Group - II
Paper 10 - Cost & Management Accounting

Section A – Cost & Management Accounting – Methods & Techniques

1(a) A television Company manufactures several component 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).
Solution:

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

Where, A= Annual demand,
S=Set up cost per batch,
C=carrying cost per unit per year,

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

=2,000 units

1.(b) The budgeted fixed overhead for a budgeted production of 10,000 units is ₹20,000. For a certain period, the actual production was 11,000 units and the actual expenditure came to ₹24,000. Calculate the Volume variance.
Solution:

Budgeted fixed overheard	₹20,000
Budgeted production	10,000 units
Actual production	11,000 units
Actual expenditure	₹24,000

Volume Variance=SR(AQ-BQ)=(BFO/BQ)×(AQ-BQ)
=(20,000/10,000)×(11,000-10,000)
=2×1,000
=2,000(F)

1.(c) X Ltd. has sales of ₹2,200, total fixed cost of ₹570, Variable Cost of ₹1,540, raw material consumed of ₹1,100, No. of units sold 22,000. What shall be the BEP (in unit) if raw material price is reduced by 2%.
Solution:
BEP (in unit) = Fixed cost/Marginal contribution per unit
=₹570/Re.0.031*
=18,387 units
Marginal contribution per unit=SP-Reduced material price-Other variable cost
=0.10-0.049-0.02
=0.031*

1.(d) Pass the Journal entries for the following transactions in a double entry cost accounting system:

Particulars	₹
(i) Issue of material:	

Direct	**55,000**
Indirect	**15,000**
(ii) Allocation of wages and salaries:	
Direct	**20,000**
Indirect	**4,000**
(iii) Overheads absorbed in jobs:	
Factory	**15,000**
Administration	**5,000**
Selling	**3,000**
(iv) Under/Over absorbed overheads:	
Factory (Over)	**2,000**
Admn. (Under)	**1,000**

Solution:

Journals

		Dr.	Cr.
Particulars		₹	₹
Work in progress Control A/c	Dr.	55,000	
Factory Overhead Control A/c	Dr.	15,000	
To Material Control A/c			70,000
Work in progress Control A/c	Dr.	20,000	
Factory Overhead Control A/c	Dr.	4,000	
To Wages Control A/c			24,000
Work in progress Control A/c	Dr.	15,000	
Finished goods Control A/c	Dr.	5,000	
Cost of Sales A/c	Dr.	3,000	
To Factory Overhead Control A/c			15,000
To Administration Overhead Control A/c			5,000
To Selling Overhead Control A/c			3,000
Costing Profit & Loss A/c	Dr.	1,000	
To Administrative Overhead Control A/c			1,000
Factory Overhead Control A/c	Dr.	2,000	
To Costing Profit & Loss A/c			2,000

1.(e) A Company Operates throughput accounting system. The details of product X per unit are as under:

Selling price	**₹50**
Material Cost	**₹20**
Conversion Cost	**₹15**
Time on Bottleneck resources	**10 minutes**

What will be the return per hour for product X?

Solution:

Return per hour Product X = (Selling price – Material cost)/Time on bottleneck resource

= [(₹50-₹20)/10 Minutes]x 60

= ₹180 per hour

1.(f) A firm engaged in the profession of rendering software services provides three different kinds of services to its clients. The following are relating to these services:

Types of services	A	B	C
	₹/Job	₹/Job	₹/Job
Annual fee	**3,000**	**2,400**	**1,800**

Annual variable cost	**1,350**	**800**	**810**
Annual fixed costs	**600**	**320**	**225**

The total annual fixed costs are budgeted at ₹5,74,200 and none of these costs are specific to any type of service provided by the firm.
The firm has estimated the number of service contracts to be sold in the next year in the proportion of 20%, 30% and 50% respectively for the three types of services namely A, B and C.
What will be the break-even of the firm?
Solution:

Service Type	A	B	C
	₹/Job	₹/Job	₹/Job
Annual fee	3,000	2,400	1,800
Annual Variable cost	1,350	800	810
Contribution	1,350	1,600	990
Proportion of Services	2	3	5
Contribution per set of three services	3,300	4,800	4,950

Total of contribution for a set= ₹(3,300+4,800+4,950)= ₹13,050
No. of sets to breakeven= F/C= ₹5,74,200/₹13,050= 44
Annual fee for a set of services= ₹3,000x2+₹2,400x3+₹1,800x5=₹22,200
Breakeven sales= 44x₹22,200= ₹9,76,800.

1.(g) The standard set of material consumption was 100kg. @ ₹2.25 per kg.
In a cost period:
Opening stock was 100kg.@ ₹2.25 per kg.
Purchase made 500kg. @₹2.15 per kg.
Consumption 110 kg.
Calculate usage variance and price variance.
Solution:

(a) Computation of Material usage variance

Material usage variance= SQSP-AQSP
= SP (SQ-AQ)
=2.25(100-110)
22.50 (A)

(b) Computation of Price Variance:

Material Price Variance= AQSP-AQAP
= (110x2.25)-(110x2.15)
= 11(F)

1.(h) A company has estimated the selling prices and the variable costs of one of its products as under:

Selling Price (per unit)		Variable costs (per unit)	
Probability	**₹**	**Probability**	**₹**
0.25	**60**	**0.25**	**30**
0.45	**75**	**0.40**	**45**
0.30	**90**	**0.35**	**60**

The company will be able to produce and sell 4,000 units in a month irrespective of the selling price. The selling price and variable cost per unit are independent of each other. The specific fixed cost relating to this product is ₹ 20,000. How much will be the probability that the monthly net profit of the product will be ≥ ₹ 1,20,000.
Solution:

The sales demand is 4,000 units per month. The monthly contribution must absorb the fixed costs of ₹ 20,000 and leave at least a surplus of ₹ 1,20,000 profit. So, the contribution per unit must be ₹ 1,40,000 / 4,000 units = ₹ 35 in the minimum.
The following selling price and variable cost pairs will produce a contribution of more than ₹ 35:

Selling Price (₹)	Variable Cost (₹)	Contribution (₹)	Joint Probability of SP & VC
75	30	45	0.45 x 0.25 = 0.1125
90	30	60	0.30 x 0.25 = 0.0750
90	45	45	0.30 x 0.40 = 0.1200
			0.3075

1.(i) The current price of a product is ₹ 8,000 per unit and it has been estimated that for every ₹ 200 per unit reduction in price, the current level of sale, which is 10 units, can be increased by 1 unit. The existing capacity of the company allows a production of 15 units of the product. The variable cost is ₹ 4,000 per unit for the first 10 units, thereafter each unit will cost ₹ 400 more than the preceding one. The most profitable level of output for the company for the product will be how many units?

Solution:

Units	Total variable cost (₹)	Selling price (₹)	Total revenue (₹)	Total contribution (₹)
10	40,000	8,000	80,000	40,000
11	40,000 + 4,400 = 44,400	7,800	85,800	41,200
12	44,400 + 4,800 = 49,200	7,600	91,200	42,000*
13	49,200 + 5,200 = 54,400	7,400	96,200	41,800
14	54,400 + 5,600 = 60,000	7,200	1,00,000	40,800

1.(j) 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

Solution:

(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

2(a) XYZ Ltd. has prepared a flexible budget for the coming quarter. The following information is provided from the same:

Production capacity	40%	60%	90%	100%
Cost	**(₹)**	**(₹)**	**(₹)**	**(₹)**
Direct Labour	**16,000**	**24,000**	**32,000**	**40,000**
Direct Material	**12,000**	**18,000**	**24,000**	**30,000**
Production Overheads	**11,400**	**12,600**	**13,800**	**15,000**
Administrative Overhead	**5,800**	**6,200**	**6,600**	**7,000**
Selling & Distribution	**6,200**	**6,800**	**7,400**	**8,000**

Overheads				
	51,400	**67,600**	**86,800**	**1,00,000**

However, due to recession the Company will have to operate at 50% capacity in the coming quarter. Selling prices has to be lowered to an uneconomic level and expected sales revenue for the coming quarter, will be ₹49,500. But it is projected that in the next quarter following the coming quarter, the concern will operate at 75% capacity and generates sales revenue of ₹90,000.

The Management is considering a suggestion to keep the operation suspended in the coming quarter and restart operation from the quarter when it is expecting to operate at 75% capacity. If the operation i8s suspended in the next quarter it is estimated that:

(i) The present fixed cost for the quarter would be reduced to ₹11,000.
(ii) There will be cost of ₹7,500 for closing down operations.
(iii) There would be additional maintenance cost of ₹1,000 for quarter.
(iv) There would be an onetime cost of ₹4,000 in re opening the plant.

You are required to advice weather the factory should be kept operational during the coming quarter and also what will be the profit at 75% capacity utilization level.

Solution:

Working Notes:

	40% (₹)	**60% (₹)**	**Diff. 20% (₹)**	**Diff.10% (₹)**	**Fc (₹)**
Direct Labour	16,000	24,000	8,000	4,000	Nil
Material	12,000	18,000	6,000	3,000	Nil
Prodn OHs	11,400	12,600	1,200	600	9,000
Admn. OHs	5,800	6,200	400	200	5,000
Sales OHs	6,200	6,800	600	300	5,000
			Total	8,100	19,000

Evaluation of options for ABC Ltd.:

	Operation at 50%	**Temporary Closure**
	₹	₹
Revenue:	49,500	Nil
Variable Cost (₹8,100×5)	40,500	------
Fixed Cost	19,000	11,000
Closing down cost	------	7,500
Maintenance cost	------	1,000
Reopening cost	-------	4,000
Profit/(Loss)	(10,000)	(23,500)

As temporary closure will increase loss, the Company should remain operational profitability at 75% capacity for ABC Ltd.

	₹	₹
Revenue	90,000	
Costs		
Variable Cost (₹8,100×7.5)	60,750	
Fixed Cost	19,000	79,750
Profit		10,250

2.(b) What is Inter Firm Comparison? Enumerate some of its advantages.

Answers: 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.

This Comparison has many advantages which are as follows:

(i) It promotes a sense of cost consciousness among member units and helps to improve their efficiency.

(ii) It throws light on weak-areas and enables member units to take remedial action.

(iii) It prevents unhealthy price cuffing.

(iv) It enables the members to present a united stand before Government and other regulatory bodies.

(v) An overall improvement in the industry will result in higher profit for member, more benefit to labour, lower prices to consumers and high revenue to the government by way of taxes/duties.

3(a) Zenith Transport Company has given a route of 40 kilometers long to run bus. The bus costs the company a sum of ₹1,00,000. It has been insured at 3% p.a. and the annual tax will amount to ₹2,000. Garage rent is ₹200 per month. Annul repairs will be ₹2,000 and the bus is likely to last for 5 yea₹ The driver's salary will be ₹300 per month and the conductor's salary will be ₹200 per month in addition to 10% of takings as commission (to be shared by the driver and the conductor equally.)

Cost of stationary will be ₹100 per month. Manager-cum-accountant's salary is ₹700 per month petrol and oil will be ₹50 per 100 kilomete₹ The bus will make 3 up and down trips carrying on an average 40 passengers on each trip.

Assuming 15% profit on takings, calculate the bus fare to be charged from each passenger. The bus will run an average 25 days in a month.

