Paper 10 – Cost & Management Accountancy

1. Answer all questions :

(i) The cost-volume-profit relationship of a company is described by the equation y = ₹ 8,00,000 + 0.60x, in which x represents sales revenue and y is the total cost at the sales volume represented by x. If the company desires to earn a profit of 20% on sales, what is the required sales level ? [2]

Answer.

(i) Variable cost = 60% , therefore, contribution to sales ratio = 40% (P/V ratio)
Company's target profit 20% in sales, therefore, revised contribution which covers only fixed cost = 40% - 20% = 20%.
Required sales = Fixed Cost / Revised Contribution = ₹ 8,00,000/ 20% = ₹ 40,00,000

(ii) Akash Ltd. is preparing its cash budget for the period. Sales are expected to be ₹1,00,000 in April 2012, ₹2,00,000 in May 2012, ₹3,00,000 in June 2012 and ₹ 1,00,000 in July 2012. Half of all sales are cash sales, and the other half are on credit. Experience indicates that 70% of the credit sales will be collected in the month following the sale, 20% the month after that, and, 10% in the third month after the sale. What is the budgeted collection for the month of July 2012 ? [2]

Answer.

Collection from	
July 2012 cash sales will be half of total sales or	₹ 50,000
From April ₹ 50,000 of credit sales, collection should be 10% or	₹ 5,000
From May ₹ 1,00,000 of credit sales, collections should be 20% or	₹ 20,000
From June ₹ 1,50,000 of credit sales, collection will be 70% or	₹ 1,05,000

Thus total collections will amount to ₹ 1,80,000

(iii) A lorry starts with a load of 25 tonnes of goods from station A. It unloads 5 tonnes at station B and rest of goods at station C. It reaches back directly to station A after getting reloaded with 18 tonnes of goods at station C. The distance between A to B, B to C and then from C to A are 60 kms. 100kms, and 150 kms respectively. Compute 'Absolute tones – kms' and 'Commercial tones – kms'. [3]

Answer.

'**Absolute tones – kms**': It is the sum total of tones – kms. arrived at by multiplying various distances by respective load quantities carried. Mathematically it is:

= 25 tonnes × 60 kms + 20 tonnes × 100 kms + 18 tonnes × 150 kms.
= 6,200 tonnes – kms.

'**Commercial tones – kms**' = Average load × Total kms. travelled.

$$= \left(\frac{25+20+18}{3}\right) \text{tones} \times 310 \text{ kms.}$$

= 6,510 tonnes – kms.

(iv) What do you understand by Batch Costing? In which industries it is applied? [3]

Answer.

Batch Costing: It is a form of job costing. In this, the cost of a group of products is ascertained. The unit of cost is a batch or a group of identical products instead of a single job, order or contract. Separate cost sheets are maintained for each batch of products by assigning a batch number. The cost per unit is ascertained by dividing the total cost of a batch by the number of items produced in that batch.

Batch costing is employed by companies manufacturing in batches. It is used by readymade garment factories for ascertaining the cost of each batch of cloths made by them. Pharmaceutical or drug industries, electronic component manufacturing units, radio manufacturing units too use this method of costing for ascertaining the cost of their product.

(v) 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-

(i) transformation of raw materials, components, sub-assemblies, or parts into semi-finished or finished products; or

(ii) 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

(iii) 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.

(vi) What are the managerial use of production function? [4]

Answer.

Managerial Use of Production Functions:

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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.

(vii) The cost function is C = 100 + q where the product is sold at ₹ 5 per unit. Determine breakeven sales and profit when 125 units are sold. [2]

Answer.

Here TR = Pq = 5q and C = 100 + q.
For breakeven TR = C $\Rightarrow$ 5q = 100 + q $\Rightarrow$ q = 25
For breakeven sales = 5 x 25 = ₹ 125.
Now π = TR – C = 5q – 100 - q = 4q – 100.
For, q = 125, π = (4 x 125) – 100 = 400.

Section A – Answer any two questions from this section

2. (a) Alpha Limited has decided to analyse the profitability of its five new customers. It buys bottled water at ₹ 90 per case and sells to retail customers at a list price of ₹ 108 per case. The data pertaining to five customers are:

	Customers				
	A	**B**	**C**	**D**	**E**
Cases sold	**4,680**	**19,688**	**1,36,800**	**71,550**	**8,775**
List Selling Price	**₹ 108**	**₹ 108**	**₹ 108**	**₹ 108**	**₹ 108**
Actual Selling Price	**₹ 108**	**₹ 106.20**	**₹ 99**	**₹ 104.40**	**₹ 97.20**
Number of Purchase orders	**15**	**25**	**30**	**25**	**30**
Number of Customer visits	**2**	**3**	**6**	**2**	**3**
Number of deliveries	**10**	**30**	**60**	**40**	**20**
Kilometers travelled per delivery	**20**	**6**	**5**	**10**	**30**
Number of expedited deliveries	**0**	**0**	**0**	**0**	**1**

Its five activities and their cost drivers are:

Activity	**Cost Driver Rate**
Order taking	**₹ 750 per purchase order**
Customer visits	**₹ 600 per customer visit**
Deliveries	**₹ 5.75 per delivery Km traveled**
Product handling	**₹ 3.75 per case sold**
Expedited deliveries	**₹ 2,250 per expedited delivery**

Required:

(i) Compute the customer-level operating income of each of five retail customers now being examined (A, B, C, D and E). Comment on the results.

