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) The following information relates to budgeted operations of Division A of a manufacturing Company.

Particulars	Amount in ₹
Sales-50,000 units @₹8	4,00,000
Less: Variable costs @₹6 per unit	3,00,000
Contribution margin	1,00,000
Less: Fixed Costs	75,000
Divisional Profits	25,000

The amount of divisional investment is ₹1,50,000 and the minimum desired rate of return on the investment is the cost of capital of 10%.

Calculate

I. Divisional expected ROI and

II. Divisional expected RI

Answer:

I. ROI= ₹25,000/1,50,000x100=16.7%

II. RI=Divisional profit- Minimum desired rate of return= 25,000-10% of 1,50,000=₹10,000

(b) In a factory of XYZ LTD., where Standard Costing is followed, the budgeted fixed overheads for a budgeted production of 4,800 units is ₹24,000. For a certain period actual (FOH) expenditure was ₹22,000 resulting in a fixed overhead volume variance of ₹ 3,000 (Adv.)

Answer:

Fixed Overhead volume variance = ₹3,000 (Adv):
Budgeted Fixed overhead – Actual Production × Std. rate
= 24,000 –Actual Production × (24,000 ÷ 4,800)
Hence, 3,000 (A) = 24,000 – Actual Production × 5
Actual Production for the period: (24,000 – 3,000) ÷ 5 = 4,200 units.

(c) What is Inter Firm Comparison?

Answer:

Inter Firm Comparison, as the name indicates, is a technique by which a Company evaluates its performance with those of other firms in the same industry. Uniform Cost accounting is a must for such meaningful comparison. To facilitate such comparison and evaluation, generally a central organization is formed to collect the necessary data periodically in a standard format from all member industries. To safeguard the confidentiality of the individual firm's performance details, the data are collected as a ratio or percentage by the central organization in the industry. Information collected may relate to costs, capacity utilization, raw material usage, labour productivity, ROI etc.

(d) SAMPARK LTD. operates a throughput accounting system. The details of product B-1 per unit are as under:

Selling Price	**₹30**
Material Cost	**₹12**
Conversion Cost	**₹15**

Time on bottleneck resources 6 minutes

Calculate the Return per hour for Product B-1

Answer:

$$\text{Return per hour for Product B-1} = \frac{\text{Selling Price - Material Cost}}{\text{Time of bottleneck resuorce}}$$

$$= \frac{30-12}{6\,\text{minutes}} \times 60\,\text{minutes}$$

$$= \frac{18}{6} \times 60 = ₹180$$

(e) A television Company manufactures several components in batches.

The following data relate to one component:

Annual demand	**32,000 units**
Set up cost/batch	**₹120**
Annual rate of interest	**12%**
Cost of production per unit	**₹16**

Calculate the Economic Batch Quantity (EBQ).

Answer:

$$\text{E.B.Q} = \sqrt{\frac{2AS}{C}}$$

Where, A= Annual demand,

S=Set up cost per batch,

C=carrying cost per unit per year,

$$\text{E.B.Q} = \sqrt{\frac{2 \times 32{,}000 \times 120}{16 \times 0.12}}$$

=2,000 units

(f) Whether Separate Form 23C is required to be filed by a Company having two or more different types of products covered under Cost Audit?

Answer:

The company would be required to file individual form 23C for each product under reference even if the same auditor is appointed for all the products.

(g) A Company has been in existence since 1990 and is covered under cost audit for the first time in 2011-12. Whether it is mandatory to indicate previous year figure while submitting the report.

Answer:

A company coming under the purview of the Cost audit for the first time, the cost auditor shall mention figures for the previous year(s) certifying by means of a note that the figure so stated are the on the basis of information furnished by the management, for which he has obtained a certificate from them.

(h) Given $C = x^3 - 10x^2 + 5x$; $R = 8x^2 + 11x - 4$. Find the total profit and hence marginal profit.

