanded increases much of little for a given fall in the price and diminishes much of little for a given rise in the price".
   - Marshall

ii. "Elasticity is the degree of change in demand as a result of change in price".
   - P. A. Samuelson.

Price Elasticity of Demand:
It explains the proportionate change in demand to a proportionate change in price.

$$P.Ed = \frac{\text{Proportionate Change in Demand}}{\text{Proportionate Change in Price}}$$

$$= \frac{\Delta Q}{Q} / \frac{\Delta P}{P}$$

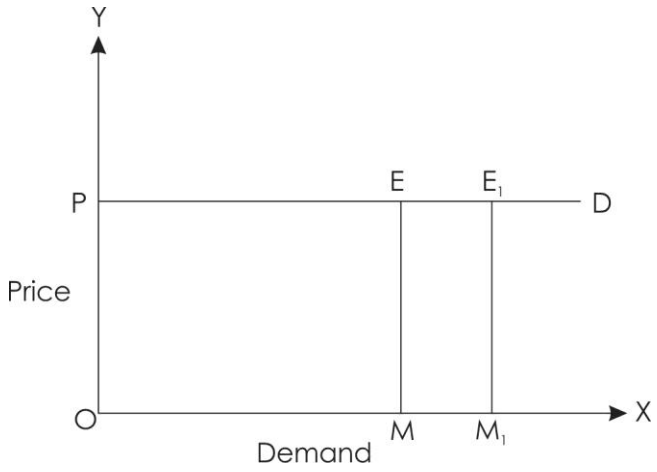
$$= \frac{P}{Q} \cdot \frac{\Delta Q}{\Delta P}$$

Types of Price elasticity of Demand

1. Perfectly Elasticity of Demand
2. Perfectly In elastic Demand
3. Relatively Elastic Demand
4. Relatively Inelastic Demand
5. Unitary Elastic Demand

1. Perfectly Elasticity of Demand:

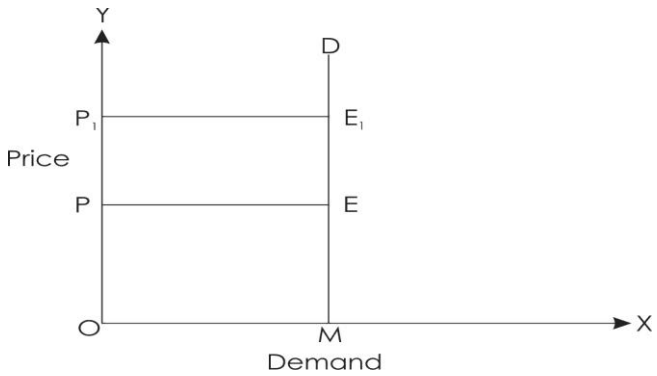
A small change in the price brings an infinite change in Demand is known as perfectly elastic Demand. The perfectly elastic demand curve is a line parallel to the X – axis. (ED = α)



In the diagram on the X – axis demand and on the Y – axis price are shown. PD is the perfectly elastic demand curve. At OP price level the demand increases from OM to OM_1, level. This shows any amount is demanded at a given price.

2. Perfectly In elastic Demand:

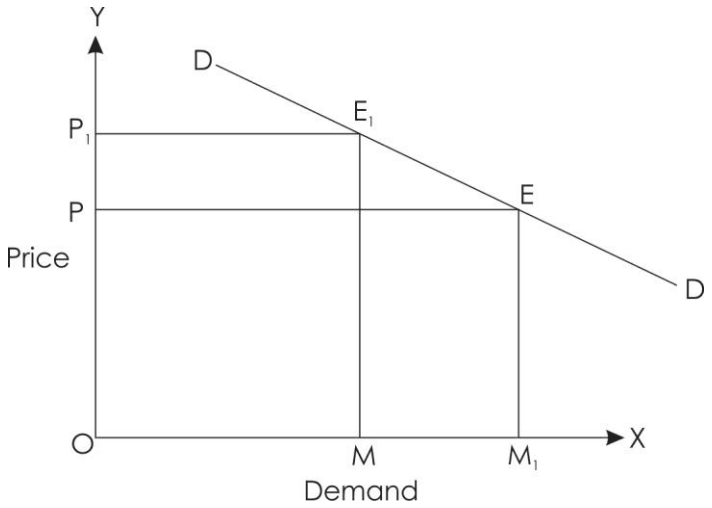
If a change in price does not bring any change in demand, it is called perfectly inelastic Demand. The perfectly inelastic demand curve is parallel to the Y – axis. (Ed = 0)



In the diagram on the X- axis demand, and on the Y – axis price are shown. MD is the perfectly inelastic curve.
Even through Price increases from OP to OP_1, the demand remains the same at OM.

