GROUP - II
Paper 8 - Cost & Management Accounting

1.

a) A firm requires 16,000 nos. of certain component, which it buys at ₹60 each. The cost of placing an order and following it up is ₹120 and the annual storage charges work out to 10% of the cost of the item. To get maximum benefit the firm should place order for how many units at a time?

b) What is Sunk Cost?

c) Time allowed for a job is 45 hours; a worker takes 40 hours to complete the job. Time rate per hour is ₹15. Compute the total earnings of the worker.

d) The extracts from the payroll of Dutta Bros. is as follows:-

Number of employees at the beginning of 2012	**150**
Number of employees at the end of 2012	**200**
Number of employees resigned	**20**
Number of employees discharged	**5**
Number of employees replaced due to resignation and discharges	**20**

Calculate the Labour Turnover Rate for the factory by different methods.

e) A work measurement study was carried out in a firm for 10 hours and the following information was generated.

Units produced	**340**
Idle time	**15%**
Performance rating	**120%**
Allowance time	**10% of standard time**

What is the Standard time for task?

Solution:

a)

Annual demand=16,000 units
Ordering cost=₹ 120
Storage cost=10% of ₹60 =₹ 6

$$EOQ=\sqrt{\frac{2\times Annual demand\times ordering cost}{10\%of₹60}}$$

$$=\sqrt{\frac{2\times 16{,}000\times 120}{6}}=800units$$

b) Sunk costs are historical costs which are incurred i.e. sunk in the past and are not relevant to the particular decision making problem being considered. Sunk costs are those that have been incurred for a project and which will not be recovered if the project is terminated. While considering the replacement of a plant, the depreciated book value of the old asset is irrelevant as the amount is sunk cost which is to written-off at the time of replacement.

c)

Total Earnings	=H x R+ 50% [S-H] R
Total Earnings	=40 x ₹15+50% [45-40] ₹15
Total Earnings	=₹600+ ₹37.5= ₹637.50

d)

(i) Separation Method	=25÷(150+200)/2 x100
	=0.1429 x100
	=14.29%

(ii) Replacement Method	=(20/175) x 100
	=11.43%

(iii) Flux Method	=(25+20)÷175 x 100
	= 25.71%

e)

Calculation of standard time for task

Total time= 10 x 60	=600 minutes
(-) Down time or idle time @ 15%	=90 minutes
Actual time	=510 minutes
Normal time= 510 x 120%	=612 minutes
(+) Relaxation allowance(10% or 1/10 on standard time i.e. 1/9 on normal time)	=68 minutes
Standard time for job	=680 minutes
Standard time for each unit=680/340	=2 minutes

2.

a) In a factory bonus system, bonus hours are credited to the employees in the proportion of time taken, which time saved bears to time allowed. Jobs are carried forward from one week to another. No overtime is worked and payment is made in full for all units worked on, including those subsequently rejected. From the fallowing information you are required to calculate for each employee:

(i) The bonus hours and amount of bonus earned;
(ii) The total wage costs; and
(iii) The wages cost of each good unit produced.

Particulars	Worker A	Worker B	Worker C
Basic rate per hour	**₹10**	**₹16**	**₹12**
Units produced	**2,600**	**2,200**	**3,600**
Time allowed for			
100 units	**2 hours 30 minutes**	**3 hours**	**1 hour 30 minutes**
Time taken	**52 hours**	**75 hours**	**48 hours**
Rejects	**100 units**	**40 units**	**400 units**

b) Distinguish between Scrap, Spoilage and Defectives in an engineering industry.

Solution:

a) The computation is shown in the following table:

Statement showing Bonus and Wage cost per unit

Particulars	Worker A	Worker B	Worker C
Units produced	2,600	2,200	3,600
Rejects	100 units	40 units	400 units
Good units	2,500 units	2,160 units	3,200 units
Time allowed for 100 units	2 hrs 30 minutes	3 hrs	1 hrs 30 minutes
Total time allowed	65 hours	66 hours	54 hours
Time taken	52 hours	75 hours	48 hours
Time saved [Time allowed-Time taken]	13 hours	-	6 hours
Basic rate per hour	₹10	₹16	₹12

Statement showing Bonus and Cost per unit

Particulars	Worker A	Worker B	Worker C
Basic wages	₹520	₹1,200	₹576
Bonus*	₹104	-	₹64
Total wage cost	₹624	₹1,200	₹640
Wages cost per unit of good units produced#	₹ 0.25	₹ 0.56	₹ 0.20

#Wages cost per unit of good unit is computed by dividing the total wages cost by the good units.

*Bonus is computed as follows:

The Bonus is to be paid in the proportion of time taken which the time saved bears to the time allowed. For A, the time saved is 13 hours while the time allowed is 65 hours. This means that the proportion of time saved to time allowed is 13/65=1/5 hours and hence the bonus is 1/5th of the basic wages i.e. ₹104.

For B, there is no time saved and hence he is not entitled for any bonus.

For C, time saved is 6 hours while the time allowed is 54 hours which means that the time saved is 1/9th.

b) Distinguish between Scrap, Spoilage and Defectives in an engineering industry.

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 be 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 subtle. In some engineering units, even they are all clubbed under one head.

3.

a) The production department of factory furnishes the following information for the month of March 2012:

Materials used	**₹54,000**
Direct wages	**₹45,000**
Overheads	**₹36,000**
Labour hours worked	**36,000**
Hours of machine operation	**30,000**
For an order executed by the department during a particular period, the relevant information was as under:	
Materials used	**₹6,00,000**
Direct Wages	**₹3,20,000**
Labour hours worked	**3,200**
Machine hours worked	**2,400**

Calculate the overhead charges chargeable to the job by the following methods:

(i) Direct materials cost percentage rate
(ii) Labour hour rate; and
(iii) Machine hour rate

b) Write short notes on Batch Costing.

Solution:

a)

(i) Direct material cost percentage rate= (overheads/ direct material) x 100	
=(₹36,000/54,000) x100	=66.67%
Materials used on the order ₹6,00,000, so overhead will be @ 66.67% = ₹4,00,000.	
(ii) Labour hour rate=Overhead/Direct labour hours	
=36,000/36,000	= ₹1
Overheads will be @ ₹1= 3,200 hrs x 1= ₹ 3,200	
(iii) Machine hour rate=Overhead/Machine hours	
= ₹ 36,000/30,000	= ₹1.2
Overheads will be ₹1.2 per hour x 2,400 hours = ₹2,880	

b) Batch Costing is very similar to job costing. Instead of a single job a number of similar units of the product are manufactured in a group or batch. The cost per batch is found and divided by the number of units in the batch to give the cost per unit. Batch costing becomes necessary in the following cases:

(i) When the customer orders a large number of identical units of the same product/part.
(ii) Internal manufacturing order is raised for a batch of identical parts.
(iii) Where it is vital that color or shading or specific characteristics of goods sold to a customer is uniform.