Solution:

Statement showing fare to be charged

Particulars	**Amount p.a. (₹)**	**Amount p.m.(₹)**
(a) Standing charges:		
• Insurance @35 on ₹ 1,00,000	3,000	
• Tax	2,000	
• Garage rent @ ₹200/ month	2,400	
• Driver's salary @₹200/month	3,600	
• Conductor's Salary @₹200/month	2,400	
• Stationary @₹100/month	1,200	
• Manager-cum-accountant's Salary @₹700 month	8,4000	
• **Total standing charges**	**23,000**	**1,916.67**
(b) Running Expenses		
• Depreciation ₹1,00,000/5	20,000	1,666.67
• Repairs	2,000	166.66
• Petrol & oil ₹0.50×[40km×2×3×25]		3,000.00
• Commission		900.00
• Profit		1,350.00
• **Total Taking**		**9,000**
• Fare per passenger kilometer (₹9,000/2,40,000#)	0.0375	0.0375
• Fare passenger (₹9,000/6,000)		₹1.50

*** Computation of commission and profit.**

Less: Total taking be x

Commission @ 10%=x/10, profit is 15% of taking.
* Hence Profit=15x/100=3x/20
* Total cost without commission=₹6,750 (standing charges+ Running charges)
* Hence x=₹6,750+ x/10 =3x/20
Solving the equation for x we get x= ₹9,000, which is total takings.
* Therefore, commission will be 10% of total taking=₹900
* Profit @15% of total taking=₹1,350

 # Total passenger kilometers an computed is shown below:
40 km. ×2(up+ down)×3 trips×25 days×401 passengers
=2,40,000 passenger km/month.

3.(b) Write short note on Cost Plus Contract.
Answer: CIMA defines Cost plus Contract is one where Contractor is reimbursed allowable or otherwise defined Cost Plus a percentage of these costs or a fixed fee towards profit. The customer has the right to verify the actual costs as these forms the basis for calculation of profit. Cost Plus Contracts are usually entered into during times of emergency such as war when there is no time to go through detailed tender formalities for settlement of a contract. It is also resorted when it is not possible to estimate the cost of the work with any degree of accuracy especially when prices are subject to wide fluctuations.

The advantage to the contractor in such contract is that he is protected from fluctuations in prices of materials, labour and services and he is assured of his profit as per the terms of the agreement. Moreover he need not to go through tender formalities and he can even take up works which cannot be detailed in advance. Further as the customer has the right of conducting cost audit, he cannot be exploited by the contractor and the customer are both benefited by this agreement.
This advantage of such contracts is that the contractor has no motivation to effect cost savings, as it will indirectly bring down his profit also. The customer also has no clear idea of his liability until after completion of the entire work. Unless the contract agreement provides clearly for definition of cost elements, allowable wastage, if any, mode of charging depreciation on assets, settlement of disputes etc. cost plus contracts may lead to dissatisfaction for both the contractor and the customer.

4(a) What is meant by 'Relevant Cost,? Explain with the help of illustration.
Answer: For the purpose of decision making, Costs are classified into two groups, namely relevant Costs and irrelevant Costs. Relevant Costs are taken into consideration while making a particular decision.
Relevant Costs are those which differ from one set of circumstances to another depending upon the nature of decision to be made. This concept is a valuable tool for decision making in a variety of situations. It should be used, however, with care and discretion. Thus the cost of petrol will be relevant if the decision to be made between driving upto a destination or using another mode of transport such as train.
If a special price export order is to be evaluated, relevant costs will be additional variable costs, any overtime or other export related expenses. The relevant benefits will be export subsidies and incentives.

4(b) A factory is currently working at 50% capacity and produces 5,000 units at a cost of ₹90 per unit as per details given below:

Materials	**₹50**
Labour	**₹15**
Factory Overhead	**₹15 (₹6 fixed)**
Administration Overhead	**₹10 (₹5 fixed)**

The current selling price ₹100 per unit.
At 60% working, material cost per unit increases by 2% and selling price per unit falls by 2%.
At 80% working, material cost per unit increases by 5% and selling price per unit falls by 5%.
Calculate the current profit at 50% working. Estimate profits of the factory at 60% and 80% working. Which capacity of production would you recommend?
Solution:
Fixed costs are not relevant to the decision since they are not directly related to the export order. They may be considered sunk cost or already incurred cost, whether or not the export order is accepted.

Statement of Comparative Profitability

Capacity	**50%**	**60%**	**80%**
Production/sales (units)	5,000	6,000	8,000
	₹	₹	₹
Material	50.00	51.00	52.50
Labour	15.00	15.00	15.00
Variable O/H	9.00	9.00	9.00
Variable Adm. O/H	5.00	5.00	5.00
	79.00	80.00	81.50
Sales/unit	100.00	98.00	95.00
Contribution/unit	21.00	18.00	13.00
Total Contribution	1,05,000	1,08,000	1,08,000
Fixed O/H (5,000x6+5,000x5)	55,000	55,000	55,000
Profit	50,000	53,000	53,000

It can be observed from above that the profit is the same at 60% and 80% capacity. At 80% capacity more production, more working capacity, more efforts are required to get the profit of ₹53,000 which is the same at 60% capacity. Hence 60% capacity production is recommended to achieve the profit of ₹53,000 which is more than the present profit of ₹50,000. More risk more endeavours are involved for production and sales at higher level of 80% capacity.

5(a) An amount of ₹19,80,000 was incurred on a contract work upto 31.03.2013. Certificates have been received to date to the value of ₹24,00,000 against which ₹21,60,000 has been received in cash. The cost of work done but not certified amounted to ₹45,000. It is estimated that by spending an additional amount of ₹1,20,000 (including provision for contingencies) the work can be completed in all respects in another two months. The agreed contract price of the work is ₹25 lakhs. Compute a conservative estimate of the profit to be taken to the profit & Loss Account.
Solution:

COMPUTATION OF ESTIMATED TOTAL PROFIT (N.P)

	₹19,80,000
Expenditure incurred upto 31st March, 2013	1,20,000
Estimated additional expenditure (including provision for contingencies)	21,00,000
Estimated total cost (A)	25,00,000
Contract price (B)	4,00,000
Estimated total profit (B-A)	

COMPUTATION OF CONSERVATIVE ESTIMATE OF THE PROFIT TO BE TAKEN TO PROFIT & LOSS ACCOUNT:

(i) $$\text{Estimated Profit} \times \frac{\text{Value of work certified}}{\text{Contract price}} \times \frac{\text{Cash received}}{\text{Value Certified}}$$

$$= 4,00,000 \times \frac{24,00,000}{25,00,000} \times \frac{21,60,000}{24,00,000}$$

=₹3,45,600

Or,

(ii) $\text{Estimated profit} \times \frac{\text{Cost of work to date}}{\text{Estimated Total Cost}} \times \frac{\text{Cash received}}{\text{Value Certified}}$

$= 4,00,000 \times \frac{19,80,000}{21,00,000} \times \frac{21,60,000}{24,00,000}$

=₹3,39,429 i.e., 3,39,430

Or,

(iii) $\text{Estimated profit} \times \frac{\text{Cash received}}{\text{Value Certified}}$

$= 4,00,000 \times \frac{21,60,000}{24,00,000}$

=₹3,60,000

Or,

$= \frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash received}}{\text{Work Certified}}$

$= 2/3 \times 4,00,000 \times \frac{21,60,000}{24,00,000}$

=₹2,40,000

Or,

(iv) $\text{Notional Profit} \times \frac{\text{Work Certified}}{\text{Contract Price}}$

$= 4,00,000 \times \frac{24,00,000}{25,00,000}$

=₹3,84,000

5(b) ABC Ltd. produces three joint products X,Y and Z. The products are processed further. Pre-separation costs are apportioned on the basis of weight of output of each joint product. The following data are provided for month just concluded:

Cost incurred upto separation point is ₹10,000.

	Product X	Product Y	Product Z
Output (in litre)	**100**	**70**	**80**
	₹	₹	₹
Cost incurred after separation point	**2,000**	**1,200**	**800**
Selling price per Litre:			
After further processing	**50**	**80**	**60**
At pre separation point (estimated)	**25**	**70**	**45**

You are required to:

(i) Prepare a statement showing profit or loss made by each product using the present method of apportionment of pre-separation cost, and

(ii) Advice the management whether, on purely financial consideration, the three products are to be processed further.

Solution:

Profit Statement for three Joint products:

	Product X	Product Y	Product Z	Total
	₹	₹	₹	₹
Sales	5,000	5,600	4,800	15,400
Less:				
Pre Separation Costs	4,000	2,800	3,200	10,000

Post Separation Cost	2,000	1,200	800	4,000
Profit/(Loss)	(1,000)	1,600	800	1,400

Decision whether to further process the product or not:

Product	Incremental Revenue	Incremental Costs	Incremental Profit/(Loss)
	₹	₹	₹
X (₹25x100)	2,500	2,000	500
Y (₹10x70)	700	1,200	(500)
Z (₹15x80)	1,200	800	400
			400

Product X and Z should be further processed. Y should be sold at point of separation.

6(a) ABC Ltd. is manufacturing three products X, Y and Z. All the products use the same raw material which is scarce and availability to the extent of 61,000 kg. only. The following information is available from records of the Company:

Particulars	Product X	Product Y	Product Z
Selling price per unit (₹)	**100**	**140**	**90**
Variable cost per unit (₹)	**75**	**110**	**65**
Raw Material Requirement per unit (kg.)	**5**	**8**	**6**
Market Demand (Units)	**5,000**	**3,000**	**4,000**
Fixed Costs			**₹1,50,000**

Advice the Company about the most profitable product mix. Compute the amount of profit resulting from such product mix.

Solution:

It is given that availability of raw material is limited to the extent of 61,000 kg. only. It can be noticed that if the products are produced to the maximum possible extent according to the market demand, the resultant profit will be highest. However, it is not possible as the raw material is not available to that extent. Therefore it is necessary to find out priority of the product by ranking them on the basis of contribution per kg. of raw material.

Particulars	Product X	Product Y	Product Z
Selling price per unit	₹100	₹140	₹90
Less: Variable cost/unit	75	110	65
Contribution per unit	₹25	30	25
Contribution per constraint	25/5	30/8	25/6
i.e., kg. of raw materials	=5	=3.75	=4.16
Priority Ranking	I	III	II

It is evident that X will be produced 1st to meet total market demand of 5,000 units.

product	No. of units	Raw material consumed	Contribution
X	5,000	25,000 kg.	₹1,25,000
Y	4,000	24,000kg.	1,00,000
Z	1,500	12,000kg.*	45,000
		(Balance to go upto 61,000kg.)	
		61,000kg.	₹2,70,000

Contribution	₹2,70,000
Less: Fixed Cost	₹1,50,000
Profit	1,20,000

This will be the highest profit in the given situation by producing

5,000 units of X
1,500 units of Y and

4,000 units of Z

6.(b) Monarch Limited undertakes to supply 1,000 units of a component per month for the months of January, Feb. and March 2012. Every month a batch order is opened against which materials and labour cost are booked at actual. Overheads are levied at a rate per labour hour. The selling price is constructed 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 3,000 units.