3. Relatively Elastic Demand:

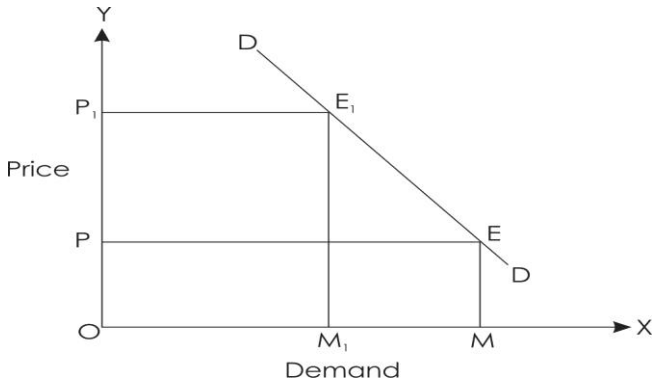
If the proportionate change in the demand is more than the proportionate change in the price it is called relatively elastic demand. Here the elasticity of demand is more than one (Ed > 1)



In the diagram on the X – axis demand and on the Y – axis price are shown. DD is the demand curve. When the price is increases from OP to OP_1 the demand has decreased from OM to OM_1. Here the change in the demand (MM_1) is more than the change in the Price (PP_1). So the demand is elastic.

4. Relatively Inelastic Demand:

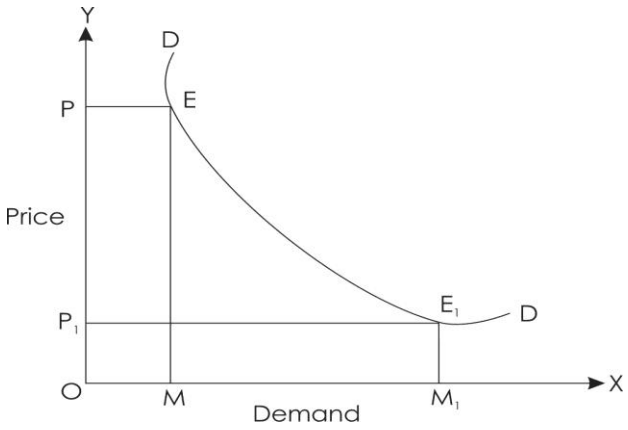
If the proportionate change in the demand is less than the proportionate change in the price, it is called relatively inelastic demand. Here the elasticity of demand is less than one (Ed < 1)



In the diagram on the X – axis demand and on the Y – axis price are shown. DD is the demand curve. When the price is increased from OP to OP_1, the demand is decreased from OM to OM_1. Here the change in demand (MM_1) is less than the change in the price (PP_1). So the demand is less elastic.

5. Unitary Elastic Demand:

If the proportionate change in Demand and proportionate change in price are equal, it is called unitary elastic Demand. Here the elasticity of demand in one. (Ed = 1)



In the diagram on the X – axis demand and on the Y – axis price are shown, DD is the demand curve. It is a rectangular hyperbola. When the price is decreased from OP to OP_1 then the demand is increased from OM to OM1; here the change in the demand (MM_1) and the change in the price (PP_1) are equal.

1. (b)

Year	x	x	xy	x^2
2010	-2	100	-200	4
2011	-1	150	-150	1
Middle Year 2012	0	100	0	0
2013	1	160	160	1
2014	2	200	400	4
	$\sum x = 0$	$\sum y = 710$	$\sum xy = 210$	$\sum x^2 = 10$

Now the regression equation is

$y = a + bx \rightarrow (1)$

$\therefore$ The Normal equations are

$\sum y = aN + b\sum y \rightarrow (2)$

$\sum xy = a\sum x + b\sum x^2 \rightarrow (3)$

From (2). $710 = a\,(5) + b\,(0)$ $\because \sum x = 0$ N is no of years)

$\Rightarrow 710 = 5$

$\Rightarrow a = \frac{710}{5} = 142$

From (3). $210 = a(0) + b(10)$

$\Rightarrow 210 = 10b$

$\Rightarrow b = \frac{210}{10} = 21$

The regression equation is

$y = 142 + 21x \rightarrow (4)$

From (4) the sales for 2015 is

y = 142 + 21(3) = 142 + 63 = ₹205 (lakhs)

2. (a) Factors involved in demand forecasting:

Expecting future demand for a product is called "Demand Forecasting". Most of the business decisions depend on the basis of expected sales in future. The success of business is also influenced by the accuracy of forecasted reports.