(ii) What insights are gained by reporting both the list selling price and the actual selling price for each customer?

(iii) What factors Alpha Limited should consider in deciding whether to drop one or more of five customers? [10+2+2+2=16]

Answer.

Working note:

Computation of revenues (at listed price), discount, cost of goods sold and customer level operating activities costs:

	Customers				
	A	B	C	D	E
Cases sold: (a)	4,680	19,688	1,36,800	71,550	8,775
Revenues (at listed price) (₹): (b) {(a) x ₹ 108)}	5,05,440	21,26,304	1,47,74,400	77,27,400	9,47,700
Discount (₹): (c) {(a) x Discount per case}	-	35,438 (19,688 cases x ₹ 1.80)	12,31,200 (1,36,800 cases x ₹ 9)	2,57,580 (71,550 cases x ₹ 3.60)	94,770 (8,775 cases x ₹ 10.80)
Cost of goods sold (₹) : (d) {(a) x ₹ 90}	4,21,200	17,71,920	1,23,12,000	64,39,500	7,89,750
Customer level operating activities costs					
Order taking costs (₹): (No. of purchase orders x ₹ 750)	11,250	18,750	22,500	18,750	22,500
Customer visits costs (₹) (No. of customer visits x ₹ 600)	1,200	1,800	3,600	1,200	1,800
Delivery vehicles travel costs (₹) (₹ 5.75 per km) (Kms traveled by delivery vehicles x ₹ 5.75 per km.)	1,150	1,035	1,725	2,300	3,450
Product handling costs (₹) {(a) x ₹ 3.75}	17,550	73,830	5,13,000	2,68,313	32,906
Cost of expediting deliveries (₹) {No. of expedited deliveries x ₹ 2,250}	-	-	-	-	2,250

Total cost of customer level operating activities (₹)	31,150	95,415	5,40,825	2,90,563	62,906

(i) Computation of Customer level operating income

	Customers				
	A	B	C	D	E
	₹	₹	₹	₹	₹
Revenues (At list price) (Refer to working note)	5,05,440	21,26,304	1,47,74,400	77,27,400	9,47,700
Less: Discount (Refer to working note)	-	35,438	12,31,200	2,57,580	94,770
Revenue (At actual price)	**5,05,440**	**20,90,866**	**1,35,43,200**	**74,69,820**	**8,52,930**
Less: Cost of goods sold (Refer to working note)	4,21,200	17,71,920	1,23,12,000	64,39,500	7,89,750
Gross margin	84,240	3,18,946	12,31,200	10,30,320	63,180
Less: Customer level operating activities costs (Refer to working note)	31,150	95,415	5,40,825	2,90,563	62,906
Customer level operating income	53,090	2,23,531	6,90,375	7,39,757	274

Comment on the results:

Customer D is the most profitable customer, despite having only 52.30% of the unit volume of customer C. The main reason is that C receives a ₹ 9 per case discount while customer D receives only a ₹ 3.60 discount per case.

Customer E is less profitable, in comparison with the small customer A being profitable. Customer E received a discount of ₹ 10.80 per case, makes more frequent orders, requires more customer visits and requires more delivery kms. in comparison with customer A.

(ii) Insight gained by reporting both the list selling price and the actual selling price for each customer:

Separate reporting of both-the listed and actual selling prices enables Alpha Ltd. to examine which customer has received what discount per case, whether the discount received has any relationship with the sales volume. The data given below provides us with the following information;

Sales volume	Discount per case (₹)
C (1,36,800 cases)	9.00
D (71,550 cases)	3.60
B (19,688 cases)	1.80
E (8,775 cases)	10.80

A (4,680 cases) 0

The above data clearly shows that the discount given to customers per case has a direct relationship with sales volume, except in the case of customer E. The reasons for ₹ 10.80 discount per case for customer E should be explored.

(iii) Factors to be considered for dropping one or more customers:

Dropping customers should be the last resort to be taken by Alpha Ltd. Factors to be considered should include:

What is the expected future profitability of each customer? Are the currently least profitable (E) or low profitable (A) customers are likely to be highly profitable in the future?

What costs are avoidable if one or more customers are dropped?

Can the relationship with the "problem" customers be restructured so that there is at "win win" situation?

(b) What is Equivalent Unit ? [4]

Answer.

CIMA defines Equivalent Units as " a notional quantity of completed units substituted for an actual quantity of incomplete physical units in progress, when the aggregate work content of the incomplete units is deemed to be equivalent to that of the substituted quantity of completed units e.g. 150 units 50 percent complete = 75 equivalent units".

When opening and closing stocks of work-in-process exist, unit costs cannot be computed by simply dividing the total cost by total number of units still in process. We can convert the work-in-process units into finished units called equivalent units so that the unit cost of these units can be obtained.

Equivalent completed units = Actual number of units in the process of manufacture × Percentage of work completed

The two principal methods of calculating equivalent units are :

i) Weighted average
ii) First in first out.