Batch Costing is employed in toy making, footwear, radio and T.V. parts, pharmaceuticals, watch making etc. When components are manufactured in batches, it becomes economical and reduces the overall cost of the product.

Two elements of cost, which help to determine the lowest cost of operation, are:

(i) Set up or operation cost-which remains fixed per batch irrespective of the size of the batch.

(ii) Carrying cost or storage cost, which vary directly with the size of the batch.

Taking into account the above determinants, the economic batch-quantity (EBQ) is determined by the following,

$$EBQ=\sqrt{\frac{2\times Annual demand\times set\ up\ cost\ per\ batch}{Annual cost\ of\ storing one\ unit}}$$

4. **IPL Limited uses a small casting in one of its finished products. The castings are purchased from a foundry. IPL Limited purchases 54,000 casting per year at a cost of ₹800 per casting.**

The castings are used evenly throughout the year in production process on a 360 day per year basis. The company estimates that it costs ₹9,000 to place a single purchase order and about ₹300 to carry one casting in inventory for a year. The carrying costs result from the need to keep the castings in carefully controlled temperature and humidity conditions, and from the high cost of insurance.

Delivery from the foundry generally takes 6 days, but it can take as much as 10 days. The days of delivery time and percentage of their occurrence are shown in the following table-

Delivery Time (days)	6	7	8	9	10
Percentage of occurrence	75	10	5	5	5

(i) Compute the Economic Order Quantity.

(ii) Assume that the company is willing to take a 15% risk of being out of a stock. What would be the safety stock and the Re-Order point?

(iii) Assume that the company is willing to take a 5% risk of being out of stock. What would be the safety stock and Re-Order point?

(iv) Assume 5% stock-out risk. What would be the total cost of ordering and carrying inventory for one year?

(v) Refer to the original data. Assume that using process re-engineering the company reduces its cost of placing a purchase of order to only ₹600. In addition, the company estimates that when the waste and in inefficiency caused by inventories are considered, the true cost of carrying a unit in stock is ₹720 per year. (a) Compute new EOQ and (b) How frequently would the company be placing an order, as compared to the old purchasing policy?

Solution:

(i) $EOQ=\sqrt{2AB\div C}$, Where,

A=Annual Requirement of materials= 54,000 castings

B= Buying cost per order= ₹9,000 per order

C=Carrying cost p.u. p.a.= ₹300 per unit per annum.

On substitution, EOQ=1,800 castings

(ii)

Average Consumption per day	=54,000 castings ÷ 360 days	=150 castings
Average lead time	=(10+6)÷2	=8 days
For **15% stock-out risk**, relevant delivery time (Cumulative percentage of occurrence up to 7 days is 75+10=85%. Hence, risk of stock-out is 15%)		=7 days
Hence Safety stock	=7 days consumption= 7 x150	**=1,050 Castings**

Re-order point	= Safety stock+ Lead time consumption	=1,050 +(150 x 8)	**2,250 Castings**

(iii)

For 5% stock-out risk, relevant delivery time	=9 days	
(Cumulative % of occurrence up to 9 days is 75+10+5+5=95%. Hence, risk of stock-out is 5%)		
Hence, Safety Stock	=9 days consumption=9 x 150	**=1,350 castings**

Re-order point	=Safety Stock+ Lead time consumption	=1,350 +(150 x 8)	**=2,550 castings**

(iv)

Ordering Costs per annum	=(54,000 ÷1,800)orders x ₹9,000 per order	=₹2,70,000
Carrying costs per annum	=(1,800 ÷ 2 +1,350 units) x ₹300 p.u. per annum(Since safety stock will always be held)	=₹6,75,000
Hence, Total costs per annum	=₹2,70,000+₹6,75,000	**=₹9,45,000**

(v) EOQ= $\sqrt{2AB \div C}$, Where,

A=Annual Requirement of Raw Materials = 54,000 castings.
B=Buying Cost per order = ₹600 per order.
C=Carrying Cost p.u. p.a. = ₹720 per unit per annum.
On substitution, **EOQ=300 castings.**

Number of orders p.a.	=54,000 ÷1,800	**=30 orders(old)**	And 54,000÷300	**=180 orders(new)**

The Company should be placing an order every alternative day (360 ÷ 180) i.e. once in two days under the new system, whereas it was making an order once in 12 days earlier. (360÷30)

5.

a) A factory has three production departments A, B and C and also two service departments 'X' and 'Y'. The primary distribution of the estimated overheads in the factory has just been completed. These details and the quantum of service rendered by the service departments, to the other departments are given below:

	A	B	C	X	Y
Primary distribution (₹)	**2,40,000**	**2,10,000**	**2,50,000**	**1,40,000**	**96,000**
Service rendered by					
Dept 'X'	**30%**	**20%**	**35%**	**-**	**15%**
Dept 'Y'	**25%**	**40%**	**25%**	**10%**	**-**

Prepare a statement showing the distribution of service dept. overheads to the production departments, by the simultaneous equation method.

b) The following are the costing records for the year 2012 of a manufacturing Company. Production 1,00,000 units; Cost of raw materials ₹20,00,000; Labour cost ₹12,00,000; Factory overheads ₹8,00,000; Office overheads ₹4,00,000; Selling Expenses ₹1,00,000, Rate of Profit 25% on the selling price. The manufacturing Company decided to produce 1,50,000 units in 2013. It is estimated that the cost of materials will increase by 20%, the labour cost will increase by 10%, 50% of the

overhead charges are fixed and the other 50% are variable. The selling expenses per unit will be reduced by 20%. The rate of profit will remain the same.
Prepare a cost statement for the year 2013 showing the total profit and selling price per unit.

Solution:

a)

Let, P and N be the total overheads of the service departments 'X' and 'Y' respectively.
Then,

P=1,40,000 + 0.10N i.e.,	10P - N	=14,00,000
N = 96,000 + 0.15P and	-0.15P+N	=96,000
(By adding)	9.85P	14,96,000
	P=14,96,000/9.85	=₹1,51,878
By substitution,	N = 96,000 + 0.15 x 1,51,878	
	=96,000 + 22,782	=₹1,18,782

Statement showing the distribution of service dept. overheads to the production departments

	(Production Depts.)			
Distribution of overheads of	**A(₹)**	**B(₹)**	**C(₹)**	**Total (₹)**
1,40,000 Deptt X (85% of ₹1,51,878)	45,563	30,376	53,157	1,29,096
96,000 Deptt Y (90% of ₹ 1,18,782)	29,696	47,513	29,695	1,06,904
2,36,000				
Total	75,259	77,889	82,852	2,36,000

b)

Statement of Cost & Profit (Cost Sheet)
(Output 1,00,000 units)

Particulars	**Cost per unit (in ₹)**	**Total Cost (in ₹)**
Raw Materials	20	20,00,000
Labour	12	12,00,000
Prime Cost	32	32,00,000
Add: Factory overhead	8	8,00,000
Work Cost	40	40,00,000
Add: Office Overhead	4	4,00,000
Cost of production	44	44,00,000
Add: Selling Expenses	1	1,00,000
Cost of sales	45	45,00,000
Add: Profit (25% on selling price or 33.33% on cost of sales)	15	15,00,000
Selling Price	60	60,00,000