Month	Batch output (Numbers) ₹	Material Cost ₹	Labour Cost ₹
January 2012	**1,250**	**6,250**	**2,500**
February 2012	**1,500**	**9,000**	**3,000**
March 2012	**1,000**	**5,000**	**2,000**

Labour is paid at the rate of ₹2 per hour. The other details are:

Month	Overheads	Total labour Hour
January 2012	**₹12,000**	**4,000**
February 2012	**₹9,000**	**4,500**
March 2012	**15₹000**	**5,000**

Solution:

Statement of Cost and Profit per unit of each Batch

Particulars	January	February	March	Total
A. Batch Output (Number)	1,250	1,500	1,000	3,750
B. Sales Value (Ax₹15)	₹18,750	₹22,500	₹15,000	₹56,250
C. Material	6,250	9,000	5,000	20,250
Wages	2,500	3,000	2,000	7,500
Overheads	3,750	3,000	3,000	9,750
Total Cost	12,500	15,000	10,000	37,500
D. Profit per batch (B-C)	6,250	7,500	5,000	18,750
E. Cost per unit (C/A)	10	10	10	10
F. Profit Per unit (D/A)	5	5	5	5

Working Notes:

Particulars	Jan. 2012	Feb. 2012	March 2012
A. Labour Hours (Labour Cost/Labour rate per hour)	₹2,500/2 =1,250	₹3,000/2 =1,500	₹2,000/2 =1,000
B. Overheads per hour (Total Overheads/Total Labour Hours)	₹12,000/4,000 =₹3	₹9,000/4 =₹2	₹15,000/5,000 =₹3
C. Overheads for the batch (Ax B)	₹3,750	₹3,000	₹3,000

Paticulars	₹
A. Sales Value (3,000 units x ₹15)	45,000
B. Less: total Cost (3,000 units x ₹10)	30,000
Profit (A-B)	15,000

7 A Company manufacture its sole product by passing the raw material through three distinct process in its factory. During the month of April 2013, the company purchased 96,000 kg of raw material at ₹5 per kg & introduced the same in process 1. Further particulars of manufacture for the month are given below:-

	Process I	Process II	Process III
Material consumed	**₹33,472**	**₹27,483**	**₹47,166**
Direct labour	**80,000**	**72,000**	**56,000**

Overhead	**1,20,000**	**1,08,000**	**84,000**
Normal Waste in process as % of input	**3%**	**1%**	**1%**
Sale value of waste (₹/kg)	**2**	**3**	**5**
Actual output during the month (kg)	**93,000**	**92,200**	**91,500**

Prepare the three process accounts relating to abnormal; loss/gain, if any.

Solution:

-----Company

Three Process Accounts are given below:

Process-1 Account

	Quantity (kg.)	Rate (₹)	Amount (₹)		Quantity (kg.)	Rate (₹)	Amount (₹)
To Input of R.M.	96,000	5.00	4,80,000	By Process-II A/C (Transferred to)	93,000	7.60	7,06,800
To Other materials			33,472	By Normal Waste A/C (3% of 96,000)	2,880	2.00	5,760
To Direct labour			80,000	By Abnormal Loss A/C	120	7.60	912
To Overheads			1,20,000				
	96,000		7,13,472		96,000		7,13,472

Process-II Account

	Quantity (kg.)	Rate (₹)	Amount (₹)		Quantity (kg.)	Rate (₹)	Amount (₹)
To Process-I A/C (Transferred from)	93,000	7.60	7,06,800	By Process-III A/C (Transferred to)	92,200	9.90	9,12,780
To Materials			27,483	By Normal Waste A/C (1% of 93,000)	930	3.00	2,790
To Direct labour			72,000				
To Overheads			1,08,000				
To Abnormal gain	130	9.90	1,287				
	93,130		9,15,570		93,130		9,15,570

Process-III Account

	Quantity (kg.)	Rate (₹)	Amount (₹)		Quantity (kg.)	Rate (₹)	Amount (₹)
To Process-II A/C (Transferred from)	92,200	9.90	9,12,780	By Finished Goods Stock	91,500	12.00	10,98,000
To Materials			47,166	By Normal waste (1% of 92,200)	922	5.00	4,610
To Direct labour			56,000				
To Overheads			84,000				
To Abnormal gain	222	12.00	2,664				
	92,422		11,02,610		92,422		11,02,610

Accounts relating to Abnormal Loss/Gains are as under:-

Abnormal Loss Account

	Quantity (kg.)	Amount (₹)		Quantity (kg.)	Amount (₹)
To Process-I	120	912	By Cash @ ₹2	120	240

Account			(normal waste)		
			By Profit & Loss Account	------	672
	120	912		120	912

Abnormal Gain Account

	Quantity (kg.)	Amount (₹)		Quantity (kg.)	Amount (₹)
To Process-II A/C (normal waste) @₹3	130	390	By Process-II A/c	120	1,287
To Process-III A/c (Normal waste)	222	1,110	By Process-III A/c	222	2,664
To Profit & Loss A/C	-----	2,451			
	352	3,951		352	3,951

Working Notes:-

Valuations of output, abnormal loss/Gain are worked out below:

$$= \frac{\text{Total Cost of Input - Sale Value of Normal Waste}}{\text{(Input quantity - Qty of Normal Waste)}}$$

$$\text{Process-I}: \frac{7,13,472 - 5,760}{96,000 - 2,880}$$

$$= \frac{7,07,712}{93,120}$$

$$= ₹7.60$$

$$\text{Process-II}: \frac{9,14,283 - 2,790}{(93,000 - 930)}$$

$$= \frac{9,11,493}{92,070}$$

$$= ₹9.90$$

$$\text{Process-III}: \frac{10,99,946 - 4,610}{92,200 - 922}$$

$$= \frac{10,95,336}{91,278}$$

$$= ₹12.00$$

8(a) The Profit & Loss A/c. of XYZ Ltd., for the year ended 31st March 2012 was as follows:

Dr. Profit & Loss a/c. for the year ended 31st March 2012 Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Materials	**4,80,000**	**By Sales**	**9,60,000**
To Wages	**3,60,000**	**By Work-in progress:**	
To Direct Expenses	**2,40,000**	**Material**	**30,000**
To Gross Profit	**1,20,000**	**Wages**	**18,000**
		Direct Expenses	**12,000**

		By Closing stock	**1,80,000**
Total	**12,00,000**	**Total**	**12,00,000**
To Administration Expenses	**60,000**	**By Gross Profit**	**1,20,000**
To Net Profit	**66,000**	**By Dividend received**	**6,000**
Total	**1,26,000**	**Total**	**1,26,000**

As per the cost records, the direct expenses have been estimated at a cost of ₹30 per kg. and administration expenses at ₹15 per kg. During the year production was 6,000 kgs. And sales were ₹9,60,000.

Prepare a statement of costing Profit & Loss A/c. and reconcile the profit with financial profit.

Solution:

A. Statement Showing Profit as per Cost Accounts

Particulars	Amount (₹)	Amount (₹)
Purchase of Materials':	4,80,000	
Less: work-in-progress	30,000	4,50,000
Wages	3,60,000	
Less: Work-in-progress	18,000	3,42,000
Direct Expenses: ₹30/kg.x6,000 kg		1,80,000
Administration Expenses: ₹15/kg.x6,000		90,000
Cost of production of 6,000 units		10,62,000
Less: Closing Stock-1,200 units		2,12,400
Cost of Goods Sold-4,800 units		8,49,600
Sales	9,60,000	
Profit as per cost accounts		1,10,400

Value of Closing Stock is computed as shown below:

For 6,000 units, the cost of price is ₹10,62,000. So for 1,200 units, the cost of production will be ₹10,62,000/6,000x1,200=₹2,12,400

B. Reconciliation Statement:

Particulars	Amount (₹)
Profit as per Cost Accounts	1,10,400
Add: Over absorption of administration Overhead in cost accounts only (₹90,000-₹60,000)	30,000
Add: Dividends received recorded in financial accounts only	6,000
Total	1,46,400
Less: Over-valuation of Closing Stock: (₹1,80,000-2,12,400)	32,400
Under absorption of directly expenses in cost accounts: (₹1,80,000-₹2,28,000)	48,000
Total	80,400
Profit as per financial accounts:	66,000

- Administration overhead incurred on ₹601,000 as per the financial accounts. However in cost accounts, the amount charged I ₹90,000, (as the per unit administrative overheads are ₹15/kg. and the total production during the year was 6,000kgs., which means, the administrative overheads recovered in cost accounts are ₹90,000) thus resulting in over absorption of ₹30,000.
- Closing Stock as per Financial accounts is ₹1,80,000 while as per cost accounts, the value comes as ₹2,12,400. Hence over valuation of ₹32,400 in cost
- Direct Expenses as per Financial accounts as ₹2,28,000 [₹2,40,000 -₹12,000 WIP] while in cost accounts, the amount recovered is ₹1,80,000.

8.(b) Write short notes on Zero-Base Budgeting (ZBB).

Answer: Zero Base Budgeting is a method of budgeting starting from scratch or zero level. Proposals for the coming period should be based on merit and not related to past performance.

Budgets prepared by conventional methods are the incremental type of budget based on actual performance in the past periods. In the zero base budget, the results of the past year is not accepted as a basis, since the past may conceal inefficiencies.
Zero Base Budget is mainly prepared by taking the following steps.

(i) Identification of decision units
(ii) Preparation of decision packages.
(iii) Ranking of decision packages using cost benefit analysis.
(iv) Allotment of available funds according to the priority determined by ranking each decision package is a self contained module explaining the need for a certain activity, its costs, its benefits consequences if the packages is not accepted etc. The ranking of package based on cost benefit analysis by the difficult levels of management starring from the bottom upward ensures allotment of funds to relatively more important and essential activities.

9(a) A factory has a key resource (bottleneck) of Facility A which is available for 31,300 minutes per week. Budgeted factory costs and data on two products, A and B, are shown below:

Product	Selling price/Units	Material cost/Unit	Time in Facility A
A	**₹40**	**₹20.00**	**5 minutes**
B	**₹40**	**₹17.50**	**10 minutes**

Budgeted factory cost per week:

	₹
Direct labour	**25,000**
Indirect labour	**12,500**
Power	**1,750**
Depreciation	**22,500**
Space Costs	**8,000**
Engineering	**3,500**
Administration	**5,000**

Actual production during the last week is 4,750 units of product A and 650 units of product B. Actual factory cost was ₹78,250.
Calculate:

(i) Total factory costs (TFC)
(ii) Cost per factory minute
(iii) Return per factory minute for both products
(iv) TA ratios for both product
(v) Throughput cost per the week
(vi) Efficiency ratio

Solution:

(i) Total factory cost= Total of all costs except materials.
= ₹25,000+₹12,500+₹1,750+₹22,500+₹8,000+₹3,500+₹5,000
=₹78,250

(ii) Cost per Factory Minute=Total Factory Cost÷ Minutes available
= ₹78,250÷ 31,300
=₹2.50

(iii)

(a) Return per bottleneck minute for the product A= $\frac{\text{Selling Price} - \text{Material Cost}}{\text{Minutes in bottleneck}}$
= (40-20)/5
=₹4

(b) Return per bottleneck minute for the product Y= $\frac{\text{Selling price} - \text{Material Cost}}{\text{Minutes in bottleneck}}$

= (40-17.5)/10
=₹2.25

(iv) Throughput Accounting (TA) Ratio for the product X= $\frac{\text{Return per Minute}}{\text{Cost per Minute}}$

= (4/2.5)
=₹1.6

Throughput Accounting (TA) Ratio for the product Y= $\frac{\text{Return per Minute}}{\text{Cost per Minute}}$

= (2.25/2.5
=₹0.9

Based on the review of the TA ratios relating to two products, it is apparent that if we only made product B, the enterprise would suffer a loss, as its TA ratio is less than 1. Advantage will be achieved, when product A is made.

(v) Standard minutes of throughput for the week:
= [4,750×5] + [650×10]
= 23,750+6,500
=30,250 minutes

Throughput Cost per week:
=30,250×₹2.5 per minutes
=₹75,625

(vi) Efficiency % =(Throughput Cost/ Actual TFC) %
= (₹75,625/₹78,250) ×100
=96.6%

The bottleneck resource of facility A is advisable for 31,300 minutes per week but produced only 30,250 standard minutes. This could be due to:

(a) The process of a 'wandering' bottleneck causing facility A to be underutilized.
(b) Inefficiency in facility A.