3. (a) The following figures are extracted from the Financial Accounts of Sellwel Ltd. For the year ended 31-3-2012:

	₹	₹
Sales (20,000 units)		**50,00,000**
Materials		**20,00,000**
Wages		**10,00,000**
Factory Overheads		**9,00,000**
Administrative Overheads		**5,20,000**
Selling and Distribution Overheads		**3,60,000**
Finished Goods (1,230 units)		**3,00,000**
Work-in-progress:		
Materials	**60,000**	
Labour	**40,000**	
Factory Overheads	**40,000**	
		1,40,000
Goodwill Written off		**4,00,000**

Interest paid on capital **40,000**

In the costing records, Factory Overhead is charged at 100% of Wages, Administration Overhead 10% factory cost and Selling and Distribution Overhead at the rate of ₹ 20 per unit sold.

Prepare a statement reconciling the profit as per Cost Records with the profit as per Financial Records. **[8]**

Answer.

Sellwel Ltd.
Profit & Loss Account
(For the year ended 31-3-2012)

Dr.			**Cr.**
To Opening Stock	Nil	By Sales (20,000 units)	50,00,000
To Materials	20,000	By Closing Stock (1,230 units)	3,00,000
To Wages	10,00,000	By Work-in-progress	1,40,000
To Factory Overheads	9,00,000		
To Administrative Overheads	5,20,000		
To Selling & Distribution Overheads	3,60,000		
To Goodwill written off	4,00,000		
To Interest on Capital	40,000		
To Net Profit	2,20,000		
	54,40,000		54,40,000

Cost Profit & Loss Statement
(For the year ended 31-3-2012)

	₹
Materials	20,00,000
Wages	10,00,000
Prince Cost	30,00,000
Add: Factory Overhead @ 100% of wages	10,00,000
	40,00,000
Less: Closing Work-in-progress	1,40,000
Factory Cost (20,000 + 1,230) units	38,60,000
Administrative Overheads @ 10% of Factory Cost	3,86,000
	42,46,000
Less: Closing Stock of Finished Goods 1,230 units (See Note)	2,46,000
Cost of Production (20,000 units)	40,00,000
Selling & Distribution Overhead @ ₹ 20 per unit	4,00,000
Cost of Sales (20,000 units)	44,00,000
Sales Revenue (20,000 units)	50,00,000
Profit	6,00,000

Note: Cost of 21,230 units is ₹ 42,46,000. Therefore, the cost of one unit is ₹ 200. Hence the cost of 1,230 units is ₹ 2,46,000.
Alternatively : Administrative overheads could be excluded from the cost of production.

Reconciliation Statement

	₹	₹
Profit as per Cost Records		6,00,000
Add: Factory Overheads over-absorbed		
(₹ 10,00,000 – ₹ 9,00,000)	1,00,000	
Selling & Distribution Overhead Over-absorbed	–	
(₹ 4,00,000 – ₹ 3,60,000)	40,000	
Difference in the valuation of closing stock of finished goods		
(₹ 3,00,000 – ₹ 2,46,000)	54,000	1,94,000
		7,94,000
Less: Administrative Overhead Underabsorbed		
(₹ 5,20,000 – ₹ 3,86,000)	1,34,000	
Goodwill written off relates to Financial Accounts	4,00,000	
Interest on Capital	40,000	5,74,000
Profit as per Financial Accounts		2,20,000

(b) Rex Limited commenced a contract on 01.07.2012. The total contract price was ₹ 5,00,000 but Rex Limited accepted the same for ₹ 4,50,000. It was decided to estimate the total profit and to take to the credit of profit and loss account that proportion of estimated profit on cash basis which the work completed bore to the total contract. Actual Expenditure till 31.12.2012 and estimated expenditure in 2013 are given below:–

Expenses	**Actuals Till 31.12.12** ₹	**Estimate For 2013** ₹
Materials	**75,000**	**1,30,000**
Labour	**55,000**	**60,000**
Plant Purchased (original cost)	**40,000**	**—**
Misc. Expenses	**20,000**	**35,500**
Plant Returned to Stores on 31.12.09 at original cost	**10,000**	**35,500**
		As on 30.09.10
Materials at Site	**5,000**	**Nil**
Work Certified	**2,00,000**	**Full**
Work Uncertified	**7,500**	**Nil**
Cash Received	**1,80,000**	**Full**

The Plant is subject to annual depreciation @ 20% of original cost. The contract is likely to be completed on 30.09.2013.
You are required to prepare the contract account for the year ended 31.12.12. Workings should be clearly given. It is the policy of the company to charge depreciation on time basis. [7]

Answer.