Answer:

$C = x^3 - 10x^2 + 5x$

$R = 8x^2 + 11x - 4$

Total Profit = R – C
$= 8x^2 + 11x – 4 – x^3 + 10x^2 – 5x$
$= - x^3 + 18x^2 + 6x -4$
$= -(x^3 – 18x^2 – 6x + 4)$ (Say P)

Marginal Profit $\frac{dp}{dx} = (3x^2 -36x – 6)$

(i) What is Temporary Monopoly?

Answer:

This situation occurs more frequently. A firm invents a new product 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.

(j) What are the essential conditions to obtain the equilibrium position of the industry under perfect competition?

Answer:

In order to obtain the equilibrium position of the industry under perfect competition the following conditions are essential.

- The industry gets an equilibrium position where MC=MR.
- All firms in the industry get only normal profits.
- At equilibrium point the Mc, AC, MR and AR are equal.
- Number of the firms is constant.
- Possible only in long period.

2. Answer any two questions from a, b and c. [2x20=40]

(a)

(i) What do you understand by Operating Costs? Describe its essential features and state where it can be usefully implemented. [5]

Answer.

Operating Costs are the costs incurred by undertakings which do not manufacture any product but provide a service. Such undertakings for example are — Transport concerns, Gas agencies; Electricity Undertakings; Hospitals; Theatres etc. Because of the varied nature of activities carried out by the service undertakings, the cost system used is obviously different from that followed in manufacturing concerns.

The essential features of operating costs are as follows:

- The operating costs can be classified under three categories. For example in the case of transport undertaking these three categories are as follows:
  - Operating and running charges. It includes expenses of variable nature. For example expenses on petrol, diesel, lubricating oil, and grease etc.
  - Maintenance charges. These expenses are of semi-variable nature and includes the cost of tyres and tubes, repairs and maintenance, spares and accessories, overhaul, etc.
  - Fixed or standing charges. These includes garage rent, insurance, road licence, depreciation, interest on capital, salary of operating manager, etc.
- The cost unit used is a double unit like passenger-mile; Kilowatt-hour, etc.

It can be implemented in all firms of transport, airlines, bus-service, etc., and by all firms of Distribution Undertakings.

(ii) A group of workers consisting of 30 men above 30 years of age, 15 females above 30 years of age, and 10 youth of age between 20-30 are paid standard hourly rates as follows:

Males .....₹80/- per hour
Females .....₹60/- per hour
Youth.....₹40/-per hour

In a normal working week of 40 hours, the group is expected to produce 2,000 units of output. During a week, the group consisting of 40 males, 10 females and 5 youth produced 1,600 units. They were paid wages @₹70/- for males, ₹65/- for females and ₹30/- for youth per hour. 4 hours were lost due to abnormal idle time. The Actual and Standard Hrs are as follows:

	Standard Hrs	Actual Hrs
Male	**1200**	**1600**
Female	**600**	**400**
Youth	**400**	**200**
	2200	**2200**

Calculate;

I. Wage variance
II. Wages rate variance;
III. Labour efficiency variance;
IV. Labour mix variance;
V. Labour idle time variance. **[2+3+3+4+3=15]**

Answer:

Working for variance analysis from given data:

Workers	Std. hrs	Std. rate ₹	Std. Amt ₹	Actual Hrs	Actual rate ₹	Actual Amount ₹
Male	1200	80	96,000	1600	70	1,12,000
Female	600	60	36,000	400	65	26,000
Youth	400	40	16,000	200	30	6,000
Total	2200		1,48,000	2200		1,44,000

I. Labour wages variance = Std labour cost for Actual output – Actual amount

$$\left(\frac{1,48,000}{2,000} \times 1,600\right) - ₹1,44,000 = ₹25,600 \text{ (Adv)}$$

II. Labour (Wages) Rate variance = Difference in rates (Std – Act) x Act Hrs
For male ₹ (80 – 70) x 1,600 = ₹16,000 (Fav)
For Female ₹(60 – 65) x 400 = ₹2,000 (Adv)
For Youth ₹(40 – 30) x 200 = ₹2,000 (Fav)
Total = ₹16,000 (Fav)

