GROUP - I
Paper 8 - Cost Accounting & Financial Management

Section A - Cost 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,

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

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)

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

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

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

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

= 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

Section B
Financial Management

1. **In each of the cases given below one out of four is correct. Indicate the correct answer and give your workings/ reasons briefly.**

a) Airtel Communications is trying to estimate the first – year operating cash flow (at t=1) for a proposed project. The finance staff has collected the following information:
Projected sales =₹1 crore
Operating costs =₹70 lakhs (not including depreciation)
Depreciation =₹20 lakhs
Interest expense = ₹20 lakhs
The company faces a 40% tax rate. What is the project's operating cash flow for the year (t=1)?

b) Sales of two executive months of a company are ₹3, 80,000 and ₹4, 20,000. The Company's net profit for these months amounted to ₹24,000 and ₹40,000 respectively. There is no change in P/V ratio or fixed costs. What will be the P/V ratio of the Company?

c) The budgeted annual sales of firm are ₹80 lakhs and 25% of the same is cash sales. If the average amount debtors of the firm are 5 lakhs, the average collection period of credit sales will be how many months' months?

d) GEMINI LTD. has total assets of ₹60 crore and a Debt/equity ratio of 0.5. Its sales are ₹27 crore and it has total fixed cost of ₹7 crore. If the company's EBIT is ₹6 crore, its tax rate is 40% and the interest rate on debt is 12%, the ROE of GEMINI LTD. would be how much?

e) The degree of operating Leverage (DOL) and the Degree of Financial Leverage of ALANTA LTD. are 3 and 1.67 respectively. If the management of the company targets to increase the EPS by 10 per cent, by how much percentage should sales volume be increased? (Round off your answer to the nearest value)

f) Ascertain the future value and compound interest of an amount of ₹ 85,000 at 8% compounded semi annually for 5 years.

g) The average daily sales of a company are ₹5 lakh. The company normally keeps cash balance of ₹80,000. If the weighted operating cycle of the company is 45 days, what will be the working capital requirement?

h) The shares of BBA Company are selling at ₹30 per share. The firm had paid dividend @ ₹2 per share last year. If the estimated growth of the company is approximately 8 per cent per year, what will be the cost of equity capital of the company?

i) A chemical company has net sales of ₹50 million, cash expenses (including Taxes) of ₹35 million and depreciation expenses of ₹5 million. If Debtors decrease over the period by ₹6 million, what will be the cash from operation?

j) Consider the following for strong Ltd:
Return on Government Securities : 12%
Share Beta : 1.50

Market Return : 16%
Based on CAPM, find out the cost of equity capital.

Solution:

a) Operating cash Flow: (t=1)

Sales revenue	100,00,000
Operating costs	7,00,000
Depreciation	2,00,000
Operating income before taxes	10,00,000
Taxes (40%)	4,00,000
Operating income after taxes	6,00,000
Add back depreciation	20,00,000
Operating cash flow	26,00,000

b)

Calculation of Profit Volume Ratio

$$\text{P/V Ratio} = \frac{\text{Difference of Net profit's of the two months}}{\text{Difference os Sales of the two months}} \times 100$$

$$= \frac{40,000 - 24,000}{4,20,000 - 3,80,000} \times 100$$

$$= \frac{16,000}{40,000} \times 100$$

$$= 40\%$$

c) Cash Sales = 80 lakhs×25%= 20 lakhs
Credit sales = (80-20) lakhs= 60 lakhs
Average Collection Period=debtors/Credit Sales/month
= (5÷60/12)
= 5÷5
=1 month.

d)

Total Equity+ Total Debt	=₹60 crore
Total equity= (60/1.5)	=₹40 crore
Total Debt= (60-40)	=₹20 crore
Net income= [(EBIT)-1] × (1-t)	=(6-2.40) (1-.40)
	=3.60×0.6
	= ₹2.16 crore.
ROE = (2.16/40) ×100	= 5.40%

e) DTL = DOL × DFL = 3×1.67 = 5.01
Therefore, as per the concept of DTL, in order to increase the EPS by 10% the sales volume will be increased by 10÷ 5.01 = 2%

f) Amount Invested = ₹ 75,000

Rate of Interest = 8%

No. of Compounds = 2 x 5 = 10 times

$$\text{Rate of Interest for half year} = \frac{8}{4} = 4\%$$

Compound Value or Future Value = $p\ (1+i)^n$

Where

p = Principle Amount

i = Rate of Interest (in the given case half year interest)

n = No. of years (no. of compounds)

= 85,000 $(1+4\%)^{10}$

= 85,000 x 1.4802

= ₹ 1, 25,817

Compound Value = 1, 25,817

Compound Interest = Compound Value – Principle Amount

= ₹1, 25,817– ₹ 85,000

= ₹ 40,817.

g) The working capital requirement is for 45 days of the weighted operating cycle plus the normal cash balance = Sales per day × weighted operating cycle + cash balance requirement.

