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) In a factory repairs and maintenance expenses were ₹1,50,000 at 60% capacity level out of these 40% was fixed. Calculate the repairs and maintenance expenses for the capacity level of 80%.

Answer:

Machine shop expenses at 60% capacity level:

Fixed - ₹150,000 x 40%	=₹60,000
Variable- ₹150,000 -60,000	=₹90,000
	₹150,000

The expenses for level of 80% of capacity:

= (90,000x80/60) + 60,000 = ₹1,80,000

(b) SHAAN LTD. earned a profit of ₹3,00,000 during the year 2014-15. If the marginal cost and selling price of a product are ₹80 and ₹100 per unit respectively, find out the amount of 'Margin of Safety'.

Answer:

Margin of Safety = Profit / (P/V ratio)

But P/V v ratio= Contribution/Sales = 20/100 = 20%

Hence, Margin of Safety= ₹3,00,000/ 0.20

= ₹15,00,000

(c) OPTIMA LTD. is committed to supply 24,000 bearings per annum to BKT Ltd. on a steady basis. It is estimated that it costs ₹2.40 as inventory holding cost per bearing per annum and that the set - up cost per run of bearing manufacture is ₹648. Calculate the optimum run (batch) size for hearing manufacture.

Answer:

EBQ = Optimum production runs (batch) size:

$$= \sqrt{\frac{2 \times \text{Setup cost per batch} \times \text{Annual demand}}{\text{Annual cost of storing unit}}}$$

$$= \sqrt{\frac{2 \times 24{,}000 \times 648}{2.40}}$$

$$= \sqrt{1{,}29{,}60{,}000}$$

=3,600 bearingts

(d) A factory transferred out 8,800 completed units during November' 2014. Opening stock was 400 units 75% completed; closing stock was 800 units 50% completed. Assuming FIFO method, estimate the equivalent production in November 2014.

Answer:

Equivalent Production= 8,800 - (400x0.75) + (800 x0.50) units
= 8800 –300 + 400 = 8,900 units

(e) List out any three the limitations of Inter-firm comparison.

Answer:

Limitations of Inter firm comparison are:

- Top management may not be convinced of the utility of inter-firm comparison.
- Reluctance to disclose data which a concern considers to be confidential.
- A sense of complacence on the part of the management who may be satisfied with the present level of profit

(f) Whether the Companies (Cost Records and Audit) Rules, 2014 are applicable to foreign companies, State.

Answer:

For the purposes of sub-section (1) of section 148 of the Act, the class of companies, including foreign companies defined in clause (42) of section 2 of the Act engaged in the production of the goods or providing services, having an overall turnover from all its products and services of rupees thirty five crore or more during the immediately preceding financial year, shall include cost records for such products or services in their books of account

(g) Whether Cost Auditor of the company has to directly submit his Cost Audit Report to the Central Government?

Answer:

No. The report on the audit of cost records shall be submitted by the cost accountant in practice to the Board of Directors of the company. Then the company shall within 30 days from the date of receipt of a copy of the cost audit report prepared in pursuance of a direction under sub-section (2) furnish the Central Government with such report along with full information and explanation on every reservation or qualification contained therein.

(h) MESCAB LTD. is operating in a perfectly competitive market. The price elasticity of demand and supply of the product estimated to be 6 and 4 respectively. The equilibrium price of

the product is ₹120. If the Government imposes a specific Tax of ₹10 per unit, what will be the new equilibrium price

Answer:

Distribution of tax burden between buyers and sellers is in Ratio of elasticity of supply to elasticity of demand.

Thus tax burden borne by the Buyers = 10x4/10 = ₹4.

If the tax burden borne by buyer is ₹4 now equilibrium price will be ₹(120+4)= ₹124.

(i) List out the components of time series.

Answer:

A typical time services has the following four major components:

- A Secular trend
- Cyclical fluctuations
- Seasonal variations
- Random or unsystematic variations

(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 what level will it be.