Statement of Cost & Profit (Cost Sheet)
(Output 1,50,000 units)

Particulars	Cost per unit (in ₹)	Total cost (in ₹)
Raw Materials (₹20 x120% x 1,50,000)	24.00	36,00,000
Labour (₹12 x110% x 1,50,000)	13.20	19,80,000
Prime Cost	37.20	55,80,000
Add: Factory Overhead (₹8,00,000 x 50% + ₹4 x 1,50,000)	6.67	10,00,000
Work Cost	43.87	65,80,000
Add: Office Overhead (₹4,00,000 x 50% + ₹2 x 1,50,000)	3.33	5,00,000
Cost of Production	47.20	70,80,000
Add; Selling Expenses (₹1 x 80% x 1,50,000)	0.80	1,20,000
Cost of Sales	48.00	72,00,000
Add: Profit (25% on selling price or 33.33% on cost of sales)	16.00	24,00,000
Selling Price	64.00	96,00,000

6. ABC Ltd. are the manufactures of picture tubes for T.V. The following are the details of their operation during the year 2012:

Average monthly market demand	**2,000 tubes**
Ordering cost	**₹100 per order**
Inventory carrying cost	**20% per annum**
Cost of tubes	**₹500 per tube**
Normal usage	**100 tubes per week**
Minimum usage	**50 tubes per week**
Maximum usage	**200 tubes per week**
Lead time to supply	**8-10 weeks**

Compute from the above:

(i) Economic order quantity. If the supplier is willing to supply quarterly 1,500 units at a discount of 10% is it worth accepting?

(ii) Maximum level of stock

(iii) Minimum level of stock

(iv) Re-order level

Solution:

A	=Annual usage of tubes	=Normal usage per week x 52 weeks =100 tubes x 52 weeks =5,200
O	=Ordering cost per order	=₹100 per order
C	=Inventory carrying cost per unit per annum	=20% x ₹500 =₹100 per unit, per annum

$$EOQ = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 5{,}200 \text{units} \times ₹100}{₹100}} = 102 \text{tubes(approx.)}$$

If the supplier is willing to supply 1,500 units at a discount of 10% is it worth accepting?

Total Cost (when order size is 1,500 units) =Cost of 5,200 units+ Ordering cost+ Carrying cost.

=5,200 units x 450 +[(5,200units/1,500 units) x ₹100]+ (1,500 units x 20% x ₹450) ÷2
=₹23,40,000 + 346.67 + ₹67,500 = ₹24,07,847

Total cost (when order size is 102 units)

=5,200 units x ₹500 +[(5,200 units/102 units) x ₹100]+ (102 units x 20% x ₹500)÷2
=₹26,00,000 + ₹5,098.03 + ₹5,100 = ₹26,10,198.03

Since the total cost under quarterly supply of 1,500 units with 10% discount is lower than that when order size is 102 units, the other should be accepted. While accepting this offer capital blocked on order size of 1,500 units per quarter has been ignored.

Maximum Level of Stock
=Re-order Level+ Re-order Quantity- Min. Usage x Min. Re-order period
=2,000 units + 102 units - 50 units x 8 =1,702 units

Minimum Level of Stock
= Re-order Level – Normal usage x Average Re-order period
=2,000 units – 100 units x 9 weeks =1,100 units

Re-order Level
=Maximum Consumption x Maximum Re-order period
=200 units x 10 weeks = 2,000 units

7. The employees in a factory are paid wages at the rate of ₹7 per hour for an eight-hour shift. Each employee produces 5 units per hour. The overhead is ₹10 per direct labour hour. Employees and the management are considering the following piece rate wage proposal:

Upto 45 units per day of 8 hours-	**₹1.30 per unit**
From 46 units to 50 units-	**₹1.60 per unit**
From 51 units to 55 units-	**₹1.65 per unit**
From 56 units to 60 units-	**₹1.70 per unit**
Above 60 units-	**₹1.75 per unit**

The working hours are restricted to 8 hours per day. Overhead rate does not change with increased production.

Prepare a statement indicating advantages to employees as well as to management of production level of 40, 45, 55 and 60 units.

Solution:

Present cost of manufacture:	₹
Wages per hour	7
Overhead per hour	10
Conversion cost per hour	17
Conversion cost per unit (17/5)	3.40

Statement showing advantage to employees

Output	Time Wages per day (₹)	Piece Wages per unit (₹)	Per day (₹)	Benefit to employees (₹)
40	56.00	1.30	52.00	-4.00
45	56.00	1.30	58.50	+2.50
55	56.00	1.65	90.75	+34.75
60	56.00	1.70	102.00	+46.00

Statement showing advantage to Management

Output	Proposed piece rate (₹)	Piece Wages (₹)	Overhead (₹)	Proposed Total Cost (₹)	Total cost as per existing Scheme @ ₹ 3.40 p.u. (₹)	Saving ₹ (₹)
40	1.30	52.00	80.00	132.00	136.00	+4.00
45	1.30	58.50	80.00	138.50	153.00	+14.50
55	1.65	90.75	80.00	170.75	187.00	+16.25
60	1.70	102.00	80.00	182.00	204.00	+22.00

8. **XYZ Ltd. Company produced a simple product in three sizes X, Y and Z. Prepare a statement showing the selling and distribution expenses apportioned over these three sizes applying the appropriate basis for such apportionment in each case from the particulars indicated:**

Express the total of the costs so apportioned to each size as:

(i) Cost per unit sold (nearest paise).

(ii) A percentage of sales turnovers (nearest to two places for decimal).

The expenses are;

Expenses	Amount (₹)	Basis of apportionment
Sales salaries	10,000	Direct charge
Sales commission	6,000	Sales turnover
Sales office expenses	2,096	Number of orders
Advt. General	5,000	Sales turnover
Advt. specific	22,000	Direct charge
Packing	3,000	Total volume cu.ft. product sold
Delivery expenditure	4,000	-do-
Warehouse expenses	1,000	-do-
Expenses credit collection	1,296	Number of orders

Data available relating to the three sizes are as follows:

	Total	Size X	Size Y	Size Z
(i) No. of salesmen, all paid same salary	10	5	1	4
(ii) Units sold	10,400	3,400	4,000	3,000
(iii) No. of orders	1,600	700	800	100
(iv) % of specific advt.	100%	30%	40%	30%
(v) Sales turnover	2,00,000	58,000	80,000	62,000
(vi) Volume of cu.ft. per unit of finished products	-	5	8	17

Solution:

Statement showing apportionment of selling expenses over the sizes and computation of cost per unit and % of sales:

(₹)

