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**

QUESTION 1, which is compulsory.
Section-A has three questions, Attempt any two.
Section-B has three questions, Attempt any two.
Section-C has four questions, Attempt any three.
(Working Notes should form part of the answer.)

1.

(i) From the following particulars, write up Contract Account and find out the value of tender (contract) price: Materials use ₹ 30,000; Productive wages ₹ 25,000; Direct expenses ₹ 500; Provide 60% on productive wage for works overhead and 12 ½ % on works cost for office overhead. Profit to be realized 15% on the tender price. [3]

Solution :

Memorandum Contract Account

Particulars	Amount (₹)	Particulars	Amount (₹)
Materials used	30,000.00	Contract price to be tendered	93,308.82
Productive wages	25,000.00		
Direct expenses	500.00		
Prime cost	**55,500.00**		
Work overhead : 60% of ₹ 25,000	15,000.00		
Work cost	**70,500.00**		
Office overhead: 12.5% of (₹)70,500	8,812.50		
Total cost	**79,312.50**		
Add : Profit 15% on Tender price or 15/85 on 79,312.50	13,996.32		
	93,308.82		**93,308.82**

(ii) A company prepares a budget for a production of 2,00,000 units. Variable cost per unit is ₹ 15 and the fixed cost is ₹ 2 per unit. The company fixes its selling price to fetch a profit of 10% on cost.
What is the break-even point ? (both in units and ₹) [3]

Solution :

Break Even Point (unit) = Fixed cost/ Contribution per unit
= (₹ 2 x 2,00,000 units) / ₹ 3.7
= 1,08,108 units

Break Even Point (₹) = 1,08,108 × 18.70 = ₹ 20,21,620

Note : Selling price per unit = Total cost + 10% profit on cost
= ₹ 17.00 + 10% of 17
= ₹ 18.70

Contribution per unit = Selling price – Variable cost
= ₹ 18.70 - ₹ 15.00
= ₹ 3.70

(iii) The budgeted working conditions for a cost centre are as follows :

Normal working per week	**42 hours**
Number of machines	**14**
Normal weekly loss of hours on maintenance	**5 hours per machine**
Number of weeks works per year	**48**
Estimated annual overheads	**₹ 1,24,320**
Actual result in respect of a 4 week period are :	
Overhead incurred	**₹ 10,200**
Machine hours produced	**2,000**

On the basis of the above information you are required to calculate :

(a) The machine hour rate

(b) The amount of under or over-absorption of overhead **(2+2=4)**

Solution :

(a) Effective working hours p.a.
= Normal working hours – Normal loss due to maintenance
= (14 x 42 x 48) – (14 x 5 x 48) = 24,864 hours
∴ Overhead rate per machine hour = ₹ 1,24,320/24,864 hours = ₹ 5 per machine hr.

(b) Under-absorbed overhead = Actual overhead – Overhead absorbed
= ₹ 10,200 – (2,000 hours x ₹ 5 per hr.) = ₹ 200
Effective working hours per week = 4 week x 42 hours per week x 14 machines
= 2,352 hours

(iv) Whether each and every transactions with Related Parties is to be disclosed under Para D-5 of Annexure to the Cost Audit Report? [2]

Solution :
Details of related Party Transaction are required to be provided in respect of each Related Party and each Product/Service for the year as a whole and not transaction-wise.

(v) Distinguish between Cost Accounting policy and Cost Accounting system? [2]

Solution :
Cost Accounting Policy of a company state the policy adopted by the company for treatment of individual cost components in cost determination.

The Cost Accounting system of a company, on the other hand, provides a flow of the cost accounting data/information across the activity flow culminating in arriving at the cost of final product/service.

(vi) A firm faces the demand curve q = 200- 100p. If the objective of the firm is to maximize total revenue, what is the output level. [4]

Solution :

As $q = 200 - 100p \Rightarrow p = 2 - \frac{1}{100}q$.

$\Rightarrow MR = 2 - \frac{1}{50}q$.

Now TR is maximum if $\frac{d}{dq}(TR) = 0 \Rightarrow MR = 0$.

$\therefore$ If MR = 0. We have $2 - \frac{1}{50} q = 0 \Rightarrow q = 100$.

$\therefore$ firm must sell 100 units to maximize total revenue.

SECTION A
Answer any two questions from this section.