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 $\frac{dy^2}{dx^2}$

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

$\Rightarrow 2x = 4$

$\therefore x = 2$

$\frac{dy^2}{dx^2}=2$ 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 from a, b and c. [2x20=40]

(a)

(i) A Construction Company undertook a contract at an estimated price ₹108 lacks, which includes a budgeted profit of ₹18 lacks. The relevant data for the year ended 31.3.2015 are as under

	(₹ 000's)
Materials issued to site	**5,000**
Direct wages paid	**3,810**
Plant hired	**600**
Site office costs	**370**
Materials returned from site	**100**
Direct expenses	**500**
Work certified	**10,000**
Progress payment received	**7,200**

A special plant was purchased specifically for this contract at ₹10,00,000 and after use on this contract till the end of 31.03.2015, it was valued at ₹7,00,000. The cost of materials at site at the end of the year was estimated at ₹18,00,000. Direct wages accrued as on 31.03.2015 was ₹1,00,0000.

Prepare the Contract Account for the year ended 31st March, 2015 and compute the profit to be taken to the Profit & Loss account. [8]

Answer:

In the books of ---------

Contract Account for the year ended 31.3.2015

Dr. **Cr.**

Particulars	Amount (₹ in '000)	Particulars	Amount (₹ in '000)
To Material A/c	5,000	By Material A/c	1,800
To Wages A/c 3,810 Add: Outstanding 100	3,910	By Material A/c (returns)	100
To Direct Expenses	500	By Cost of contract c/d (balancing figure)	8,780
To Site Office Costs	370		
To Depreciation of special plant (₹10,00,000 - ₹7,00,000)	300		
To Hire charges of plant	600		
	10,680		10,680
To Cost of contract b/d	8,780	By Work-in-progress A/c Work Certified	10,000
To Notional Profit (Balancing figure)	1,220		
	10,000		10,000
To Costing Profit and Loss A/c (refer to note # 1)	1,200	By Notional Profit b/d	1,220
To Work-in-progress A/c (balancing figure)	20		

	1,220		1,220

Working Note 1: Amount to be transferred to the Costing Profit and Loss Account

$$= \frac{\text{Work Certified}}{\text{Contract Price}} \times 100$$

$$= \frac{₹1,00,00,000}{₹1,08,00,000} \times 100 = 92.59\%$$

$$= \text{Estimated Profit} \times \frac{\text{Work Certified}}{\text{Contract Price}} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

$$= ₹18,00,000 \times \frac{₹1,00,00,000}{₹1,08,00,000} \times \frac{₹72,00,000}{₹1,00,00,000}$$

$$= ₹12,00,000$$

(ii) Goureseen Company Private limited, manufacturing "Bimjal" pressure cookers has drawn up the following budget for the year 2014-2015:

Raw materials	**₹20,00,000**
Labour, stores, power and other variable costs	**6,00,000**
Manufacturing overheads	**7,00,000**
Packing and variable distribution costs	**4,00,000**
General overheads including selling	**3,00,000**
	40,00,000
Income from sales	**50,00,000**
Budgeted profit	**10,00,000**

The General Sales Manager suggests to reduce selling price by 5% and expects to achieve an additional volume of 50%. There is sufficient manufacturing capacity. More intensive manufacturing programme will involve additional costs of ₹50,000 for production planning. It will also be necessary to open an additional sales office at the cost of ₹1,00,000 per annum.

The Sales Manager, on the other hand, suggests to increase selling price by 10%, which it is estimated will reduce sales volume by 10%. At the same time, saving in Manufacturing Overheads and General Overheads at ₹50,000 and ₹1,00,000 per annum respectively is expected on this reduced volume.