Rex Limited
Contract Account
(For the year ending 31.12.12)

	₹		₹
To Materials	75,000	By Plant returned to Stores	
To Labour	55,000	(Cost – Depreciation)	
To Plant	40,000	(See Note-3)	9,000
To Misc. Expenses	20,000	By Plant at site	
To P/L A/c	26,400	(See Note – 3)	27,000
(See Note – 2)		By Material at site	
To Balance c/d	32,100	By WIP	5,000
		Work Certified	
		Work Uncertified	2,00,000
			7,500
	2,48,500		2,48,500

	₹	₹
To WIP		
Work Certified	2,00,000	
Work Uncertified	7,500	
To Plant at Site	27,000	
To Material at site	5,000	
		2,39,000
Less: Reserve	32,100	2,07,400

Working Notes

(1) **Memorandum Contract Account**
(01.07.12 to 30.09.2013)

	₹		₹
To Material	2,05,000	By Plant returned to store	27,750
To Labour	1,15,000	(Cost – Depreciation)	
To Plant	40,000	(See Note 3(i) & (ii))	
To Misc. Expenses	55,500	By Plant at Site	3,750
To Estimated Profit	66,000	(See Note 3(iv))	
		By Contractee's A/c	4,50,000
	4,81,500		4,81,500

(2) **Profit to be transferred to P/L A/c of the Contract ending on 31.12.12**

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

$$= ₹\ 66,000 \times \frac{Rs.1,80,000}{Rs.2,00,000} \times \frac{Rs.2,00,000}{Rs.4,50,000}$$

$= ₹\ 26,400$

Assumption: Work Certified is considered equal to work completed. On cash basis has been interpreted as cash received to work certified.

(3) (i) **Calculation of Plant returned to stores on 31-12-12** ₹

Original Cost 10,000

Less: Depreciation @ 20% for 6 months	1,000
	9,000

(ii) **Plant at site on 30-12-12**
=(Original Cost of Plant – Plant returned – Depreciation)
=₹ 40,000 – ₹ 10,000 – ₹ 3,000
=₹ 27,000/-

(iii) **Plant returned to stores on 30-09-2010**	₹
Original Cost	25,000
Less: Depreciation	6,250
	18,750

(iv) **Plant at site on 30-9-2013**	₹
Original Cost	5,000
Less: Depreciation	1,250
$\left(\text{Rs.}5{,}000 \times \frac{20}{100} \times \frac{15}{12}\right)$	3,750

(c) 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:

(1) The operating costs can be classified under three categories. For example in the case of transport undertaking these three categories are as follows:
   (a) *Operating and running charges.* It includes expenses of variable nature. For example expenses on petrol, diesel, lubricating oil, and grease etc.
   (b) *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.
   (c) *Fixed or standing charges.* These includes garage rent, insurance, road licence, depreciation, interest on capital, salary of operating manager, etc.
(2) 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.

4. (a) A company has two divisions. Division 'M' and Division 'N'. Division 'M' has a budget of selling 2,00,000 nos. of a particular component 'x' to fetch a return of 20% on the average assets employed. The following particulars of Division 'M" are also known :

Fixed overhead	**₹ 5 lakhs**
Variable cost	**₹ 1 per unit**
Average assets	
Sundry debtors	**₹ 2 lakhs**
Inventories	**₹ 5 lakhs**
Plant & equipments	**₹ 5 lakhs**

However, there is constraints in Marketing and only 1,50,000 units of the component 'x' can be directly sold to the Market at the proposed price.

It has been gathered that the balance 50,000 units of component 'x' can be taken up by Division 'N'. Division 'M' wants a price of ₹ 4 per unit of 'x' but Division 'N' is prepared to pay ₹ 2 per unit of 'x'.

Division 'M' has another option in hand, which is to produce only 1,50,000 units of component 'x'. This will reduce the holding of assets by ₹ 2 lakhs and fixed overhead by ₹ 25,000.

You are required to advise the most profitable course of action for Division 'A'. [5]

Answer.
Working Notes :

1. Profit= 20% return on average assets employed

Average Assets	₹ In lakhs
Sundry debtors	2
Inventories	5
Plant & Equipment	5
Total	12

Profit = ₹ 12,00,000 x 20/100 = ₹ 2,40,000

2. Budgeted sales revenue (2,00,000 units of component x)	₹ In lakhs
Fixed costs	5.00
Variable cost (2,00,000 units @ Re.1)	2.00
Profit	2.40
Total sales	9.40

Selling price per unit of component x = ₹ 9,40,000/ 2,00,000 units = ₹ 4.70 per unit

Options in hand with Division M
Option I - Sell 1,50,000 units in market and transfer 50,000 units to Division N
Option II – Sell only 1,50,000 units in market

Statement of profitability of Division M under two options

₹

Particulars	**Option – I**	**Option –II**
Sales (1,50,000 units @ ₹ 4.70)	7,05,000	7,05,000
Transfer to Division N (50,000 units @ ₹2)	1,00,000	-
Total sales revenue	8,05,000	7,05,000
Less : variable overhead	2,00,000	1,50,000
Contribution	6,05,000	5,55,000

Less : Fixed cost		5,00,000	4,75,000
Profit	(a)	1,05,000	80,000
Capital employed	(b)	12,00,000	10,00,000
Return on capital employed	[a) / (b)] x 100	8.75%	8%

Analysis : From the analysis of the above it is observed that under Option – I. division M's, Profit and ROCE is increased by ₹ 25,000 and 0.75% respectively. Hence Option –I is suggested for Division-M.