2. (a) (i)

Leo Limited undertakes to supply 1,000 units of a component per month for the months of January, February and March 2015. Every month a batch order is opened against which materials and labour cost are booked at actuals. Overheads are levied at a rate per labour hour. The selling price is contracted at ₹ 15 per unit.

From the following data, present the cost and profit per unit of each batch order and the overall position of the order for the 3000 units:

Month	Batch Output (Numbers)	Material Cost	Labour Cost	Overheads	Total Labour Hours
January	**1,250**	**₹ 6,250**	**₹ 2,500**	**₹ 12,000**	**4,000**
February	**1,500**	**9,000**	**3,000**	**9,000**	**4,500**
March	**1,000**	**5,000**	**2,000**	**5,000**	**5,000**

Labour is paid at the rate of ₹ 2 per hour. **[3+3+2=8]**

Solution:

Statement showing the Cost and Profit per unit for each batch.

		January	February	March	Total
(i)	Batch output (numbers)	1,250	1,500	1,000	3,750
(ii)	Total sales realisation from (i) above @ ₹15	₹ 18,750	₹ 22,500	₹ 15,000	₹ 56,250
(iii)	Costs				
	Material	6,250	9,000	5,000	20,250
	Labour	2,500	3,000	2,000	7,500
	Overheads (see working note)	3,750	3,000	3,000	9,750
	Total Cost	12,500	15,000	10,000	37,500
(iv)	Profit (ii) - (iii)	6,250	7,500	5,000	18,750
(v)	Profit per unit (iv ÷ i)	5	5	5	
(vi)	Cost per unit (iii ÷ i)	10	10	10	

Profitability for 3,000 units

Sales value	(3,000 × ₹ 15)	₹ 45,000
Less: Costs	(3,000 × ₹ 10)	₹ 30,000
Profit		15,000

Working Note: The batch labour cost for the month is given. The labour is paid @ ₹ 2 per hour. Thus, by dividing the batch labour cost with hourly rate, batch labour hours can be found out:

(a)	Batch labour hours	₹ 2,500 ÷ 2 = 1250 hrs.	₹ 3,000 ÷ 2 = 1500 hrs.	₹ 2,000 ÷ 2 = 1000 hrs.
(b)	Overhead per hour (Total overheads ÷ Total labour hours)	12000 ÷ 4000 = ₹ 3	9000 ÷ 4500 = ₹ 2	15000 ÷ 5000 = ₹ 3
	Overhead for the batch (a × b)	Or ₹ 3,750	Or ₹ 3,000	Or ₹ 3,000

2. (a) (ii)

XYZ Ltd. is selling three brands of its products in the brand names X, Y and Z. The details, regarding unit cost and selling prices are as under:

	X	Y	Z
Direct Materials	**₹ 6**	**₹ 12**	**₹ 16**
Direct labour	**8**	**8**	**20**
Variable Overhead	**6**	**20**	**14**
Selling Price	**36**	**50**	**96**

The monthly fixed expenditure is ₹ 5,40,000. Sales volume for the months of July and August of 2014 are as follows:

	X	Y	Z
July	**20,000**	**20,000**	**20,000**
August	**40,000**	**26,000**	**10,000**

Find out the monthly profits and if your computation brings out that higher profit was earned in the month having lower sales volumes, kindly justify the finding with reasons. 8

Solution:

(a) Statement of Cost/Contribution per unit

	X	Y	Z
Direct Materials	₹ 6	₹ 12	₹ 16
Direct Labour	8	8	20
Variable Overhead	6	20	14
Marginal Cost	20	40	50
Selling Price	36	50	96
Contribution	16	10	46

For July

	X	Y	Z	Total
Sales (units)	20,000	20,000	20,000	60,000 units
Contribution (₹)	3,20,000	2,00,000	9,20,000	14,40,000
Fixed Cost (₹)				5,40,000
Profit (₹)				9,00,000

For August

	X	Y	Z	Total
Sales (units)	40,000	26,000	10,000	76,000 units
Contribution (₹)	6,40,000	2,60,000	4,60,000	13,60,000
Fixed Cost (₹)				5,40,000
Profit (₹)				8,20,000

Comments – Physical sales in units have gone up from 60,000 units in July to 76,000 units in August. Still profit has come down from ₹ 9,00,000 in July to ₹ 8,20,000 in August. This is due to change in composition of sales. Z is making a contribution of ₹ 46 per unit. Its sale has gone down from 20,000 units in July to 10,000 units in August. The increase in physical sales of X and Y could not compensate for loss of sales of Z, which was making highest contribution per unit.