Particulars	Basis	Total	X	Y	Z
Sales Salaries	(5:1:4)	10,000	5,000	1,000	4,000
Sales commission	(29:40:31)	6,000	1,740	2,400	1,860
Sales office expenses	(7:8:1)	2,096	917	1,048	131
Advt. General	(29:40:31)	5,000	1,450	2,000	1,550
Advt. Specific	(3:4:3)	22,000	6,600	8,800	6,600

Packing	(17:32:51)	3,000	510	960	1,530
Delivery	(17:32:51)	4,000	680	1,280	2,040
Warehouse	(17;32:51)	1,000	170	320	510
Credit collection	(7:8:1)	1,296	567	648	81
		54,392	**17,634**	**18,456**	**18,302**

	Particulars	**X**	**Y**	**Z**
(i)	Cost per unit sold	(17,634/3,400)= 5.19	(18,456/4,000)= 4.61	(18,302/3,000)= 6.10
(ii)	% on sales	(17,634/58,000)x100 =30.40	(18,456/80,000)x100 =23.07	(18,302/62,000)X100 =29.52

Working:

	X	**Y**	**Z**
Volume of cu.ft. per unit of finished products	5	8	17
Units sold	3,400	4,000	3,000
Total volume of cu.ft.	17,000	32,000	51,000

9.

a) Briefly State the various causes of Labour Turnover?

b) In a Manufacturing unit, overhead was recovered at a predetermined rate of ₹25.10 per man day. The total factory overhead incurred and the man days actually worked were ₹41,65,000 and 1,50,000 respectively. Out of the 40,000 units produced during a period 30,000 units were sold. There were also 30,000 uncompleted units which may be reckoned at 66.67% complete.
On analyzing the reasons, it was found that 40% of the unabsorbed overheads were due to defective planning and the rest were attributable to increase overhead costs. How would unabsorbed overhead be treated in Cost Accounts?

Answer:

a) Broadly, the causes of Labour turnover can be divided into two categories: Avoidable and unavoidable.

(i) Avoidable Causes: These causes include the following:
- Dissatisfaction with the job.
- Dissatisfaction with the working hours.
- Dissatisfaction with the working environment.
- Relationship with colleagues.
- Dissatisfaction with monetary and non monetary incentives.
- Relationship with superiors.
- Other reasons like lack of facilities like absence of group insurance, good canteens, poor housing amenities, bad management etc.

(ii) Unavoidable causes: These causes include the following:
- Personnel betterment
- Retirement
- Death
- Illness or accident
- Termination
- Marriage
- Pregnancy
- Other reasons like family commitments, attitude, organizational culture, etc.

b)

	₹
Overheads incurred	41,65,000
Overheads absorbed (1,50,000 x 25.10)	37,65,000
Under absorption	4,00,000

The under absorption of ₹4,00,000 being considerable whether due to defective planning or due to increase in prices, would be disposed-off by applying supplementary OH rate in the following manner:

Supplementary OH rate	=4,00,000/[30,000+10,000+(30,000×2/3)] =4,00,000/60,000	=20/3
To be absorbed on cost of goods sold	=30,000×20/3	=2,00,000
To be absorbed on closing stock	=10,000×20/3	=66,667
To be absorbed on work in progress	=30,000×2/3×20/3	=1,33,333
		=4,00,000

10. ABC Ltd distributes a wide range of water purifier systems. One of its best selling items is a standard water purifier. The management of ABC Ltd uses the EOQ decision model to determine optimal number of standard water purifiers to order. The Management now wants to determine how much safety stock to hold. ABC Ltd estimates the annual demand (360 working days) to be 36,000 standard water purifiers. Using the EOQ decision model, the Company orders 3,600 standard water purifiers at a time. The lead-time for an order is 6 days. The annual carrying cost of one standard purifier is ₹450. Management has also estimated that the additional stock-outs costs would be ₹900 for shortage of each standard water purifier.

ABC Ltd. has analyzed the demand during 200 past re-order period. The records indicate the following pattern:-

Demand during lead time	**540**	**560**	**580**	**600**	**620**	**640**	**660**	**Total**
Number of times quantity was demanded	**6**	**12**	**16**	**130**	**20**	**10**	**6**	**200**

- **Determine the level of Safety Stock for standard water purifier that ABC Ltd. should maintain in order to minimize expected stock-out costs and carrying costs. When computing carrying costs, assume that the safety stock is on hand at all times and that there is no overstocking caused by decrease in expecting demand (consider safety stock levels of 0,20,40 and 60 units)**
- **What would be ABC's new re-order point?**
- **What factors ABC Ltd. should have considered in estimating stock-outs costs?**

Solution:

i. Determination of the level of safety stock to minimize expected stock-out costs and carrying costs :

Average daily usage	=Annual demand÷ No. of working days	=36,000÷360	=100 units per day
Re-order point	=Average daily usage X Lead time	=100 units per day X 6 days	=600 units
Possible safety stock level	=possible demand Less Reorder point		

Probability of demand during lead time is as under:-

Demand during lead time	540	560	580	600	620	640	660	Total
No. of times quantity was demanded	6	12	16	130	20	10	6	200
Probability (% of total)	0.03	0.06	0.08	0.65	0.10	0.05	0.03	1.00

ii. Cost Analysis: Relevant costs under different safety stock situations are as under:-

Safety stock level (units)	**Demand realizations resulting in stock outs**	**Stock out in units (3)= (2)-600-(1)**	**Probability of stock out**	**Relevant stock-out cost (5)=(3) X ₹900**	**No. of orders per year**	**Expected stock-out cost (7)= (4)×(5)×(6)**	**Relevant carrying cost (8)= (1)×4.50**	**Total Relevant costs (9)=(7)+(8)**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
I-0	620	20	0.10	18,000	10	18,000		
	640	40	0.05	36,000	10	18,000		
	660	60	0.03	54,000	10	16,200		
						52,200	0	52,200
II-20	640	20	0.05	18,000	10	9,000		
	660	40	0.03	36,000	10	10,800		
						19,800	9,000	28,800
	660	20	0.03	18,000	10	5,400	18,000	23,400
	Nil	Nil				0	27,000	27,000

iii. Decision: Safety stock of 40 units would minimize ABC Ltd's total expected stock-out and carrying cost.

(a) New Re-order point=ROL + Safety stock=600 units+40 units=640 units

(b) Factor to consider in estimating stock-out cost-

- Expediting an order from supplier (additional ordering cost plus any associated transportation cost).
- Loss of sales due to stock out (opportunity cost in terms of lost contribution margin on sales not made due to stock-out plus any contribution margin lost in future sales due to customer, that will be caused by the stock-out.)

11.

a) Basic pay ₹6,00,000; Lease rent paid for accommodation provided to an employee ₹2,00,000, amount recovered from employee ₹40,000, Employer's contribution to P.F. ₹95,000; Reimbursement of medical expenses ~70,000, Hospitalization expenses of employee's family member borne by the employer ₹30,000, Festival Bonus ₹20,000, Festival advance ₹30,000. Compute the employee cost.

b) In a factory guaranteed wages at the rate of ₹1.80 per hour are paid in a 50 hour week. By time and motion study it is estimated that to manufacture one unit of a particular product 20 minutes are taken, the time allowed is increased by 25%. During the week A produced 180 units of the product. Calculate his wages under the following method:

(i) Time rate.