Which of these two proposals would you accept and why? [7+1]

Answer:

Comparative Statement of Budgeted Profit

	Proposal I (₹)	Proposal II (₹)
I. Sales Volume		
(50,00,000 x 150/100 x 95/ 100)	71,25,000	
(50,00,000 x 90/ 100 x 110/ 100)		49,50,000
II. Cost of Sales:		
Raw materials	30,00,000	18,00,000

Labour and other variable costs	9,00,000	5,40,000
Manufacturing overheads	7,50,000	6,50,000
Packing and variable distribution cost	6,00,000	3,60,000
General overheads including selling	4,00,000	2,00,000
	56,50,000	35,50,000
Profit (I – II)	14,75,000	14,00,000

It is clear from the above analysis that proposal I is more profitable, since it will increase the profit figure by ₹75,000. Manufacturing capacity is available and therefore, there should be no hesitation in accepting this proposal. In case of proposal II, the idle capacity of the factory will increase by another 10% which is not desirable from any angle – industry as well as the society. More production of pressure cookers will generate more employment, more earning capacity of people, more demand for them which will ultimately result in more profit to the factory and less price for the consumers.

(iii) State the principle reasons which give rise to variances between actual and standard in standard costing. [4]

Answer:

The variances between actual and standards arise mainly due to the following reasons:

- Inefficient operations due to inefficient operations, in adequate machine usage/ faulty machinery
- Departure from laid down procedure
- Human error
- Inappropriate setting of standards
- Frequent changes in market prices of various inputs in an instable condition
- Errors in recording actual results.

(b)

(i) The XYZ Company has the following budget for the year ended 2014-15:

Sales (1,00,000 units @ ₹20)	**₹20,00,000**
Variable cost	**10,00,000**
Contribution	**10,00,000**
Fixed Cost	**4,00,000**
Net Profit	**6,00,000**

From the above set of information find out:

(I) The adjusted profits for 2014-15 if the following two sets of changes are introduced and also suggest which plan should be implemented.

Plan A	%	Plan B	%
Increase in price	**20**	**Decrease in price**	**20**
Decrease in volume	**25**	**Increase in volume**	**25**
Increase in variable cost	**10**	**Decrease in variable cost**	**10**
Increase in fixed cost	**5**	**Decrease in fixed cost**	**5**

(II) The P/V ratio and break-even point under the two plans referred above. [4+5]

Answer:

XYZ Co.
Budget 2014-15

(Units 1,00,000)

	Per Unit	Total
Sales	₹20	₹20,00,000
Variable cost	10	10,00,000
Contribution	10	10,00,000
Fixed Cost	4	4,00,000
Net Profit	6	6,00,000

(I)

	Plan 'A'	Plan 'B'
Units: [1,00,000 – (1,00,000 x 25%)]	75,000	
[1,00,000 + (1,00,000 x 25%)]		1,25,000
Selling price per unit [₹20 x 1.20]	24	
[₹20 x 0.80]		16
Variable cost per unit [₹10 x 1.10]	11	
[₹10 x 0.90]		9
Contribution per unit	13	7
Total Contribution	9,75,000	8,75,000
Fixed Cost [4,00,000 x 1.05]	4,20,000	
[4,00,000 x 0.95]		3,80,000
Profit	5,55,000	4,95,000

It can be clearly seen from the above working that estimated profit is highest in the original budget. Therefore, neither Plan A nor Plan B should be implemented and followed.

(II)

	Budget	Plan A	Plan B
Contribution (₹)	10,00,000	9,75,000	8,75,000
Sales	20,00,000	18,00,000	20,00,000
Fixed Cost	4,00,000	4,20,000	3,80,000
P/V Ratio	50%	54.1667%	43.75%
BEP (Fixed Cost/ P/V Ratio)	₹8,00,000	7,75,385	8,68,571
BEP (units) (By dividing of sales by selling price per unit)	40,000	32,308	54,286

(ii) "If the products are truly joint products, the cost of process can be applied to these products:

I. On the basis of the weight or other physical quantity of each product.

II. In respect of the marginal cost of the process on the basis of physical quantities and in respect of the fixed costs of the process on the basis of the contribution made by the various products.

III. On the basis of the selling values of the different products."

Using the following figures in respect of the joint production of A and B for a month, show the apportionment of joint costs and profits made, on the above three bases.