2.(a) (iii)

Describe the steps that need to be undertaken for making reporting of variances more effective. [4]

Solution:

In order that variance reporting should be effective, it is essential that the following requisites are fulfilled:

- The variances arising out of each factor should be correctly segregated. If part of a variance due to one factor is wrongly attributed to or merged with that of another, the analysis report submitted to the management would be misleading and wrong conclusions may be drawn from it.
- Variances, particularly the controllable variances should be reported with promptness as soon as they occur. Mere operation of Standard Costing and reporting of variances is of no avail. The success of a Standard Costing system depends on the extent of responsibility which the management assumes in correcting the conditions which cause variances from standard. In order to assist the management in assuming this responsibility, the variances should be reported frequently and on time. This would enable corrective action being taken for future production while work is in progress and before the project or job is completed.
- For effective control, the line of organization should be properly defined and the authority and responsibility of each individual should be laid down in clear terms. This will avoid 'passing on the buck' and shirking of responsibility and will enable the tracing of the causes of variances to the appropriate levels of management.
- In certain cases, a particular variance may be the joint responsibility of more than one individual or department. It is obvious that if corrective action has to be effective in such cases, it should be taken jointly.

2. (b) (i)

A contractor commenced work on a particular contract on 1st April 2014. He closes the books of accounts for the year on 31st December of each year. The following information is revealed from his costing records on 31st December, 2014:

Materials sent to site ₹ 43,000 Foreman 12,620 Labour 1,00,220

A machine costing ₹ 30,000 remained in use on site for 1/5th of the year. Its working life was estimated at 5 year and scrap value at ₹ 2,000.

A supervisor is paid ₹ 2,000 per month and had devoted half of his time on contract.

All other expenses were ₹ 14,000. The materials on site were ₹ 2,500. The contract price was ₹ 4,00,000. On 31st December, 2014, 2/3rd of the contract was completed, however, the architect gave certificate only for ₹ 2,00,000 on which 80% was paid. Prepare contract account. [8+2=10]

Solution:

CONTRACT ACCOUNT

Particulars	Amount (₹)	Particulars	Amount (₹)
To Materials	43,000	By Materials at site	2,500
To Wages	1,00,220	By Work-in-progress:	
To Foreman's Salary	12,620	Work Certified	2,00,000
To Depreciation on Plant (WN:1)	1,120	Work Uncertified (WN:2)	44,365
To Supervisor's Salary (2,000×9×½)	9,000		
To Other Expenses	14,000		
To Profit c/d	66,905		

	2,46,865		2,46,865
To Profit and Loss Account (WN:3)	35,683	By Profit b/d	66,905
To Work-in-progress a/c (Reserve)	31,222		
	66,905		66,905

Working Notes:

1. Depreciation on plant $\frac{₹30,000-₹2,000}{5\times5} = ₹\ 1,120.$
2. Cost of work uncertified:

Expenditure incurred to date	₹ 1,79,960
Less: Materials at site	2,500
	1,77,460

₹ 1,77,460 represents the cost of completing 2/3 of the total contract. Thus the estimated cost of the total contract will amount to ₹ 2,66,190 (i.e. 1,77,460 × 3/2).
The architect's certificate represents 1/2 of the contract price. It, therefore, covers an expenditure of ₹ 1,33,095 (i.e. 2,66,190 × 1/2).
The cost of work uncertified is, therefore, ₹ 44,365 (i.e. ₹ 1,77,460 - ₹ 1,33,095)

3. Profit taken to profit and loss account: = $66,905\times\frac{2}{3}\times\frac{80}{100} = ₹\ 35,683$ (approx.)

2. (b) (ii)

The following set of information is presented to you by your client AB Ltd. producing two products X and Y:

		X	Y
1.	**Direct material per unit**	**₹ 20**	**₹ 18**
2.	**Direct wages (per unit)**	**6**	**4**
3.	**Fixed overhead during the period is expected to be ₹ 1,600**		
4.	**Variable overhead is allocated to products at the rate of 100% of direct wages.**		
5.	**Sales price per unit (₹)**	**40**	**30**
6.	**Proposed sales mix:**		
	(i) 100 units of X and 200 units of Y		
	(ii) 150 units of X and 150 units of Y		
	(iii) 200 units of X and 100 units of Y		