(ii) Piece rate with a guaranteed weekly wages.
(iii) Halsey premium bonus.
(iv) Rowan premium Bonus.

Solution:

a)

Computation of Employee Cost

	Particulars	**Amount (₹)**
	Basic pay	6,00,000
Add	Net cost to employer towards lease rent paid for accommodation provided to an employee [=lease rent paid less amount recovered from employee]=[2,00,000-(-)40,000]	1,60,000
Add	Employer's contribution to PF	95,000
Add	Reimbursement of medical expenses	70,000
Add	Hospitalization expenses of employee's family member paid by the employer	30,000
Add	Festival Bonus	20,000
	Employee Cost	9,75,000

Note:

(i) Festival advance is a recoverable amount, hence not included in employee cost.
(ii) Employee's contribution to PF is not a cost to the employer, hence not considered.

b)

i) Calculation of wages under Time Rate system:
Earning under time wages=T x R = 50 ×1.8 = ₹90

ii) Calculation of wages under piece rate with Guaranteed Wage Rate

Normal time for one unit	=20 minutes
(+) Relation allowance@25%	=5 minutes
Standard time	=25 minutes
No. of pieces per hour	60/25 pieces
Piece rate	=Hourly Rate/No. of piece per hour
	=1.8÷(60/25)
	=0.75
Earning under Piece Rate	=180×0.75=₹135

iii) Calculation of wages under Halsey premium Bonus

Standard time for actual production	=180×25/60	=75 hours
Earning under Halsey plan	=(50×1.8)+50/100(75-50)×1.8	
	= 90+22.5	= ₹112.50

iv) Calculation of wages under Rowan premium Bonus

Standard time for actual production	=180×25/60	=75 hours
Earning under rowan plan	=(50×1.8)+(75-50/75)×(50×1.8)	
	=90+30.00	=₹120.00

12. **Opening Stock of raw materials (10,00 units) ₹1,80,000; purchased of raw materials (35,000 units) ₹7,00,000; Closing Stock of raw materials 7,000 units; Freight inward ₹80,000; self-manufactured packing material for purchased raw materials only ₹60,000 (including share of administrative overheads related to marketing sales ₹8,000); Demurrage charges levied by transporter for delay in collection ₹16,000; Normal Loss due to shrinkage 1% of materials; Abnormal Loss due to absorption of moisture before receipt of materials 100 units. Also solved based on FIFO method. When Opening Stock of Raw material is (20,000 units) ₹2,00,000**.

Solution:

Computation of value of closing stock of raw materials [Average cost method]

	Particulars	**Quantity (Units)**	**Amount (₹)**
	Opening stock of Raw Materials	10,000	1,80,000
Add	Purchase of raw materials	35,000	7,00,000
Add	Freight inwards		80,000
Add	Demurrage Charges levied by transporter for delay in collection		16,000
			9,76,000
Less	Abnormal loss of raw materials (due to absorption of moisture before receipt of materials)=[(7,00,000+80,000+16,000)×100]/35,000	(100)	(2,274)
Less	Normal loss of materials due to shrinkage during transit [1% of 35,000 units]	(350)	----------
Add	Cost of self-manufactured packing materials for purchased raw materials only (60,000-8,000)		52,000
	Cost of raw materials	44,450	10,25,726
Less	Value of closing stock= Total cost/(Total units-Units of normal loss) [10,25,726/(10,000+35,000-350]×7,000	(7,000)	(1,61,169)
	Cost of raw material Consumed	37,450	8,64,557

Note:

(i) Units of normal loss adjusted in quantity only and not in cost, as it5 is an includible item.

(ii) Cost of self manufactured packing materials does not include any share of administrative overheads or finance cost or marketing overheads. Hence marketing overheads excluded.

(iii) Abnormal loss of materials arised before the receipt of the raw materials, hence, valuation done on the basis of costs related to purchase s only. Value of opening stock is not considered for arriving at the valuation of abnormal loss.

(iv) Demurrage charges paid to transporter is an includible item. Since this was paid to the transporter, hence considered before estimating the value of abnormal loss.

Based on FIFO method when Opening Stock is 20,000 units (₹2,00,000):

Computation of value of closing stock of raw materials [FIFO Method]

	Particulars	**Quantity (Units)**	**Amount(₹)**
	Opening stock of raw materials	20,000	2,00,000
Add	Purchase of raw materials	35,000	7,00,000
Add	Freight inwards		80,000
Add	Demurrage Charges levied by transporter for delay in collection		16,000

			9,96,000
Less	Abnormal loss of raw materials (due to absorption of moisture before receipt of materials)=[(7,00,000+80,000+16,000)×100]35,000	(100)	(2,274)
Less	Normal loss of materials due to shrinkage during transit=[1% of 35,000 units]	(350)	----------
Add	Cost of self-manufactured packing materials for purchased raw materials only (60,000-8,000)		52,000
	Cost of raw materials	54,550	10,45,726
Less:	Value of Closing Stock=Total cost/(Total units-Units of Normal Loss), Where Total Cost=[7,00,000+80,000+16,000-2,274+52,000]=8,45,726 And Total units=[35,000-1% of 35,000]=34,650 Value of Closing Stock=[8,45,726×7,000]/34,650	(7,000)	(1,70,854)
	Cost of Raw Materials Consumed	**47,550**	**8,74,872**

Note:

(i) Since FIFO methods followed, hence for the purpose of estimating the unit's sold/used/consumed, it is presumed that there is no units left out units in opening stock.

(ii) Since normal loss is in transit, hence it is calculated on units purchased only.

13. The stock of material held on 1-4-2013 was 400 units @ 50 per unit. The following receipts and issues were recorded. You are required to prepare the Stores Ledger Account, showing how the values of issues would be calculated under Base Stock Method, both through FIFO AND LIFO base being 100 units.