Total Cost

Direct Materials	**₹26,000**
Direct Labour	**10,000**
Variable Overhead	**8,000**
Fixed Overhead	**22,000**

Sales A – 100 tonnes @ ₹600 per tone

B – 120 tonnes @ ₹200 per tone **[4+4+3]**

Answer:

Sales:

A 100 × ₹600		₹60,000
B 120 × ₹200		24,000
Total sales		84,000
Less: Marginal cost:		
Direct Materials	₹26,000	
Direct Labour	10,000	
Variable Overhead	8,000	44,000
Contribution		40,000
Less: Fixed cost		22,000
Profit		18,000

Apportionment of Joint Costs

I. On the basis of weight:

Marginal cost	₹44,000
Fixed costs	22,000
Joint costs to be apportioned	66,000

Product	Weight (Tonne)	Apportioned Costs	Sales	Profit/Loss)
A	100	₹30,000	60,000	30,000
B	120	36,000	24,000	(12,000)
	220	66,000	84,000	18,000

II. Marginal cost on the basis of weight and fixed costs on the basis of contribution :

Product	Production (tone)	Contribution (₹)	Marginal Cost (₹)	Fixed Cost (₹)	Total Cost (₹)	Sales (₹)	Profit (₹)
A	100	40,000*	20,000	22,000	42,000	60,000	18,000
B	120	-	24,000	-	24,000	24,000	-
	220	40,000	44,000	22,000	66,000	84,000	18,000

III. On the basis of sales

Product	Sales	Product Cost	Profit
A	₹60,000	₹47,143	₹12,857
B	24,000	18,857	5,143
	84,000	66,000	18,000

(c)

(i) From the following particulars pass the journal entries in an integral accounting system:

I. Issued materials ₹3,00,000 of which ₹2,80,000 (standard ₹2,40,000) is direct materials:

II. Net wages paid ₹70,000 deduction being ₹12,000 (standard ₹75,000)

III. Gross salaries payable for the period is ₹26,000 (standard ₹25,000). Deductions ₹2,000.

IV. Sales (Credit) ₹8,00,000.

V. Discount allowed ₹5,000. **[5x2=10]**

Answer:

Journal Entries

Particulars	DR.	Cr.
I. Work-in-progress Led. Control A/c Dr.	₹2,40,000	
Production Overheads Control A/c Dr.	20,000	
Material Usage Variance A/c Dr.	40,000	
To Stores Ledger Control A/c		
(Being the issue of materials)		3,00,000
II. Wages Control A/c Dr.	75,000	
Labour Rate Variance A/c Dr.	7,000	
To Cash A/c		70,000
To Expenses Creditors A/c		12,000
(Being the provision for salaries payable)		
III. Salaries Control A/c Dr.	25,000	
Labour Rate Variance A/c Dr.	1,000	
To salaries payable A/c		24,000
To Expenses Creditors A/c		2,000
(Being the provision for salaries payable)		
IV. Debtors Ledger Control A/c Dr.	8,00,000	
To Sales A/c		8,00,000
(Being the discount allowed to debtors)		
V. Discount A/c Dr.	5,000	
To Debtors Ledger Control A/c		5,000
(Being the discount allowed to debtors)		

(ii) From the following, prepare variance analysis of a particular department for a month:

Variables overhead items

Variable overhead items	Actual (₹)
Materials handling	**8,325**
Idle time	**850**

Rework	**825**
Overtime premium	**250**
Supplies	**4,000**
	14,250

Fixed overhead items	Actual (₹)
Supervision	**1,700**
Depreciation Plant	**2,000**
Depreciation Equipment	**5,000**
Rates	**1,150**
Insurance	**350**
	10,200

Normal capacity 10,000 standard hours, budgeted rate ₹1.70 standard hour for variable overhead and ₹ 1.00 per standard hour for fixed overhead. Actual level: 8,000 standard hours. [4+6]

Answer:

For Variable Overhead Variances

VO_1 -Actual variable overhead	= ₹14,250
VO_2 - Actual hours worked at std. V.O rate 8,000 hrs × ₹ 1.70	= 13,600
V. O. Expenditure Variance VO_1- $V0_2$	= 650 (A)