As a Cost Accountant you are requested to present to the management of AB Ltd. the following:

I. The unit marginal cost and unit contribution.
II. The total contribution and the resultant profit from each of the above sales mixes.
III. The proposed sales mixes to earn a profit of ₹ 300 and ₹ 600 with the total sales of X and Y being 300 units. [2+2+6=10]

Solution:

I. Statement showing the unit marginal cost and unit contribution

	Product	
	X	Y
Selling price	₹ 40	₹ 30
Marginal Cost		
Direct material	20	18

Direct wages	6	4
Variable overhead	6	4
Total	32	26
Contribution	8	4

II. Statement showing the Profitability of Various Sales Mixes

	(i)			(ii)			(iii)		
	X	Y	Total	X	Y	Total	X	Y	Total
Sales mix (units)	100	200	300	150	150	300	200	100	300
Total Contribution (₹)	800	800	1,600	1,200	600	1,800	1,600	400	2,000
Less: Fixed overhead			1,600			1,600			1,600
Profit			---			200			400

(c)

	Case I	Case II
Required profit (₹)	300	600
Add: Fixed overhead	1,600	1,600
Total Contribution	1,900	2,200

Case I

Suppose number of X units to be sold = p
Then, number of Y units to be sold will be = (300 - p)
Equating 8p + 4 (300 - p) = 1,900
or 8p + 1,200 - 4p = 1,900 or p = 175.
Proposed mix X = 175 units
Y = 125 units
300 units

Case II

Suppose number of X units to be sold = q
The number of Y units will be = (300 - q)
Equating 8q + 4(300 - q) = 2,200
or 8q + 1,200 - 4q = 2,200 or q = 250.
Proposed mix X = 250 units
Y = 50 units
300 units

2. (c) (i)

Given below is the Trading and Profit and Loss Account of Vikas Electronics for the accounting year ended 31st March, 2015.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Direct materials consumed	**3,00,000**	**By Sales: 2,50,000 units**	**7,50,000**
To Direct wages	**2,00,000**		
To Factory expenses	**1,20,000**		
To Office expenses	**40,000**		
To Selling and distribution expenses	**80,000**		
To Net profit	**10,000**		
	7,50,000		**7,50,000**

Normal output of the factory is 2,00,000 units. Factory overheads are fixed upto ₹ 60,000 and office expenses are fixed for all practical purposes. Selling and distribution expenses are fixed to the extent of ₹ 50,000; the rest are variable.

Prepare a statement reconciling profit as per Cost Accounts and Financial Accounts. 8

Solution:

STATEMENT OF PROFIT/LOSS AS PER COST ACCOUNTS

Particulars	₹	₹
Direct materials		3,00,000
Direct wages		2,00,000
Prime Cost		5,00,000
Add: Factory overheads:		
Variable (Rs 1,20,000 - 60,000)	60,000	
Fixed (60,000 × 2,50,000/2,00,000)*	75,000	1,35,000
Factory Cost		6,35,000
Add: Office overheads (40,000 × 2,50,000/2,00,000)*		50,000
Cost of Production		6,85,000
Add: Selling and distribution overheads:		
Variable (80,000 - 50,000)	30,000	
Fixed (50,000 × 2,50,000/2,00,000)*	62,500	92,500
Cost of Sales		7,77,500
Loss		27,500
Sales		7,50,000
Profit as per Financial Accounts	₹ 10,000	
Less: Over-recovery of overheads in Cost Accounts:		
Factory Overheads (1,35,000 - 1,20,000)		₹ 15,000
Office Overheads (50,000 - 40,000)		10,000
Selling and Distribution Overheads (92,500 - 80,000)		12,500
	10,000	37,500
Loss as per Cost Accounts	27,500	

*Overheads must have been charged in cost accounts on the basis of predetermined overhead rate calculated on the basis of normal output.