2-4-2013 Purchased 100 units @ ₹55 per unit
6-4-2013 Issued 400 units
10-4-2013 Purchased 600 units @ ₹55 per unit
13-4-2013 Issued 400 units
20-4-2013 Purchased 500 units @ ₹65 per unit.
25-4-2013 Issued 600 units
10-5-2013 Purchased 800 units @ ₹70 per unit
12-5-2013 Issued 500 units
13-5-2013 Issued 200 units
15-5-2013 Purchased 500 units @ ₹75 per unit
12-6-2013 Issued 400 units
15-6-2013 Purchased 300 units @ ₹ 80 per unit

Solution:

Stores Ledger Account [under Base Stock through FIFO Method]

Date	Receipts			Issue			Balance		
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹
1-4-2013	--	--	--	--	--	--	100	50	5,000
							300	50	15,000
2-4-2013	100	55	5,500	--	--	--	100	50	5,000

							300	50	15,000
							100	55	5,500
6-4-2013	--	--	--	300	50	15,000			
				100	55	5,500	100	50	5,000
10-4-2013	600	55	33,000	--	--	--	100	50	5,000
							600	55	33,000
13-4-2013	--	--	--	400	55	22,000	100	50	5,000
							200	55	11,000
20-4-2013	500	65	32,500	--	--	--	100	50	5,000
							200	55	11,000
							500	65	32,500
25-4-2013	--	--	--	200	55	11,000	100	50	5,000
				400	65	26,000	100	65	6,500
10-5-2013	800	70	56,000	--	--	--	100	50	5,000
							100	65	6,500
							800	70	56,000
12-5-2013	--	--	--	100	65	6,500	100	50	5,000
				400	70	28,000	400	70	28,000
13-5-2013	--	--	--	200	70	14,000	100	50	5,000
							200	70	14,000
15-5-2013	500	75	37,500	--	--	--	100	50	5,000
							200	70	14,000
							500	75	37,500
12-6-2013	--	--	--	200	70	14,000	100	50	5,000
				200	75	15,000	300	75	22,500
15-6-2013	300	80	24,000	--	--	--	100	50	5,000

							300	75	22,500
							300	80	24,000

Stores Ledger Account [under Base Stock through LIFO Method]

Date	Receipts			Issue			Balance		
	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹	Qty.	Price ₹	Value ₹
1-4-2013	--	--	--	--	--	--	100	50	5,000
							300	50	15,000
2-4-2013	100	55	5,500	--	--	--	100	50	5,000
							300	50	15,000
							100	55	5,500
6-4-2013	--	--	--	100	55	5,500			
				300	50	15,000	100	50	5,000
10-4-2013	600	55	33,000	--	--	--	100	50	5,000
							600	55	33,000
13-4-2013	--	--	--	400	55	22,000	100	50	5,000
							200	55	11,000
20-4-2013	500	65	32,500	--	--	--	100	50	5,000
							200	55	11,000
							500	65	32,500
25-4-2013	--	--	--	500	65	32,500	100	50	5,000
				100	55	5,500	100	55	5,500
10-5-2013	800	70	56,000	--	--	--	100	50	5,000
							100	55	5,500
							800	70	56,000
12-5-2013	--	--	--	500	70	35,000	100	50	5,000
							100	55	5,500

							300	70	21,000
13-5-2013	--	--	--	200	70	14,000	100	50	5,000
							100	55	5,500
							100	70	7,000
15-5-2013	500	75	37,500	--	--	--	100	50	5,000
							100	55	5,500
							100	70	7,000
							500	75	37,500
12-6-2013	--	--	--	400	75	30,000	100	50	5,000
							100	55	5,500
							100	70	7,000
							100	75	7,500
15-6-2013	300	80	24,000	--	--	--	100	50	5,000
							100	55	5,500
							100	70	7,000
							100	75	7,500
							300	80	24,000

14. Write Short notes on:-

(i) Perpetual Inventory a System.

(ii) Uniform Costing.

(iii) Limitation of Activity Based Costing.

Answer:

(i) Perpetual Inventory system means continuous stock taking. Under this system, a continuous record of receipt and issue of materials is maintained by the store department and the information about the stock of materials is always available. Entries in the Bin Card and the Stores Ledger are made after every receipt and issue and the balance is reconciled on regular basis with the physical stock.

The main advantage of this system is that it avoids disruptions in the production caused by periodic stock taking.

Similarly this system helps in having detailed and more reliable check on the stocks. The stock records are more reliable and stock discrepancies are investigated and appropriate action is taken immediately.

(ii) Uniform Costing:-Uniform Costing is the use by several undertaking of the same costing principles and or practices. The goal is set with uniformity of principles and

similarly of methods with the understanding that in particular undertaking there may exist conditions which require variations in some respects from absolute uniformity.
Features of uniform costing are as follows:

a) Common bases for the apportionment and allocation of overhead to be followed by all units in the same industry.
b) The Department sections or production centers to be used for analysis and comparison of costs to be determined
c) What items shall be regarded as factory or distinct from administration expenses to be clearly indicated.
d) Common basis for recovery of overheads.
e) Common rates of depreciation should be applied to plant and machinery.
f) Uniform method of arriving service departments cost.
g) 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 factors.

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 al benefits to the concerned parties.

(iii) Though Activity Based Costing system is very effectively, it suffers from some limitation as given below:

a) Activity Based Costing is a complex system and requires lot of records and tedious calculations.
b) For small organization, traditional cost accounting system may be more beneficial than Activity Based Costing due to the simplicity of operation of the former.
c) Sometimes it is difficult to attribute costs to single activities as some costs support several activities.
d) There is a need of trained professionals who are limited in number.
e) This system will be successful if there is a total support from the top management.
f) Substantial investment of time and money is required for the implementation of this system.

15.

a) The following details are available in respect of a Consignment of 1,250 kgs. of materials 'X':

(i) Invoice price-₹20 per kg.
(ii) Excise duty-25% of invoice price.
(iii) Sales Tax-8% on Invoice price including Excise Duty
(iv) Trade discount-10% on Invoice price
(v) Insurance-1% of aggregate net price
(vi) Delivery charges-₹250
(vii) Cost of containers @₹60 per container for 50 kg. of material. Rebate is allowed @ ₹40 per container if returned within six weeks, which is a normal feature.
(viii) One container load of material was rejected on inspection and not accepted.
(ix) Cost of unloading and handling @ 0.25% of the cost of materials ultimately accepted.

On the basis of above you are required to find out the landed cost per kg. of material 'X'.

b) Purchase Manager has decided to place orders for minimum quantity of 500 Nos. of a particular item in order to get a discount of 10%. From the records; it was found out that in the last year, 8 orders each of size 200 Nos. have been placed. Given ordering cost=₹500 per order, inventory carrying cost=40% of the inventory value and the cost per unit=₹400, is the Purchase Manager justified in his decision? What is the effect of his decision to the Company?

Solution:

a) Computation of landed cost of Material 'X'

		Total cost for 1,250 kg in ₹	Cost per kg. in ₹
	Invoice price	25,000.00	20.00
Add:	Excise Duty (25,000×25%)	6,250.00	5.00
		31,250.00	25.00
Add:	Sales Tax (31,250×8%)	2,500.00	2.00
		33,750.00	27.00
Less:	Trade Discount @ 10% on invoice price	2,500.00	2.00
		31,250.00	25.00
Add:	Insurance @ 1% on above	312.50	0.25
		31,562.50	25.25
Add:	Delivery Charges	250.00	0.20
	Cost of container @ ₹60 for 50Kg.	1,500.00	1.20
		33,312.50	26.65
Less:	Cost of material returned*	1,332.50	--------
		31,980.00	26.65#
Add:	Cost of handling @0.25%	79.95	0.07#
		32,059.95	26.72#
Less:	Credit for container returnable @	960.00	0.80#
	Total landed cost	31,099.95	25.92#

*1Container of 50kg. rejected. (33,312÷1,250)×50	=₹1,332.50
@Total consignment 1,250 kg. less 50 kg. (1 container returned)	=1,200 kg.
Credit (₹40÷50)×1,200kg	=₹960
#Per unit cost is determined by dividing 1,200kg. and not by 1,250 kg. as 1 container of 50kg. was returned.	

b)

$$EOQ = \sqrt{\frac{2ab}{cs}}$$

$$= \sqrt{\frac{2 \times Annual Consumption \times Buying cost per order}{Cost per order \times Storage and Carrying cost rate}}$$

$$= \sqrt{\frac{2 \times (8 \times 200) \times 500}{400 \times 40\%}}$$

$$= \sqrt{\frac{16,00,000}{160}}$$

= 100 Nos.