Factors involved in Demand forecasting:

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

2. Level factor: Demand forecasting may be undertaken at three different levels.

   a) Macro level: It is concerned with business conditions over the whole economy.
   b) Industry level: Prepared by different industries.
   c) Firm level: Firm – level forecasting is the most important from managerial view point.

3. General of Specific purpose factor: The firm may factors: The firm may find either general of specific forecasting of both useful according to its requirement.
4. Product: Forecasting varies type of product i. e. new product of existing product or well established product.
5. 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.
   Fore casting methods for producers goods and consumer goods will be different accordingly.

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

2. (b) Let the cost be 'c' and units be x.

$\therefore$ Average Cost (AC) = $\frac{C}{x}$ (say y)

To find the slope of average cost curve, differentiate the average cost function w. r. to 'x'

$$\therefore \frac{dy}{dx} = \frac{x\frac{dc}{dx} - c}{x^2}$$

$$= \frac{1}{x}\frac{dc}{dx} - \frac{c}{x^2}$$

$$= \frac{1}{x}\left[\frac{dc}{dx} - \frac{c}{x}\right]$$

$= \frac{1}{x}\left[Mc - Ac\right]$

$\therefore$ Slope of Average cost curve is $\frac{1}{x}\left[Mc - Ac\right]$

Hence Proved.

3. (a) Given cost function of a firm c = $\frac{1}{3}x^3 - x^2 + 5x + 3$

(i) Marginal cost (Mc) = $\frac{dc}{dx} = x^2 - 2x + 5$ (say 4)

In order to that marginal Cost is to be minimum its derivatives is zero and second derivative greater than 0.

$\therefore \frac{dy}{dx} = 0 \Rightarrow 2x - 2 = 0$

$\Rightarrow x = 1$

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

$\therefore$ Marginal cost is minimum at x = 1 unit

(ii) Average Cost (AC) = $\frac{c}{x} = \frac{1}{3}x^2 - x + 5 + \frac{3}{x}$

Average variable cost (AVC) = $\frac{1}{3}x^2 - x + 5$ (say y)

In order to that the average variable cost is to be minimum its derivate is zero and second derivate must be positive.

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

$\Rightarrow \frac{2}{3}x - 1 = 0$

$\Rightarrow \frac{2}{3}x = 1$

$\Rightarrow x = \frac{3}{2} = 1\frac{1}{2}$

Again $\frac{d^2y}{dx^2} = \frac{2}{3} > 0$ (which is + ve)

$\therefore$ Average variable cost is minimum at x = 1 ½ units.

3. (b) Given demand functions of two commodities are

(i)

$x_1 = P_1^{-1.7} \cdot P_2^{0.8}$ and $x_2 = P_1^{0.5} \cdot P_2^{-2}$

Differentiate partially x_1, w. r. to P_2 we get

$\frac{dx}{dp^2} = P_1^{-1.7}(0.8)\ P_2^{0.2} = \frac{0.8}{P_1^{1.7} \cdot P_2^{0.2}}$ which is greater than zero.

Again different partially x_2 w. r. to p_1 we get

$\frac{dx_2}{dp_1} = (0.5) P_1^{0.5}\ P_2^{-2}$

$= \frac{0.5}{P1^{0.5} \cdot P^2_2} > 0$ which is the

Hence the commodities are substitutes.

(ii) Given demand function of two commodities are

$x_1 \frac{4}{P_1^2 P_2}$ and $x_2 = \frac{16}{P_1 \cdot P_2^2}$

Differentiate partially x, w. r.. to P2 we get

$$\frac{dx}{dp_2} = \frac{4}{P_1^2} \cdot \left(\frac{-1}{P_2^2}\right)$$

$= \frac{-4}{P_1^2 \cdot P_2^2} < 0$ (which is – ve)

Again differentiate partially x2 w. r. to P1 we get

$$\frac{dx_2}{dp_1} = \frac{16}{P_2^2} \cdot \left(\frac{-1}{P_1^2}\right)$$

$= \frac{-16}{P_1^2 \ P_2^2} < 0$ (which is –ve)

$\therefore$ the commodities are complementary.