Reconciliation Statement

Particulars	₹	₹
Profit as per Financial accounts		10,000
Less : Over-recovery of overheads in Cost Accounts		
Factory overheads (1,35,000 – 1,20,000)	15,000	
Office overheads (50,000 – 40,000)	10,000	
Selling and distribution overheads (92,500 – 80,000)	12,500	37,500
Loss as per Cost Accounts		27,500

2. (c) (ii)

ABC Ltd. makes two types of polish-one for floors and one for cars. It sells both types to industrial users only, in one liter containers. The specifications for the two products per patch of 100 liters are:

Materials	Floor Polish	Car Polish
Delta	**120 liters**	**100 liters**
Gamma	**20 kg**	**10 kg**
Containers – Cost per 100	**₹ 100**	**₹ 100**

Direct labour		
Manufacturing	**12 man-hours**	**16 man-hours**
Primary Packing	**5 man-hours**	**5 man-hours**

During the six months to end of 30th September, the company expects to sell 15,000 1itres of floor polish at ₹ 9 per litre and 25,000 litres of car polish at ₹7 per litres. Materials are expected to cost ₹1 a litre for Delta and ₹8 a kg. for Gamma.

Manufacturing wages in the industry look like being stable at ₹6 per hour and packing wages at ₹4 per hour throughout the period.

Flexible overhead expense budgets are operated for manufacturing and packing departments based on the number of man-hours worked. These budgets for six months to end of September are:

Manufacturing Dept.			Primary Packing Dept.		
5,000	**man-hour**	**₹40,000**	**1,700**	**man-hour**	**₹26,000**
6,000	**man-hour**	**₹50,000**	**1,900**	**man-hour**	**₹28,000**
7,000	**man-hour**	**₹60,000**	**2,100**	**man-hour**	**₹30,000**
8,000	**man hour**	**₹80,000**	**2,300**	**man hour**	**₹32,000**

General administration overhead are budgeted at ₹37,000. At the beginning of the period 1st April, paced stocks will be:

Floor Polish	**2,000 liters**
Car Polish	**3,000 liters**

By end of the period 30th September, it is desired to maintain the pecked stocks of the two products at 3000 liters are 4000 litres respectively. The following are required:

1. **A statement of the standard prime cost per 100 litres of each product.**
2. **A sales and production budget (in quantities) for the six months to 30th September.**
3. **A profit forecast for the period. Show separate gross profits for the two products but do not attempt to allocate overheads between them. No overheads are included in stock valuations. [3+3+6=12]**

Solution:

1. **Statement showing standard prime cost of 100 litres of each product**

Materials		Floor Polish		Car Polish
Delta @ ₹ 1/litre		₹ 120		₹ 100
Gamma @ ₹ 8/kg		160		80
		280		180
Container		100		100
Direct Labour:				
Manufacturing @ ₹ 6/hour	72		96	
Primary packing @ ₹ 4/hour	20	92	20	116
Standard Prime cost		472		396

2. **Sales and Production Budgets (in litres) for the six months to 30th September**

	Floor Polish	Car Polish
Sales (liters)	15,000	25,000
Add : Closing stock	3,000	4,000
Total	18,000	29,000
Less: Opening stock	2,000	3,000
Production	16,000	26,000

3. Statement showing profit forecast for the period

		Floor Polish	Car Polish	Total
Quantity produced		16,000 Lts.	26,000 Lts.	
Quantity sold		15,000 Lts.	25,000 Lts.	
		₹	₹	₹
Sales value		1,35,000	1,75,000	3,10,000
Less: Prime cost [Refer to (I)]		70,800	99,000	1,69,800
Gross margin		64,200	76,000	1,40,200
Less: overheads:				
Manufacturing	₹ 50,800 (II)			
Packing	30,000 (III)			
Administration	37,000			1,17,800
Net profit for the period				22,400

Working Notes:

(I)

Floor Polish	15,000 × ₹ 4.72 =	₹ 70,800
Car Polish	25,000 × ₹ 3.96 =	₹ 99,000

(II) Overheads for manufacturing

Man hours required:	
Floor polish(12 hrs. ÷ 100 liters) × 16,000	1920 hrs.
Car polish (16 hrs ÷ 100 liters) × 26,000	4160 hrs.
	6080 hrs.
Overheads for 6,000 hrs. (given)	₹ 50,000
Overhead for next 80 hours: [(₹ 60,000 – 50,000) ÷ (7,000 – 6,000)] × 80	= 800
Overheads of Manufacturing Deptt.	50,800

(III) Overheads for Primary Packing

Man hours required:	
Floor Polish (5 hrs ÷ 100 litres) × 16,000	800 hrs
Car Polish (5 hrs ÷ 100 litres) × 26,000	1300 hrs
	2,100 hrs
Overheads for 2,100 hrs. (Packing)	30,000

Note. As given in the question, no overheads are included in stock valuation.

Section B

Answer any two questions from this section.

