1 a) Select the correct answer in each of the followings:(*Answer are recorded in **bold***)
(i) One of the most important tools in cost planning is:
A)Direct cost
B)Cost Sheet
C)Budget
D)Marginal Costing.

(ii)Conversion cost is equal to the total of
A)Material Cost and direct wages
B)Material Cost and indirect wages
C)Direct wages and factory overhead
D)Material cost and factory overhead.

(iii)Which of the following is not a relevant cost?
A)Replacement cost
B)Sunk cost
C)Marginal cost
D)Standard cost.

(iv)Which of the following is an accounting record?
A)Bill of Material
B)Bin Card
C)Stores Ledger.
D)All of these.

(v)Material mix variance is sub-variance of:
A)Material cost variance.
B) Material price variance.
C) Material quantity variance.
D) Material yield variance.

(vi)The fixed-variable cost classification has a special significance in preparation of :
A)Flexible Budget
B)Master Budget
C)Cash Budget
D)Capital Budget

(vii)Input in a process is 4000 units and normal loss is 20%. When finished output in the process is only 3240 units, there is an :
A)Abnormal loss of 40 units
B) Abnormal gain of 40 units
C)Neither abnormal loss nor gain.
D)Abnormal loss of 60 units.

(viii)Direct cost chargeable to Contract does not include:
A)Materials
B)Labour
C)Supervision
D)Storage cost

(ix)Idle capacity of a plant is the difference between:
A)Maximum capacity and practical capacity
B)Practical capacity and normal capacity
C)Practical capacity and capacity based on sales expectancy
D)Maximum capacity and actual capacity.

(x)When P/V ratio is 40% and sales value is ₹10,000, the variable cost will be
A)Rs 4000
B)Rs 6000
C)Rs 10000
D)Variable Cost cannot be calculated from data given.

b)Fill in the blanks with appropriate word(s): (Answer in bold)
i)Out of pocket cost means----------.(**cost which gives rise to cash expenditure**)
ii)----------is that level of materials at which a new order for purchase of materials is to be placed.**(Re-order level)**
iii)Two important opposing factors in fixing the economic order quantity are --------- and ----------**(Ordering cost, Carrying cost)**
iv)Wages under Halsey Plan and Rowan Plan are exactly equal when time saved is Nil or it is ----------% of standard time.(**50**)
v)----------is the process of recording the time spent by workers on different jobs.(**Time booking**)
vi)The technical term for charging of overheads to cost units is known as ----------(**Absorption**)
vii)In determining equivalent production , degree of completion for normal process loss is taken as ----------(**Nil**)
viii)----------determines the priorities in functional budgets.(**Key factor**)
ix)Overhead Cost variance=(Std. Hrs for Actual Output*----------)- (Actual OH Cost).(**Std. OH Absorption Rate**)
x)In profit volume graph, horizontal axis represents ----------(**Sales**)

c) State the unit of cost and method of costing generally used for accounting purpose in the following cases:

i)Toy making ;(ii) Brick-works ; (iii) Oil refining mill ;(iv)Ship building; (v) Hospital

Ans:

Industry	Method of Costing	Unit of Cost
(i) Toy making	Batch	Per batch
(ii) Brick – works	Single or output	1000 bricks
(iii)Oil refining	Process	Per tonne
(iv) Ship building	Contract	Per Ship
(v) Hospital	Operating	Per Bed per day or Per patient per day

2a) The books of AB Ltd. present the following data for the month of December, 2011.

Direct labour cost ₹ 17,500 being 175% of works overheads.

Cost of goods sold excluding administrative expenses ₹ 56,000.

Inventory accounts showed the following opening and closing balance:

	Dec 1	Dec 31
	₹	₹
Raw materials	8,000	10,600
Works in progress	10,500	14,500
Finished goods	17,600	19,000

Other data are :	₹
Selling expenses	3,500
General and administration expenses	2,500
Sales for the month	75,000

You are required to:

(i) Compute the value of materials purchased

(ii) Prepare a cost statement showing the various elements of cost and also the profit earned.

b)Distinguish between:

i)Conversion Cost and Value Added

ii)Production Account and Cost Sheet.

Ans: (a)(i) Computation of the value of materials purchased

	₹
Cost of goods sold	56,000
Add: Closing stock of finished goods	19,000
	75,000
Less: Opening stock of finished goods	17,600
Cost of goods manufactured	57,400
Add: Closing stock of works-in-progress	14,500
	71,900
Less: Opening stock of work-in-progress	10,500
Works Cost	61,400
Less: Factory Overhead: $\left(\frac{100}{175}\text{of Direct Labour Cost}\right)$	10,000
Prime Cost	51,400
Less: Direct Labour	17,500
Raw materials consumed	33,900
Add: Closing stock of raw materials	10,600
Raw materials available	44,500
Less: Opening stock of raw materials	8,000
Value of materials purchased	36,500

(i) Cost Statement Showing the various elements of Cost and Profit Earned

	₹
Raw material consumed	33,900
*(*Refer to Statement (I) above*)*	
Direct labour cost	17,500
Prime Cost	51,400
Add: Factory Overheads	10,000
Works Cost	61,400
Add: Opening Work-in-progress	10,500
	71,900
Less: Closing Work-in-progress	14,500
Cost of goods manufactured	57,400
Add: Opening stock-of finished goods	17,600

	75,000
Less: Closing stock of finished goods	19,000
Cost of Goods Sold	56,000
Add: General and administration expenses	2,500
Add: Selling expenses	3,500
Cost of Sales	62,000
Profit (Balance figure ₹ 75,000 – ₹ 62,000)	13,000
Sales	75,000

bi) Conversion cost is the production cost excluding the cost of direct material (but including the cost resulting from variations in direct material, weight or volume) of producing partly or fully finished products. In other words, conversion cost of finished product or work in-progress is comprised of direct labour and the manufacturing overhead. Added value means the charge in market value resulting from an alteration in the form, location or availability of a product or service, excluding the cost of bought out materials or services. Unlike conversion cost, it includes profit.

ii) The following are the points of difference between a Production Account and a Cost Sheet.

I)Production Account is based on double entry system whereas cost sheet is not based on double entry system.

II)Production Account consists of two parts. The first part shows cost of the components and total production cost. The second part shows the cost of sales and profit for the period. Cost sheet presents the elements of costs in a classified manner and the cost is ascertained at different stages such as prime cost; works cost of production; cost of goods sold; cost of sales and total cost.

III)Production account shows the cost in aggregate and thus facilitates comparison with other financial accounts. Cost sheet shows the cost in detail and analytical manner which facilitates comparison of cost for the purpose of cost control.

IV)Production accounts is not useful for preparing tenders or quotations. Estimated cost sheets can be prepared on the basis of actual costs sheets and these are useful for preparing tenders or quotations.

3a) M/s XY Ltd. are the manufacturers of picture tubes for T.V. The following are the details of their operation during 2011:

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	6-8 weeks

Compute from the above:

(1) Economic Order Quantity. If the supplier is willing to supply quarterly 1,500 units at a discount of 5%, is it worth accepting?
(2) Maximum level of stock
(3) Minimum level of stock
(4) Reorder level

b) Discuss the accounting treatment of spoilage and defectives in Cost Accounting.