9.(b) Starlight Co. and Jupiter Co. Ltd. sell the same type of product. Budgeted Profit & Loss A/c. of these companies for the year ended 31st march 2012 given below.

	Starlight Co. (₹000)		Jupiter Co. (₹000)	
Sales		**300**		**300**
Less: Variable Cost:				
Material	**100**		**80**	
Labour	**110**		**100**	
Overhead	**30**	**240**	**20**	**200**
Fixed Cost		**30**		**70**
		30		**30**

You are required to find out the break-even point of each Company. Also state clearly which Company is likely to earn greater profit if there is (i) heavy demand; and (ii) poor demand for its product.

Solution:

Statement of BEP

	Starlight Co. (₹000)	Jupiter Co. (₹000)
Sales	300	300
Variable Cost	240	200

Contribution	60	100
Fixed Cost	30	70
Budgeted Profit	30	30
P/V Ratio x100	60/300 x100=20%	100/300 x100=33.33%
BEP= F/P.V Ratio	30,000/20%=₹1,50,000	70,000/33.33%= ₹2,10,000
Margin of Safety (Sales-BE=P)	₹3,00,000-1,50,000 =₹1,50,000	3,00,000-2,10,000 =₹90,000

(i) In case of high demand, Jupiter co. is more profitable as its PV ratio is higher at 33.33%. After meeting its fixed cost of ₹70,000 the profit in Jupiter co. will be 33.33% of sales, whereas, it will be 20% of sales in case of Starlight Co. after meeting its fixed cost of ₹30,000.

(ii) In case of low demand, Starlight Co. is more profitable as its fixed cost and BEP are very low. After meeting fixed cost of ₹30,000 it will earn profit. Margin of safety is also higher in case of Starlight Co. Even if the sale is reduced to 50%.

10(a) A Product is manufactured by mixing and processing three raw materials X, Y and Z as per standard data given below:

Raw material	Percentage of input	Cost per kg.
X	**40%**	**₹40**
Y	**40%**	**₹60**
Z	**20%**	**₹85**

Note: Loss during processing is 5% of input and this has no realizable value.
During a certain period 5,80,000 kg of finished product was obtained from inputs as per details given below:

Raw material	Quantity consumed	Cost per kg.
X	**240000 kg**	**₹38**
Y	**250000 kg**	**₹59**
Z	**110000 kg**	**₹88**

Calculate the total material cost variance with details of sub- variances relating to Price, Mix, Yield and Usage.
Solution:

Standard cost of the finished product:

Raw material	Percentage of % Input	Quantity (kg)	Cost per Kg. (₹)	Total (₹)
X	40%	40	40	1600
Y	40%	40	60	2400
Z	20%	20	85	1700
	Total Input	100		5700
	Less: Loss in processing	5		
	Output @5%	95		5700

Standard cost per Kg $\frac{5700}{95} = ₹60$

COMPUTATION OF VARIANCES:

Total material cost variance: Std cost of Actual Production (Output) – actual material cost for production

$$580000 \times ₹60 - \begin{cases} 240000 \times ₹38 = ₹34800000 \\ 250000 \times ₹59 \\ 11000 \times ₹88 \end{cases} - ₹33550000$$

= ₹ 1250000 (FAV)

Material Price Variance: (Std Price – actual Price) x Actual qty consumed

X: (40-38) x 240000 = ₹480000 (FAV)
Y: (60- 59) x 250000 = ₹250000 (FAV)
Z: (85 – 88) X 110000 = ₹330000 (ADV)
₹400000(FAV)

Material Mix variance: (Input in Std proportion – actual input) x Std cost of input/kg

X (240000 – 240000) x ₹40 = Nil
Y (240000 – 250000) x ₹60 = ₹600000(ADV)
Z (12000 - 110000) x ₹85 = ₹850000 (FAV)
600000 600000 ₹250000 (FAV)

Yield variance = (Std yield from actual input – actual input) x std cost of finished product

$= (600000 \times \frac{95}{100} - 580000) \times ₹60$

= 10000 x ₹60 ₹ 600000(EAV)

Usage Variance: Standard cost (output) of Actual production/ (output) – Standard Cost of Actual quantity Consumed.

580000 x 60 – X: 240000 x 40
Y: 250000 x 60
Z: 110000 x 85
₹34800000 – ₹33950000 = ₹850000 (FAV)

Mix variance + Yield variance
₹250000 (FAV) + ₹600000(FAV)
₹850000(FAV)

10.(b) Explain the meaning of Uniform Costing. Write down the features of Uniform Costing.

Solution: Uniform Costing is the use by several undertaking of the same costing principles and practices. The goal is set with Uniformity of principles and similarity of methods with the understanding that in a particular undertaking there may exist conditions which require variations in some respects from absolute uniformity.

Features of Uniform Costing are as follows:

- **(i)** Common bases for the apportionment and allocation of overhead to be followed by all units in the same industry.
- **(ii)** The departments sections or production centre's to be used for analysis and comparison of costs to be determined
- **(iii)** What items shall be regarded as factory or distinct from administration expenses to be clearly indicated
- **(iv)** Common basis for recovery of overheads.
- **(v)** Common rates of depreciation should be applied to plant & machinery.
- **(vi)** Uniform method of arriving service departments cost.
- **(vii)**To set up an organization to prepare comparative statistics for the use of those adopting the uniform system. Privacy of Individual data and confidence in the coordinating office Are essential facto₹

There may be some operational problems in this system. The main point is the mutual understanding and belief if that is built in good sense it certainly brings all benefits to the concerned parties.

11(a) In a factory the following cost for Job no. 777 to determine the selling price.

Particulars	Per unit (₹)
Materials	**70**
Direct wages 18 hours at 2.5	**45**
Dept. A-8 hours	
Dept. B-6	
Dept. C-4 hours	
Chargeable expenses (special store items)	**5**
	120
Plus 33% Overheads	**160**

Analysis of the Profit/Loss Account for 2012 shows the following

Particulars	₹	₹	Particulars	₹	₹
Materials		**1,50,000**	**Sales**		
Direct Wages:					
Dept. A	**10,000**				
Dept. B	**12,000**				
Dept. C	**8,000**	**30,000**			
Special stores items		**4,000**			
Overheads:					
Dept. A	**5,000**				
Dept. B	**9,000**				
Dept. C	**2,000**	**16,000**			
		2,00,000			
Gross profit c/d		**50,000**			
		2,50,000	**Gross profit b/d**		**2,50,000**
Selling expenses		**20,000**			**50,000**
Net Profit c/d		**30,000**			
		50,000			**50,000**

It is also noted that average hourly rates for the 3 departments, A, B and C are similar.
You are required to:

(i) Draw up a Job Cost Sheet
(ii) Calculate the entire revised cost using 2012 actual figures as basis;
(iii) Add 25% to total cost to determine selling price.

Solution:

Contribution of departmental overhead Rates

Particulars	Departments		
	A (₹)	**B (₹)**	**C (₹)**
(i) Direct Wages	10,000	12,000	8,000
(ii) Rate of wages per hour	2.5	2.5	2.5
(iii) Hours	4,000	4,800	3,200
(iv) Actual overheads in 8%	5,000	9,000	2,000
(v) Department Overhead Rates per hour (iv÷iii)	1,250	1,875	0.625

Revised job cost sheet

Particulars			₹
Materials			70
Labour:			
Dept. A	8x2.5	20	
Dept. B	6x2.5	15	
Dept. C	4x2.5	10	45
Direct Expenses			5
Prime Costs			120
Dept.Overheads:			
Dept. A	8x1.250	10.00	
Dept. B	6x1.875	11.25	
Dept. C	4x0.625	2.50	23.75
Total Cost			143.75
Add: Profit 25%			35.90
Selling price			179.65

11.(b) XYZ Ltd. is committed to supply 24,000 bearings per annum to MNC Ltd. on a steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is ₹324.

(i) What would be the optimum run size for bearing manufacture?

(ii) What is the minimum inventory holding cost at optimum run size?

(iii) Assuming that the company has a police of manufacturing 8,000 bearing per run, how much extra costs would the company be incurring as compared to the optimum run suggested in (a)?

Solution:

(a) Optimum production Run Size (Q)= $\sqrt{\frac{2AO}{C}}$

Where, A=No. of units to be produced within one year

O=Set-up cost per production run

C= Carrying cost per unit per annum

$=\sqrt{\frac{2x24,000x324}{0.10x12}}$

=3,600 units

(b) Minimum inventory Holding Cost, if run size is 3,600 bearings

= Average inventory x carrying cost per unit

= (3,600/2)x(0.10x12)=₹2,160

(c) Statement showing Total Cost at Production Run size of 3,600 and 8,000 bearings

A.	Annual requirement	24,000	24,000
B.	Run Size	3,600	8,000
C.	No. of runs (A/B)	6.667	3
D.	Set up cost per run	₹324	₹324
E.	Total set up cost (CxD)	₹2,160	₹972
F.	Average inventory (B/2)	1,800	4,000
G.	Carrying cost per unit p.a.	1.20	1.20
H.	Total Carrying cost (FxG)	2,160	4,800
I.	Total cost (E+H)	4,320	5,772

Extra cost incurred, if run size is of 8,000=₹5,772-4,320=₹1,452

12(a) Prepare a cash budget for the three months ending June, 1986 from the information given below:

(a) Months	Sales	Materials	Wages	Overheads
February	₹14,000	₹9,600	₹3,000	₹1,700
March	15,000	9,000	3,000	1,900
April	16,000	9,200	3,200	2,000
May	17,000	10,000	3,600	2,200
June	18,000	10,400	4,000	2,300

(b) Credit terms are:-

Sales/Debtor-10% sales are on cash, 50% of the credit sales are collected next month and the balance in the following month.

Creditors	**Material**	**2 months**
	Wages	**¼ months**
	Overheads	**½ month**

(c) Cash and bank balance on 1st April,2012 is expected to be ₹6,000.

(d) Other relevant information is:

(i) Plant & machinery will be installed in February 2012 at a cost of ₹96,000. The monthly installments of ₹2,000 ia payable from April onwards.

(ii) Dividend @5% on preference share Capital of ₹2,00,000 will be paid on 1st June.

(iii) Advance to be received for sale of vehicle ₹9,000 in June.

(iv) Dividends from investments amounting to ₹1,000 are expected to be received in June.

(v) Income tax (advance) to be paid in June is ₹2,000.

Solution:

Cash Budget
April-June 2012

	April	May	June	Total
1. Balance b/f	6,000	3,950	3,000	6,000
2. Receipts				
Sales (Note 1)	14,650	15,650	16,650	46,950
Dividend			1,000	1,000
Advance against vehicle			9,000	9,000
Total	20,650	19,600	29,650	62,950
3. Payments				
Creditors*	9,600	9,000	9,200	27,800
Wages*	3,150	3,500	3,900	10,550
Overhead*	1,950	2,100	2,250	6,300
Capital expenditure	2,000	2,000	2,000	6,000
Dividend on preference shares		-	10,000	10,000
Income tax advance			2,000	2,000
Total	16,700	16,600	29,350	62,650
4. Balance c/f	3,950	3,000	300	300

Working Notes

Collection from Sales/Debtors

Month	Calculation	April (₹)	May (₹)	June (₹)
Feb.	(14,000-10% of 14,000)x50%	6,300		
March	(15,000-10% of 15,000)x50%	6,750	6,750	
April	10% of 16,000	1,600		
	(16,000-10% of 16,000)x50%		7,200	7,200
May	10% of 17,000		1,700	
	(17,000-10% of 17,000)x50%			7,650
June	10% of 18,000			1,800
		14,650	15,650	16,650

*Payment for creditors, Wages and overhead have been computed on the same pattern.