III. Labour efficiency variance = (Std hrs for Act output – Act hours) x std rate

For Male $\left(\frac{1,200}{2,000} \times 1,600 - 1,600\right) \times ₹\,80 = ₹51,200 \text{ (Adv)}$

For Female	$\left(\frac{600}{2,000} x 1,600-400\right) x$ ₹60 = ₹4,800 (Fav)
For Youth	$\left(\frac{400}{2,000} x\ 1,600-200\right) x$ ₹40 = ₹4,800 (Fav)
Total	₹41,600 (Adv)

IV. Labour mix variance = Effective hrs = Hrs paid – Idle time (hrs)

Male	1600 – 4 x 40	1440 hrs
Female	400 – 4 x 10	360 hrs
Youth	200 – 4 x 5	180 hrs
Total		1980 hrs
Total effective hours in std mix:		
Male	$\left(\frac{1200}{2,200} x 1980\right)$	1080 hrs
Female	$\left(\frac{600}{2,200} x 1980\right)$	540 hrs
Youth	$\left(\frac{400}{2,200} x 1980\right)$	360 hrs
Total		1980 hrs

The required variance = (Effective hrs in Std. mix – Actual effective hrs.) x Std. rate

For Male	(1080 – 1440) x ₹80	₹28,800 (Adv)
For Female	(540 – 360) x ₹60	₹10,800 (Fav)
For Youth	(360 – 180) x ₹40	₹7,200 (Fav)
Total		₹10,800 (Adv)

V. Labour idle time variance = Idle hours x Std. rate

For Male	(4 x 40) x ₹80	₹12,800 (Adv)
For Female	(4 x 10) x ₹60	₹2,400 (Aav)
For Youth	((4 x 5) x ₹40	₹800 (Aav)
Total		₹16,000 (Adv)

(b)

(i) Enumerate the factors which are to be considered before installing a System of Cost Accounting. [7]

Answer:

The following points should be considered before installing a cost system are:

- The nature, method and stages of production, the number of varieties and the quantity of each product and such other technical aspects should be examined. It is to be seen how complex or how simple the production methods are and what is the degree of control exercised over them.
- The designer should consider the objectives of costing system, i.e the expectations of the management
- The size, layout and organization of the factory should be studied.
- Organization structure should be studied to determine the manner in which costing system could be introduced, without altering or extending the organization
- The methods of purchase, receipt, storage and issue of materials should be examined and modified wherever considered necessary.

- The wage payment methods should be studied.
- The policy adopted by the management towards cost control should be kept in view.
- The cost of the system to be installed should be considered. It is needless to emphasise that the installation and operation of system should be economic.
- The system should be simple and easy to operate.
- The system can be effectively run if it is appropriate and properly suited to the organization.
- Forms and records of original entry should be so designed that it involves minimum clerical work and expenditure.
- The system should be so designed that cost control can be effectively exercised.
- The system should incorporate suitable procedure for reporting to the various levels of management. This should be based on the principles of exception.

(ii) The following are the figures relating to a factory for two successive years:

	Year I (₹)	Year II (₹)
Sales	**10,00,000**	**16,80,000**
Marginal Cost of Sales	**6,00,000**	**8,00,000**
Contribution	**4,00,000**	**8,80,000**

During Year II, the selling price increased by 20% and the company implemented a cost reduction programme very aggressively. You are required to analyse the increase in contribution due to:

I. Increase in selling price

II. Increase in sales volume

III. Reduction in cost **[3+3+3]**

Answer:

Increase in Contribution = ₹8,80,000 – ₹4,00,000 = ₹4,80,000

Calculation of P/V Ratio:

P/V Ration = Contribution / Sales

$$\text{Year I: P /V Ratio} = \frac{4,00,000}{10,00,000}$$

= 40%

$$\text{Year II: P /V Ratio} = \frac{8,80,000}{16,80,000}$$

= 52.38%

It is assumed that the no. of units sold are 1,00,000.