Ans: a) S=Annual usage of tubes = Normal usage per week × 52 weeks
=100 tubes × 52 weeks = 5,200 tubes

C_o=Ordering cost per order = ₹ 100/- per order
C_1=Cost per tube = ₹ 500/-
$_iC_1$=Inventory carrying cost per unit per annum
=20% × ₹ 500 = ₹ 100/- per unit, per annum
Economic order quantity:

$$E.O.Q = \sqrt{\frac{2SC_O}{{}_iC_1}} = \sqrt{\frac{2 \times 5{,}200 \text{ units} \times Rs.100}{Rs.100}} = 102 \text{ tubes (approx.)}$$

The supplier is willing to supply 1500 units at a discount of 5%, is it worth accepting
Total cost (when order size is 1500 units) = Cost of 5,200 units + Ordering cost
+ Carrying cost.

$$= 5{,}200 \text{ units} \times ₹ 475 + \frac{5{,}200 \text{units}}{1{,}500 \text{ units}} \times ₹100 + \frac{1}{2} \times 1{,}500 \text{ units} \times 20\% \times ₹ 475$$

=₹ 24,70,000 + ₹ 346.67 + ₹ 71,250
=₹ 25,41,596.67
Total cost (when order size is 102 units)

$$= 5{,}200 \text{ units} \times ₹ 500 + \frac{5{,}200 \text{units}}{102 \text{ units}} ₹ 100 + \frac{1}{2} 102 \text{ units} \times 20\% \times ₹ 500$$

=₹ 26,00,000 + ₹ 5,098.03 + ₹ 5,100
=₹ 26, 10,198.03
Since, the total cost under quarterly supply of 1,500 unit with 5% discount is lower than that when order size is 102 units, therefore the offer should be accepted. While accepting this offer consideration of capital blocked on order size of 1,500 units per quarter has been ignored.

(2)Minimum level of stock
=Re-order level + Reorder quantity – Min. usage × Min. reorder period
=1,600 units + 102 units – 50 units × 6 weeks =1,402 units.

(3)Minimum level of stock
=Re-order level – Normal usage × Average reorder period
=1,600 units – 100 units × 7 weeks = 900 units.

(4)Reorder level
=Maximum consumption × Maximum re-order period
=200 units × 8 weeks =1,600 units

b) Normal spoilage cost (which is inherent in the operation) are included in cost either by charging the loss due to spoilage to the production order or charging it to production overhead so that it is spread over all products. Any value realized from the sale of spoilage is credited to production order or production overhead account, as the case may be.
The cost of abnormal spoilage (i.e. spoilage arising out of causes not inherent in manufacturing process) is charged to the Costing Profit and Loss Account. When spoiled work is due to rigid specifications, the cost of spoiled work is absorbed by good production, while the cost of disposal is charged to production overheads.
The problem of accounting for defective work is the problem of accounting of the costs of rectification or rework. The possible ways of treatment are as below:
(i) Defectives that are considered inherent in the process and are identified as normal can be recovered by using the following methods:

- Charged to good products
- Charged to general overheads
- Charged to department overheads
- Charged to identifiable job.

(ii) If defectives are abnormal and are due to causes beyond the control of organisation, the rework, cost should be charged to Costing Profit and Loss Account.

4a) Raw materials 'X' costing ₹ 150 per kg. and 'Y' costing ₹ 90 per kg. are mixed in equal proportions for making product 'W'. The loss of material in processing works out to 25% of the product. The production expenses are allocated at 40% of direct material cost. The end product is priced with a margin of 20% over the total cost.

Material 'Y' is not easily available and substitute raw material 'Z' has been found for 'Y' costing ₹ 75 per kg. It is required to keep the proportion of this substitute material in the mixture as low as possible and at the same time maintain the selling price of the end product at existing level and ensure the same quantum of profit as at present.

You are required to compute the ratio of the mix of the raw materials 'X' and 'Z'.

b) The following are the details of receipts and issues of a material of stores in a manufacturing company for the period of three months ending 30th June, 2011:

Receipts:

Date	Quantity (kgs)	Rate per kg. (₹)
April 10	1,600	5
April 20	2,400	4.90
May 5	1,000	5.10
May 17	1,100	5.20
May 25	800	5.25
June 11	900	5.40
June 24	1,400	5.50

There was 1,500 kgs. in stock at April 1, 2011 which was valued at ₹ 4.80 per kg.

Issues:

Date	Quantity (kgs)
April 4	1,100
April 24	1,600
May 10	1,500
May 26	1,700
June 15	1,500
June 21	1,200

Issues are to be priced on the basis of weighted average method. The stock verifier of the company reported a shortage of 80 kgs. on 31st May, 2011 and 60 kgs. on 30th June, 2011. The shortage is treated as inflating the price of remaining material on account of shortage.

You are required to prepare a Stores Ledger Account.

Ans: a) (i) Computation of material mix ratio:

Let 1 kg. of product A requires 1.25 kg. of input of materials X and Y

Raw materials are mixed in equal proportions.

Then raw material X = $\frac{1.25}{2} = .625\text{kg}.$

Then raw material Y = $\frac{1.25}{2} = .625\text{kg}.$

(ii) Computation of selling price / kg. of product W

	₹
Raw material X .625 kg. × 150 = ₹ 93.75	
Raw material Y .625 kg. × 90 = ₹ 56.25	150.00
Production expenses (40% of material cost)	60.00
Total cost	210.00
Add: profit 20% of total cost	42.00
Selling price	252.00

Computation of proportions of materials X and Z in 'W'

Let material Z required in product W be m kg.

Then for producing 1 kg of product 'W', material X requirement = (1.25 – m) kg.

To maintain same level of profit and selling price as per Working note (ii), it is required that the total cost of material in 1 kg. of product W should not exceed ₹ 150,
i.e., m kg. × ₹ 75 + (1.25 –m) kg. × 150 = ₹ 150
or 75 m + 187.5 – 150 m = 150
or 75 m = 37.5
or m = 0.5 kg.
Raw material X requirement in product W = 1.25 – .5 = .75 kg.
So, proportion of material X and Z = .75 : .50 = 3 : 2.

(b)

Stores Ledger Account
for the three months ended 30th June, 2011
(Weighted Average Method)

Date	Receipts GRN No. MRR No.	Qty. (Kgs.)	Rate (₹)	Amt (Rs)	Issues Requisit-ion. No.	Qty. (Kgs.)	Rate (₹)	Amt (₹)	Balance Qty. (Kgs.)	Amt (₹)	Rate for further Issue (₹)
2011											
April 1									1,500	7,200	4.80
April 4						1,100	4.80	5,280	400	1,920	4.80
April 10		1,600	5.00	8,000					2,000	9,920	$\frac{9,920}{2,000}=4.96$
April 20		2,400	4.90	11,760					4,400	21,680	$\frac{21,680}{4,400}=4.93$
April 24						1,600	4.93	7,888	2,800	13,792	$\frac{13,792}{2,800}=4.93$
May 5		1,000	5.10	5,100					3,800	18,892	$\frac{18,892}{3,800}=4.97$
May 10						1,500	4.97	7,455	2,300	11,437	$\frac{11,437}{2,300}=4.97$
May 17		1,100	5.20	5,720					3,400	17,157	$\frac{17,157}{3,400}=5.05$
May 25		800	5.25	4,200					4,200	21,357	$\frac{21,357}{4,200}=5.09$
May 26						1,700	5.09	8,653	2,500	12,704	$\frac{12,704}{2,500}=5.09$
May 31					Shortage	80			2,420	12,704	$\frac{12,704}{2,420}=5.25$
June 11		900	5.40	4,860					3,320	17,564	$\frac{17,564}{3,320}=5.29$
June 15						1,500	5.29	7,935	1,820	9,629	$\frac{9,629}{1,820}=5.29$
June 21						1,200	5.29	6,348	620	3,281	$\frac{3,281}{620}=5.29$
June 24		1,400	5.50	7,700					2,020	10,981	$\frac{10,981}{2,020}=5.40$
June 30					Shortage	60			1,960	10,981	$\frac{10,981}{1,960}=5.60$

5a) Bonus paid under the Halsey Plan with Bonus at 50% for the time saved equals the bonus paid under the Rowan System. When will this statement hold good ? Justify your answer.

b) XYZ Ltd. is working by employing 50 skilled workers it is considered the introduction of incentive scheme-either Halsey scheme (with 50% bonus) or Rowan scheme of wage payment for increasing the labour productivity to cope up the increasing demand for the product by 40%. It is believed that proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers; it could act as sufficient incentive for them to produce more.

Because of assurance, the increase in productivity has been observed as revealed by the figures for the month of September, 2011.

Hourly rate of wages (guaranteed)	₹ 30
Average time for producing one unit by one worker at the previous	1.975 hours
Performance (This may be taken as time allowed)	
Number of working days in the month	24
Number of working hours per day of each worker	8
Actual production during the month	6,120 units

Required:

(i) Calculate the effective rate of earnings under the Halsey scheme and the Rowan scheme.