No of orders=1,600÷100 or 16 orders p.a.

(i) Cost of 16 orders	
Ordering cost (16×500)	₹8,000
Carrying Cost of average in inventory (100×160)÷2	8,000
Purchase cost (1,600×₹400)	6,40,000
Total Cost of Inventory	6,56,000

(ii) Last year's total inventory cost	
Ordering cost (8×₹500)	4,000
Ordering Cost (200×160)÷2	16,000
Purchase Cost	6,40,000
Total cost of inventory	6,60,000

(iii) Total inventory cost due to Purchase Manager's decision	
Minimum quantity	=500 Nos. @₹360 per unit*
Carrying Cost	=360×40% or ₹144
No. of orders	=1,600÷500 or 3.2 say 4 orders
Ordering Cost(4X₹500)	₹2,000
Carrying Cost of average inventory (500X144)÷2	36,000
Purchase Cost (1,600X₹360)	5,76,000
Total Cost inventory	6,14,000

*(₹400-10% of ₹400)

Effect of the decision of purchase Manager to the Company

(i) Total inventory cost (*EOQ level)	₹6,56,000
(ii) Total inventory cost (last year)	6,60,000
(iii) Total inventory cost due to purchase Manager decision	6,14,000
Saving (₹6,60,000-6,14,000)	46,000

It is noticed that total inventory cost due to purchase Manager's decision is the minimum. Purchase Manager is justified in his decision as it resulted in maximum saving, i.e. ₹46,000.

16. A Company re-apportions the cost incurred by two service cost centres, material handling and inspection, to the three production cost centre's of machining, finishing and assembly.

The following are the overhead costs which have been allocated apportioned to the five cost centre's:

	₹'000'
Machining	**400**
Finishing	**200**
Assembly	**100**
Material handling	**100**
Inspection	**50**

Estimate of the benefits received by each cost centre are as follows:

	Machinery (%)	**Finishing (%)**	**Assembly (%)**	**Material handling (%)**	**Inspection (%)**
Material handling	**30**	**25**	**35**	**-----**	**10**
Inspection	**20**	**30**	**45**	**5**	**------**

You are required to:

Calculate the charge for overhead to each of the three production cost centres, including the amounts reapportioned from the two service centres, using:

(i) The continuous allotment (or repeated distribution) method, and

(ii) An algebraic method.

Solution: (i) Repeated Distribution Method

	Machining	Finishing	Assembly	Material handling	Inspection
Initial cost	₹4,00,000	₹2,00,000	₹1,00,000	₹1,00,000	₹50,000
Reapportioned:					
Material handling	30,000	25,000	35,000	(1,00,000)	10,000
	4,30,000	2,25,000	1,35,000	------	60,000
Inspection	12,000	18,000	27,000	3,000	(60,000)
	4,42,000	2,43,000	1,62,000	3,000	------
Material handling	900	750	1,050	(3,000)	300
	4,42,900	2,43,750	1,63,050	------	300
Inspection	60	90	135	15	(300)
	4,42,960	2,43,840	1,63,185	15	-------
Material handling	5	4	6	(15)	-------
	4,42,965	**2,43,844**	**1,63,191**	-------	

(ii) Algebraic method

Let materials handling=x;	Let inspection=y
x	=1,00,000 + 0.05y……..(1)
Y	=50,000 + 0.1x……(2)
Y	=20,00,000 – 20x……(3) (By multiplying (1) by (20)
2y	=20,50,000 ÷ 19.9x…….(4) (By adding)=(2) + (3)
X	=20,50,000 ÷ 19.9 or x=₹1,03,015
Y	=50,000 + 0.1 (1,03,015)……..(2)
y	=50,000 + 10,301 or y=₹60,301

	Machining	Finishing	Assembly
Initial cost	₹4,00,000	₹2,00,000	₹1,00,000
(x) Material handling	(0.3) 30,905	(0.25) 25,754	(0.35) 36,055
(y) Inspection	(0.2) 12,060	(0.3) 18,090	(0.45) 27,136
	4,42,965	2,43,844	1,63,191

17.

a) 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:

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

The current selling price is ₹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?

b) ABC Ltd. provides you the following figures for the year 2011-2012

Particulars	₹
Direct Material	3,20,000
Direct Wages	8,00,000
Production Overheads (25% Variable)	4,80,000
Administration Overhead (75% Fixed)	1,60,000
Selling and Distribution Overheads (2/3rd Fixed)	2,40,000
Sales @ 125 per unit	25,00,000

For the year 2012-13, it is estimated that:

(i) Output and sales quantity will increase by 20% by incurring additional Advertisement Expenses of ₹45,200.
(ii) Material price will go up 10%.
(iii) Wages Rate will go up by 5% along with, increase in overall direct labour efficiency by 12%.
(iv) Variable Overheads will increase by 5%.
(v) Fixed production Overheads will increase by 33 1/3%.

Required:

(a) Calculate the cost of sales for the year 2011-2012 and 2012-2013.
(b) Find out the new selling price for the year 2012-2013.
(i) If the same amount of profit is to be earned as in 2011-2012.
(ii) If the same percentage of profit to sales is to be earned as in 2011-2012.
(iii) If the existing percentage of profit to sales is to be increased by 25%.
(iv) If profit per unit ₹15 is to be earned.