Selling Price = 10,00,000 / 1,00,000

= ₹10

Increase in selling price by 20% in year II

Therefore, selling price in the year II = ₹12

No. of units in Year II = 16,80,000 / 12

= 1,40,000 units

I. Increase in Contribution due to increase in Selling Price

The increase in selling price will lead to the increase in contribution. Selling price has increase by 20% and the contribution has increased by 120%. This means for every 1% increase in the selling price the contribution will increase by 6%. The increase in the selling price was directly related to the increase in the contribution. Change in the selling price will not affect in the production thereby the change in the variable cost, as both are not related activities in the production.

II. Increase in Contribution due to increase in Sales Volume

In the given situation, the increase in the sales volume (from I year to II year) resulted in increase in the contribution to some extent. The amount of sales is increased as the no. of units sold has been increased. By this, the amount of contribution is also increased. The increase in the sales volume was directly related to the increase in the contribution. There is no relation between the sales volume and production run.

III. Increase in Contribution due to reduction in cost

Since the company has implemented a cost reduction programme, the cost of production per unit will be automatically reduced and there by contribution per unit will go up. In the absence of the data as to quantitative details, we cannot attribute whether the increase in contribution is resulted due to increase in quantity of goods sold or due to implementation of cost reduction programme. However, if the quantum of increase in sales units is less than 40% of the number of units, then, we conclude that the increase in contribution is due to implementation of the cost reduction programme to that extent.

(iii) State the treatment of By-product Cost in Cost Accounting, when they are of small total value. [4]

Answer:

Treatment of By-product cost in Cost Accounting:

When the by-products are of small total value:

- Miscellaneous Income or Other Income Method
  This method is adopted when the sales value of the products is very small as compared to the sales value of the main product and is sold off without further processing. Here the sales value of the by-product is credited to the Costing Profit & Loss A/c as miscellaneous income. The entire joint costs (or common processing costs) are apportioned among the main products and nothing is apportioned to the by-product.
- Total cost less sales value of by-product
  The sales value of the by-products is deducted from the total common costs of the main products. The common costs, so reduced will then be apportioned among the main products. If the by-product requires further processing or certain selling and distribution expenses are required to be incurred, then these costs will have to be first subtracted from the sales value of the by-products. The balance amount, if any is to be deducted from the common costs.

(c)

(i) From the following forecast of income and expenditure prepare a Cash Budget for three months ending on June, 2014:

Month	Sales (₹)	Purchase (₹)	Wages (₹)	Misc. (₹)
2014 February	1,20,000	84,000	10,000	7,000
March	1,30,000	1,00,000	12,000	8,000
April	80,000	1,04,000	8,000	6,000
May	1,16,000	1,06,000	10,000	12,000
June	88,000	80,000	8,000	6,000

Additional Information:

- **Sales: 20% realised in the month of sales, discount allowed 2%, balance realised equally in two subsequent months.**
- **Purchases: These are paid in the month following the month of supply.**
- **Wages: 25% paid in arrears in the following month.**
- **Misc. Expenses: Paid a month in arrears.**
- **Rent: ₹ 1,000 per month paid quarterly in advance due in April.**

- **Income Tax: First installment of advance tax ₹ 25,000 due on or before 15th June to be paid within the month.**
- **Income from Investment: ₹5,000 received quarterly in April, July etc.**
- **Cash in Hand: ₹5,000 in April 1, 2014.** **[12]**

Answer:

Cash Budget April – June 2014

Particulars	April (₹)	May (₹)	June (₹)
A) Opening Balance	5,000	6,000	(6,300)
B) Debtors Realised	1,16,000	1,07,200	96,000
C) Income from Investment	5,000		
(1)	1,26,000	1,13,200	89,700
D) Creditor Paid	(1,00,000)	(1,04,000)	(1,06,000)
E) Wages Paid			
March	(3,000)	—	
April	(6,000)	(2,000)	—
May	—	(7500)	(2,500)
June	-	-	(6,000)
F) Rent (1000 x 3)	(3,000)	-	-
G) Income Tax	-	-	(25,000)
H) Miscellaneous Expenses	(8,000)	(6,000)	(12,000)
(2)	1,20,000	1,19,500	1,51,500
Closing Balance (1 – 2)	6,000	(6,300)	(61,800)

Working Notes:

Calculation of collection from debtors

	February	March	April	May	June
Sales (₹)	1,20,000	1,30,000	80,000	1,16,000	88,000
20% realised	24,000	26,000	16,000	23,200	17,600
Balance	96,000	1,04,000	64,000	92,800	70,400
Balance equally realized in two subsequent month		48,000	48,000		
			52,000	52,000	
				32,000	32,000
					46,400
Collection from debtor		(26,000+48,00) =74,000	(16,00+48,000 +52,000) =1,16,000	(23,200+52,000 + 32,000) =1,07,200	(17,600+ 32,000+ 46,400) =96,000

(iii) A shop floor supervisor of a small factory presented the following cost for Job no.421 to determine selling price.

	Per unit
Material	**₹70**
Direct Wages 18 hrs. @ ₹ 2.50 (Deptt. X 8 hours; Dept. Y6 hours; Deptt. Z 4 hours)	**45**
Chargeable Expenses (Special stores items)	**5**
	120
Add: 33 1/3% for Overheads	**40**
Total Cost	**160**

Analysis of the Profit/Loss Account for 2014 shows the following:

Material used		**₹1,50,000**	**Sales less Returns**	**₹2,50,000**
Direct Wages:				
Dept. X	**10,000**			
Dept. Y	**12,000**			
Dept. Z	**8,000**	**30,000**		
Special stores items		**4,000**		
Overheads:				
Dept. X	**5,000**			
Dept. Y	**9,000**			
Dept. Z	**2,000**	**16,000**		
Total Cost		**2,00,000**		
Gross Profit c/d		**50,000**		
		2,50,000		**2,50,000**
Selling Expenses		**20,000**		**50,000**
Net Profit		**30,000**	**Gross Profit b/c**	
		50,000		**50,000**

It is also noted that average hourly rates for the three departments X, Y, Z are similar.
Required:
Draw up a job cost sheet.
Calculate the entire revised cost using 2014 actual figures as basis.
Add 20% to total cost to determine selling price. **[8]**

Answer:

In order to prepare the job cost sheet, the overhead rates of different departments will have to be first determined on the basis of previous year's figures. The rates are as follows:

FACTORY OVERHEAD RATES

Deptts.	**X**	**Y**	**Z**
(i) Overheads	₹ 5,000	₹ 9,000	₹ 2,000
(ii) Direct Labour Hours = Total Wages/Hourly Rates	4,000	4,800	3,200
(iii) Rate per hour (i) ÷ (ii)	1.25	1.875	.625

COST SHEET OF JOB NO. 421

Particulars	**Rate**	**Hrs.**	**Amount**
Material			₹70.00
Direct Wages: Deptt. X	₹ 2.50	8hrs.	20.00
Deptt. Y	2.50	6 hrs.	15.00
Deptt. Z	2.50	4 hrs	10.00
Chargeable Expenses			5.00
Prime Cost			120.00
Overheads Deptt. X	1.250		10.00
Deptt. Y	1.875	8 hrs.	11.25
Deptt. Z	.625	6 hrs	2.50
Total Cost		4 hrs.	143.75
Add: Profit 20% of Total Cost			28.75
Selling Price			172.50

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

(a)

(i) How is "Manufacturing Activity" defined under the Companies (Cost Accounting Record Rules), 2011? [4]

Answer.