(ii) Calculate the savings to the XYZ Limited in terms of direct labour cost per piece.

(iii)Which incentive scheme will be better?

Ans: a) Bonus under Halsey Plan

= Standard wage rate $\times \frac{50}{100} \times$ Time saved ..... (i)

Bonus under Rowan Plan

= Standard wage rate $\times \frac{\text{Time saved}}{\text{Time allowed}} \times$ Time taken ..... (ii)

Bonus under Halsey Plan will be equal to the

Bonus under Rowan Plan when the following condition holds good

Standard wage rate $\times \frac{50}{100} \times$ Time saved

$= \text{Standard wage rate} \times \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken}$

or $\frac{1}{2} = \frac{\text{Time taken}}{\text{Time allowed}}$

or Time taken = $\frac{1}{2}$ of Time allowed

Hence, when the time taken is 50% of the time allowed the bonus under Halsey and Rowan Plans is equal.

b)1. Computation of time saved (in hours) per month:

= (Standard production time of 6,120 units – Actual time taken by the workers)

= (6,120 units × 1.975 hours – 24 days × 8 hrs per day × 50 skilled workers)

= (12,087 hours – 9,600 hours)

= 2,487 hours

2. Computation of bonus for time saved hours under Halsey and Rowan schemes:

Time saved hours (Refer to working note 1)	= 2,487 hours
Wage rate per hour	= ₹ 30
Bonus under Halsey Scheme (With 50% bonus)	= ½ × 2,487 hours × ₹ 30
	=₹ 37,305

Bonus under Rowan Scheme $= \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \times \text{Rate per hour}$

$= \frac{2{,}487 \text{ hours}}{12{,}087} \times 9{,}600 \text{ hours} \times ₹30$

= ₹ 59,258.38 P.

(i) Computation of effective rate of earnings under the Halsey and Rowan schemes:

Total earnings (under Halsey scheme) = Time wages + Bonus
*(*Refer to working note 2*)*

= 24 days × 8 hours + 50 skilled workers × ₹ 30+ ₹ 37,305

= ₹ 2,88,000 + ₹ 37,305 = ₹ 3,25,305

Total earnings (under Rowan scheme) = Time wages + Bonus
(Refer to working note 2*)*

= ₹ 2,88,000 + ₹ 59,258.38

= ₹ 3,47,258.38

Effective rate of earnings per hour (under Halsey Plan = ₹ 33.89
(₹ 3,25,305/9,600 hrs*)*

Effective rate of earnings per hour (under Rowan Plan = ₹ 36.17
(₹3,47,258.38/9,600 hrs*)*

(ii) Savings to the XYZ Ltd., in terms of direct labour cost per piece:

	₹
Direct labour cost (per unit) under time wages system (1,975 time per unit × ₹ 30)	59.25
Direct labour cost (per unit) under Halsey Plan (₹ 3,25,305 / 6,120 units)	53.15
Direct labour cost (per unit) under Rowan Plan (₹ 3,47,258.38/6,120 units)	56.74
Saving of direct labour cost under:	
* Halsey Plan (₹ 59.25 – 53.15)	₹ 6.10
* Rowan Plan (₹ 59.25-56.74)	₹ 2.51

(iii) Advise to XYZ Ltd: (about the selection of the scheme)

Halsey scheme brings more savings to the management of XYZ Ltd., over the present earnings of ₹ 2,88,000 but the other scheme viz Rowan fulfils the promise of 20% increase over the present earnings of ₹ 2,88,000 by paying 20.58% in the form of bonus. Hence Rowan Plan may be adopted.

7a) MB Ltd. have three production department A1, A2 and A3 and two Service Departments Z1 and Z2 the details pertaining to which are as under:-

	A1	A2	A3	Z1	Z2
Direct Wages (₹)	3,000	2,000	3,000	1,500	195
Working Hours	3,070	4,475	2,419	–	–
Value of Machines (₹)	60,000	80,000	1,00,000	5,000	5,000
HP of Machines	60	30	50	10	–
Light Points	10	15	20	10	5
Floor space (Sq.Ft.)	2,000	2,500	3,000	2,000	500

The following figures extracted from the Accounting records are relevant:

	₹
Rent and Rates	5,.000
General Lighting	600
Indirect Wages	1,939
Power	1,500
Depreciation on Machines	10,000
Sundries	9,695

The expenses of the service departments are allocated as under:-

	A1	A2	A3	Z1	Z2
Z1	20%	30%	40%	–	10%
Z2	40%	20%	30%	10%	–

Find out the total cost of product Q which is processed for manufacture in Departments A1, A2 and A3 for 4,5 and 3 hours respectively, given that its Direct Material cost in ₹ 50 Direct Labour cost ₹30.

b) What do you understand by the term 'pre-determined rate of recovery of overheads'? What are the bases that are usually advocated for such pre-determination?

Ans: a) Statement Showing Distribution of Overheads of MB Ltd.

Particulars			Production Depts.			Service Depts.	
	Basis	Total	A1	A2	A3	Z1	Z2
		₹	₹	₹	₹	₹	₹
Rent and Rates	Area	5,000	1,000	1,250	1,500	1,000	250
General Lighting	Light points	600	100	150	200	100	50
Indirect Wages	Direct Wages	1,939	600	400	600	300	39
Power	H.P.	1,500	600	300	500	100	–
Depreciation of machines	Value of machines	10,000	2,400	3,200	4,000	200	200
Sundries	Direct Wages	9,695	3,000	2,000	3,000	1,500	195
		28,734	7,700	7,300	9,800	3,200	734

Redistribution of Service Departments' Expenses Over Production Departments

Particulars	Total	Production Depts.			Service Depts.	
	₹	A1 ₹	A2 ₹	A3 ₹	Z1 ₹	Z2 ₹
Total Overheads	28,734	7,700	7,300	9,800	3,200	734
Dept. Z1 Overheads apportioned in the ratio (20:30:40:– : 10)	3,200	640	960	1,280	–3,200	320
Dept. Z2 Overheads apportioned in the ratio (40:20:30:10:–)	1,054	421.60	210.80	316.02	105.40	–1.054
Dept. Z1 Overheads apportioned in the ratio (20:30:40: - : 10)	105.40	21.08	31.62	42.16	–105.40	10.54
Dept. Z2 Overheads apportioned in the ratio (40:20:30:10:–)	10.54	4.22	2.11	3.16	1.05	-10.54
Dept. Z1 Overheads apportioned in the ratio (20:30:40:–10)	1.05	0.21	0.32	0.42	-1.05	0.10
Dept. Z2 Overheads apportioned in the ratio (40:20:30:10:–)	0.10	0.05	0.02	0.03	—	-0.10
Total		8,787.16	8,504.87	11,441.79		
Working hours		3,070	4,475	2,419		
Overhead rate per hour *(See working Note. 1)*		2.86	1.90	4.73		

Cost of the product 'Q'	₹
Direct Material Cost	50
Direct Labour Cost	30
Overhead Cost (See Working Note 2)	35.13
	115.13

Working Note:

1. Overhead rate per hour for production department

$$A_1 = \frac{Rs.8,787.16}{3,070} = ₹\ 2.86$$

Similarly overhead rate for production departments A2 and A3 are ₹ 1.90 and ₹ 4.73

2. Overhead cost

₹ 2.86 x 4 + ₹1.90 x 5 + ₹ 4.73 x 3

= ₹11.44 + ₹ 9.50 + ₹ 14.19 = ₹35.13

b) The term 'pre-determined' rate of recovery of overheads' refers to a rate of overhead absorption. It is calculated by dividing the budgeted overhead expenses for the accounting period by the budgeted base for the period. This rate of overhead absorption is determined prior to the start of the activity; that is why it is called a 'pre-determined rate'. The use of the pre-determined rate of recovery of overheads enables prompt preparation of cost estimates and quotations and fixation of sales prices. For prompt billing on a provisional basis before completion of work, as for example in the case of cost plus contracts, pre-determined overhead rates are particularly useful.