3. (a)

(i) A company is engaged in construction of residential housing, offices, industrial units, Roads, Bridges, Marine facilities etc. having sites in India and abroad. The company also has Joint venture projects in India and abroad. Whether Companies (Cost Records and Audit) Rules 2014 would be applicable to the company? [5]

Solution :

All companies engaged in construction business either as contractors or as sub-contractors, who meet with the threshold limits laid down in the Companies (Cost Records and Audit) Rules, 2014 and undertake jobs with the use of own materials [whether self-manufactured/produced or procured from outside] shall be required to maintain cost

records and get cost audit conducted as per the provisions of the Companies (Cost Records and Audit) Rules, 2014.

The provisions of the Companies (Cost Records and Audit) Rules, 2014 would also apply for construction activities undertaken under BOT/BOOT mode, or the projects undertaken as EPC contractor or the projects undertaken abroad by a company incorporated in India.

The Companies (Cost Records and Audit) Rules, 2014, do not make any distinction between the Contractor and Sub-Contractor and accordingly all such companies will be included within the ambit of the Rules.

(ii) Who can be appointed as a cost auditor? [3]

Solution:
Only a Cost Accountant, as defined under section 2(28) of the Companies Act, 2013, can be appointed as a cost auditor.

Clause (b) of sub-section (1) of section 2 of the Cost and Works Accountants Act, 1959 defines "Cost Accountant". It means a Cost Accountant, who holds a valid certificate of practice under sub-section (1) of section 6 of the Cost and Works Accountants Act, 1959 and is in whole-time practice. Cost Accountant includes a Firm of Cost Accountants and a LLP of Cost Accountants.

3. (b)

(i) A company has units in SEZ and in non-SEZ areas. The Companies (Cost Records and Audit) Rules 2014 has exempted companies operating in special economic zones from cost audit. What would be applicability of the Companies (Cost Records and Audit) Rules 2014 on such a company in respect of maintenance of cost accounting records and cost audit? [5]

Solution:
Rule 3 of the Companies (Cost Records and Audit) Rules 2014 is specific and it has mandated maintenance of cost accounting records on all products/activities listed under Table-A and Table-B subject to threshold limits. No exemption is available to any company from maintenance of cost accounting records once it meets the threshold limits. Hence, the above company would be required to maintain cost accounting records for all its units including the one located in the special economic zone.

In view of the provisions of Rule 4(3)(ii) of the Companies (Cost Records and Audit) Rules 2014 the unit located in the special economic zone would be outside the purview of cost audit and the company would not be required to include particulars of such unit in its cost audit report. The other units of the company located outside the special economic zone would be covered under cost audit subject to the prescribed threshold limits.

(ii) State the meaning of "Turnover" in relation to the Companies (Cost Records and Audit) Rules, 2014. [3]

Solution :
Sub-section 91 of Section 2 of the Companies Act, 2013 defines "turnover" as "the aggregate value of the realization of amount made from the sale, supply or distribution of goods or on account of services rendered, or both, by the company during a financial year. For the purposes of these Rules, "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 exclude duties and taxes. Export benefit received should be treated as a part of sales.

3. (c)
(i) Explain the coverage of Aeronautical Services. [6]

Solution:
Clause 3(B)(8) of the Companies (Cost Records and Audit) Rules, 2014 covers under the ambit of the Rules "Aeronautical services of air traffic management, aircraft operations, ground safety services, ground handling, cargo facilities and supplying fuel rendered by airports and regulated by the Airports Economic Regulatory Authority under the Airports Economic Regulatory Authority of India Act, 2008 (27 of 2008)".

The Airports Economic Regulatory Authority of India Act, 2008 has defined "aeronautical services" as follows:

- For navigation, surveillance, and supportive communication thereto for air traffic management;
- For the landing, housing or parking of an aircraft or any other ground facility offered in connection with aircraft operations at an airport;
- For ground safety services at an airport;
- For ground handling services relating to aircraft, passengers and cargo at an airport;
- For the cargo facility at an airport;
- For supplying fuel to the aircraft at an airport;

The Rule has covered all the above services under the ambit of maintenance of cost accounting records and cost audit subject to threshold limits.

However, all airports and aircraft operations belonging to or subject to the control of the Armed Forces or Paramilitary Forces of the Union are excluded from the scope of these Rules.