"Manufacturing Activity" includes any act, process or method employed in relation to-

- transformation of raw materials, components, sub-assemblies, or parts into semi-finished or finished products; or
- making, altering, repairing, fabricating, generating, composing, ornamenting, furnishing, finishing, packing, re-packing, oiling, washing, cleaning, breaking-up, demolishing, or otherwise treating or adapting any product with a view to its use, sale, transport, delivery or disposal; or
- Constructing, reconstructing, reconditioning, servicing, refitting, repairing, finishing or breaking up of any products.

The above definition of " manufacturing " is couched in the widest possible terms and extends the scope of cost record maintenance obligations under section 209(1)(d) of the Act to all except those companies which qualify as SMEs under the 2011 Record Rules.

(ii) Distinguish between "Notes" and "Qualifications" in Cost Audit Report. Give suitable examples. [4]

Answer.

Section 227(2) of the Company's Act, 1956, requires the auditor to make report to the shareholders on the accounts examined by him. When in any of the matters as required to be stated, the Auditor feels that satisfactory compliance was not done by the company, the auditor shall state the fact of none-compliances and suitably qualify the point with reason.

The same principle also holds well for the Cost Auditor, though the report is to be submitted to the Central Government. Wherever a particular statement or basis of costing needs some explanation or clarification, the auditor shall add suitable "Notes" at appropriate places by way of explanation. For example, if a company has added a new activity, on account of which a portion of overhead charges to a product gets reduced during a year, this may be explained by way of "Notes".

On other hand if a company has deviated from the accepted Cost Accounting principles, in order to inflate costs, the auditor shall make a qualified report to the Government.

For example, if a company has spent a huge amount on evaluation of new product ideas and has charged the entire amount to the Administrative Overhead, the Cost Auditor should qualify the excess amount and the impact on each unit of Cost of Production of the products under audit. Such report will be a "qualified report".

(b)

(i) A company has produced all accounting records within the stipulated time for your audit. It however is unable to produce audited financial accounts, as financial audit is not yet completed. As a cost Auditor, how would you deal with? [2]

Answer:

Cost Audit Report is finalized with provisional figures a forwarding letter should be attached by the Cost Auditor to the aforesaid report stating clearly that the company has been unable to produce audited financial accounts since the financial audit is not yet complete. As such the report submitted is based on unaudited/provisional figures only as has been given to him by the company. Subsequently a supplementary report should be submitted by the Cost Auditor to the Government as soon as the audited financial accounts are made available.

(ii) Answer the following questions with respect to the Companies (Cost Accounting Records) Rules, 2011:

I. Whether product manufactured for 100% captive/ self –consumption shall be covered under these Rules?

II. What does turnover mean under these Rules? Is gross turnover inclusive of excise duty?

III. Whether film industry like film producing companies/ studios registered under Indian Companies Act shall be covered under these Rules? [2x3=6]

Answer.

I. The test of inclusion under the Rules is whether it is a production, processing, manufacturing or mining activity resulting in a product intended for use, consumption, sale, transport, store, delivery or disposal and whether the company carrying out the activity falls within the criteria mentioned under Rule 3(1). If the company meets requirement of Rule 3(1), the activity – whether or not for captive / self-consumption – will come under the ambit of these Rules. (CARR-2011).

II. As per Rule 2(p), "Turnover" means gross turnover made by the company from the sale or supply of all products or services during the financial year. It includes any turnover from job work or loan license operations but does not include any non-operational income. From a reading of the Rules, it appears that the word "Gross" denotes "total". Hence, the "Turnover" under these Rules would exclude duties and taxes. (CARR-2011)

III. The companies (Cost Accounting Records) Rules 2011 is applicable to developing, fixing, and washing exposed photographic or cinematographic film or paper to produce either a negative image or a positive image. In case a film producing company is also engaged in these activities, the same would be covered.