=₹5 lakh × 45 + ₹0.80 = ₹225.8 lakh

h)

$$\text{Cost of equity} = K_e = \frac{D_1}{P_0} + g = \frac{2(1+0.08)}{30} + 0.08 = 0.152 = 15.20\%$$

i) Cash from operation = operation profit + noncash charges + decrease in debtors

= ₹ [(50-35-5) +5+6] million = ₹21 million

j) $\text{Cost of equity Capital } (K_e) = R_f + \beta(K_m - R_f)$

= 0.12+1.50 (0.16-0.12)

= 0.18 i.e., 18%

2.

a) Write short notes on Sensitivity Analysis.

b) A company is faced with the problem of choosing between two mutually exclusive projects. Project A requires a cash outlay of ₹2, 00,000 and cash running expenses of ₹35,000 per year. On the other hand, project B will cost ₹2, 50,000 and require cash running expenses of ₹20,000 per year. Both the machines have a eight-year life. Project A has a salvage value of ₹4,000 and Project B has a salvage value of ₹14,000. The company's tax rate is 50% and it has a 10% required rate of return.
Assuming depreciation on straight line basis, ascertain which project should be accepted. Present value of an annuity of re.1 for 8 years = 5.335 and present value of ₹1 at the end of 8 years = 0.467, both at the discount rate of 10%.

Solution:

(a) Sensitivity Analysis shows the measure of sensitivity of a decision, due to changes in the values of one or more parameters/ variables.
Sensitivity Analysis in capital Budgeting seeks to identify the effect of changes in any one variable, e.g. Initial Investment, project life, Discount Rate, CFAT, etc. on the NPV or IRR, by keeping all other variables constant. It is a study which determines how changes or errors in the values of parameters affect the output of a model.

Objectives: sensitivity Analysis seeks to provide the decision maker with information concerning-

i) The behavior of the measure of economic effectiveness due to errors in estimating various values of the parameters, and
ii) The potential for reversal in the preferences as for economic investment alternatives.

Advantages:

i) This analysis seeks to identify the effect of all Critical Factors, one at a time.
ii) This analysis is simple to understand and implement.

(b)

Company
Financial Evaluation of project A & Project B

Particulars	Project A(₹)	Project B(₹)	Incremental cash flows(₹)
Cash outflows	2,00,000	2,50,000	(50,000)
Cash running expenses (for 8 years)	35,000	20,000	15,000
Depreciation (for 8 years)	24,500	29,500	(5,000)
Total saving			10,000
Less: tax @50%			(5,000)
Saving after tax			5,000
Add: Depreciation (not being cash outflow)			5,000
Net saving (P.A)			10,000
Salvage value at the end of 8th year	4,000	14,000	10,000
Present value of annual saving for 8 year [P.V. of annuity for 8 yrs = 10,000×5.335]			53,350
Present value of incremental salvage value at the end of 8th year [0.467×10,000]			4670
Total			58,020
Less: cash outflow (incremental)			50,000
Net Present Value (incremental)			8,020

Recommendation:
Since incremental NPV is positive, it is recommended to accept Project B.
Note:
Annual depreciation of project A= (2, 00,000 - 4,000) ÷8 =24,500
Annual depreciation of project B = (2, 50,000 – 14,000) ÷8 =29,500

3.

(a)

The following is an extract from the financial Statements of SDS Ltd. (in ₹ lakhs)

Operating Profit **Less: Interest on Debentures**	**105** **33**
Net operating Income before tax **Less: Income tax**	**72** **36**
Net Profit after Tax	**36**
Equity share capital (shares of ₹10 each) **Reserves and surplus** **15% Non-Convertible Debentures (of ₹100 each)**	**200** **100** **220**
Total	**520**

Market Price per Equity Share is ₹18 and per Debenture is ₹83.75. What is the Earning per Share?

What is the percentage cost of capital to the Company for the Debenture Funds and the Equity?

(b) Company MTL is forced to choose between two machines A and B. The two machines are designed differently, but have identical and do exactly the same job. Machine A costs ₹2, 50,000 and will last for 3 years. It costs ₹40,000 per year to run. Machine B is an 'economy' model Costing only ₹2, 00,000, but will last only for 2 years, and costs ₹60,000 per year to run. These are real Cash Flows. The Costs are forecasted in rupees of constant purchasing power. Ignore tax. Opportunity cost of capital is 10 percent. Which machine Company X should Buy?