(b) In its budget for the period ahead 'M' Ltd. Is considering two possible sales forecasts for the three products as follows :

	Product		
Forecast	**X**	**Y**	**Z**
I. Sales (Units)	**22,000**	**40,000**	**6,000**
Selling price per unit	**₹ 10**	**₹ 6**	**₹ 7.50**
II. Sales (Units)	**30,000**	**50,000**	**7,000**
Selling price per unit	**₹ 9**	**₹ 5.50**	**₹ 7.50**

Variable costs per unit are expected to be the same at the different levels of possible sales. The variable costs per unit are as follows :

	Product		
Particulars	**X**	**Y**	**Z**
Direct material	**3.00**	**2.00**	**4.00**
Direct labour	**2.00**	**1.50**	**1.00**
Variable overheads	**1.00**	**0.50**	**1.00**

Fixed overheads are expected to total ₹ 1,00,000. These are expected to be unaffected by the possible changes in activity which are being considered. Due to recent high labour turnover problems, direct labour will be restricted to a maximum of ₹ 1,30,000 in the period. It can be assumed that all labour is of the same grade and is freely transferable between products. Other resources are expected to be generally available.

You are required to :

Taking each of the possible sales forecasts in turn

- **(i) Say what the principal budget factor is for each of the forecasts.**
- **(ii) For each forecast calculate the sales budget that you would recommend to maximize profits.**
- **(iii) What profit would you expected from each sales budget ?**

Assume that the products will be sold according to the selling price estimated as per the forecast and no interchange of the forecast is allowed. [4+4+4=12]

Answer.

(i) Determination of Principal Budget Factor :

Particulars	**Products**			**Total**
	X	**Y**	**Z**	
Forecast I				

Sales (units)	22,000	40,000	6,000	
Labour cost (₹ Per unit)	2.00	1.50	1.00	
Total labour cost (₹)	44,000	60,000	6,000	1,10,000
Direct labour available (₹)				1,30,000
Forecast II				
Sales (units)	30,000	50,000	7,000	
Labour cost (₹ Per unit)	2.00	1.50	1.00	
Total labour cost (₹)	60,000	75,000	7,000	1,42,000
Direct labour available (₹)				1,30,000

Sales is the principal budget factor in Forecast I, and labour is the principal budget factor in Forecast II.

(ii) Sales budget – Forecast I (Sales – principal budget factor)

Product	Sales (units)	Selling price p.u. ₹	Amount ₹
X	22,000	10.00	2,20,000
Y	40,000	6.00	2,40,000
Z	6,000	7.50	45,000
Total			5,05,000

Sales budget – Forecast II (Labour - principal budget factor)

Product	Sales (units)	Selling price p.u. ₹	Amount ₹
X	30,000	9.00	2,70,000
Y	42,000	5.50	2,31,000
Z	7,000	7.50	52,500
Total			5,53,500

(iii) Budgeted sales and profit – Forecast I

Particulars	Products			Total
	X	Y	Z	
Sales (units) (i)	22,000	40,000	6,000	
Selling price p.u.	10.00	6.00	7.50	
Variable cost p.u.	6.00	4.00	6.00	
Contribution p.u. (ii)	4.00	2.00	1.50	
Total contribution (i) x (ii)	88,0000	80,000	9,000	1,77,000
Less : Fixed cost				1,00,000
Profit				77,000

Working notes : In case of Forecast II, since labour is the principal budget factor, in order to maximize profit, the product which gives highest contribution per rupee of direct labour should be given priority in production and sales.

Ranking of products based on contribution per rupee of direct labour :

Particulars	Products		
	X	Y	Z
Selling price (a)	9.00	5.50	7.50

Variable cost			
Direct material	3.00	2.00	4.00
Direct labour	2.00	1.50	1.00
Variable overheads	1.00	0.50	1.00
(b)	6.00	4.00	6.00
(i) Contribution (a) – (b)	3.00	1.50	1.50
(ii) Labour cost	2.00	1.50	1.00
Contribution per rupee of direct labour (i)/(ii)	1.50	1.00	1.50
Ranking	I	III	II

Manufacturing budget based on ranking

Product	Units	Labour cost per unit ₹	Total labour cost ₹
X	30,000	2.00	60,000
Z	7,000	1.00	7,000
Y	42,000#	1.50	63,000*
		Total	1,30,000

*Balancing figure # ₹ 63,000/₹ 1.50 = 42,000 units

Budgeted sales and profit – Forecast II

Particulars	Products			Total
	X	Y	Z	
Sales (units) (i)	30,000	42,000	7,000	
Selling price p.u.	9.00	5.50	7.50	
Less : Variable cost p.u.	6.00	4.00	6.00	
Contribution p.u. (ii)	3.00	1.50	1.50	
Total contribution (i) x (ii)	90,000	63,000	10,500	1,63,500
Less : Fixed cost				1,00,000
Profit				63,500

(c) What is meant by 'Inter-firm comparison'? [3]

Answer.

It is the technique of evaluating the performance efficiency, costs and profits of firms in an industry. It consists of voluntary exchange of information/data concerning costs, prices, profits, productivity and overall efficiency among firms engaged in similar type of operations for the purpose of bringing improvement in efficiency and indicating the weaknesses. Such a comparison will be possible where uniform costing is in operation.