Bases Available: The bases available for computing 'pre-determined rate of recovery of overheads' are given below:-

1. Rate per unit of output
2. Direct labour cost method
3. Direct labour hours method
4. Machine hour rate method
5. Direct material cost method
6. Prime cost method.

The choice of a suitable method for calculating 'pre-determined rate of recovery of overhead, depends upon several factors. Some important ones are- type of industry, nature of product and processes of manufacture, nature of overhead expenses, organizational set-up, policy of management etc.

8a)ABC Ltd has its own power plant, which has two users, Department X(Cutting) and Department Y(Welding). When the plans were prepared for the power plant, top management decided that its practical capacity should be 1,50,000 machine hours. Annual budgeted practical capacity fixed costs are ₹ 9,00,000 and budgeted variable costs are ₹ 4 per machine-hour. The following data are available:

	Cutting Department (X)	Welding Department (Y)	Total
Actual Usage in 2010-11 Machine hours)	60,000	40,000	1,00,000
Practical capacity for each department (machine hours)	90,000	60,000	1,50,000

Required

(i) Allocate the power plant's cost to the cutting and the welding department using a single rate method in which the budgeted rate is calculated using practical capacity and costs are allocated based on actual usage.

(ii) Allocate the power plant's cost to the cutting and welding departments, using the dual -rate method in which fixed costs are allocated based on practical capacity and variable costs are allocated based on actual usage,

(iii) Allocate the power plant's cost to the cutting and welding departments using the dual-rate method in which the fixed-cost rate is calculated using practical capacity, but fixed costs are allocated to the cutting and welding department based on actual usage. Variable costs are allocated based on actual usage.

(iv)Give your observation on your result obtained in (i), (ii) and (iii).

b) A machine was purchased January 1,2000, for ₹ 5 lakhs. The total cost of all machinery inclusive of the new machine was ₹ 75 lakhs. The following further particulars are available:

Expected life of the machine 10 years

Scrap value at the end of ten years ₹ 5,000.

Repairs and maintenance for the machine during the year ₹ 2,000 Expected number of working hours of the machine per year, 4,000 hours Insurance premium annually for all the machines ₹ 4,500 ; Electricity consumption for the machine per hour (@ 75 paise per unit) 25 units ; Area occupied by the machine 100 sq.ft. Area occupied by other machine 1,500 sq.ft.; Rent per month of the department ₹ 800.
Lighting charges for 20 points for the whole department, out of which three points are for the machine ₹ 120 per month.
Compute the machine hour rate for the new machine on the basis of the data given above.

Ans: a) Working notes:

I. Fixed practical capacity cost per machine hour:

Practical capacity (machine hours)	1,50,000
Practical capacity fixed costs (₹)	9,00,000
Fixed practical capacity cost per machine hour (₹ 9,00,000 / 1,50,000 hours)	₹ 6

II. Budgeted rate per machine hour (using practical capacity):

= Fixed practical capacity cost per machine hour + Budgeted variable cost per machine hour

= ₹ 6 + ₹ 4 = ₹ 10

(i) Statement showing Power Plant's cost allocation to the Cutting & Welding departments by using single rate method on actual usage of machine hours

	Cutting Department (X) ₹	Welding Department (Y) ₹	Total ₹
Power plants cost allocation by using actual usage (machine hours) (Refer to working note 2)	6,00,000 (50,000 hours × ₹ 10)	4,00,000 (40,000 hours × ₹ 10)	10,00,000

(ii) Statement showing Power Plant's cost allocation to the Cutting & Welding departments by using dual rate method.

	Cutting Department (X) ₹	Welding Department(Y) ₹	Total ₹
Fixed Cost (Allocated on practical capacity for each department i.e.): (90,000 hours : 60,000 hours)	5,40,000 $\left(\frac{Rs.9,00,000\times 3}{5}\right)$	3,60,000 $\left(\frac{Rs.9,00,000\times 2}{5}\right)$	9,00,000
Variable cost (Based on actual usage of machine hours)	2,40,000 (60,000 hours × ₹ 4)	1,60,000 (40,000 hours × ₹4)	4,00,000
Total cost	7,80,000	5,20,000	13,00,000

(iii) Statement showing Power Plant's cost allocation to the Cutting & Welding Departments using dual rate method

	Cutting Department(X) ₹	Welding Department(Y) ₹	Total ₹
Fixed Cost	3,60,000	2,40,000	6,00,000
Allocation of fixed cost on actual usage basis (Refer to working note 1)	(60,000 hours × ₹ 6)	(40,000 hours × ₹ 6)	
Variable cost (Based on actual usage)	2,40,000 (60,000 hours × ₹ 4)	1,60,000 (40,000 hours × ₹ 4)	4,00,000
Total cost	6,00,000	4,00,000	10,00,000

(iv) Observations:

Under dual rate method, under (iii) and single rate method under (i), the allocation of fixed cost of practical capacity of plant over each department are based on single rate. The major advantage of this approach is that the user departments are allocated fixed capacity costs only for the capacity used. The unused

capacity cost ₹ 3,00,00 (₹ 9,00,000 – ₹ 6,00,000) will not be allocated to the user departments. This highlights the cost of unused capacity.

Under (ii) fixed cost of capacity are allocated to operating departments on the basis of practical capacity, so all fixed costs are allocated and there is no unused capacity identified with the power plant.

b) Computation of Machine Hour Rate

Standing charges	₹ (p.a.)	₹ (per hour)
Depreciation (Note 1)	49,500	
Insurance premium (Note 2)	300	
Repair and Maintenance	2,000	
Rent *(*Note 3*)*	600	
Light Charges *(*Note 4*)*	216	
Total Standing Charges	52,616	
Hours rate for Standing Charges (₹ 52,616 / 4,000 hours)		13,154
Machine Expenses:		
Electricity Consumption: 25 units p.h. @ 0.75p p.u.		18.75
Machine hour rate		31.904

Note:

		₹
(i)	Cost of new machine:	5,00,000
	Less: Scrap Value	5,000.00
	Net Cost of the machines	4,95,000

Life of the machine 10 years:

Depreciation = $\frac{\text{Rs. } 4,95,000}{10 \text{ years}}$ = ₹ 49,500

(ii)	Total cost of all the machines	75,00,000
	Total Insurance premium paid for all the machines	4,500

Total annual insurance premium of the new Machine = $\frac{\text{Rs. } 4,500 \times \text{Rs. } 5,00,000}{\text{Rs. } 75,00,000}$

= ₹ 300

(iii) Rent paid per annum = ₹ 9,600

Total Area occupied = 1600 Sq.Ft.

Rent for the area occupied by New machine (100 sq.ft.) = $\frac{\text{Rs. } 9,600 \times 100 \text{ sq.ft.}}{1,600 \text{ sq.ft.}}$

= ₹ 600

(iv) Total annual light charges of 20 Points for the whole department is ₹ 1,440.

Light charges for the machine p.a. = $\frac{\text{Rs. } 1,440 \times 3 \text{ points}}{20 \text{ points}}$ = ₹ 216.

9a) A factory incurred the following expenditure during the year 2011:

		₹
Direct material consumed		12,00,000
Manufacturing Wages		7,00,000
Manufacturing overhead:		
Fixed	3,60,000	
Variable	2,50,000	6,10,000
		25,10,000

In the year 2012, following changes are expected in production and cost of production.

(i) Production will increase due to recruitment of 60% more workers in the factory.
(ii) Overall efficiency will decline by 10% on account of recruitment of new workers
(iii) There will be an increase of 20% in Fixed overhead and 60% in Variable overhead.
(iv) The cost of direct material will be decreased by 6%.
(v) The company desire to earn a profit of 10% on selling price.

Ascertain the cost of production and selling price.

b) Distinguish between Job Costing & Batch Costing. Mention the type of industries in which they are used.