Solution:

a)

$$EPS = \frac{\text{Earning After Tax}}{\text{No. of Equity Shares}} = \frac{₹36\,\text{Lakhs}}{20\,\text{Lakhs Shares}} = ₹1.80$$

$$K_e = \frac{\text{Earning per Share}}{\text{Market per Share}} = \frac{₹1.80}{₹18.00} = 10\%$$

Cost of Debt K_d may be computed as under-

Particulars	Book Value	Market Value
Cost – Interest	₹33.00 lakhs	₹33.00 lakhs
Interest after tax of 50%	₹16.50 Lakhs	₹16.50 Lakhs
Value of Debentures	₹220.00 Lakhs	(220/100×83.75)= ₹184.25 lakhs
K_d = After Tax Interest ÷ Value of Debenture	7.5%	8.95%

b)

Working Notes:

Compound present value of 3 years @ 10% = 2.486
P.V. of Running cost of Machine A for 3 years = ₹40,000×2.486 = ₹99,440
Compound present value of 2 years @10% =1.735
P.V. of Running cost of Machine B for 2 years =₹60,000 ×1.735
=₹1, 04,100

Statement showing evaluation of Machine A and B

Particulars	Machine A	Machine B
Cost of purchase Add: PV. Of running cost for 3 years	2,50,000 99,440	2,00,000 1,04,100
P.V. of Cash Outflow	349440	3,04,100
	2.486	1.735
Equivalent Present Value of annual Cash outflows	1,40,563	1,75,274

Analysis: Since the annual Cash outflow of Machine B is highest, Machine A can be purchased.

4.

a) A firm is considering pushing up its sales by extending credit facilities to the following categories of customers:

i) Customers with a 10% risk of non-payment, and

ii) Customers with a 30% risk of non-payment.

The incremental sales expected in case of category (a) are ₹ 40,000 while in case of category (b) they are ₹ 50,000.

The cost of production and selling costs are 60% of sales while the collection costs amount to 5% of sales in case of category (i) and 10% of sales in case of category (ii).

You are required to advise the firm about extending credit facilities to each of the above categories of customers.

b) A firm's sales, variable costs and fixed cost amount to ₹ 75, 00,000, ₹42, 00,000 and ₹6, 00,000 respectively. It has borrowed ₹45, 00,000 at 9% and its equity capital totals ₹55, 00,000.

i) What is the firm's ROI?
ii) Does it have favorable financial leverage?
iii) If the firm belongs to an industry whose asset turnover is 3, does it have high or low asset leverages?
iv) What are the operating, financial and combined leverages of the firm?
v) If the sales drop to ₹50, 00,000, what will the new EBIT be?

Solution:

a) Evaluation of Credit Policies

Category i) 10% risk of non-payment

Particulars	₹
Incremental sales	40,000
Less: Bad debts @ 10%	4,000

Sales realized		36,000
Less: Cost of production and selling cost (40,000 x 60%)	24,000	
Less: Collection cost (40,000 x 5%)	2,000	26,000
Incremental profit		10,000

Category b) 30% risk of non-payment

		₹
Incremental sales		50,000
Less: Bad debts @ 30% (50,000 x 30%)		15,000
Sales realized		35,000
Less: Cost of production and selling cost (50,000 x 60%)	30,000	
Less: Collection cost (50,000 x 10%)	5,000	35,000
Incremental profit		Nil

Comment: Advise to extend credit facility to category (i) customers alone.

b)

Sales	75,00,000
Variable cost	42,00,000
Contribution	33,00,000
Fixed cost	6,00,000
EBIT	27,00,000
(-) interest	4,05,000
EBT	22,95,000

i) $ROI = \frac{EBIT}{Capital\ employed} = \frac{2700000}{10000000} \times 100 = 27\%$

ROI > K_d the firm has favorable financial leverage i.e., trading on equity

ii) Asset turnover ratio = (sales / total assets)
= (7500000 / 10000000) = 0.75

Much lower than the industry average

iii) DOL = (C / EBIT) = (33 / 27) = 1.2222
DFL = (EBIT / EBT) = (27 / 22.95) = 1.18
DCL = 1.22 X 1.18 = 1.44

iv) Using leverages

Sales	5000000
DOL (1.2222 x (2 / 3)]	0.81874
New EBIT = 2700000x (1-0.407062) =	1600000
[EBIT dropped by 1.222 x (1x3) = 40.7062]	

5. The following is the balance sheet of M/S Yamuna Enterprise for the year ended 31-12-08;

Balance Sheet as on 31st December, 2008

Liabilities	₹	Assets	₹
Equity share capital	**1,00,000**	**Cash in hand**	**2,000**
12% Preference share capital	**1,00,000**	**Cash in Bank**	**10,000**
16% debentures	**40,000**	**Bills Receivable**	**30,000**
18% Public debts	**20,000**	**Investors**	**20,000**
Bank overdraft	**40,000**	**Debtors**	**70,000**
Creditors	**60,000**	**Stock**	**40,000**
Proposed dividends	**7,000**	**Furniture**	**30,000**
Reserves	**10,000**	**Machinery**	**1,00,000**
Provision for taxation	**1,50,000**	**Land & Building**	**2,20,000**
Profit & Loss account	**20,000**	**Goodwill**	**35,000**
	20,000	**Preliminary expenses**	**10,000**
	5,67,000		**5,67,000**

During the year provision for taxation was ₹20,000. Dividend was proposed at ₹10,000. Profit carried forward from the last year was ₹ 15,000. You are required to calculate:

a) Short term solvency ratios, and

b) Long term solvency ratios.