12.(b) What are the problems associated with apportionment of joint cost?

Answer: Problems associated with apportionment of joint costs include:

(i) Apportionment of joint costs is made on the basis of some assumed paramete₹ Therefore, the same need to be accurate.

(ii) As the apportioned costs do not relate to activities and use of resources, reliable decisions may not be made from them.

13(a) Relevant data relating to a Company are:

	Products			
	A	**B**	**C**	**Total**
Production and sales (Units)	**60,000**	**40,000**	**16,000**	
Raw material usage in units	**10**	**10**	**22**	
Raw material costs (₹)	**45**	***40***	**22**	**24,76,000**
Direct labour hours	**2.5**	**4**	**2**	**3,42,000**
Machine hours	**2.5**	**2**	**4**	**2,94,000**
Direct Labour Costs (₹)	**16**	**24**	**12**	
No. of production runs	**6**	**14**	**40**	**60**
No. of deliveries	**18**	**6**	**40**	**64**
No. of receipts	**60**	**140**	**880**	**1,080**
No. of production orders	**30**	**20**	**50**	**100**

Overheads:	₹
Setup	**60,000**
Machines	**15,20,000**
Receiving	**8,70,000**
Packing	**5,00,000**
Engineering	**7,46,000**

The Company operates a JIT inventory policy and receives each component once per production run.

Required:

(i) Compute the product cost based on direct labour-hour recovery rate of overheads.

(ii) Compute the product cost using activity based costing.

Solution:

(i) Traditional method of absorption of overhead i.e. on the basis of Direct Labour Hours

$$\text{Total Overheads} = \frac{36,96,000}{[\text{Hours}(60,000\text{x}2.5)+(40,000\text{x}4)+(16,000\text{x}2)]}$$

=36,96,000/3,42,000

=₹10.81 per labour hour

Calculation of Factory cost of the products under Traditional Method of apportioning overheads:

	A	**B**	**C**
	₹	₹	₹
Raw Material	45.000	40.00	22.00
Direct Labour	16.000	24.00	12.00
Overheads (2.5x10.81)	27.025	43.24	21.62
Factory cost (Total)	88.025	107.24	55.62

(ii) Under Activity Based Costing System

Computation of Cost driver's rates.

Set up cost: Cost driver->No. of production run

60,000/60=₹1,000/per run

Machines: cost driver-> Machine hour Rate
15,20,000/2,94,000=₹5.17 per machine hour
Receiving cost: cost driver->No. of receipts
8,70,000/1,080=₹805.56
Packing: Cost driver->No. of deliveries
5, 00,000/64= ₹7,812.5 per delivery
Engineering: cost driver->No. of production order
7, 46,000/100= ₹7,460 per order

Calculation of Factory Cost per unit of production

	A		B		C	
	₹	₹	₹	₹	₹	₹
Materials		45.00		40.00		22.00
Direct Labour		16.00		24.00		12.00
Overheads						
Setup cost	0.10		0.35		2.50	
Machines	12.93		10.34		20.68	
Receiving cost	0.81		2.82		44.31	
Packing	2.34		1.17		19.53	
Engineering	3.73	19.91	3.73	18.41	23.31	110.33
Factory cost (Total)		80.91		82.41		144.33

13.(b) Write short note on Opportunity Cost.

Answer: As per CIMA terminology opportunity cost is defined as 'the value of the benefit sacrificed when one course of action is chosen, in preference to an alternative. The opportunity cost is represented by the forgone potential benefit from the best rejected course of action'. In opportunity cost we are to identify the value of benefit forgone as the result of choosing a particular course of action in preference to another.

Notional rent foregone by a company by using its own building instead of renting it out and foregoing rent that it could have earned is an example of opportunity cost.

Another example of opportunity cost is considered for even an obsolete material lying in store for long. When it is found to be useful for a new job, the sale value of material even as scrap is taken as the opportunity cost of using that material for the new job.

14.(a) Distinguish between Scrap, Spoilage and Defectives .

Answer:

Scrap is a residual material resulting from a manufacturing process. It has a recovery value and is measurable. Its treatment in cost account will depend on the total value of scrap.

For the control purposes, scrap could be divided into: legitimate scrap, administrative scrap and defective scrap.

It can be controlled through selection of right type of material and manpower, determination of acceptable limit of scrap and reporting the source of waste.

Spoilage is the production that fails to meet quality or dimensional requirements and so much damaged in manufacturing operations that they are not capable of rectification and hence has to be withdrawn and sold off without further processing.

Rectification can be done but its cost may e uneconomic.

Defectives: are parts of production units, which do not conform to the standards of quality but can be rectified with additional application of materials, labour and /or processing and made it into saleable conditions either as firsts or seconds, depending upon the characteristics of the product.

The accounting treatment of defectives is same as those of spoilage.

Thus the difference between Scrap, Spoilage and defective is very suitable.

14.(b) A company produces three joint products in one common process. Each product can be separately processed further after split-off point. The estimated data for a particular month are as under

	Product		
	A	**B**	**C**
Selling price at split-off point (₹ /litre)	**100**	**120**	**150**
Selling price after further processing (₹ /litre)	**200**	**200**	**250**
Post separation point cost (₹)	**3,50,000**	**4,50,000**	**2,00,000**
Output in litres	**3,500**	**2,500**	**2,000**

Pre-separation point joint costs are estimated to be ₹ 2,40,000. As per current practice such costs are apportioned to the three products according to production quantity.
You are required to

(i) Prepare a statement of estimated profit or loss for each product and in total for the month if all three products are processed further; and

(ii) From the profit statement comments how profit could be maximized if one or more products are sold at split-off points.

Solution:

(i) Profitability after further processing all three products: (₹ In '000)

	Product			
	A	**B**	**C**	**Total**
Sales revenue	700	500	500	1700
Costs: Pre-separation*	-105	- 75	- 60	- 240
Post-separation	-350	- 450	- 200	- 1000
Profit / Loss (-)	245	- 25	240	460

* apportioned on the basis of output, i.e., @ (₹ 2,40,000 / 8,000 liters or ₹ 30 per litre).

(ii) Whether to process further or not
Profitability by further processing

Product	**Incremental Revenue (₹ '000)**	**Incremental cost (₹ '000)**	**Incremental Profit (₹ '000)**
A	100 x 3,500 = 350	350	Nil
B	80 x 2,500 = 200	450	- 250
C	100 x 2,000 = 200	200	- Nil

It is seen that further processing will not be gainful for products A or C, whilst there will be loss of ₹ 2,50,000 in product B.

Note that instead of this product –wise analysis, one can find the same overall result if a study is made of the joint products together, as under:

	Product A	**Product B**	**Product C**	**Total**
	₹ '000	**₹ '000**	**₹ '000**	**₹ '000**
Sales revenue	350	300	300	950
Costs up to Pre-separation	-105	- 75	- 60	- 240
Profit	245	225	240	710
Profit at post-separation, as worked in answer (b) (i)				460

□ Further processing will result in reduction of profit by ₹ 2,50,000 [7,10,000 – 4,60,000].

15 "When goods are passed between divisions of an organization, a central transfer price policy is needed so that no sub-optimal or dysfunctional results ensue ….. One way to attain this objective is to aim at the same contribution margin ratio (P/V ratio) on the goods subject to internal transfer for both the transferor division and the transferee division."

The Managing Director of Fairdeal Limited has just attended a lecture on Transfer Pricing in a seminar organized by ICWAI. The above is a quoted from the said lecture.

Fairdeal has two divisions, Wholesale (W) and Retail (R). As per the existing rule, W sells its products @ ₹ 150 per tonne in the external market but supplies identical product @ ₹ 90 per tonne to R. R uses the transferred material as captive consumption and produces finished goods in the ratio of 1 tonne input : 100 pieces of output. R sells all its output in the external market. W insists that R be charged at market price, to which R does not agree.
The MD of Fairdeal Ltd. requests you to find the transfer price of the goods that his wholesale division supplies to the Retail division, conforming to the principle laid out in the above quote.
For your information the Accountant of Fairdeal Ltd. furnishes you with an estimated Statement of the company as under:
Estimated Profit Statement of Fairdeal Ltd. for the current quarter (July – Sept.'13)

	Wholesale (₹ '000)	Retail (₹ '000)	Company (₹ '000)
External sales 1,200 t. @ ₹ 150	**180**	**---**	**180**
1,20,000 pcs. @ ₹ 2.67	**---**	**320**	**320**
Internal transfer 1,2000 t. @ ₹ 90	**108**	**(108)**	**---**
Variable cost 2,400 t. @ ₹ 58.33	**(140)**	**---**	**(140)**
1,20,000 pcs. @ ₹ 0.50	**---**	**(60)**	**(60)**
Fixed costs	**(100)**	**(40)**	**(140)**
Profit		**112**	**160**

Note: Your answer should (i) highlight the need for a change in the ruling transfer price and (ii) show that the suggested transfer price meets the MD's requirement.

Solution:

(i) As per the Projected Profit Statement for the quarter ended 30 Sep'13, the contribution margin (P/V) ratios are:

	Wholesale Division (₹ '000)	Retail Division (₹ '000)	Company (₹ '000)
External sales	180	320	500
Variable costs of external sales			
At W	(70)	(70)	(140)
At R	---	(60)	(60)
Contribution	110	190	300
P/V or contribution margin ratio	61.1%	59.4%	60%

Comments: The difference in P/V ratios between W and R has to be borne as the products are different with different market prices. Obviously, the divisional managers admit this fact. The bone of contention is then the ruling transfer price which is 60% of current market price. So, the MD wants to fix the transfer price on a reasonable basis. He wants that the P/V ratios on internal transferred material are same for both W and R.

(ii) Let the value of transferred material for the quarter ended 30 Sep. '13 be ₹ T ('000). Then, for W the P/V ratio is {(T – 70)/T} x 100% and for R the P/V ratio is {(320 – T – 60)/320} x 100%. These two ratios should be equal, i.e.,
(T – 70) /T = (320 – T – 60) / 320
Or, $T^2 + 60T – 22,400 = 0$
Whence, T = 122.6 or – 182.6 [using the quadratic equation: $T = \{ - b \pm v (b^2 – 4ac)\} / 2a\}$]
Since T (the transferred value) cannot be negative,
T = ₹ 1,22,600.
□ the required transfer price is ₹ 1,22,600 / 1,200 t = ₹ 102.17 per tonne.
P/V ratio on internal transfer:

With projected transfer price (₹ In "000") of ₹ 90 per tonne				With suggested (required) transfer price of ₹ 102.17 per tonne.			
Sales	---	320	320	Sales	---	320	320
Transfer	108	(108)	---	Transfer	122.6	(122.6)	---
Var. cost	(70)	(60)	(130)	Var. cost	(70)	(60)	(130)
Contbn.	38	152	190	Contbn.	52.6	137.4	190
P/V%	35.2%	47.5%	59.4%	P/V%	42.9%	42.9%	59.4%

It is seen that the difference in PV ratios between W and R is gone with the introduction of the suggested (as required by MD) transfer price. This change will do away with the grievance of the divisional managers but will not affect the overall PV ratio of the company.