For Fixed Overhead Variance

FO_1- Actual F.O incurred	= ₹10,200
FO_2- Budgeted F.O.(10.000 HRS × ₹ 1)	= 10,000
FO_3- Not applicable	
FO_4 -Fixed overhead for actual hours worked at std. rate (8,000 hrs × ₹1)	= 8,000
FO_5 - Not applicable in this situation	
F.O. Expenditure variance FO_1- FO_2- ₹ 10,200- 10,000	= 200 (A)
F.O. Capacity Variance FO_2 - $F0_4$ = 10,000- 8,000	= 2,000 (A)
F.O. Variance = F.O. Expenditure Variance + F.O. Capacity Variance	= 2,200 (A)

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

(a)

(i) As a Cost Auditor, list out the area which you will verify in the area of 'overheads and indirect expenditure'. [4]

Answer:

A Cost Auditor must verify the following aspects in the area of 'overheads and indirect expenditure'.

- That allocation of overheads are as per CAS-3 which deals with overheads;

- That allocation of indirect expenditure over production, sales, and distribution is logical and correct;
- That compared with the value of production in a production shop, the overhead charges are not excessive;
- That the actual indirect expenditure does not exceed budgets or standard expenditure significantly and that any variations are satisfactorily explained and accounted for;
- That the relation of indirect expenditure in keeping with the load on individual production shop is appropriate;
- correctness of appropriate allocation of overhead expenditure (both production and sales) will be certified by Cost Auditor;
- That allocation of overheads between finished products and unfinished products is in accordance with principles as per CAS-3.

(ii) As a Cost Auditor, list out the area which you will verify in the area of work-in-progress. [4]

Answer:

The Cost Auditor should verify the following area of work-in-progress:

- That the work-in-progress has been physically verified and it agrees with the quantity shown in job-cards of uncompleted work.
- That the valuation of the work-in-progress is correct with reference to the stage of completion of each job or process and the value of job cost cards or process cost sheet.
- That there is no over-valuation or under valuation of opening work-in-progress or closing work-in-progress, thereby artificially, pushing up and down net profits or net assets as the case may be.
- That the volume and value of work-in-progress is not disproportionate as compared with finished production

(b) Describe the duty liabilities of a Cost Auditor of a Company relating to reporting of frauds identified during audit. [8]

Answer:

Reporting of fraud by Cost Auditor –

- For the purpose of sub-section (12) of section 143, in case the auditor has sufficient reason to believe that an offence involving fraud, is being or has been committed against the company by officers or employees of the company, he shall report the matter to the Central Government immediately but not later than sixty days of his knowledge and after following the procedure indicated herein below:
  - auditor shall forward his report to the Board or the Audit Committee, as the case may be, immediately after he comes to knowledge of the fraud, seeking their reply or observations within forty-five days;
  - on receipt of such reply or observations the auditor shall forward his report and the reply or observations of the Board or the Audit Committee along with his comments

(on such reply or observations of the Board or the Audit Committee) to the Central Government within fifteen days of receipt of such reply or observations;

- in case the auditor fails to get any reply or observations from the Board or the Audit Committee within the stipulated period of forty-five days, he shall forward his report to the Central Government along with a note containing the details of his report that was earlier forwarded to the Board or the Audit Committee for which he failed to receive any reply or observations within the stipulated time.

- The report shall be sent to the Secretary, Ministry of Corporate Affairs in a sealed cover by Registered Post with Acknowledgement Due or by Speed post followed by an e-mail in confirmation of the same.
- The report shall be on the letter-head of the auditor containing postal address, e-mail address and contact number and be signed by the auditor with his seal and shall indicate his Membership Number.
- The report shall be in the form of a statement as specified in Form ADT-4.