Ans: a) Budgeted Cost Sheet for the year 2011

Particulars			*Amount(₹)*
Direct material consumed		12,00,000	
Add: 44% due to increased output		5,28,000	
		17,28,000	
Less: 6% for decline in price		1,03,680	16,24,320
Direct wages (manufacturing)		7,00,000	
Add: 60% increase		4,20,000	11,20,000
Prime cost			27,44,320
Manufactured Overhead:			
Fixed	3,60,000		
Add: 20% increase	72,000		
		4,32,000	
Variable	2,50,000		
Add: 60% increase	1,50,000		
		4,00,000	8,32,000
Cost of production			35,76,320
Add: 1/9 of Cost or 10% on selling price			3,97,369
Selling price			39,73,689

Production will increase by 60% but efficiency will decline by 10%.
160 – 10% of 160 = 144%. So increase by 44%.

b)

Job Costing	Batch Costing
It is a method of costing which is used when the work is undertaken as per the customer's special requirement. When an inquiry is received from the customer, costs expected to be incurred on the job are estimated and on the basis of this estimate, a price is quoted to the customer. Actual cost of materials, labour and overheads are accumulated and on the completion of job, these actual costs are compared with the quoted price and thus the profit or loss on it is determined.	It is a variant of job costing. Under batch costing, a lot of similar units which comprises the batch may be used as a unit for ascertaining cost. In the case of batch costing separate cost sheets are maintained for each batch of products by assigning a batch number. Cost per unit in a batch is ascertained by dividing the total cost of a batch by the number of units produced in that batch.
Job costing is applicable in printing press, hardware, ship-building, heavy machinery, foundry, general engineering works, machine tools, interior decoration, repairs and other similar work.	Such a method of costing is used in the case of pharmaceutical or drug industries, readymade garment industries, industries, manufacturing electronic parts of T.V. radio sets etc.

10a) Following data are available for a product for the month of August, 2011.

	Process I	Process II
Opening work-in-progress	NIL	NIL
	₹	₹
Cost Incurred during the month:		
Direct materials	60,000	–
Labour	12,000	16,000
Factory overheads	24,000	20,000

Units of production:		
Received in Process	40,000	36,000
Completed and transferred	36,000	32,000
Closing work-in-progress	2,000	?
Normal loss in process	2,000	1,500

Production remaining in Process has to be valued as follows:

Materials	100%
Labour	50%
Overheads	50%

There has been no abnormal loss in Process II

Prepare process accounts after working out the missing figures and with detailed workings.

bi) "The value of scrap generated in a process should be credited to the process account." Do you agree? Justify your answer.

ii) Write short note on Abnormal gain in Process Costing

Ans: a) **Statement of equivalent production units (Process – I)**

TABLE 1

Particulars	Units Introduced	Units Out	Equivalent Production			
			Material		Labour and Overhead	
			% Completion	Units	% Completion	Units
Units in	40,000					
Units completed and transferred to Process-II		36,000	100	36,000	100	36,000
Normal loss		2,000	—	—	—	—
Closing work-in-progress		2,000	100	2,000	50	1,000
Total	40,000	40,000		38,000		37,000

Computation of cost per equivalent unit for each cost element

TABLE 2

	Total Cost ₹	*Equivalent Units*	*Cost per Equivalent Unit* ₹
Direct materials	60,000	38,000	1.5780
Labour	12,000	37,000	0.3243
Factory overheads	24,000	37,000	0.6487
Total			2.5519

Process –1 Account

	Units	₹		*Units*	₹
To Units introduced (Direct materials)	40,000	60,000	By Normal Loss	2,000	NIL
To Labour		12,000	By Process – III transferred (Refer to Working Note-1)	36,000	91,869
To Factory overheads		24,000	By Work in-process (Refer to Working Note 2)	2,000	4,131
	40,000	96,000		40,000	96,000

Statement of equivalent production units (Process – II)

TABLE 3

Particulars	Units Introduced	Units Out	Equivalent Production	
			Material	Labour and Overheads

			% Completion	Units	% Completion	Units
Units transferred from process-I	36,000	32,000	100	32,000	100	32,000
Normal loss	–	1,500	–	–	–	–
Closing work-in-process	–	2,500	100	2,500	50	1,250
	36,000	36,000		34,500		33,250

Computation of cost per equivalent unit for each cost element

TABLE 4

	Total Cost ₹	*Equivalent Units*	*Cost per Equivalent Units* ₹
Cost of 36,000 units transferred from Process – I	91,869	34,500	2.6629
Labour	16,000	33,250	0.4812
Factory overheads	20,000	33,250	0.6015
Total			3.7456

Process-II Account

	Units	₹		*Units*	₹
To Units introduced (Transferred from Process-I)	36,000	91,869	By Normal Loss	1,500	–
			By Finished stock transferred	32,000	1,19,859
To Labour		16,000	(Refer to Working Note 3)		
To Factory overheads		20,000	By Work-in-process (Refer to Working Note 4)	2,500	8,010
	36,000	1,27,860		36,000	1,27,869

Working Notes:

1. **Cost of 36,000 completed units in Process – I:**
= 36,000 × Cost per unit (Refer to Table 2)
= 36,000 × ₹ 2.5519 = ₹ 91,869.

2. **Cost of 2,000 units under work-in-process in Process-I:**
=Cost of 2,000 equivalent units of material + Cost of 1,000 equivalent units of labour and overheads (Refer to Tables 1 and 2).
=2,000 × ₹ 1.5789 + 1,000 × ₹0.3243 + 1,000 × ₹ 0.6487
= ₹ 4,131

3. **Cost of 32,000 units of finished stock in Process-II:**
= 32,000 × Cost per unit (Refer to Table 3)
= 32,000 × ₹ 3.7456 = ₹ 1,19,589

4. **Cost of 2,500 units under work-in-process in Process-II:**
=Cost of 2,500 equivalent units of material + Cost of 1,250 equivalent units of labour and overhead (Refer to Tables 3 and 4)
=2,500 × ₹ 2.6629 + 1,250 × ₹ 0.4812 + 1,250 × ₹ 0.6015
= ₹ 6657.25 + ₹ 601.50 + ₹ 751.88
= ₹ 8,010.63.

bi) This statement is not correct .The value of scrap (as normal loss) received from its sale is credited to the process account. But the value of scrap received from its sale under abnormal conditions should be credited to Abnormal Loss Account.

ii) If in a process the actual process loss (which is inherent in a process) is less than the estimated normal loss, the difference is considered as abnormal gain. Abnormal gain is accounted for in the same way as abnormal process loss.

The concerned process account is debited with the abnormal gain units and value, and the abnormal gain account is credited. The abnormal gain account is debited with the figure of reduced normal loss (in units) and value. The balance of the abnormal gain account is transferred to the costing profit and loss account.

11a) The input to a purifying process was 16,000 kgs. of basic material purchased @ ₹ 1.20 per kg. Process wages amounted to ₹720 and overhead was applied @ 240% of the labour cost. Indirect materials of negligible weight were introduced into the process at a cost of ₹ 336. The actual output from the process weighed 15,000 kgs. The normal yield of the process is 92%. Any difference in weight between the input of basic material and output of purified material (product) is sold @ Re. 0.50 per kg.

The process is operated under a licence which provides for the payment of royalty @ Re.0.15 per kg. of the purified material produced.

Prepare:

(i) Process Account
(ii) Normal Wastage Account
(iii) Abnormal Wastage / Yield Account
(iv) Royalty Payable Account

b)Explain the term equivalent units.

Ans: a)

Process Account

Dr. Cr.

	Qty. kg.	Rate per kg. ₹	Amount ₹		Qty. kg.	Rate per kg. ₹	Amount ₹
To Basic material	16,000	1.20	19,200	By Normal wastage 8% of 1,60,000 Kg.	1,280	0.50	640
To Wages			720				
To Overheads 240% of ₹ 720			1,728	By Purified stock	15,000	1.60	24,000
To Indirect materials			336				
To Royalty payable on normal yield 14,720 kg × 0.15			2,208				
To Abnormal yield	280	1.60	448				
	16,280		24,640		16,280		24,640

(ii) Normal Wastage Account

Dr. Cr.

	Qty. kg.	Rate per kg. ₹	Amount ₹	Particulars	Qty. Kg.	Rate per kg. ₹	Amount ₹
To Purifying process (Normal wastage)	1,280	0.50	640	By Purifying Process (Ab. Yield) reduction	280	0.50	140
				By Cash sale of wastage	1,000	0.50	500
	1,280		640		1,280		640

(iii) Abnormal Yield Account

Dr. Cr.