Solution:

Short term solvency ratios:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$= \frac{1,52,000}{1,37,000} = 1.109 \text{ times}$$

The ideal ratio is 2 but in the instant case it is only 1.109, hence it is not satisfactory.

$$\text{Liquid ratio} = \frac{\text{Liquid Assets}}{\text{Current Liabilities}} = \frac{1,12,000}{1,37,000} = 0.818$$

The ideal ratio is 1; hence it is not quite satisfactory.

$$\text{Interest Coverage ratio} = \frac{\text{EBIT}}{\text{Interest}}$$

$$= \frac{45,000}{10,000} = 4.5 \text{ times}$$

	EBIT
Profit retained	5000
(+) proposed dividend	10000
PAT	15000
(+) tax	20000
PBT	35000
(+) interest [6400 + 3600]	10000
EBIT	**45000**

Long term solvency ratios:

$$\text{Debt equity ratio} = \frac{\text{Long term debt}}{\text{Long term fund}}$$

$$= \frac{60,000}{3,85,000} = 0.156$$

Long term debt:

Debentures	40000
Public debt	20000
	60000

Share holder funds:

Particulars	₹
Equity capital	100000
Preference capital	100000
Reserves	150000
P & L a/c	20000
(-) good will	35000
(-) Preliminary exp	10000
	325000

(2) Long term debt/ share holders funds = 60000/ 325000 = 0.18
Both are quite satisfactory.
It seems the company has adopted a conservative policy for raising Finance. Under such policy the equity share holders may not avail the benefit of trading on equity.
Fixed assets ratio = Fixed assets/ long term funds = 350000/385000 = 0.91
The ratio is satisfactory.
Proprietary ratio = share holder funds/ total tangible assets
= [325000 / (567000 – 45000)] = 0.6226
Ratio is ideal. And long term position is quite satisfactory, it is advised to improve short term.

6.

a) In considering the most appropriate capital structure for the Bharat Manufacturers Ltd. (BML), its finance department has made estimate of the interest rate on debt and the cost of equity capital at various levels of debt-equity mix summarized below :

Debt-equity mix (leverage)	Coupon rate (%)	Cost of equity (%)
0	8	12.0
10	8	12.0
20	9	12.5
30	9	13.5
40	10	14.5
50	13	16.0
60	15	20.0
70	18	25.0

The debt is in the form of 10-year redeemable at par ₹1,000 debentures with coupon rates varying with the equity-debt ratio and 5per cent flotation cost. As a matter of policy, BML always keeps 10 per cent of its finances in the form of preference shares carrying 2 per cent extra return compared to the debenture coupon rates. The duration and the floatation costs are similar to debentures.

Required : Assuming (i) 17.5 per cent dividend distribution tax and (ii) corporate tax rate, 35 per cent, determine the optimal capital structure)debt-equity mix) for the BML.

b) The directors of Wholesalers Ltd. Have forecast a steady rise in turnover for the coming year and have asked you to set out the implications of this on the company's cash position.

The turnover for the current year to 31st March 2009, was ₹12 crore, a steady ₹1 crore per month. It is felt that as a result of an advertising campaign in December 2008- March 2009, this would rise to ₹1.3 crore per month for the first six months of 2009-2010 and to ₹1.5 crore per month for the second six months and thereafter.

Wholesalers Ltd. Achieve a gross profit on sales of 25% and take two months credit from suppliers; 40% of customers pay in the month of purchase, 40% pay in the following month and 20% pay one month later. The Company holds stocks for forecast sales in April and plans to maintain this one month stock level. Variable overheads are usually 10% of sales and are paid in the month incurred. Fixed overheads of ₹1.5 crore are forecast for 2009-2010 which include ₹30, 00,000 depreciation. Fixed overheads are paid in the month incurred. The company plans to spend ₹20, 00,000 in June on additional office furniture and prefabricated warehousing.

You are required to produce a summarizes forecast of cash flow for 2009-2010 with supporting schedules. Ignore taxation.

Solution:

a) Determination of Optimum Capital structure

Degree of leverage	Coupon rate (%) (I)	Preference dividend (%) (D_p)	Cost of equity (K_e)	K_d	K_p	K_o
0	8.0	10.0	12.0	0.0585	0.1256	0.1206
10	8.0	10.0	12.0	0.0585	0.1256	0.1144
20	9.0	11.0	12.5	0.0651	0.1377	0.1143
30	9.0	11.0	13.5	0.0651	0.1377	0.1143
40	10.0	12.0	14.5	0.0718	0.1497	0.1162
50	13.0	15.0	16.0	0.0918	0.1859	0.1285
60	15.0	17.0	20.0	0.1051	0.2100	0.1441

70	18.0	20.0	25.0	0.1251	0.2462	0.1622

Conclusion: The optimum capital structure lies between 20 and 30 per cent of leverage.