15.(b) A Company fixes the inter-divisional transfer prices for its products on the basis of cost plus an estimated return on investment in its divisions. The relevant portion of the budget for the Division A for the year 2012-13 is given below:

Particulars	Amount in ₹
Fixed assets	**5,00,000**
Current assets (other than debtors)	**3,00,000**
Debtors	**2,00,000**
Annual fixed cost for the division	**8,00,000**
Variable cost per unit of product	**10**
Budgeted Volume of production per year (units)	**4,00,000**
Desired Return on investment	**25%**

You are required to determine the transfer price for Division A.

Solution:

Particulars	Amount in ₹
Variable cost	10.00
Fixed Cost (8,00,000/4,00,000)	2.00
Total cost	12
Add: Desired return (10,00,000x 25%)÷4,00,000	0.625
Transfer price	12.625

Section B – Cost Records and Cost Audit

16. a) Are there any sectors exempted under Companies (Cost Accounting Records) Rules 2011?

Answer.

MCA General Circular No. 67/2011 dated 30th November 2011, states that the Companies (Cost Accounting Records) Rules, 2011 are not applicable to wholesale & retail trading, banking, financial, leasing, investment, insurance, education, healthcare, tourism, travel, hospitality, recreation, transport services, business/professional consultancy, IT & IT enabled services, research & development, postal/courier services, etc. unless any of these have been specifically covered under any other Cost Accounting Records Rules.

b) A company , manufacturing Cotton Textile , wrote off in the same year , the expenditure in replacement of Copper Rollers used for printing fabrics and Stainless Steel frames used for Dying Yarn whose life are more than one year. State whether the Cost Auditor can qualify the report for these?

Answer.

The Cost Auditor is justified in qualifying his report since as per the Cost Accounting Records(Textiles) Rules , cost of items like Copper Rollers used for printing fabrics and the stainless steel frames used for dying yarn put into use in the relevant year shall be treated as deferred revenue expenditure and spread over the effective life of such items . Thus writing off such items in same year is not correct.

c) Para 9 of the Companies (Cost Audit Report) Rules 2011 requires disclosure of "Cost of Production" and "Cost of Sales" at a company level. How the same would be available when all the products/ activities are not covered under cost audit?

Answer.

The Companies (Cost Accounting Records) Rules 2011 [CARR] is now applicable to all companies engaged in production, processing, manufacturing & mining. Hence, product-wise/ activity-wise cost of production and cost of sales would be available from the Cost Accounting Records of all the products/ activities, irrespective of whether these are covered under cost audit or not.

It may further be noted that in such a situation, the company would also be required to file a compliance report and for this purpose, product-wise/ activity-wise cost of production and cost of sales would be determined to prepare the reconciliation statement as required in the compliance report.

d) What is 'equalised transportation cost ' under CAS 5?

Answer.

The term 'equalised transportation cost' has been defined as average transportation cost incurred during a specified period. The standard requires the detailed record to be maintained w.r.t collection , allocation , and apportionment of transportation cost .

e) The Companies (Cost Accounting Records) Rules 2011 have not prescribed any specific formats for the cost statements. In what manner and format would the cost statements be kept under these Rules?

Answer.

As per sub rule (2) of Rule 4, the companies are required to maintain cost records on regular basis in such manner so as to make it possible to calculate per unit cost of production or cost of operations, cost of sales and margin for each of its products and activities for every financial year on monthly/quarterly/half-yearly/annual basis. The cost statements are to be prepared for every unit and every product produced, processed, manufactured or mined.

As per sub rule (3), the cost records are to be maintained in accordance with the generally accepted cost accounting principles and cost accounting standards issued by the Institute; to the extent these are found to be relevant and applicable.

17. As a Cost management Auditor, you are asked to look into the proposed decision of accompany to temporarily suspend operations due to depressed market conditions.
The data available are:

Budgeted level (per annum)	Capacity Utilisation ₹ In '000	
	60%	80%
Direct Material	180	240
Direct Labour	240	320
Production overhead	126	138
Administrative overhead	62	66
Selling & Distribution overhead	68	74
Total	676	838

The company is likely to operate at 50% capacity only and the turnover is expected to be ₹ 4,95,000 p.a. Market Research indicates that the depression will be over in a year and after that they can effect a sale of ₹ 9,00,000 p.a. utilizing 75% of capacity.
If operations are suspended for a year, the following cost will be incurred:
---- Fixed cost ₹ 40,000;
---- Settlement with labour force will cost ₹ 35,000;
---- Maintenance of plant will continue and cost ₹ 10,000;
---- Cost of re-opening will be ₹ 10,000.
Draft a report to the Management of the following two options:
(i) To suspend production for one year and restart thereafter when market improves.
(ii) To continue production at 50% capacity level.

Answer
To
The Managing Director,

Dear Sir,

Sub: Report on proposal for temporary suspension of Operations due to depressed market conditions.

This has reference to your letter no _____ dated_____

As desired, I have examined carefully both the options that are available viz.,
(i) To suspend production for one year and restart thereafter when market improves, or
(ii) To continue production at 50% capacity level.

Due to depressed market condition, the plant has to be operated only at a low cost capacity utilization of 50%. The market research report has predicted that the adverse market conditions are going to be a temporary phenomenon for a period of only one year.

Thereafter, the market conditions shall improve considerably due to which it would be possible to operate the plant (after one year) at 75% capacity utilization with a turnover of ₹ 9,00,000.
Details pertaining to the feasibility of both the options are as under:

Option – 1: Suspension of Production for one year.
As per the question, the following cost will be incurred:

Particulars	₹
Fixed Cost	40,000
Settlement with labour	35,000
Plant maintenance	10,000
Cost of re-opening	10,000
Total	95,000

Option – II: Continue operations at 50% capacity level.

Particulars	**50% Capacity Current Year** ₹	**75% Capacity Next Year** ₹
Direct Materials	1,50,000	2,25,000 (Note – 1)
Direct Labour	2,00,000	3,00,000 (Note – 2)
Production Overhead	1,20,000	1,35,000 (Note – 3)
Administrative Overhead	60,000	65,000 (Note – 4)

Selling & Distribution Overhead	65,000	72,500 (Note – 5)
Total Cost	5,95,000	7,97,500
Sales	4,95,000	9,00,000
Profit/Loss	(-) 1,00,000	(+) 1,02,500

Analysis of the above Comparative data shows that if the company continues operations as 50% capacity, there will be a loss of ₹ 1,00,000.
If, on the other hand, operations are suspended for one year, the loss will be ₹ 95,000. Thus if operations are continued, there will be additional loss of ₹ 5,000.
If the operations are suspended, the company may have encounter the following problems:
Once operations are suspended, the company may face a lot of practical difficulties for resuming production like
---- Recruitment of new personnel,
---- Link with old customer will be broken,
---- it may have an adverse effect on the image of the company,

Attaining 75% capacity utilization immediately after closer for a year may not be easy to achieve. It may therefore be seen from above that even though the Company may save just ₹ 5,000 merely by suspending operations for a year, but by doing so it may have to face a lot of difficulties as listed above.

Final Recommendation: The company is advised to continue production at 50% capacity utilization and never mind the small loss of ₹ 5,000 by continuing production in view of factors discussed above.

Hope you would find the above report and analysis to be in order.

Thanking you very much,

Sd/-
(Cost and Management Auditor)

Working Notes:
Note – 1:
Direct Material Cost is a 100% Variable Cost
Direct Material Cost at 75% Capacity = 1,80,000/60 x 75 = ₹ 2,25,000
Direct Material Cost at 50% Capacity = 1,80,000/60 x 50 = ₹ 1,50,000.

Note – 2:
Direct Labour Cost is a 100% Variable Cost.
Direct Labour Cost at 75% Capacity = 2,40,000/60 x 75 = ₹ 3,00,000
Direct Labour Cost at 55% Capacity = 2,40,000/60 x 50 = ₹ 2,00,000.

Note – 3:
Production Overhead is a semi-variable cost.
At 80%, Production Overhead is ₹ 1,38,000
At 60%, Production Overhead is ₹ 1,26,000
For 20% Variation, difference is ₹ 12,000
Variable production overhead at 60% capacity = 12,000/20 x 60 = ₹ 36,000
Fixed production overhead = ₹ 1,26,000 - ₹ 36,000 = ₹ 90,000
This at 50% capacity, Fixed production overhead = ₹ 90,000 and

Variable production overhead = ₹ 36,000/60 x 50 = ₹ 30,000
Therefore at 50% capacity, total production overhead = ₹ 90,000 + ₹ 30,000 = ₹ 1,20,000
Similarly at 75% capacity,
Variable production overhead = 36,000/60 x 75 = ₹ 45,000
Therefore, Total Production Overhead at 75% Capacity = ₹ 90,000 + ₹ 45,000 = ₹ 1,35,000

Note- 4:
Administrative overhead is a semi-variable overhead.
At 80% capacity, Administrative overhead = ₹ 66,000
At 60% capacity, Administrative overhead = ₹ 62,000
For 20% capacity, = ₹ 4,000
At 60% capacity,
Variable Administrative Overhead = ₹ 4,000/20 x 60 = ₹ 12,000
Therefore, Fixed Administrative Fixed Administrative Overhead = ₹ (62,000 – 12,000) = ₹ 50,000
Similarly, at 50% capacity,
Variable Administrative Overhead = ₹ 12,000/60 x 50 = ₹ 10,000
Therefore, Total Administrative overhead at 50% = ₹ 10,000 + ₹ 50,000
(Variable) (Fixed)
= ₹ 60,000
At 75% Capacity, Variable Administrative O/H = 12,000/60 x 75 = ₹ 15,000
Therefore, Total Administrative O/H = ₹ 15,000 + ₹ 50,000
(Variable) (Fixed)
= ₹ 65,000

Note – 5:
Selling and Distribution O/H (S&D O/H);
This is a semi- variable O/H.
At 80%, S&D O/H = ₹ 74,000
At 60%, S&D O/H = ₹ 66,000
For 20% Difference = ₹ 6,000
Therefore, at 60% capacity, S&D O/H = 6,000/20 x 60 = ₹ 18,000
Therefore, at 60% capacity, Fixed S&D O/H = ₹ (68,000 – 18,000) = ₹ 50,000
Therefore, at 50% capacity Variable S&D O/H = 18,000/60 x 50 = ₹ 15,000
Therefore, at 50% capacity Total S&D O/H = ₹ 15,000 + ₹ 50,000 = ₹ 65,000
(Variable) (Fixed)
Similarly at 75%, Variable S&D O/H = 18,000/60 x 75 = ₹ 22,500
Therefore, Total S&D O/H at 75% capacity = ₹ 22,500 + ₹ 50,000 = ₹ 72,500
(Variable) (Fixed)

18. a) ABC Ltd. has received an enquiry for supply of 200000 numbers of Special Type of Machine Parts. Capacity exists for manufacture of the machine parts, but a fixed investment of ₹ 80000/- and working capital to the extent of 25% of Sales Value will be required to undertake the job.
The costs estimated as follows:
Raw Materials-20000Kgs @ ₹ 2.50 per kg.
Labour Hours-9000 of which 1000 would be overtime hours payable at double the labour rate.
Labour Rate- ₹2 per hour.
Factory Overhead-₹ 2 per direct labour hours
Selling and Distribution Expenses- ₹ 23000
Material recovered at the end of the operation will be ₹6000 (estimated).

The Company expects a Net Return of 25% on Capital Employed.
You are Management Accountant of the Company. The Managing Director requests you to prepare a Cost and Price Statement indicating the price which should be quoted to the Customer.

Solution.
Statement of Cost and Price Quotation.
Product : Special Type Machine Parts. Quantity=200000 units.