An inter-firm comparison indicates the efficiency of production and selling, adequacy of profits, weak spots in the organisation, etc and thus demands from the firm's management an immediate suitable action. Inter-firm comparison may enable the management to challenge the standards which it has set for itself and to improve upon them in the light of the current information gathered from more efficient units. Such a comparison may be pharmaceuticals, cycle manufacturing, etc.

Section B – Answer any one question from this section

5. (a) The following figures are extracted from Accounts of IREVNA LTD., a single product manufacturing company:

Year ended 31st March	2012	2011	2010
	(Amount in ₹ lakh)		
Gross Sales including Excise duty:	2,856	2,779	2,625
Excise Duty	413	392	371
Raw materials consumed	1,596	1,484	1,365
Direct wages	49	45	38
Power and fuel	42	38	34
Stores and spares	8	7	5
Depreciation charges to production cost centres Factory Overheads:	22	21	18
Salaries and wages	7	6	4
Depreciation	3	3	3
Rates and taxes	1	1	1
Other Overheads	8	7	6
Administrative Overheads:			
Salaries and Wages	14	13	11
Rates and taxes	3	3	3
Other Overheads	231	216	207
Selling and Distribution Overheads:			
Salaries and wages	10	8	7
Packing and forwarding	8	8	7
Depreciation	1	1	1
Other overheads	174	165	151
Interest	119	104	95
Bonus and Gratuity	17	14	13
Current Assets	1,176	1,014	896
Current Liabilities and Provisions	454	427	344

You are required to compute the following ratios as per requirement of PARA-9 to the Annexure of the Companies (Cost Audit Report) Rule, 2011:

(i) Profit Before Tax (PBT) to Value Added
(ii) Value Added to Net Sales;
(iii) Profit Before Tax (PBT) to Net Sales. **[4+4+2=10]**

Answer.

IREVNA LTD

(Calculation of Profit Before Tax) (PBT)

Year ended 31st March	2012	2011	2010
	(Amount in ₹ Lakh)		

Gross Sales inclusive of Excise duty	2,856	2,779	2,625
Excise duty	413	392	371
NET Sales (A)	2,443	2,387	2,254
Cost of Sales			
Raw Material Consumed	1,596	1,484	1,365
Direct Wages	49	45	38
Power and Fuel	42	38	34
Stores & Spares	8	7	5
Depreciation charged to production centres	22	21	18
Factory overheads (including Depreciation):	19	17	14
Administration Overheads	248	232	221
Selling and Distribution Overheads (inclusive depreciation) :	193	182	166
Interest	119	104	95
Bonus and Gratuity	17	14	13
Total (B)	2,313	2,144	1,969
Profit Before Tax (PBT) (A-B)	130	243	285

Calculation of Valued Added:

Year ended 31st March	**2012**	**2011**	**2010**
	(Amount in ₹ Lakh)		
Net Sales (A)	2,443	2,387	2,254
Less: Cost of Bought out of Inputs:			
Direct Materials Consumed	1,596	1,484	1,365
Stores & Spares	8	7	5
Power & Fuel	42	38	34
Overheads (exclusive salaries & wages, rates & taxes and Depreciation)	421	396	371
Total Cost of Bought out of Inputs (B)	2,067	1,925	1,775
VALUE ADDED (A-B)	376	462	479

NOTE : Value Addition is defined in Para-8 of the Companies (Cost Audit report) Rules-2011 as "the difference between Net output value (Net Sales) and Cost of bought out materials and services for the product under reference".

Year ended 31st March	**2012**	**2011**	**2010**
	(Amount in ₹ Lakh)		
(i) Profit Before Tax (PBT) to Value	130/376	243/462	285/479

Added as (%)	34.57%	52.60%	59.50%
(ii) Value Added to Net Sales as (%)	376/2443 15.39%	462/2387 19.35%	479/2254 21.25%
(iii) Profit Before Tax (BPT) to Net Sales as (%)	130/2443 5.32%	243/2387 10.18%	285/2254 12.64%

(b) What are the differences between Accounting Records & Statistical Records? Is it compulsory to maintain statistical records under Cost Accounting Records Rules? If so, why? [4+2 = 6]

Answer.

Difference between 'Accounting Records' and 'Statistical Records'

'Accounting Records' refer to the Books of Account to be kept by a company with respect to : (a) all sums of money received and expended and the matters in respect of which the receipt and expenditure take place : (b) all sales and purchases of goods : (c) all assets and liabilities. They also refer to the books of account relating to utilization of material or labour or other items of cost as prescribed in the case of a company pertaining to any class of companies engaged in production, processing, manufacturing or mining activities. Accounting records may be classified into two broad categories – Cost Accounting Records and Financial Accounting Records. Ordinarily, these are maintained in the form of 'registers' or 'loose leaf' sheets. The documents like, Bills, Cash Memos, Invoices, Vouchers, Cheque Counterfoils etc. also form part of the accounting records. In relation to the Cost Accounting Records Rules, the Books of Account specified in the Schedules I and II and the relevant Annexures and Proformae ledgers and memorandum accounts and trial balances etc. constitutes financial accounting records.