Working note:

$K_d = [I (1 – t) + Flotation\ costs/N] \div (RV + SV)/2$

$K_p = [D_p (1 + D_t) + Flotation\ costs/N] \div (RV + SV)/2$

Where, I = Interest
D_p = Dividend on preference shares
t = Tax rate
RV = Redemption value
SV = Sale value (face value – flotation cost)
n = Maturity period
D_t = Dividend payment tax

$K_o = (W_d \times K_d) + (W_p \times K_p) + (W_e + K_e)$

It may be noted that 10% debt-equity mix implies 90% shareholders equity (consisting 10% of preference shares and 80% of ordinary shares).

b)

Wholesalers Limited
Forecast of Cash Flow for 2009-2010 (₹ in crores)

Receipts:		
Sales= (₹1.3×6+₹1.5×6)	(₹1.3×6+₹1.5×6)=	₹16.8 crores
Add: opening Debtors =	1×0.6+1×0.2=	₹0.8 crores
Less: closing Debtors=	1.5×0.2+1.5×0.6=	₹1.2 crores
Total		₹16.4 crores
Payments:		
Cost of Sales=(16.8×0.75)	12.6	
Closing Stock=(1.5×0.75)	1.125	
Opening Stock=(1.3×0.75)	0.975	
Purchases:	12.75	
Op. creditors(1.3×0.75+1×0.75)	1.725	
cl. Creditors (1.5×0.75×2 m)=	2.25	
Payment to Creditors:		₹12.225 Crores
Variable overheads 10% of 16.8		₹1.68 crores
Fixed overheads (1.5-0.30 Depn.)		₹1.20 Crores
Purchase of furniture		₹0.20 crores
Total		₹15.305 Crores
Surplus		₹1.095 crores

Note: Opening debtors consist of 60% of March 09 Debtors and 20% of February 09 debtors, who will pay in 2009-10, while 60% of March 10 Debtors and 20% of February 10 Debtors will not pay in 2009-10. The sales figure is adjusted with opening and closing debtors.

7.

a) C. Ltd.'s current operating income is Rs. 4 lakh. The firm has Rs. 10 lakh of 10 per cent debt outstanding. Its cost of equity capital is estimated to be 15 per cent.
Required:
(i) Determine the current value of the firm, using traditional valuation approach.

(ii) Calculate the overall capitalization rate as well as both types of leverage ratio: (a) B/S [Debt/Equity ratio]; (b) BN [Debt/Value ratio].
(iii) The firm is considering increasing its leverage by raising an additional Rs. 5, 00,000 debts and using the proceeds to retire that amount of equity. As a result of increased financial risk, k_j is likely to go up to 12 per cent and k_e to 18 per cent. Would you recommend the plan?

b) Explain the main features of SEBI.

Solution:
a)

EBIT	4,00,000
Less : Interest	1,00,000
Earnings for equity holders (N1)	3,00,000
Equity-capitalisation rate (ke)	0.15
Market value of equity (S)	20,00,000
Market value of debt (B)	10,00,000
Total value of firm (S + B) 30,00,000	30,00,000
(ii) Overall capitalisation rate $= \frac{EBIT}{V} = \frac{4,00,000}{30,00,000}$	0.1333
(a) Debt/Equity ratio (B/S)	0.5
(b) Debt/Value ratio (B/V)	0.33
(iii) EBIT	4,00,000
Less : Interest	1,80,000
Earnings for equityholders (N1)	2,20,000
Equity-capitalisation rate (ke)	0.18
Market value of equity (S)	12,22,222
Market value of debt (B)	15,00,000
Total market value of firm (S+B)=V	27,22,222

The plan is not recommended as the value of the firm would decrease from ₹30, 00,000 to ₹ 27, 22,222.

b) The main features of SEBI are as follows :

i) SEBI is an autonomous body created by the Government of India in 1988 and given statutory form in 1992 with the SEBI Act 1992.

ii) Its Head office is in Mumbai and has regional offices in Chennai, Kolkata, and Delhi.

iii) SEBI is the regulator of Securities markets in India.

iv) SEBI has to be responsive to the needs of three groups, which constitute the market:

- The issuers of securities.
- The investors.
- The market intermediaries.

v) SEBI has three functions rolled into one body quasi-legislative, quasi-judicial and quasi-executive.

vi) It drafts regulations in its legislative capacity, it conducts investigation and enforcement action in its executive function and it passes rulings and orders in its judicial capacity.

vii) Though this makes it very powerful, there is an appeal process to create accountability. There is a Securities Appellate Tribunal which is a three member body.

viii) A second appeal lies directly to the Supreme Court.

8.

a) The following information relates to nana Ltd.

Earnings of the Company	**₹10, 00,000**
Dividend payout ratio	**60%**
No. of shares outstanding	**2, 00,000**
Rate of Return on Investment	**15%**
Equity Capitalization Rate	**12%**

i) What would be the Market Value per Share as per Walter's Model?

ii) What is the optimum Dividend Payout Ratio according to Walter's Model, and the Market Value of Company's Share at that payout ratio?

b) Explain the criticism on MM hypothesis Modal.