(c) Describe the duties of Cost Auditor. [8]

Answer:

Duties of cost auditor

The provisions of the Companies Act, the Cost Audit (Report) Rules, the Cost and Works Accountants Act and Regulations, and the different laws that are applicable on a particular company or companies govern the duties of a Cost Auditor. The duties may be described as follows:

- Auditor should submit his Cost Audit Report to the Central Government within one hundred and eighty days from the end of the company's financial year to which such report relates, and a copy of the said report to the company.
- He should also qualify his report to the extent it differs, where he is not satisfied with any of the provisions stated above.
- He should owe his duty of care primarily to the company act honestly and sincerely.
- He should assist the Government in the latter's investigation process being launched for the purpose of examining the affairs of the company.
- He should understand and appraise the company's policies and procedures and systems adopted for the purpose of controlling wastages and inefficiencies.
- He should see and ensure what other exceptional duties are case upon him by the Articles of the company
- He should give necessary advice to the company about the irregularities in the maintenance and recording of cost accounts books and statements.
- He should keep records of various errors or omissions and commissions done by the client staff.
- He should, if he considers if necessary after submission of his report, submit a supplementary report, to the Central Government before the date fixed for holding the annual general meeting of the company, limited to the extent of reconciliation of the cost statements with the company's financial accounts
- He has a continuing duty to maintain his professional knowledge and skill at a level

conducive to act as a cost auditor competently.

- He should clearly state, in his report, that :
  - He has obtained all the information and explanations relating to the cost accounts which to the best of his knowledge and belief were necessary for the purposes of the cost audit.
  - In his opinion the company's cost accounting records have been properly kept so as to give a true and fair view of the cost of production, processing, manufacturing or mining activities, and marketing of the product.
  - The books and records kept by the company give the information in the manner required by the Companies Act.
  - Proper cost accounting records as required under the relevant Cost Accounting (Records) Rules have been kept by the company.
  - Proper returns adequate for the purpose of his cost audit have been received from the branches not visited by him.

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

(a)

(i) What are the components of time series? [4]

Answer.

A typical time services has the following four major components:

- **A Secular trend**: representing the long-term direction, or average movement in the time series.
- **Cyclical fluctuations:** which usually follow variations in the growth of the economy in general, around a long-term, secular trend
- **Seasonal variations**: caused by changes in weather conditions and social habits, such as the need to buy X-mas cards in December and dresses during the festival season (Dewali or Durga Puja).
- **Random or unsystematic variations**: such as wars, revolutions, crop failures, natural calamities, and changes in tastes and preferences of buyers.

(ii) What are the managerial uses of production function? [4]

Answer.

Managerial Use of Production Functions:

- The economics of production management takes, as its starting point, the study of the entire group of possible factor combinations that could be used to produce a certain output, within a given state of technology. This type of analysis is carried out through production function.
- A production function is a expression of the dependent or functional relationships that exists between the inputs of production process and the output that results. Hence it is sometimes known as input-output relations.
- Of the various types of production function the Cobb-Douglas function is the most celebrated. Because it has certain important properties which are useful for managerial decision making.
- This study of production function is useful not for its own sake. Because it answers certain questions faced by the management. It enables the management to know beforehand the most profitable decision concerning the employment of resources and the scheduling of the output. It is also useful in deriving a firm's cost function.

(b) What are features of an Oligopolistic Market? [8]

Answer.

Features of Oligopolistic Market:

- Interdependence – Firms have a high degree of dependence in their business policies, price and output fixation.
- High cross elasticity – Firms under oligopoly have high degree of cross elasticity and are always in fear of retaliation by rivals. Firms consider the possible action and reaction of its competitors while making changes in price or output.
- Each firm tries to attract customers towards its product by incurring excessive advertisement expenditure. It is only under oligopoly that advertising comes into its own.
- Constant struggle – Competition in oligopoly consists of constant struggle of rivals against rivals and is unique.
- Lack of uniformity – There is lack of uniformity in the size of different oligopolies.
- Lack of certainty – In oligopolistic competition firms have two conflicting motives – (a) to remain independent in decision making and (b) to maximize profits despite being interdependent. To pursue these ends, they act and react to the price-output variation of one another in an unending atmosphere of uncertainty.
- Price rigidity – Each firm sticks to its own price due to constant fear of retaliation from rivals in case of reduction in price. The firm rather resorts to non-price competition by advertising heavily.
- Kinked demand curve – According to Paul Sweezy, firms in an oligopolistic market, have a kinky demand curve for their products.