'Statistical Records' refer to those which contain statistical data – financial or non-financial accounting or non-accounting, collation of past periods information or computations out of them by relating one set of data with the other to convey any meaning or message. In relation to the Cost Accounting Records Rules, the statistical records may comprise those which are maintained to analyse and evaluate the matters like product-wise sales in quantity and value, product-wise/ process-wise wastes and rejections, machine utilization and stoppages, labour, overtime or idletime, process-wise overheads, input-output analysis, efficiency analysis, etc. Similarly, data contained in the schedules forming part of Balance Sheet (e.g. Share Capital, Reserves and Surplus, Loans, Fixed Assets, Capital goods-in-stock, Contingent Liabilities, Director's Remuneration, Employee remuneration details, Value of imports, Foreign exchange earning, lincesed/ installed production capacities and actual production, etc are also statistical records in nature and content.

It is interesting to note that the statistical records, in most cases, are the end products of the detailed accounting records and that they are generated to be maintained through the processes of summarization, collation, tabulation, computation and analysis to meet the requirements of internal management as well as the statutory requirements or various authorities.

Statistical Records : Under the Cost Accounting Records, Rules, the maintenance of these records is compulsory due to the following reasons.

(i) To enable the company to comply with the requirements of the Schedules I and II;

(ii) To reconcile the date furnished to the Director General of Technical Development and the Central Excise and other Govt. authorities from time to time;
(iii) To enable the cost auditor to report to the Company Law Board on all the points referred to in the Cost Audit (Report) Rules 1996; and
(iv) To enable the Company to exercise control over operations and costs.

6. (a) A company with multiple products range is having Cost Audit for some of its products. What would be the applicability of Cost Audit on other products now covered under the Companies (Cost Accounting Records) Rules, 2011? [2]

Answer.

The Cost Audit on other products now covered under the Companies (Cost Accounting Records) Rules-2011 will not be applicable until Cost Audit orders are issued for its other products/ activities. However, Compliance Report is required to be submitted for the 'Company as a whole' under different product groups. If the Company's remaining products belong to the exempted categories, then Companies (Cost Accounting Records) Rules will not be applicable on such exempted category products.

(b) The following details of the process wise, Input Output and Direct Employees Costs are taken from the RUKMARI INDUSTRIES LTD., a manufacturing company, for the year ended March 31,2012:

Process	Input (Tonne)	Output (Tonne)	Direct Employee Costs (₹)
I	48,000	43,200	1,29,600
II	50,000	44,000	1,76,000
III	72,000	66,240	3,31,200
IV	60,000	55,500	4,44,000
V	80,000	73,400	6,60,600

Required :

Calculate " the Direct Employees Cost per Tonne of the product under reference" as required in PARA-5 of the Annexure to the Cost Audit report Rules, 2011. [8]

Answer.

RUKMARI INDUSTRIES LTD

The total Direct Employees Cost per Tonne of the product under Audit must be an aggregation of process wise Direct Employee Cost after taking into account the good units occurring in each process.

Process	Input (T)	Output (T)	Factor
I	48,000	43,200	48,000/43,200= 1.1111
II	50,000	44,000	50,000/44,000 = 1.1364
III	72,000	66,240	72,000/66,240 = 1.0870
IV	60,000	55,500	60,000/55,500 = 1.0811

V	80,000	73,400	80,000/73,400 = 1.0900

Process wise Direct Employees Cost per Tonne of the output are:

Process		₹
I	1,29,600 ÷ 43,200 =	3
II	1,76,000 ÷ 44,000 =	4
III	3,31,200 ÷ 66,240 =	5
IV	4,44,000 ÷ 55,500 =	8
V	6,60,600 ÷ 73,400 =	9

Aggregating all the above to the Finished Product from Process V :

Process I	= ₹ 3.00
Process II	= ₹ 3 x 1.1364 + 4 = ₹ 7.4092
Process III	= (₹ 7.4092 x 1.0870) + ₹ 5= ₹13.0538
Process IV	= (₹ 13.0538 x 1.0811) + ₹ 8 = ₹ 22.1125
Process V	= (₹ 22.1125 x 1.09) + ₹ 9 = ₹ 33.1026 per Tonne of Finished Product

(c) 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.

Section C – Answer any two from this section

7. (a) Define Managerial Economics. [3]

Answer.
Managerial economics is a science which studies the economic aspects of behavior of the firm as an enterprise, and helps to allocate scarce resources to their alternative uses in such a manner as to optimize the firm's ultimate objective, as an organization and a social institution, under conditions of the imperfect knowledge, risk and uncertainty. It provides principles, method, and techniques of analysis of economic behavior and at the same time prescribes ways and means to optimize economic efficiency.

(b) Distinguish between macro and micro economics [6]

Answer.
Broadly speaking, microeconomic analysis is individualistic, whereas macroeconomic analysis is aggregative. Microeconomics deals with the part (individual) units while macroeconomics deals with the whole (all units taken together) of the economy,

1. Difference in nature: Microeconomics is the study of the behaviour of the individual units. Macroeconomics is the study of the behaviour of the economy as a whole.