Solution:

a)

$$\text{Value per share} = \frac{DPS}{K_e} + \frac{(EPS - DPS) \times \frac{R}{K_e}}{K_e}$$

Computation of Factors:

Earnings Per Share (EPS)	₹10 lakhs÷ 2 lakhs = ₹5	Cost of Equity (K_e)	**12%**
Dividend Per Share (DPS)	EPS₹5×payout60% =₹3	Return on Investment (R)	**15%**

i) Value per Share $= \frac{₹3}{0.12} + \frac{(₹5 - ₹3) \times \frac{0.15}{0.12}}{0.12} = ₹25 + ₹20.83 = ₹45.83$

ii) Optimum payout Ratio: since the company's earning capacity i.e. ROI (of 15%) is greater than Shareholder's Expectation (of 12%), the shareholder's Wealth would be maximized at "Zero" payout, i.e. Nil Dividend.

iii) Value Per Share at Optimum Payout

$$= \frac{₹0}{0.12} + \frac{(₹5 - ₹0) \times \frac{0.15}{0.12}}{0.12} = ₹0 + 52.08 = ₹52.08$$

b) The arbitrage process is the behavioral and operational foundation for MM Hypothesis. But this process fails the desired equilibrium because of the following limitations.

i) Rates of interest are not the same for the individuals and firms. The firms generally have a higher credit standing because of which they can borrow funds at a lower rate of interest as compared to individuals.

ii) Home – Made leverage is not a perfect substitute for corporate leverage. If the firm borrows, the risk to the shareholder is limited to his shareholding in that company. But if he borrows personally, the liability will be extended to his personal property also. Hence, the assumption that personal or home – made leverage is a perfect substitute for corporate leverage is not valid.

iii) The assumption that transaction costs do not exist is not valid because these costs are necessarily involved in buying and selling securities.

iv) The working of arbitrage is affected by institutional restrictions, because the institutional investors are not allowed to practice home – made leverage.

v) The major limitation of M – M hypothesis is the existence of corporate taxes. Since the interest charges are tax deductible, a levered firm will have a lower cost of debt due to tax advantage when taxes exist.

9.

a) Is share Buyback is a financing decision or an investment decision?

b) Slow Players are regular customers of Goods Dealers Ltd., Calcutta and have approached the sellers for extension of credit facility for enabling them to purchase goods from Goods Dealers Ltd. On the analysis of past performance and on the basis of information supplied, the following pattern of payment schedule emerges in regard to Slow Players:

Schedule	Pattern
At the end of 30 days	15% of the bill
60 days	34% of the bill
90 days	30% of the bill
100 days	20% of the bill
Non recovery	1% of the bill

Slow Players wants to enter into a firm commitment for purchase of goods of ₹ 15, 00,000 in 2012, deliveries to be made in equal quantities on the first day of each quarter in the calendar year. The price per unit of the commodity is ₹ 150 on which a profit of ₹5 per unit is expected to be made. It is anticipated by the Good Dealers Ltd. that taking up of this contract would mean an extra recurring expenditure of ₹5,000 per annum. If the opportunity cost of funds in the hands of Goods Dealers is 24% per annum, would you as the Finance Manager of the seller recommend the grant of credit to Slow Players? Working should form part of your answer.

Solution:

a) When the shares are undervalued in the market and the firm does not have an alternate business opportunity, then the excess cash is returned to shareholders and thus the management prefers to invest in its own business by buying back their shares. Yes, the management has more faith in its own business. Thus it can be argued as an **investment decision** even though excess cash with the firm is given to shareholders in a different form.

Secondly, share buy-back reduces the equity portion of the firm, thereby increasing the debt portion in the overall capital structure. Moreover, for further expansion the firm may borrow thereby further increasing the leverage and risk. Thus share repurchase is a kind of **financing decision** too.

b) Appraisal of credit proposal from Slow Players:

i) Incremental profit = 15,00,000 x 5 150 = ₹ 50,000

ii) Calculation of incremental finance cost: 17,975* x 4 = ₹ 71,900

*Sales per quarter = 15, 00,000 /4 = ₹ 3, 75,000

Finance cost per quarter: ₹

For 15% of bill	3,75,000 x 15% x 24% x 30/ 360	1,125
For 34% of bill	3,75,000 x 34% x 24% x 60/ 360	5,100
For 30% of bill	3,75,000 x 30% x 24% x 90 /360	6,750
For 20% of bill	3,75,000 x 20% x 24% x 100 /360	5,000
Finance cost per quarter		17,975