(c)

(i) Explain the concept of Penetration pricing policy of a new product. [4]

Answer:

Penetration Price Policy:

Instead of setting a high price, the firm may set a low price for a new product by adding a low mark-up to the full cost. This is done to penetrate the market as quickly as possible. The assumptions behind the low penetration price policy are:

- The new product is being introduced in a market which is already served by well-known brands. A low price is necessary to attract gradually consumers who are already accustomed to other brands.
- The low price will help to maximize the sales of the product even in the short period.
- The low price is set in the market to prevent the entry of new products.

Penetration price policy is preferred to skimming price under three conditions:

In the first place, skimming price offering a high margin will attract many rivals to enter the market. With the entry of powerful rivals into the market, competition will be intensified, price will fall and profits will be competed away in the long run. A firm will prefer a low penetration price if it fears the entry of powerful rivals with plenty of capital and new technology. For a low penetration price, based on extremely low mark-up will be least profitable and potential competitors will not be induced to enter the market.

Secondly, a firm will prefer low penetration price strategy if product differentiation is low and if rival firms can easily imitate the product. In such a case, the objective of the firm to fix low price is to establish a strong market based and build goodwill among consumers and strong consumer loyalty.

Finally, a firm may anticipate that its main product may generate continuing demand for the complementary items. In such a case, the firm will follow penetration pricing for its new product, so that the product as well as its complements will get a wider market.

(ii) What are 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 assume 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.

(d)

(i) A firm has revenue function given by R=10Q where R=Gross Revenue and Q=Number of Units Sold, Production Cost function is given by C = 20000+ 50(Q / 800)2
Find: the total Profit function, and the number of Units (Q) to be sold to get the maximum Profit. [2+2]

Answer:

R = 10Q

$$C = 20000 + 50\left(\frac{Q}{800}\right)^2$$

$$\text{Profit (P)} = 10Q - 20000 - 50\left(\frac{Q^2}{640000}\right) \text{(Profit function)}$$

To find number of units to get the maximum profit,

$\frac{dP}{dQ} = 0$ and $\frac{d^2P}{dQ^2}$ should be - ve

$$= \frac{dP}{dQ} = 10 - \frac{50 \times 2Q}{640000} = 0$$

$$\Rightarrow 10 - \frac{100Q}{640000} = 0$$

Therefore, $Q = \frac{640000 \times 10}{100} = 64000$

$$\frac{d^2P}{dQ^2} = -\frac{100}{640000} = -\frac{1}{6400} \text{ Which is negative(-ve)}$$

P (Profit) is maximum at Q = 64000 units

$$\text{Maximum Profit} = 10 \times 64000 - 20000 - 50\left(\frac{64000^2}{640000}\right)$$

= 6,40,000 – 20,000 – 3,20,000 = ₹3,00,000

(ii) The demand function is $x = 80 + 2P + 5P^2$ where 'x' is the demand for the commodity at Price 'P'. Find the elasticity of demand at P = 5 [4]

Answer:

Determination of Elasticity of Demand

$X = 80 + 2P + 5P^2$

Marginal Quantity demanded $\frac{dy}{dx} = 2 + 10P$

Average Quantity demanded = $\frac{X}{p} = \frac{80 + 2p + 5p^2}{p} = \frac{80}{p} + 5p + 2$

$$Ep = \frac{dx}{dp} / \frac{x}{p} = \frac{2 + 10p}{\frac{80}{p} + 5p + 2} = \frac{p(2 + 10p)}{80 + 5p^2 + 2p}$$

At, P = 5

$$Ep = \frac{5(2 + 50)}{80 + 125 + 10} = \frac{260}{215} = \frac{52}{43}$$