2. Difference in methodology: Microeconomics is individualistic: whereas macroeconomics is aggregative in its approach.

3. Difference in economic variables: Microeconomics is concerned with the behaviour of microvariables or microquantities. Macroeconomics is concerned with the behaviour of macrovariables and macroquantities. In short, microeconomics deals with the individual incomes and output, whereas macroeconomics deals with the national income and national output.

4. Difference in field of interest: Microeconomics primarily deals with the problems of pricing and income distribution. Macroeconomics pertains to the problems of the size of national income, economic growth and general price level.

5. Difference in outlook and scope: The concept of 'industry' in microeconomics is an aggregate concept but it refers to all firms producing homogenous goods taken together. Macroeconomics uses aggregates which relate to the entire economy or to a large sector of the economy. Aggregate demand covers all market demands.

6. Demarcation in areas of study: Theories of value and economic welfare are major areas in microeconomics. Theories of Income and employment are core topics in macroeconomics.

(c) Derive the relationship between AC and MC. **[3]**

Answer.

As TC is denoted by C, we have AC = $\frac{c}{q}$

Taking the derivative w.r.t. output, we get

$$\frac{d}{dq}(AC) = \frac{d}{dq}(AC) = \frac{q\frac{dc}{dq} - c}{q^2} \Rightarrow \frac{d}{dq}(AC) = \frac{1}{q}[MC - AC]$$

Now as q>0 $\frac{d}{dq}(AC)>0 \Rightarrow$ AC is rising

$\frac{d}{dq}(AC)<0 \Rightarrow MC<AC \Rightarrow$ AC is falling

$\frac{d}{dq}(AC)=0 \Rightarrow MC = AC \Rightarrow$ AC is stationary and minimum

8. (a) The demand function is given by $p= (a – bq)^2$, a,b >0. Show
(i) the curve is downward slopping.
(ii) it is convex to the origin.
(iii) What is the relation between a & b if ed = 1? **[2+2+2=6]**

Answer.

(i) The slope is given by $\frac{dp}{dq}$ from $p = (a – bq)^2$

We get, $\frac{dp}{dq} = -2b(a – bq)$

As a, b >0 $\Rightarrow \frac{dp}{dq}<0$ slope is downward slopping.

(ii) For convexity we must show $\frac{d^2p}{dq^2}>0$

$$\frac{d^2p}{dq^2} = \frac{d}{dq}\left[\frac{dp}{dq}\right] = \frac{d}{da}[-2b(a – bq)] = 2b^2>0$$

Hence, it is convex to the origin.

(iii) $ed = \frac{dq}{dp}.\frac{p}{q} = \left\{\frac{-1}{2b(a-bq)}\right\}.\frac{(a-bq)^2}{q}$

$$\therefore |ed| = \frac{1}{2b(a-bq)}.\frac{(a-bq)^2}{q} = 1 \Rightarrow \left(\frac{a-bq}{2bq}\right) = 1$$

$\Rightarrow a = 3bq$ is the required relation

(b) What are ISQquants ? What is the difference between ISOquants curve and Indifference curve? [2+4=6]

Answer.
'ISO' means 'equal', 'quant' stands for 'quantity'. The equal product curve is called Iso-quant or 'production iso-quant'. It represents all the combinations of two factor inputs which produce a given quantity of product. It signifies a definite measurable quantity of output. A number of curves can be drawn for different specific quantities of output. All those curves together form the Iso-quant map.

Difference between Iso-quant curve and Indifference curve.

(i) Indifference curve refers to two commodities. Iso-quant curve relates to combination of two factors of production.
(ii) Indifference curve indicates level of satisfaction. Iso-quant curve indicates quantity of output.
(iii) No numerical measurement of satisfaction is possible. So it cannot be labeled. Iso-quant curve can be easily labeled, as physical units of output are measurable.
(iv) The extent of difference of satisfaction is not quantifiable in the Indifference map. But in Iso-quant map, we can measure the exact difference between quantities represented by one curve and another.

9. (a) What are features of an oligopolistic market ? [6]

Answer.

- Few sellers – Homogeneous or differentiated products supplied by a few firms.
- 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 incase 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.

(b) For the cost function $C = a_0 + b_1x - c_2x^2 + d_3x^3$, find x for which AVC & MC are minimum. [6]

Answer.
We have $C = a_0 + b_1x - c_2x^2 + d_3x^3$ and we assume that all coefficients are positive.

Now $TVC = b_1x - c_2x^2 + d_3x^3$
$\Rightarrow AVC = TVC/x = b_1 - c_2x + d_3x^2$

Now for minimum AVC we must have $\frac{d(AVC)}{dx} = o \Rightarrow -c_2 + 2d_3x = 0 \Rightarrow x = \frac{c_2}{2d_3}$

The second order condition states $\frac{d^2(AVC)}{dx} > 0 \Rightarrow 2d_3 > 0$ which is true.

Now, MC = $\frac{d(C)}{dx} = b_1 - 2c_2x + 3d_3x^2$

For minimum MC we have $\frac{d(MC)}{dx} = 0$

$\Rightarrow -2c_2 + 6d_3x = 0 \Rightarrow x = \frac{c_2}{3d_3}$

The second order condition states $\frac{d^2(MC)}{dx^2} > 0 \Rightarrow 6d_3 > 0$ which is true.