iii) Extra recurring expenses = ₹ 5,000

iv) Bad debts = 15,00,000 x 1% = ₹ 15,000

10. The following is the Balance Sheet of ABC Ltd.

Liabilities	**As at 30.06.08**	**As at 30.06.09**	**Assets**	**As at 30.06.08**	**As at 30.06.09**
Share capital (Equity shares of rs.100 each)	**10.00**	**20.00**	**Plant**	**13.00**	**18.00**
10% redeemable shares of ₹100 each	**7.50**	**2.50**	**Stock**	**8.00**	**9.50**
Share Premium	**0.50**	**0.25**	**Debtors**	**15.00**	**14.50**
Cap. Red. Reserve	**0.00**	**5.00**	**Bank balance**	**3.00**	**2.50**
Reserve	**8.00**	**4.50**	**Miscellaneous**	**1.00**	**1.00**
P & L A/c	**3.00**	**5.00**			
Provision for Liabilities	**5.00**	**6.00**			
Current Liabilities	**6.00**	**2.25**			
	40.00	**45.50**		**40.00**	**45.50**

The following further information is furnished:

a. The Company declared a dividend of 20% for the year ended 30th June 2008 to equity shareholders on 30th September, 2008. Dividend on preference share capital for the year ended 30th June, 2008 was paid on 30th June, 2008.

b. The Company issued notice to preference shareholders holding preference shares of the face value of ₹5 lakhs for redemption at a premium of 5% on 1st December, 2008 and the entire proceedings were completed before 31-12-2008 in accordance with the law.

c. The Company provided depreciation at 10% on the closing balance of plant. During the year one plant whose book value was ₹2, 00,000 was sold at a loss of ₹30,000.

d. Miscellaneous expenditure incurred during the year ended 30th June 2009 ₹25,000 for share issue and other expenses.

e. A sum of ₹4 lakhs has been provided for taxation during the year.

Prepare statement of sources and application of funds for the year ended 30th June, 2009. Also prepare a statement showing changes in working capital.

Solution:

Funds Flow statement

Sources	₹	Application	₹
Sales of Fixed assets	170000	Increase in working capital	425000
Funds from operations	1255000	Purchase of Fixed assets	900000
Issue of Equity	1000000	Redemption preference shares	525000
		Tax paid	300000
		Equity Dividend 2008	200000
		Preference dividends 2009	50000
		Miscellaneous expenditure	25000
	2425000		**2425000**

Working note No.1 changes in working capital

Particulars	2008	2009
Current assets		
Stock	800000	950000
Debtors	1500000	1450000
Bank	300000	250000
	2600000	2650000
Current Liabilities	600000	225000
Working Capital	2000000	2425000
Increase in working capital	425000	

Working note No. 2: depreciation

Particulars	₹
WDV of fixed assets @90%	1800000
For 100%	2000000
Therefore depreciation provided	200000

Working note No. 3: Purchase or sale of Fixed assets

Particulars	₹
Fixed assets	1300000
(-) depreciation	200000
(-) book value of asset sold	200000
	900000
(+) additional (b/f)	900000
	1800000

Working note No. 4 P & L Adjustment Account

Particulars	₹	Particulars	₹
To depreciation	200000	By balance b/d	300000
To transfer to reserve (950000 – 800000)	150000	By funds from operations (b/f)	1255000
To provision for tax	400000		
To miscellaneous expenditure Written off	25000		
To loss on sale of assets	30000		
To equity dividend 2008	200000		
To preference dividend 2009	50000		
To balance c/d	500000		
	1555000		**1555000**

11.

a) The selected financial date for A,B & C companies for the year ended Dec.31, 2011 are as follows:

	A	B	C
Variable expenses as a percentage of sales	**66/2/3**	**75**	**50**
Interest expenses	**₹ 200**	**₹ 300**	**₹ 1,000**
Degree of operation leverage	**5 – 1**	**6 – 1**	**2 – 1**
Degree of financial leverage	**3 – 1**	**4 – 1**	**2 – 1**
Income-tax rate	**0.50**	**0.50**	**0.50**

Prepare income statements for A,B & C Cos.

b) The annual cash requirement of A Ltd. Is ₹10 Lakhs. The company has marketable securities in lot sizes of ₹50,00, ₹1,00,000,₹2,00,000,₹2,50,000 and ₹5,00,000. Cost of conversion of marketable securities per lot is ₹1,000. The company can earn 5% annual yield on its securities.
You are required to prepare a table indicating which lot size will have to be sold by the company.

Solution:

a)

	A	B	C
Financial leverage			
(EBIT / EBT) = (EBIT / EBIT – I)	3	4	2
EBT	300	400	2000
Operating leverage (C/ EBIT)	5	6	2
Contribution	1500	2400	4000
Sales	4500	9600	8000

INCOME STATEMENT

Sales	4500	9600	8000
(-) variable cost	3000	7200	4000
Contribution	1500	2400	4000
(-) Fixed cost	1200	2000	2000
EBIT	300	400	2000
(-) interest	200	300	1000
EBT	100	100	1000
EAT	50	50	50

b) Table indicating lot size of securities

Total annual cash requirements = T= ₹10,00,000

Lot size (₹)	50,000	1,00,000	2,00,000	2,50,000	5,00,000
Number of Lots (T/C)	20	10	5	4	2
Conversion Cost (₹) = (T/C) b where b= cost of conversion per lot.	20,000	10,000	5,000	4,000	2,000
Interest charges ₹= (C/2) I	1,250	2,500	5,000	6,250	12,500
Total Cost ₹ =	**21,250**	**12,500**	**10,000**	**10,250**	**14,500**

Economic lot size is ₹2, 00,000 at which total costs are minimum.