	Qty. kg.	Rate per kg. ₹	Amount ₹	Particulars	Qty. kg.	Rate per kg. ₹	Amount ₹
To Normal Wastage A/c	280	0.50	140	By Purifying Process A/c	280	1.60	448
To Royalty payable (on abnormal yield)		0.15	42				
To Balance (Profit & Loss A/c	___		266		___		___
	280		448		280		448

(iv) Royalty Payable Account

Dr. Cr.

	Qty. kg.	Rate per kg. ₹	Amount ₹	Particulars	Qty. kg.	Rate per kg. ₹	Amount ₹
To Balance	15,000	0.15	2,250	By Purifying Process A/c	14,720	0.15	2,208
				By Abnormal yield A/c	280	0.15	42
	15,000		2,250		15,000		2,250

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

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

It consists of balance of work done on opening work-in-process, current production done fully and part of work done on closing WIP with regard to different elements of costs viz., material, labour and overhead.

12a) XYZ Limited produces four joint products P, Q, R and S, all of which emerge from the processing of one raw material. The following are the relevant data:

Production for the period:

Joint Product	Number of units	Selling price per unit ₹
P	500	18.00
Q	900	8.00
R	400	4.00
S	200	11.00

The company budgets for a profit of 10% of sales value. The other estimated costs are:

	₹
Carriage inwards	1,000
Direct wages	3,000
Manufacturing overhead	2,000
Administration overhead	10% of sales value

You are required to:

i)Calculate the maximum price that may be paid for the raw material.

ii)Prepare a comprehensive cost statement for each of the products allocating the materials and other costs based upon

I)Number of units

II)Sales value.

b) Discuss the treatment of By-product Cost in Cost Accounting.

Ans: a) Working Notes:

(1)Total Sales Value:

Joint Products	No. of Units	Selling price per unit ₹	Sales value ₹
P	500	18	9,000
Q	900	8	7,200
R	400	4	1,600
S	200	11	2,200
		Total	20,000

(2)Joint Products Cost:

= Total Sales Value – Budgeted profit (10% of sales value)

= ₹ 20,000 – ₹ 2,000

= ₹ 18,000

i) Maximum Price for the Raw Material

	₹	₹
Joint products cost (Refer to Working Notes (1) & (2)		18,000
Less: Other Costs		
Carriage inwards	1,000	
Direct Wages	3,000	
Manufacturing Overhead	2,000	
Administration Overhead	2,000	8,000
Maximum price to be paid for the raw material		10,000

(ii) (I) Comprehensive Cost Statement (Based on Units)

Joint products:

	P	Q	R	S	Total
Units:	500	900	400	200	
	₹	₹	₹	₹	₹
Raw Material	2,500	4,500	2,000	1,000	10,000
Carriage	250	450	200	100	1,000
Direct wages	750	1,350	600	300	3,000
Manufacturing Overhead	500	900	400	200	2,000
Administration Overhead	500	900	400	200	2,000
Total Cost	4,500	8,100	3,600	1,800	18,000

(II) Comprehensive Cost Statement (Based on Sales Value)

Joint products:

	P	Q	R	S	Total
	₹	₹	₹	₹	₹
Sales Value	9,000	7,200	1,600	2,200	20,000
Raw Material	4,500	3,600	800	1,100	10,000
Carriage	450	360	80	110	1,000
Direct wages	1,350	1,080	240	330	3,000
Manufacturing Overhead	900	720	160	220	2,000
Administrative Overhead	900	720	160	220	2,000
Total Cost	8,100	6,480	1,440	1,980	18,000

b) Treatment of By-product cost in Cost Accounting:

(i) When they are of small total value, the amount realized from their sale may be dealt as follows:

- Sales value of the by-product may be credited to Profit and Loss Account and no credit be given in Cost Accounting. The credit to Profit and Loss Account here is treated either as a miscellaneous income or as additional sales revenue.
- The sale proceeds of the by product may be treated as deduction from the total costs. The sales proceeds should be deducted either from production cost or cost of sales.

(ii) When they require further processing**:**

In this case, the net realizable value of the by product at the split-off point may be arrived at by subtracting the further processing cost from realizable value of by products. If the value is small, it may be treated as discussed in (i) above.

13a) MC Construction Ltd. obtained a contract No. X-48 for ₹ 40 lakhs. The following balances and information relate to the contract for the year ended 31st March, 2011:

	1.4.2010 ₹	31.3.2011 ₹
• Work-in-progress:		
• Work certified	9,40,000	30,00,000
• Work uncertified	11,200	32,000
• Materials at site	8,000	20,000
• Accrued wages	5,000	3,000

Additional information relating to the year 2010-2011 are:

	₹
• Materials issued from store	4,00,000
• Materials directly purchased	1,50,000
• Wages paid	6,00,000
• Architect's fees	51,000
• Plant hire charges	50,000
• Indirect expenses	10,000
• Share of general overheads for B-37	18,000
• Materials returned to store	25,000
• Materials returned to supplier	15,000
• Fines and penalties paid	12,000

The contractee pays 80% of work certified in cash. You are required to prepare:

(i) Contract Account showing clearly the amount of profits transferred to Profit and Loss Account.

(ii) Contractee's Account and (iii) Balance Sheet

bi)Explain the term 'Escalation Clause' in relation to Contract Costing.

ii) What is 'Notional profit' in Contract costing

Ans: a)

Books of MC Constructions Ltd.

Contract No. X-48 Account for the year ended 31st March, 2011

		₹			₹	₹
To	WIP b/d (9,40,000 + 11,200)	9,51,200	By	Wages Accrued b/d		5,000
To	Stock (materials) b/d	8,000	By	Materials returned to Store		25,000
To	Materials issued	4,00,000	By	Materials returned to suppliers		15,000
To	Materials purchased	1,50,000	By	WIP c/d -		
To	Wages paid	6,00,000		Work Certified	30,00,000	
To	Wages Accrued c/d	3,000		Uncertified work	32,000	30,32,000
To	Architect's fees	51,000	By	Materials stock c/d		20,000
To	Plant Hire charges	50,000				
To	Indirect expenses	10,000				
To	General overheads	18,000				
To	Notional profit c/d	8,55,800				
		30,97,000				30,97,000
To	Profit and Loss A/c $\left(\frac{2}{3}\times 8,55,800\times\frac{80}{100}\right)$	4,56,427	By	Notional Profit b/f		8,55,800
To	WIP Reserve c/d	3,99,373				
		8,55,800				8,55,800

Note:

Fines and penalties are not shown in contract accounts.

Contractee's Account

₹	₹

To	Balance c/d	24,00,000	By	Balance b/d (80% of 9,40,000)	7,52,000
		_____	By	Bank	16,48,000
		24,00,000			24,00,000

Balance Sheet (Extract) as on 31.3.2011

	₹			₹	₹
Profit and Loss A/c	4,56,427		Materials stock at site		20,000
Less: Fines	12,000	4,44,427	Materials stock in store		25,000
Outstanding wages		3,000	WIP:		
			Work Certified	3000000	
			Work Uncertified	32,000	
				3032000	
			Less: Advance	2400,000	
				6,32,000	
			Less: WIP Reserve	3,99,373	232,627

bi) It is a clause which is always provided in a contract to safeguard the interests of the contractor against any rise in price of materials and rates of labour and their increased utilization. If the prices of materials and rates of labour increases during the period of the contract beyond a certain defined level, the contractor will be compensated to the extent of a portion thereof. The contractor has to satisfy the contractee about his claim for compensation in respect of prices and utilisation of material and labour.

ii) Notional Profit represents the difference between the value of work certified and cost of work certified.

Notional Profit = Value of work certified – (Cost of works to date – Cost of work not yet certified)

14a) FBQ Ltd. is considering three alternative proposals for conveyance facilities for its sales personnel who have to do considerable travelling, approximately 20,000 kilometers every year. The proposals are as follows:

(i)Purchase and maintain of its own fleet of cars. The average cost of a car is ₹ 1,00,000.