	₹	₹
Materials(20000 Kgs. @ ₹2.50)	50000	
Less: Scrap value	6000	44000
Labour-		
8000 hrs @ ₹ 2	16000	
1000(OT)hrs @ ₹ 3	4000	20000
Prime Costs		64000
Factory overhead(9000 hrs @ ₹ 2)		18000
Factory Costs		82000
Selling and Distribution Expenses		23000
Total Costs		105000
Profit (Expected)		28333
Sales		133333

Selling Price / unit = 133333/200000= ₹0.67

Working Notes:
Calculation of Sales.
Let Sales be S

S= Total Cost + 25 % of Capital Employed.
=105000+25/100*(80000+S/4)
=105000+80000+S/16
Or, 16 S =1680000+320000+S
Or, 15 S=2000000
Or, S =133333.33.
Sales = ₹ 133333
Profit= Sales-Cost=133333-105000=₹ 28333
Working Capital=1/4th of Sales =133333 *1/4= ₹ 33333/-

b) How are Abnormal loss of recurring nature treated as per costing principles?

Answer.
If a particular cost is of abnormal nature but it is or recurring nature it should be treated as part of cost and not mentioned in para 17 of the Annexure to Cost Audit report. For e.g 'off-season' salary and wages paid to employees in sugar industry should not be taken as abnormal as they are recurring every year and treated as a part of cost.

19. a) Distinguish between "Notes" and "Qualifications" in Cost Audit Report. Give suitable examples.

Answer.

a) 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 good 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) Why is Cost Audit Report not made public? State whether a member of Parliament have access to the Cost Audit Report?

Answer.

According to Cost Audit Report Rules, the Cost auditor is required to submit the Cost Audit Report to the Central Government and a copy thereof to the company concerned. The shareholders and the general public have no access to the Cost audit Report unlike the Financial Audit Report. Cost Audit Report is treated as a confidential document as it contains vital information which if divulged would affect competitiveness of trade and business of the company whose information is so divulged. A Cost Audit Report contains important information such as :

I) A detailed note on manufacturing process of the Company.

II) Quantities and rates of various items of input materials, i.e the entire recipe is given.

III) Quantities and rates of utilities consumed.

IV) Average sales realization, sales promotion expenses including discount allowed.

V) Details regarding export market, quantity exported, F.O.B realization etc.

VI) Any other energy saving measure or technical improvement in process , which a company might have implemented arising out of its own research.

Such data , as a measure of business strategy should not be made available to the competitors who may take advantages and put the company to a disadvantageous position. As such cost data is a secret matter and the company secrets and management strategy contained therein should not be disclosed. There is a provision under subsection(10) of section 233-B of the Companies Act that Central Government can direct a company to make available the Cost Audit Report in full or in part to the shareholders. However this power has not been exercised so far.

It is for the same reason mentioned above that members of parliament are not allowed to access Cost Audit Report. It is the Parliament who has made the law under which Cost Audit Report is treated as confidential document other than for the Government and the company .

So unless the law is changed, members, who are representatives of public cannot have access to Cost Audit Report. But Government have agreed to give all non confidential information like overall profitability, capacity utilization etc from Cost Audit Report. In view of what has been stated above, there is no specific provision in the Companies Act or Cost Audit Report Rules to make the Cost Audit Report being made available to members of Parliament.

20. Comment on the following:
i)A company has not maintained cost accounting records though having the obligation under 209(1)(d) notification. The management is of the opinion that necessary steps could be taken after the cost audit order is received from Government. Are the Directors of the Company absolved of the obligation to maintain cost accounting records?
ii)A company receives the Cost Audit report for a period after filing of the Income Tax Return. Is the company required to submit a copy of the report to the ITO? If yes, what is the period by which the Report must be so filed?
iii)During plant stoppages, the operational labour is being utilized by the company for cleaning, oiling, and such other routine jobs of the same plant. Their wages for the period also are treated as direct wages in cost of production.
iv)Sugar mills use bagasse as fuel in the boilers. One sugar mill has not valued bagasse as according to the management it has incurred no cost in acquiring it. What is the requirement under 209(1)(d) regulations relating to sugar?

Answer.
i) The obligation to maintain cost accounting records as per the rules provided under Section 209(1)(d) is a continuing one independent of whether cost audit is ordered or not. The financial auditor also has an obligation to certify under CARO that such records have been maintained. The directors of the company cannot be absolved of the obligation as per the Rules 3 and 4 of the 209(1)(d) regulation.

ii) Sections 139(9)(e) of the Income Tax Act, 1961 requires the filling of the Cost Audit Reports along with the Income Tax return wherein an audit is ordered. Where the cost audit report is delayed beyond the date for filing of the IT Return, the Company is bound by law to submit a copy of the report to the IT authorities. There is no time limit specified for this. This must be done within a reasonable time as per general construction of law.

iii) Where operating workers are required to perform certain type of work which otherwise falls in the category of indirect labour, like oiling, cleaning, maintenance etc., their wages should be treated as indirect wages and accordingly be included in overhead.

iv) Bagasse is a by product in sugar industry, which has a realizable value. As the company is using bagasse as a fuel to produce steam, the bagasse should be valued at its realizable value. In absence of a market price , bagasse may be valued on the basis of average pithead price of coal after converting the weight of bagasse into equivalent coal adopting a thermal equivalency.

21. a) How are Cost Accounting Record Rules different from Cost Accounting Standards?

Answer.

a)

Cost Accounting Record Rules	Cost Accounting Standards
Cost Accounting Record Rules are prescribed by the Central Government w.r.t utilization of material, labour or other items other items of cost in respect of a class of companies notified under the provisions of Companies Act, 1956.	Cost Accounting Standards (CAS) are a set of standards designed to achieve uniformity and consistency in cost accounting practices. These are prescribed by Cost Accounting Standard Board(CASB) set up by The ICWAI.
Separate Rules are prescribed for each class of industry or product. Presently 44 products have been under the respective Cost Accounting Record Rules. So coverage of these rules is limited to selected companies only falling in 44 industries.	CAS on other hand are uniformly applicable to all the units including companies and easier to understand and flexible. The coverage is therefore wider.At present there are 12 Cost Accounting Standards.
Most of the Companies today are multi product organizations where only one are two products are covered by the Record Rules. Products under these Rules will be covered by different set of Rules, making it difficult for the Companies to comply them.	On other hand CAS will be equally applicable to the companies and all product manufacturers. Therefore many experts are of the opinion that prescription of Cost Accounting through CAS with appropriate compliance audit or disclosure norms may be much more effective and useful than through complicated Cost Accounting Record Rules. Moreover this will bring more numbers of companies under the ambit and will help Govt. to achieve its objectives.

21. b) A company under Cost Audit maintains its records on standard costing system. Is this acceptable for Cost Audit? What are the requirements in regard to variances and their treatment in cost proformae?

Answer.

Where a company maintains cost records on any basis other than actual such as standard costing, the records shall indicate the procedure followed by the company in working out the cost of the activities and services under the system. The cost variances shall be shown against separate heads and analyzed into material, labour, and overheads and further into quantity, price, and efficiency variances. The method followed for adjusting cost variances in determining the actual cost of activities or services should be clearly indicated in cost records. The reasons for variances should also be clearly explained in cost records.

The cost auditor should verify that treatment of variances in cost statements is reasonable and consistently applied. Whether variances are intentioned or not will be a point of specific mention by the cost auditor.

Section C – Economics for managerial decision-making

22. What are the pricing policies for introduction stage of a new product?

Answer.
There are two alternative price strategies which a firm introducing a new product can adopt, viz., skimming price policy and penetration pricing policy.

a) Skimming Price Policy:

When the product is new but with a high degree of consumer acceptability, the firm may decide to charge a high mark up and, therefore, charge a high price. The system of charging high prices for new products is known as price skimming for the object is to "skim the cream" from the market. There are many reasons for adopting a high mark-up and, therefore, high initial price:

i) The demand for the new product is relatively inelastic. The high prices will not stop the new consumers from demanding the product. The new product, novelty, commands a better price. Above all, in the initial stage, there is hence cross elasticity of demand is low.

ii) If life of the product promises to be a short one, the management may fix a high price so that it can get as much profit as possible and, in as short a period as possible.

iii) Such an initially high price is also suitable if the firm can divide the market into different segments based on different elasticity's. The firm can introduce a cheaper model in the market with lower elasticity.

iv) High initial price may also be needed in those cases where there is heavy investment of capital and when the costs of introducing a new product are high. The initial price of a transistor radio was ₹ 500 or more (now ₹ 50 or even less); electronic calculators used to cost ₹ 1,000 or more, they are now available for ₹ 100 or so.

b) 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:

a) 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.

b) The low price will help to maximize the sales of the product even in the short period.

c) 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.

23. a) What is going rate pricing ?

Answer.
A method of pricing adopted by small firms – which are price followers – is known as going rate pricing. Under this system, a firm sets its price according to the general pricing structure in the industry or according to the price set by the price leader. In a sense, each firm has "monopoly" power over its produce and it can, if it chooses, fix a monopoly price and face all the consequences of monopoly. In practice, however, it prefers the easier and more practical method of choosing price going in the market. It will change its price only when other firms do the same. Such a price policy is useful and safe to a firm under certain circumstances. For instance, the firm may not have an accurate idea of its costs or it may like to play safe and not provoke the larger firm to go for cut-throat competition. Besides, it is difficult for each firm to calculate the full implication of change in costs and prices and it is much better to follow the same pattern of pricing adopted by others. Even a large firm may be satisfied with going rate pricing lest a change in price by it unnecessarily disturbs the whole market. No firm would like to "spoil" the common market by reducing the price.

b) The cost function 'c' of a firm = $\frac{1}{3}x3 - x^2 + 5x + 3$, find the level at which the marginal cost and the average variable cost attain their respective minimum.

Solution:

$C = \frac{1}{3}x^3 - x^2 + 5x + 3$

Marginal Cost = $\frac{dc}{dx} = \frac{1}{3}3x^2 - 2x + 5$

$= x^2 - 2x + 5$ ('y' say)

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

$\therefore x = 1$

$\frac{d^2y}{dx^2} = 2$, which is positive

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

Average Variable Cost = $\frac{1}{3}x^2 - x + 5$ (y say)

$\frac{d}{dx}$ {Average Variable Cost} = $\frac{1}{3}x - 1 = 0$

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

$\therefore x = \frac{3}{2}$

$\frac{d^2y}{dx^2} = \frac{2}{3}$, positive

$\therefore$ Average Variable Cost is minimum at output $x = \frac{3}{2}$

24. a) 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.

Solution:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

b) What are the conditions for price discrimination ?

Answer.

The price discrimination is possible if the following conditions are satisfied.

(i) More than one Market: There must be two or more than two separate markets otherwise the price discrimination is not possible. Different markets must be essential for charging different prices from different persons.

(ii) Different elasticity: The elasticity of demand in each market must be different. It means that if one market is less elastic than the other it should be elastic. If the elasticity of demand is equal in all markets there will be no scope for price discrimination.