Solution:

a) Fixed cost 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 costs, 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 (5,000×6+5,000×5)	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% capacity 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 and more endeavours are involved for production and sales at higher level of 80% capacity.

b)

(a) Statement showing the cost of sales

	Particulars	**For 20,000 units**	**For 24,000 units**
A.	Direct Materials	3,20,000	4,22,400 [₹3,20,000X 110% x 120%]
B.	Direct Wages	8,00,000	9,00,000 [₹8,00,000X (105/100) x (100/112) x 120%]
C.	Prime Cost	11,20,000	13,22,400
D.	Add: production Overheads		
	Variable production overheads	1,20,000 [₹4,80,000×25%]	1,51,200 [₹1,20,000×105%×120%]
	Fixed Production Overheads	3,60,000 [₹4,80,000×75%]	4,80,000 [₹3,60,000×133%]
E.	Work Cost (C+D)	16,00,000	19,53,600
F.	Add: Administration Overheads		
	Variable Admn. Overheads	40,000	50,400 [₹40,000×105%×120%]
	Fixed Admn. Overheads	1,20,000	1,20,000
G.	Cost of Goods produced	17,60,000	21,24,000
H.	Add: Selling and Distribution Overheads		
	Variable Selling & Distribution Overheads	80,000	1,00,800 [₹80,000×105%×120%]
	Fixed Selling & Distribution OHs	1,60,000	1,60,000
	Additional Advertisement Exp.		45,200
I.	Cost of Sales [G+H]	20,00,000	24,30,000

(b)

(i) New Selling price=(₹24,30,000+₹5,00,000)/24,000 units=₹122.08
(ii) New Selling price=(₹24,30,000+25% or ₹24,30,000)/24,000 units=₹126.5625
(iii) New Selling price=(₹24,30,000+1/3rd or ₹24,30,000)/24,000 units=₹135
(iv) New Selling price=(₹24,30,000+(24,000×₹15)/24,000 units=₹116.25

18.

a) ABC Ltd. company having 25 different types of automatic machine, furnishes you the following data for 2011-2012 in respect of machine B:

1.	**Cost of machine**	**₹50,000**
	Life-10 years	**Scrap value is nil**
2.	**Overhead expenses are:**	
	Factory rent	**₹50,00 p.a**
	Heating & lighting	**₹40,000**

	Supervision	₹1,50,000 p.a
	Reserve equipment of machine B	₹6,000 p.a
	Area of the factory	80,000 sq.ft.
	Area occupied by machine B	3,000 sq.ft.
3.	Wages of operator is ₹24 per day of 8 hours including all fringe benefits. He attends to one machine when it is under set up and two machines while under operation.	
4.	Estimated production hours	3,600 p.a.
	Estimated set up time	400 hrs.p.a.
	Power 0.5 per hour	

Prepare a schedule of comprehensive machine hour rate and find the cost of the following jobs:

	Job 1002	Job 1008
Set up time (hrs.)	80	40
Operation time (hrs.)	130	160

b) For a production department of a manufacturing company you are required to:

a. Prepare a flexible budget of overhead
b. Prepare flexible budget of overhead at 70% and 110% of budget volume;
c. Calculate a departmental hourly rate of overhead absorption as per (a) and (b) above.

The budgeted level of activity of the department is 6,000 hours per period and the study of the various items of expenditure reveals the following:

	₹	₹ per hour
Indirect wages		0.40
Repairs upto 2,000 hours	100	
For each additional 500 hours		
Upto a total of4,000 hours	35	
Additional from 4,001 to 5,000 hrs.	60	
Additional above 5,000 hrs.	70	
Rent and Rates	350	
Power upto 3,600 hrs	0.25	
For hours above 3,600	0.20	
Consumable supplies		0.24
Supervision upto 2,500 hours		400
Additional for each extra 600 hrs		
Above 2,500 and upto 4,900 hrs		100
Additional above 4,900 hrs		150
Depreciation up to 5,000 hrs		650
Above 5,000 hrs and upto 6,500 hrs.	820	
Cleaning upto 4,000 hrs.	60	
Above 4,000 hrs	80	
Heat and from 2,100 hrs to 3,500 hrs	120	
Lighting from 3,500 hrs to 5,000 hrs	150	
Above 5,000 hrs	175	

Solution:

a)

Computation of machine hour rate when machine is in operation

Particulars		Amount (₹)
Standing charges:		
Rent	50,000×3/8	=1,875
Heating & Lighting	40,000×3/80	=1,500
Supervision	1,50,000×1/25	=6,000
Reserve equipment		=6,000
		15,375
Cost per hour	15,375/4,000	3.84
Machine Expenses:		
Depreciation	[50,000÷(10×3,600)]=1.39	
Wages	[24/8×1/2]=1.50	
Power	=0.50	3.39
Machine hour rate		**7.23**

Computation of machine hour rate when machine is under set up

Particulars		Amount (₹)
Standing charges:		
Rent	50,000×3/80	=1,875
Heating & lighting	40,000×3/80	=1,500
Supervision	1,50,000×1/25	=6,000
Reserve equipment		=6,000
		15,375
Cost per hour	15,375/4,000	3.84
Machine expenses:		
Depreciation	[50,000×(10×3,600)]	=1.39
Wages	[24/8]	=3.00
Power		-------
Machine Hour Rate		**=8.23**

Computation of cost of the jobs

Particulars	Job 1002	Job 1008
Set up cost		
Job 1102: 80×8.23	685.40	
Job 1308: 40×8.23		329.2
Operation Cost		
Job 1102: 130×7.23	939.9	
Job 1308: 160×7.23		1,156.8
Total Cost of the Job	**1,625.30**	**1,486.00**

b)

Fixed and Flexible budget showing overhead cost per hour:

Particulars	(3,500) 70%	(5,000) 100%	(5,500) 110%
Indirect wages (0.4/hrs.)	1,400	2,000	2,200
Repairs	205	300	370
Rent & Rates	350	350	350
Power	875	1,180	1,280

Consumable supplies	840	1,200	1,320
Supervision	600	950	950
Depreciation	650	650	820
Cleaning	60	80	80
Heating & Lighting	120	150	175
	5,100	6,860	7,545
OH rate per hour	[5,100/4,200] =1.214	[6,860/6,000] =1.143	[7,545/6,600] =1.143

1. If under absorbed OH is 10% or more of actual OH incurred-Supplementary OH rate is applied. (or)
2. If the amount is considerable, supplementary OH rate applied otherwise we may follow, transferring to P & L A/c or carry forward to next year.

Working Notes:

Repairs	100+(3×35) =205	100+(4×35)+60 =300	100+(4×35)+60+70 =370
Power	(3,500×0.25) =875	(900+280) =1,180	900+280+100 =1,280
Supervision	400+(2×100) =600	400+(4×100)+150 =950	400+(4×100)+150 =950

19. (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

19 (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)

19.(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*

19.(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

19.(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

19.(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.

19.(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)

19.(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

19.(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

19.(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

20(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 Overheads	6,200	6,800	7,400	8,000
	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

20.(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.

21(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.

21.(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.

22(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.

22(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.

23(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) $\text{Notional Profit} \times \frac{\text{Work Certified}}{\text{Contract Pice}}$

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

=₹3,84,000

23(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.

24(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

24.(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

25 (a)

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 Account	120	912	By Cash @ ₹2 (normal waste)	120	240
			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

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

Dr. Profit & Loss Account 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.

26.(a) 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.

26(b) 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.

27.(a) 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%.

27(b) 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

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

= ₹ 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 x $\frac{95}{100}$ – 580000) x ₹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)

28.(a) 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.

28(b) 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

29.(A) 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

29(B) 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.

30.(a) 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.

30(b) 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

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

=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

30.(c) 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.

30.(d) 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.

30 (e) 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].