(ii)Allow the executive to use his own car and reimburse expenses at the rate of ₹ 1.60 paise per kilometre and also bear insurance costs.

(iii) Hire cars from an agency at ₹ 20,000 per year per car. The Company will have to bear costs of petrol, taxes and tyres.

The following further details are available:

Petrol ₹ 0.60 per km.; Repairs and maintenance ₹ 0.20 P per km ; Tyre ₹ 0.12 P per km ; Insurance ₹ 1,200 per car per annum; Taxes ₹ 800 per car per annum; Life of the car: 5 years with annual mileage of 20,000 kms; Resale value : ₹ 20,000 at the end of the fifth year. Work out the relative costs of three proposals and rank them.

b) ABC Club runs a library for its members. As part of club policy, an annual subsidy of upto ₹ 5 per member including cost of books may be given from the general funds of the club. The management of the club has provided the following figures for its library department.

Number of Club members	5,000
Number of Library members	1,000
Library fee per member per month	₹ 100
Fine for late return of books	Re. 1 per book per day
Average No. of books returned late per month	500
Average No. of days each book is returned late	5 days
Number of available old books	50,000 books
Cost of new books	₹ 300 per book
Number of books purchased per year	1,200 books
Cost of maintenance per old book per year	₹ 10

Staff details	No.	Per Employee Salary per month (₹)
Librarian	01	10,000

Assistant Librarian	03	7,000
Clerk	01	4,000

You are required to calculate:

(i) the cost of maintaining the library per year excluding the cost of new books;

(ii) the cost incurred per member per month on the library excluding cost of new books; and

(iii) the net income from the library per year.

If the club follows a policy that all new books must be purchased out of library revenue (a) What is the maximum number of books that can be purchased per year and (b) How many excess books are being purchased by the library per year?

Also, comment on the subsidy policy of the club.

Ans:a)

	Alternative Proposals		
	I	II	III
	Use of Concern's Car	Use of own Car	Use of hire Car
	₹	Rs,	₹
Re-imbursement of hire charges (A)		1.60	1 (20,000/20,000Km)
Fixed Costs: (B) *(Per Car Per Km.)*			
Taxes (P.a.)	800	—	—	0.04 800/20,000 Km.
Depreciation $\frac{(Rs.1,00,000-Rs.20,000)}{5}$	16,000	—	—	—
Insurance	12,000	—	0.06 (1200/20,000 Km)	—
Total (₹ 18,000/20,000 Km.)	18,000	0.90	1.06	1.04
Running & Maintenance Cost per car per km. (C)				
Petrol		0.60	—	0.60
Repairs and maintenance		0.20	—	—
Tyre		0.12	—	0.12
Total cost: per km. (A + B + C)		1.82	1.66	1.76
Cost for 2,000 Kms.		₹36,400 (20,000×₹1.82)	₹ 33,200 (20,000×₹1.66)	₹ 35,200 (20,000×₹1.76)
Ranking of alternative proposals		III	I	II

Decision: Use of own car by Sales Executives will be the most economical proposal from the Concern's point of view. Hiring of car, for the use of Sales Executives will be the IInd best choice and maintaining a fleet of cars for its executives will be the costliest alternative.

b) **Computation of total revenue**

No. of library members	No.	1,000
Library fees per month	₹	1,00,000
Late fees per month (500 × 5 × 1)	₹	2,500
Total Revenue per month	₹	1,02,500
Total Revenue per annum (1,02,500×12)	₹	12,30,000

Computation of total cost

Staff details	*No.*	*Salary per month* ₹	*Total cost* ₹

Librarian		1	10,000	10,000
Assistant Librarian		3	7,000	21,000
Clerk		1	4,000	4,000
Total Staff cost per month				35,000
Total Staff cost per year (35,000 × 12)				4,20,000
	No.	Cost per book		
Books maintenance cost	50,000	₹ 10		5,00,000
Total maintenance cost per annum excluding cost of new books (4,20,000 + 5,00,000)				9,20,000
Cost incurred per library member per annum (₹ 9,20,000/1,000)			₹	920
Cost incurred per member per month on the library excluding cost of new books (920/12)			₹	76.67
Cost incurred per club member per annum (9,20,000/5,000)			₹	184
Cost incurred per club member per month (184/12)			₹	15.33
Net income from the library per annum (12,30,000 – 9,20,000)			₹	3,10,000
Cost per new book			₹	300
Maximum number of new books per annum (3,10,000/300)			No.	1033.333
Present number of books purchased			No.	1200
Excess books purchased (1200 – 1033.333)			No.	166.6667
Subsidy being given per annum			₹	50,000
Subsidy per library member per annum (50,000/1,000)			₹	50
Subsidy per club member per annum (50,000/5,000)			₹	10

Comment:
The club is exceeding its subsidy target to members by ₹ 45 (₹ 50 – 5) per library member and ₹ 5 (₹ 10 – 5) per club member.

15a) PQR Limited has collected the following data for its two activities. It calculates activity cost rates based on cost driver capacity.

Activity	Cost Driver	Capacity	Cost
Power	Kilowatt hours	50,000 kilowatt hours	₹ 2,00,000
Quality Inspections	Number of Inspections	10,000 Inspections	₹ 3,00,000

The company makes three products P,Q and T. For the year ended March 31, 2012, the following consumption of cost drivers was reported:

Product	Kilowatt hours	Quality Inspections
P	10,000	3,500
Q	20,000	2,500
R	15,000	3,000

Required:
(i)Compute the costs allocated to each product from each activity.
(ii)Calculate the cost of unused capacity for each activity.
(iii)Discuss the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate.
b) Explain briefly each of the following categories in Activity based Costing by giving at least two examples:
(i) Batch level activities
(ii) Product level activities
(iii) Facility level activities.

Ans: ai) Statement of cost allocation to each product from each activity

	Product

	P ₹	Q ₹	R ₹	Total ₹
Power (Refer to working note)	40,000 (10,000 kwh x ₹4)	80,000 (20,000 kwh x ₹4)	60,000 (15,000 kwh x ₹4)	1,80,000
Quality Inspections (Refer to working note)	1,05,000 (3,500 inspections x ₹ 30)	75,000 (2,500 inspections x ₹ 30)	90,000 (3,000 inspections x ₹ 30)	2,70,000

Working note:

Rate per unit of cost driver:

Power :

Quality Inspection : (₹ 3,00,000 / 10,000 inspections) = ₹ 30 per inspection

(i) Computation of cost of unused capacity for each activity:

	₹
Power (₹ 2,00,000 – ₹ 1,80,000)	20,000
Quality Inspections (₹ 3,00,000 – ₹ 2,70,000)	30,000
Total cost of unused capacity	50,000

(ii) Factors management consider in choosing a capacity level to compute the budgeted fixed overhead cost rate:

-Effect on product costing & capacity management
-Effect on pricing decisions.
-Effect on performance evaluation
-Effect on financial statements
-Regulatory requirements.
-Difficulties in forecasting chosen capacity level concepts.

b) (i) Batch level activities – The cost of some activities (mainly manufacturing support activities) are driven by the number of batches of units produced. These activities are known as Batch level activities. Examples are:

(I) Material ordering.
(II) Machine set up cost.
(III) Inspection of products - like first item of every batch.

(ii) Product level activities – The cost of some activities are driven by the creation of a new product line and its maintenance. These activities are known as Product level activities. Examples are:

(I) Designing the product.
(II) Producing parts to a certain specified limit.
(III) Advertising cost, if advertisement is for individual products.

(iii) Facility level activities – The cost of some activities cannot be related to a particular product line, instead they are related to maintaining the building and facilities. These activities are known as Facility level activities. Examples are:

(I) Maintenance of buildings.
(II) Plant security.
(III) Production manager's salary.
(IV) Advertising campaigns promoting the company.