25. Find the Elasticity of Demand for the following:

i. **P =** $\frac{10}{x+2^{2}}$

ii. **P =** $\frac{4}{2x+1^{2}}$

iii. **$x \cdot p^n = K$, where n, k are constant.**

Solution:

(i) $P = \frac{10}{x+2^{2}} = 10\ (x+2)^{-2}$

Differentiating w.r.to x

$= \frac{dp}{dD} = 10(-2)(x+2)^{-3} = -20\ (x+2)^{-3}$

$\frac{P}{x} = \frac{10}{x(x+2)^2}$

Elasticity of demand (E_p) =

$\frac{dx}{dp} \div \frac{x}{p} = -\left|\frac{dx}{dp} \times \frac{p}{x}\right|$

$\frac{dx}{dp} = \frac{1}{20\ x+2^{-2}} = \frac{x+2^{3}}{20}$

$\frac{dx}{dp} \times \frac{P}{x} = \frac{x+2^{3}}{20} \times \frac{1}{x(x+2)^2}$

$= \frac{-(x+2)}{2x}$

ii) $P = \frac{4}{(2x+1)^2} = 4\ (2x+1)$

$\frac{dp}{dx} = 4 \times -2 \times (2x+1)^{-3} = -8\ (2x+1)^{-3}$

$\frac{dx}{dp} = -\frac{1}{8(2x+1)^3} = -\frac{1}{8}(2x+1)^3 = \frac{(2x+1)^3}{8}$

$= \frac{P}{x} = \frac{4}{x(2x+1)^2}$

Elasticity of demand (E_p) = $\frac{(2x+1)^3}{8} \times \frac{4}{x(2x+1)^2} = \frac{(2x+1)}{8}$

iii) $x \times p^n = k$

$$x = \frac{k}{p^n}$$

$$\frac{x}{p} = \frac{k}{p^n xp} = \frac{k}{p^{n+1}}$$

Differentiating w.r.to x.

$x \times n.p^{n-1} + p^n.1 = 0$

$$\frac{dp}{dx} . xnp^{n-1} + p^n = 0$$

$$= \frac{dp}{dx} . xnp^{n-1} - p^n$$

$$\frac{dx}{dp} = \frac{-pn}{x.n.pn-1} = \frac{-p}{xn}$$

$$\frac{dx}{dp} = \frac{xn}{p}$$

$$\frac{p}{x} = \frac{p^{n+1}}{k}$$

$$E_p = \frac{x_n}{p} x \frac{p^{n+1}}{k}$$

$$= \frac{xnp^n}{k}$$

26. a) K Ltd. sells output in a perfectly completive market. The average variable cost function of K Ltd. is

$AVC = 300 – 40Q + 2Q^2$

K Ltd has an obligation to pay ₹ 500 irrespective of the output produced.

What is the price below which K Ltd. has to shut down its operation in the short run?

Solution:

A firm has to shut down its operation , if the price is less than average variable cost .

Under perfect competition

P = MR

i.e. Price is equal to marginal revenue. The firm will continue its operation under the short run so long as price is atleast equal to average variable cost.

Thus the equilibrium price which the firm will shut down is the minimum AVC i.e. the average variable cost .

$AVC = 300 – 40Q + 2Q^2$

AVC is minimum where $\frac{d(AVC)}{dQ} = 0$

i.e. $\frac{d(AVC)}{dQ} = - 40 + 4Q = 0$

i.e. Q = 10 units.

when the firm is producing 10 units,

$AVC = 300 – 40Q + 2Q^2$

$= 300 – 40(10) + 2 (10)^2$

$= 300 – 400 + 200 = 100$

If the price falls before ₹ 100 the firm has to shut down its operation under short run.

26. b) What is the difference between perfect competition and monopoly.

Answer.

The following are some of the differences between perfect competition and monopoly.

(i) In perfect competition there is large number of buyers and sellers who are producing homogeneous products therefore the activity of single seller may not influence the market price but in monopoly there is single seller. He controls the entire supply of the commodities. In this there is no competition.

(ii) In perfect competition the revenue curves are parallel to X-axis and where as in monopoly the revenue curves are falling down from left to right. We can know the nature of revenue curves with the help of following diagrams.

(iii) In perfect competition because of uniform price level the average revenue and marginal revenue are equal and they are parallel to X-axis but in monopoly the average cost and the marginal revenue curves fall down from left to right. If the monopolist wants to sell more he must reduce the price level and if he wants to fix more price he must reduce the output.

(iv) Under perfect competition the price is determined at that point where the demand and supply both are equal. In this competition both price and output are determined at equilibrium point. But in monopoly only the output is determined t that level where MC=MR.

(v) In perfect competition there is a free entry & exit. The new firms may enter the market when the existing firms are getting abnormal profits and leave the market when they are getting losses. But in monopoly the other firms have no freedom to enter the market.

In perfect competition the firm gets an equilibrium position where the marginal cost is at raising stage, if the marginal cost curve fall down there is no possibility of equilibrium between MC and MR. In monopoly market the firm may get an equilibrium position where the MC curve is at raising stage, constant or at falling stage.

(vi) In perfect competition there is a difference between firm and Industry. Firm is a production unit and where as industry is a group of firms. But under monopoly market, there is no difference between the firm and Industry and both is same.

(vii) In the short period under perfect competition the firm may get abnormal profits. But in the long run normal profits because of free entry, exit the firm. But in monopoly the firm may get abnormal profits in short period and in long period the firm may get normal profits, because of no free entry.

(viii) The average cost becomes minimum at equilibrium point under perfect competition. In the case of monopoly AC curve is falling at equilibrium point i.e., point R.

(ix) In perfect competition the output is more when the price is less and where as in monopoly the output is less and price is more.

(x) In perfect competition there is no price discrimination. Fixing of different prices to different customers for the same article is said to be price discrimination. The price discrimination is not possible under perfect competition. But in monopoly market there is a possible for price discrimination. Monopolist can fix different prices to different customers for the same commodities.

27. A firm assumes a cost function c(x) = x $(\frac{x^2}{10}+200)$, x is a monthly output in thousands of units. Its revenue function is given by R (x) = $\left(\frac{2200-3x}{2}\right)$x Find i) If the firm decides to produce 10,000 units per month, the firms cost and Marginal cost. ii) If the firm decides to produce Marginal cost of 320, the level of output per month, and cost of the firm. iii) The marginal revenue function. iv) If a decision is taken to produce 10,000 units each month, the total revenue and marginal revenue of the firm. v) If the firm produces with a marginal revenue of 1040, the firm's monthly output and monthly revenue. vi) The firm's profit function and marginal profit function. vii) The output required per month to make the marginal profit =0, and find the profit at this level of output. viii) Find the marginal revenue and the marginal cost at the output obtained in (vii) above comment upon the result.

Solution:

$C = x\ (\frac{x^2}{10}+200) = \frac{x^3}{10}+200x$

X = '000 units p.m.

$R = \left(\frac{2200-3x}{2}\right)x = \frac{2200-3x^2}{2}$

i) if firm's output – 10,000 units per month.

$Cost = 10\ \left(\frac{100}{10}+200\right) = 2,100$

$MC = \frac{dc}{dx} = \frac{3x^2}{10} + 200$

Marginal Cost (at x = 10) = $\frac{3(100)}{10} + 200 = 230$

ii) i.e., MC = 320

$\frac{3x^2}{10} + 200 = 320$

$3x^2 + 2000 = 3,200$

$3x^2 = 1200$

$x^2 = 400$

$\therefore \sqrt{400} = 20$

$\therefore$ Total cost = $\frac{20.20.20}{10} + 200 \times 20 = 4,800$

iii) Marginal Revenue

$= MR = \frac{dr}{dx} = \frac{2200}{2} - \frac{6x}{2}$

$= 1100 - 3x$

iv) Total revenue at x = 10

is $\frac{2200x10 - 3(100)}{2} = \frac{2200 - 300}{2} = \frac{21700}{2}$

= 10850

Marginal Revenue = 1100 – 3 x 10 = 1070

v) Given, MR = 1040

i.e. 1100 – 3x = 1040

–3x = –60

x = 20

Monthly Revenue = $\frac{2200 \times 20}{2} - \frac{3 \times 400}{2}$

= 22000 – 600 = 21400

vi) Profit = R – C = $\frac{2200x}{2} - \frac{3x^2}{2} - \frac{x^3}{2} - 200x$

Marginal Profit $\frac{-x^3}{10} - \frac{3x^3}{2} + 900x$ (say p)

= $\frac{dp}{dx} = \frac{3x^3}{2} - \frac{6x}{2} + 900$

vii) MP = 0 (given)

$(-3x^2/2) - 3x + 900 = 0$

$\Rightarrow -3x^2 - 30x + 9000 = 0$

$x^2 + 10x - 3000 = 0$

$x^2 + 60x - 50x - 3000 = 0$

$x(x + 60) - 50(x + 60) = 0$

$x(x-50)(x + 60) = 0$

$\therefore x = 50$ or $x = -60$

Profit = R – C = $\frac{2200x}{2} - \frac{3x^2}{2} - \frac{x^3}{2} - 200x$

Profit, at output x = 50

= 28750

viii) Marginal cost at x = 50

= $\frac{3x^2}{2} + 200 = \frac{3(2500)}{10} + 200 = 950$

Marginal Revenue = at x = 50

1100 – 3x = 1100 – 3 x 50 = 950

Profit will be maximum at MC = MR

28. a) A radio manufacturer produces 'x' sets per week at total cost of ₹ $x^2 + 78x + 2500$. He is a monopolist and the demand function for his product is x = $\frac{(600 - p)}{8}$, when the price is 'p' per set show that maximum net revenue is obtained when 29 sets are produced per week what is the monopoly price.

Solution:

Cost (C) = $x^2 + 78x + 2500$

Demand (D) X = (600 – P) / 8
8x = 600 – P

$\therefore$ P = 600 – 8x
Total Revenue per 'x' sets
Price x i.e., $600x - 8x^2$
Maximum revenue is obtains at MC = MR

Marginal Cost = $\frac{dc}{cx}$ = 2x + 78 – (i)

Marginal Revenue = $\frac{dr}{cx}$ = 600 – 16x – (ii)

Equity (i) & (ii)
2x +78 = 600 – 16x
= 18x = 522

$\therefore x = \frac{522}{15} = 29$

Monopoly price 600 – 8x
600 – 8 × 29
= 600 – 232 = 368

b) What are the components of time series ?

Answer.
A typical time services has the following four major components:

i) A Secular trend: representing the long-term direction, or average movement in the time series.

ii) Cyclical fluctuations: which usually follow variations in the growth of the economy in general, around a long-term, secular trend

iii) 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).

iv) Random or unsystematic variations: such as wars, revolutions, crop failures, natural calamities, and changes in tastes and preferences of buyers.

29. Calculate the trend values by the method of least squares from the data given below and estimate the sales for the year 2013.

Year	**2008**	**2009**	**2010**	**2011**	**2012**
Sales of G.A (₹ in lakhs)	**70**	**74**	**80**	**86**	**90**

Solution:

Calculation of Trend values by Least Squares Method

Year (t)	Sales Y	Time deviation(X)	XY	X^2	Trend values Y_c
2008	70	-2	-140	4	69.6
2009	74	-1	-74	1	94.8

2010	80	0	0	0	80.0
2011	86	+1	+86	1	85.2
2012	90	+2	+180	4	90.4
N =5	**∑Y=400**	**∑x=0**	**∑xY=52**	**$\sum x^2$=10**	**$\sum Y_c$=400**

Equation of Trend line = $Y_c = a + bX$ ==> $Y_c = a + (t-2010)$

Since X=0, $a = \sum Y/N = 80$

$b = \sum XY / \sum X^2 = 5.2$

The equation of Straight line would be Y = 80 + 5.2X. The value of Y when X = 2013 or in terms of deviation X = +5

$Y_{2013} = 80+(5.2 \times 5) = 80 + 26 = 106$

Trend value for 2008= 80 + (2008 – 2009) x 5.2 = 69.6

Similarly trend values for 2009, 2010 etc have been calculated.

30. What are the managerial use of production function?

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.