12. Write short note on the following :

(a) Stochastic Model

(b) External commercial Borrowings (ECB)

(c) Work breakdown structure.

(d) TRIMS &TRIPS

(e) Window Dressing

Solution:

(a) Stochastic (Miller-Orr) Model:

The model prescribes two control limits, Upper control Limit (UCL) and Lower Control Limit (LCL). When the cash balances reaches the upper limit a transfer of cash to investment account should be made and when cash balances reach the lower point a portion of securities constituting investment account of the company should be liquidated to return the cash balances to its return point. The control limits are converting securities into cash and the vice – versa, and the cost carrying stock of cash.

The "O" optimal point of cash balance is determined by using the formula

$$O = \sqrt[3]{\frac{2TV}{4I}}$$

Where,

O = Target cash balance (Optimal cash balance)

T = Fixed cost associated with security transactions

I = Interest per day on marketable securities

V = Variance of daily net cash flows.

(b) External Commercial Borrowings (ECB)

Indian promoters can also borrow directly from foreign institutions, foreign development bank, World Bank, etc. It is also known as Foreign Currency Term loans. Foreign institutions provide foreign currency loans and financial assistance towards import of plants and equipments. The interest on these loans is payable in foreign currency. On the payment date, interest amount is converted into domestic currency at the prevailing foreign exchange rate. The borrowings, repayment and interest payments can be tailor-made in view of the cash flow position of the project.

(c) Work breakdown structure -would break down the work according to various components and establish relationship connection between various components. Work can be broken down by a function orientated approach. The development of work breakdown structure consists of:

- defining the project to be performed and establishing their relationship with project end items and project objectives;
- establishing the framework for integrated cost ; schedule planning and control;
- Establishing the framework for summarizing the cost and schedule of status of project for progressively higher level of management. This serves the basis of pert network.

(d) TRIMS & TRIPS

TRIMS stand for Trade Related Investment Measures. TRIMs are the rules a country applies to the domestic regulations to promote foreign investment, often as part of an industrial policy.

i) It is one of the four principal legal agreements of the WTO trade treaty.

ii) It enables international firms to operate more easily within foreign markets.

iii) In the late 1980's, there was a significant increase in foreign direct investment throughout the world. However, some of the countries receiving foreign investment imposed numerous restrictions on that investment designed to protect and foster domestic industries, and to prevent the outflow of foreign exchange reserves.

TRIPS stand for Trade Related Aspects of Intellectual Property Rights. TRIP is an international agreement administered for the first time by the World Trade Organization (WTO) into the international trading system. It sets down minimum standards for many forms of intellectual property (IP) regulation. Till date, it remains the most comprehensive international agreement on intellectual property. It was

negotiated at the end of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994.

TRIPS contains requirements that nations' laws must meet for: copyright rights, including the rights of performers, producers of sound recordings and broadcasting organizations; geographical indications, including appellations of origin; industrial designs; integrated circuit layout-designs; patents; monopolies for the developers of new plant varieties; trademarks; trade dress; and undisclosed or confidential information. TRIPS also specify enforcement procedures, remedies, and dispute resolution procedures.

(e) Window Dressing

The term window dressing means manipulation of accounts in a way so as to conceal vital facts and present the financial statements in a way to show a better position than what it actually is. On account of such a situation, presence of a particular ratio may not be a definite indicator of good or bad management. For example, a high stock turnover ratio is generally considered to be an indication of operational efficiency of the business. But this might have been achieved by unwarranted price reductions or failure to maintain proper stock of goods.

Similarly, the current ratio may be improved just before the Balance Sheet date by postponing replenishment of inventory. For example, if a company has got current assets of ₹ 4,000 and current liabilities of ₹ 2,000 the current ratio is 2, which is quite satisfactory. In case the company purchases goods of ₹ 2,000 on credit, the current assets would go up to ₹ 6,000 and current liabilities to ₹ 4,000. Thus reducing the current ratio to1.5. The company may, therefore. Postpone the purchases for the early next year so that its current ratio continues to remain at 2 on the Balance Sheet date. Similarly, in order to improve the current ratio, the company may pay off certain pressing current liabilities before the Balance Sheet date. For example, if in the above case the company pays current liabilities of ₹ 1,000, the current liabilities would stand reduced to ₹ 1,000, current assets would stand reduced to ₹ 3,000 but the current ratio would go up to 3.