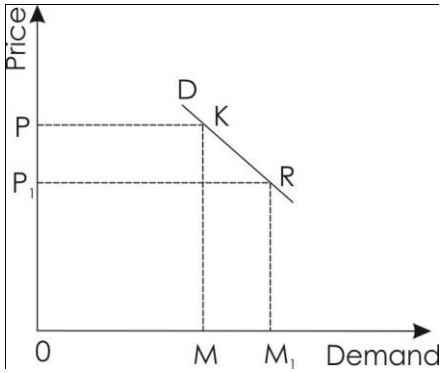
(ii) Whether figures are to be provided for Rupees per Unit or Amount in Rupees in the Product and Service Profitability Statement [CRA-3, Part D, Para 1]? [2]

Solution :
Amount in Rupees are required to be provided under this Para. The number of products or services will be equal to the number of products and services covered under cost audit and for which Abridged Cost Statement has been provided.

Section C
Answer any three questions from this section.

4. (a)
(i) Explain the term Arc Elasticity of demand. [3]

Solution :
Arc Elasticity: In arc elasticity we calculate the elasticity of demand between two points on the demand curve.



In the diagram on X-axis the demand and ON Y-axis the price are taken. K and R are the two points on the demand curve. We can measure the elasticity of demand between these points by using the following formula.

$$\text{Arc Elasticity of demand} = \frac{\text{Change in Demand}}{\text{1st demand} + \text{2nd demand}} \times \frac{\text{Change in price}}{\text{1st Price} + \text{2nd price}}$$

$$\text{In diagram Arc elasticity of demand} = \frac{MM_1}{OM + OM_1} \times \frac{PP_1}{OP + OP_1}$$

$$E_d = \left[\frac{\Delta q}{\Delta p}\right] \times \left[\frac{p_1 + P_2}{Q_1 + Q_2}\right]$$

After application of the above formula if we get result more than one then it is elastic demand, if the result is less than one then it is inelastic demand and if the result is equal to one then it is unitary demand.

(ii) Fit straight line by the least square method to the following figures of production of Sugar Factory. Estimate the production for the year 2015.

Year	2008	2009	2010	2011	2012	2013	2014
Production(in Lakh tons)	76	87	95	81	91	96	90

[5]

Solution :
Analysis of Trend by Least square Method

Year	x	Y (production)	xy	x^2
2008	-3	76	-228	9
2009	-2	87	-174	4
2010	-1	95	-95	1
2011	0	81	0	0
2012	1	91	91	1
2013	2	96	192	4
2014	3	90	270	9
Total	0	$\sum y = 616$	$\sum xy = 56$	$\sum x^2 = 28$

The two normal equations are as under:

Equation 1	Equation 2
$\sum y = na + b\sum x$	$\sum xy = a\sum x + b\sum x^2$
So, 616=7a+ b (0)	56=88 (0)+b (28)
So, 7a= 616	56=28b
a=616÷ 7=88	b=56÷28=2

The first degree polynomial trend equation (straight line trend) is Y=a+ bx

So, Y=88+2x (where original year is 2011, x=1 year unit)
Estimated production for the year 2015: Here, x=4 (i.e. from 2011 to 2015)
So, Y=88+2(4); 88+8=96.
Hence, production for the year 2015= 96 lakh tons.

4. (b)

(i) List the Elements of Market. **[4]**

Solution :

Elements of Markets:
1. Sellers and buyer agree to transact at a particular price of a product.
2. Nature of the commodity is known to both parties.
3. Price of the product is determined under conditions of the market.
4. Competition depends on the increase in the number of buyers and seller.
5. If there is increase in number of buyers, price will increase and it is treated as Seller's market.
6. If there is increase in number of sellers, price will decrease, it is treated as buyer's market.
7. Free communication between the buyers and sellers.
8. Size of the market is not restricted; it may be a city, a region a country or even the entire world.
9. Product is homogenous in case of perfect competition, and the product may be differentiated in case of other markets.