(c) Which persons cannot be appointed or reappointed as Cost Auditor of a company. [8]

Answer:

The following persons shall not be eligible for appointment as an auditor of a company, namely:—

- a body corporate other than a limited liability partnership registered under the Limited Liability Partnership Act, 2008;
- an officer or employee of the company;
- a person who is a partner, or who is in the employment, of an officer or employee of the company;
- a person who, or his relative or partner—
  - is holding any security of or interest in the company or its subsidiary, or of its holding or associate company or a subsidiary of such holding company: Provided that the relative may hold security or interest in the company of face value not exceeding one thousand rupees or such sum as may be prescribed;
  - is indebted to the company, or its subsidiary, or its holding or associate company or a subsidiary of such holding company, in excess of such amount as may be prescribed; or
  - has given a guarantee or provided any security in connection with the indebtedness of any third person to the company, or its subsidiary, or its holding or associate company or a subsidiary of such holding company, for such amount as may be prescribed
- 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;
- a person whose relative is a director or is in the employment of the company as a director or key managerial personnel;
- a person who is in full time employment elsewhere or a person or a partner of a firm holding appointment as its auditor, if such persons or partner is at the date of such

appointment or reappointment holding appointment as auditor of more than twenty companies;

- a person who has been convicted by a court of an offence involving fraud and a period of ten years has not elapsed from the date of such conviction;
- Any person whose subsidiary or associate company or any other form of entity, is engaged as on the date of appointment in consulting and specialized services as provided in section 144.

Where a person appointed as an auditor of a company incurs any of the disqualifications 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.

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

(a)

(i) Discuss briefly the degree of price discrimination as distinguished by famous Economist Prof. Pigou. [3]

Answer:

Prof. A. C. Pigou has distinguished the degree of price discrimination into three on the basis of the degree or extent or price discrimination.

- Under the first type of price discrimination the monopolist will not allow any consumer surplus to the consumers. This type of price discrimination is called perfect price discrimination.
- Second degree of price discrimination occurs where the monopolist is able to get a part of consumer surplus but not entire consumer surplus.
- In this third degree of price discrimination the monopolists divides the customer into two or more classes or groups or market and are divided on the basis of elasticity of demand. This type of discrimination is the most common one.

(ii) The Demand function is $X = 200 + 8p + 20p^2$, where X is demand for the commodity at price 'p' compute marginal quantity demand, average quantity demand and hence elasticity of demand. At p =4 [1+1+1]

Answer:

$X = 200 + 8p + 20p^2$

Marginal quantity demand = $\frac{dx}{dq}$

$\frac{dx}{dq} = 8 + 40p$ -------- (i)

Average quantity demand = $\frac{x}{p} = \frac{200}{p} + 8 + 20p$ ------- (ii)

$$E_p = \frac{dx}{dq} = \frac{x}{p} = \frac{8+40p}{\frac{200}{p}+20p+8} = \frac{(8+40p)p}{200+20p^2+8p}$$

At p = 4

$$= \frac{(8+160)4}{200+(20\times16)+(8\times4)}$$

= 28/ 23

(iii) State the term Temporary Monopoly. [2]

Answer:

This situation occurs more frequently. A firm invents a new products and places it on the market. For quite some time the demand will remain low, as consumers are not yet aware of the product. The firm will enjoy a de facto monopoly under the protection of its patents. Then, as the product enters into common usage, demand develops rapidly and additional firm try to enter the market. They develop new production methods. Gradually prices and production techniques tend to stabilize. So at the end, the market evolves towards an ordinary competitive one. A firm which invents a new product must determine a strategy relation to prices and production which leads to a maximum effective income

(b)

(i) List out the assumptions of COURNOT'S SOLUTION to Duopoly pricing. [4]

Answer:

A. A. Cournot, a French economist was found solution to duopoly pricing in 1838.
His model is based on the following assumptions:

- Total output must be sold out.
- Two sellers produce and sell a homogenous product.
- The number of buyer is large.
- Each seller knows the demand curve for his product.
- The cost of production is assumed to be zero.
- Each supplier takes the supply of his rival to be constant.
- Each accepts the market demand for his product.
- Each seller aims at maximum revenue

(ii) Describe the effects of each of the following managerial decisions or economic influences on the value of the firm:

I. The production department purchases new equipment that lowers manufacturing costs.

II. The firm raises prices. Quantity demanded in the short run is unaffected, but in the longer run, unit sales are expected to decline. [2+2 = 4]

Answer:

I. The primary effect of newer and more efficient production equipment is a reduction in the total cost component of the valuation model. Secondary effects on firm revenues

could also be important if lower costs make price reductions possible and result in an increase in the quantity demanded of the firm's products. Likewise, the capitalization rate or discount factor can be affected by the firm's changing prospects.

II. The time pattern of revenues is affected by such a pricing decision to raise prices in the near term. This will alter production relationships and investment plans, and affect the valuation model through the cost component and capitalization factor.

(c) List out the criteria of a good forecasting method. [8]

Answer:

Criteria of a good forecasting method:

- **Accuracy -** It is essential to check the accuracy of the past forecasts against present performance and of present forecast against future performance.
- **Simplicity and Ease of comprehension-**Management must be able to understand the method of demand forecasting used and must have confidence in it. Too much of mathematical and econometric procedures may not find favour with the management.
- **Economy-** A good demand forecasting method is one which is highly economical. Thus it is necessary to compare the cost of the forecasting method against its likely benefits. It is desirable so to undertake cost benefit analysis.
- **Durability-** The technique of demand forecasting must be durable.
- **Effective-** The technique used for demand forecasting should be able to give meaningful result as early as possible. So the technique must be effective and productive.
- **Flexibility-** The forecasting procedure should permit changes to be made in the relationship between different variables as & when needed. It must be not rigid.
- **Maintenance of timeliness-** It must be in up to date basis. There must be continuous alterations & addition involving latest information and data.
- Longer the lead time the forecast has before the event, the greater will be its usefulness.

(d)

(i) The market for tri-cycles for small kids is competitive and each tri-cycle is priced at ₹230. The cost function of a firm is given by $TC = 130q - 10q^2 + q^3$. Calculate the q_0 and p_0. [3]

Answer:

We have $P_0 = 230$. With $TC = 130q - 10q^2 + q^3$

$\Rightarrow MC = 130 - 20q + 3q^2$

At equilibrium

$P_0 = MC$

$\Rightarrow 230 = 130 - 20q + 3q^2$

$\Rightarrow 3q^2 - 20q - 100 = 0$

$\Rightarrow (3q + 10)(q - 10) = 0$

$= q_0 = 10$ Now $\pi_0 = P_0 q_0 - [130q_0 - 10q_0^2 + q_0^3$

= 230 x 10 – [130 x 10 – 10 x $(10)^2$ + $(10)^3$]
= 2300 – [1300] = 1000.
We see q = 10, satisfies 2nd order condition

(ii) A Chemical Company produces two compounds A and B. the following table gives the units of ingredients C and D per kg of compounds A and B as well as minimum requirements of C and D and costs/kg of A and B. Using the simplex method, find the quantities of A and B which would give a supply of C and D at a minimum cost.

		Table Compound		Minimum requirement
		A	B	
Ingredient	C	1	2	80
	D	3	1	75
Cost per kg.		4	6	

[3]

Answer:

Let x_1 be the no. of units of A
Let x_2 be the no. of units of B
Objective function: Min.Z = $4x_1 + 6x_2$
Subject to Constraints:
$x_1+2x_2 \geq 80$
$3x_1+x_2 \geq 75$
And $x_1, x_2 \geq 0$
$x_1+2x_2-x_3+A_1 = 80$
$3x_1+x_2-x_4+A_2 = 75$
Max. $Z = 4x_1+6x_2-0.x_3-0.x_4-M.A_1- M.A_2$
$x_1, x_2, x_3, x_4, A_1, A_2 \geq 0$

(iii) Name the three method of pricing of a Product. [2]

Answer:

The three method of pricing are:

- Cost Oriented Pricing
- Competition Oriented Pricing
- Demand Oriented Pricing