(ii) The demand function for a particular brand of Pocket Calculators is $P = 75 – 0.3Q – 0.05 Q^2$.
Find the consumers' surplus at the quantity (Q) of 15 calculators. **[4]**

Solution :

$P = 75 - 0.3Q - 0.05Q^2$
at $Q = 15$, $P = 75 - 0.3 \times 15 - 0.05 \times 15^2 = 59.25$ (on reduction)

Now $PQ = 59.25 \times 15 = 888.75$
Consumer's surplus $= \int_0^{15} PdQ - PQ = \int_0^{15} (75 - 0.3Q - 0.05Q^2)dQ - PQ$

$$= \left[75Q - 0.3\frac{Q^2}{2} - 0.05\frac{Q^3}{3}\right]_0^{15} - 888.75$$

$$= \left[75 \times 15 - 0.3\frac{15^2}{2} - 0.05\frac{15^3}{3}\right] - 888.75$$

$= 1035 – 888.75 = 146.25$

Hence, the consumer's surplus is 146.25.

4. (c)

(i) Explain the Criticism of Cobb-Douglas Production Function. **[4]**

Solution :

CRITICISM:

1. Cobb-Douglas production function is criticized because it shows a constant return to scale. But constant returns to scale are not actuality. Industry is either subject to increasing returns or diminishing returns. Due to scarcity and indivisibility of some factors it is not possible to make a proportionate change of all factors. So constant returns are not possible.
2. No entrepreneur will like to increase the inputs to have constant returns only. His aim will be to get increasing returns but not constant returns
3. Problems arise when this production function is applied to each firm in the industry and to the industry as a whole. This function as applied to each firm may not give the same result as that of the industry.
4. It is based on the assumption that factors of production are substitutable and excludes complementary of factors. But, in the short non-complementary of factors is possible. Therefore, it applies more to the long run than the short run.

(ii) If 'n' be the no. of workers employed the average cost of production is given by

$C = 24n + \left[\frac{3}{2(n-4)}\right]$ Show that n = 4¼ will make C minimum. [4]

Solution:

$C = 24n + \left[\frac{3}{2(n-4)}\right] = 24n + \frac{3}{2}(n-4)^{-1}$

$\frac{dc}{dn} = 24 + \frac{3}{2} \times -1 \times (n-4)^{-2} = 0$

$24 - \frac{3}{2}(n-4)^{-2} = 0$

$(n-4)^{-2} = 16$

$\frac{1}{(n-4)^2} = 16$

$(n-4)^2\ 16 = 1$

$(n-4)^2 = \frac{1}{16}$

$n - 4 = \frac{1}{4}$

$n = \frac{1}{4} + 4 = 4\frac{1}{4}$

$\frac{d^2c}{dn^2} = 0 + \frac{-3}{2} \times -2\ (n-4)^{-3}$

$= 3\ (n-4)^{-3}$

$= 3\ (\frac{17}{4} - 4)^{-3}$

$= \frac{1}{\left(\frac{1}{4}\right)^3}$ Which is Positive

Hence condition is satisfied and cost will be minimum at n = 4¼.

4. (d)

(i) Assume that for a closed economy E = C + I + G; Where E= total expenditure on consumption goods, I = Exp. on Investment goods and G = Govt. Spending. For equilibrium, we must have E = Y, Y being total income received.

For a certain Economy, it is given that C = 15 + 0.9Y, where I = 20 + 0.05Y and G = 25. Find the equilibrium values of Y, C and I. How will these change, if there is no Government spending ? [4]

Solution:

E = 15 + 0.9Y + 20 + 0.05Y+25
E = 60 + 0.95Y = (1)
As given E = Y = 60 + 0.95Y
0.05Y = 60
$\therefore Y = \frac{60}{.05} = 1200$
C = 15 + 0.9 × 1200 = 1095
I = 20 + 0.05 × 1200 = 80
When there is no government spending.
Y = 35 + 0.95Y
0 .05Y = 35
$\therefore Y = \frac{35}{.05} = 700$
C = 15 + 630 = 645
I = 20 + 35 = 55.

(ii) The total revenue from sale of 'x' units is given by the equation $R = 100x - 2x^2$, calculate the point of price elasticity of demand, when marginal revenue is 20. [4]

Solution:

$R= 100x - 2x^2$
Price = 100 - 2x
$MR = \frac{dR}{dx} = 100 - 4x$
$\frac{p}{x} = \frac{100}{x} - 2$
$\frac{dp}{dx} = -2 = \frac{dx}{dp} = \frac{1}{2}$
$E_p = \frac{1}{2} \times (\frac{100}{x} - 2)$
$= \frac{50}{x} - 1$
$= \frac{50}{20} - 1 = \frac{5}{2} - 1 = \frac{5-2}{2} = \frac{3}{2}$

Note :
100 - 4x = 20
4x = 80
X = 20.