16) ABC Ltd. produces and sells sophisticated glass items – 'X' and 'Y'. In connection with both the products the following information are revealed from the cost records for the month February, 2012:

Product	**X**	Y
Output (in units)	60,000	15,000
Sales (₹)	37,80,000	20,55,000
Cost structure:		
Direct material (₹ per unit)	18.75	45.00
Direct Wages (₹ per unit)	10.00	13.00
Direct labour hours	30,000 hours	9,750 hours

No. of quantity produced per batch	240	50
Setup time per batch	2 hours	5 hours

The Indirect costs for the month are as under:

	₹
Cleaning and maintenance wages	2,70,000
Designing Costs	4,50,000
Set up costs	3,00,000
Manufacturing operation's costs	6,37,500
Shipment costs	81,000
Distribution costs	3,91,500
Factory administration costs	2,55,000

At present the company adopts the policy to absorb indirect costs applying direct labour hour basis and enjoying a good position in the market with regard to Product Y, but facing a stiff price competition with regard to Product X. The Cost Accountant of the company, after making a rigorous analysis of the data, decided to shift from the absorption technique based on direct labour hours to activity cost driver basis and also to treat cleaning and maintenance wages as direct cost.

The cost accountant identified ₹ 1,20,000 for product X and the balance of cleaning and maintenance wages for Product Y.

The data relevant to activities and products are as follows:

Activity	Cost driver	Product X	Product Y
Designing:	Square feet	30 sq. ft.	70 sq. ft.
Manufacturing operation's:	Moulding machine hours	9,000 hrs.	3,750 hrs.
Shipment:	Number of Shipments	100	100
Distribution:	Cubic feet	45,000 cu. ft.	22,500 cu. ft.
Setup of moulding machine:	Setup hours		
Factory administration:	Direct labour hours		

You are required:

(i)to compute the total manufacturing cost and profits of both the products by applying direct labour basis of absorption, assuming cleaning and maintenance cost as indirect,

(ii)to compute the total manufacturing cost and profits of both the products by applying activity based costing, assuming cleaning and maintenance cost as indirect

(iii) to compare the results obtained from (i) and (ii) and give your opinion on the decision of cost accountant.

Ans: Working:

Calculation of Direct Labour hours:

	₹
Total Indirect Costs (₹)*	23,85,000
Total Direct labour hours (30,000 + 9,750)	39,750
Overhead absorption rate	$\frac{Rs.23,85,000}{39,750 hours} = Rs.60 per hour$

(i) Statement showing total manufacturing costs and profits

	Product X (60,000 units)		**Product Y (15,000 units)**		Total (₹)
	Per unit	Amount (₹)	Per unit	Amount (₹)	
Direct materials	18.75	11,25,000	45.00	6,75,000	18,00,000
Direct labour	10.00	6,00,000	13.00	1,95,000	7,95,000
Prime cost	28.75	17,25,000	58.00	8,70,000	25,95,000
Indirect costs (absorbed on the basis of direct labour	30.00 (18,00,000/ 60,000 units)	18,00,000 (30,000 hours @ ₹ 60 per hour)	39.00 (5,85,000/ 15,000 units)	5,85,000 (9,750 hours @ ₹ 60 per hour)	23,85,000

hours)					
Total cost	58.75	35,25,000	97.00	14,55,000	49,80,000
Sales	63.00	37,80,000	137.00	20,55,000	58,35,000
Profit (Sales – Total cost)	4.25	2,55,000	40.00	6,00,000	8,55,000

* Calculation of total Indirect Cost:

	₹
Cleaning and maintenance wages	2,70,000
Designing costs	4,50,000
Set-up costs	3,00,000
Manufacturing operations cost	6,37,500
Shipment costs	81,000
Distribution costs	3,91,500
Factory Administration Costs	2,55,000
	23,85,000

Indirect cost allocation to products A and B:

	Product X	Product Y
Direct labour hours	30,000	9,750
Direct labour hour rate:	₹ 60	₹60
Indirect costs	₹ 18,00,000	Rs 5,85,000
Output (units)	60,000	15,000
Cost per unit of output	₹ 30	₹39

Statement showing the total manufacturing costs and profits using direct labour hour basis of absorption and treating cleaning and maintenance cost as indirect cost:

	Product X		Product Y		Total
	₹/unit	Amount	₹/unit	Amount	
Output (units)		60,000		15,000	
		₹		₹	₹
Sales	63.00	37,80,000	137.00	20,55,000	58,35,000
Direct Materials	18.75	11,25,000	45.00	6,75,000	18,00,000
Direct Labour	10.00	6,00,000	13.00	1,95,000	7,95,000
Prime Cost	28.75	17,25,000	58.00	8,70,000	25,95,000
Indirect costs	30.00	18,00,000	39.00	5,85,000	23,85,000
Total costs	58.75	35,25,000	97.00	14,55,000	49,80,000
Profit	4.25	2,55,000	40.00	6,00,000	8,55,000

(ii) Calculation of Setup hours

	Product X	**Product Y**
Total Output (in units)	60,000	15,000
No. of quantity produced per batch	240	50
Setup time per batch	2 hours	5 hours
Setup hours (Total) (No. of batches × set up time per batch)	$\left(\frac{60,000}{240}\times 2\right)=500$	$\left(\frac{15,000}{50}\times 5\right)=1,500$

Calculation of Cost Driver, Rates and summary of indirect cost relating to Product X & Y:

Activity and Cost Drivers	Amount (₹)	Cost Drivers for Product			Activity Cost Rates	Indirect Costs	
		X	Y		(Amount / total of cost driver)	Product X	Product Y
Cleaning & Maintenance (Direct Labour hours)	2,70,000	30,000	9,750	39,750	6.7925 per Direct labour hour	2,03,775	66,227
Designing costs (square feet)	4,50,000	30 sq. feet	70 sq. feet	100	4,500 per sq. feet	1,35,000	3,15,000
Setup costs (setup hours)	3,00,000	500 hours	1,500 hours	2,000	150 per setup hour	75,000	2,25,000
Manufacturing operations costs (molding machine hours)	6,37,500	9,000	3,750	12,750	50 per molding hours	4,50,000	1,87,500
Shipment costs (No. of shipments)	81,000	100	100	200	405 per shipment	40,500	40,500
Distribution costs (area in cubic feet)	3,91,500	45,000 cft	22,500 cft	67,500	5.80 per cft	2,61,000	1,30,500
Factory administration costs (direct labour hours)	2,55,000	30,000	9,750	39,750	6.4151 per labour hour	1,92,453	62,547
Production (units)						13,57,728	10,27,274
						60,000	15,000
						22.63	68.48

Cost Sheet based on Activity Based Costing system:

Description	Product X		Product Y	
	Total cost	Per unit	Total cost	Per unit
	₹	₹	₹	₹
Sales	37,80,000	63.00	20,55,000	137.00
Direct Cost				
Direct Materials	11,25,000	18.75	6,75,000	45.00
Direct Labour	6,00,000	10.00	1,95,000	13.00
Total	17,25,000	28.75	8,70,000	58.00
Indirect costs	13,57,728	22.63	10,27,274	68.48
Total costs	30,82,728	51.38	18,97,274	126.48
Profit	6,97,272	11.62	1,57,726	10.52

(iii) Comparison of results:

Description	Product X		Product Y	
	Traditional Costing System	Activity Based System	Traditional Costing System	Activity Based System
	₹	₹	₹	₹
Selling Price	63.00	63.00	137.00	137.00
Direct costs	28.75	28.75	58.00	58.00
Indirect costs	30.00	22.63	39.00	68.48
Total cost per unit	58.75	51.38	97.00	126.48
Profit per unit	4.25	11.62	40.00	10.52

Opinion:

In the traditional costing system, Product Y appears to be more profitable than Product X whereas under the activity based costing system, Product X appears to be more profitable than product Y. The activities like designing, set up, manufacturing operation cost, shipment and distribution are support service activities and the consumption of resources relating to these activities are not dependent on direct labour hours. The quantum of consumption of resource of each support service activity is different in respect of the two products manufactured and hence activity based costing presents a true view of cost of production. Moreover, the suggestion to treat cleaning and maintenance activity as a direct cost pool is commendable because costs should be charged direct wherever possible. The results reveal that the company should concentrate upon product Y.

17a) The financial books of KP Ltd. reveal the following data for the year ended 31st March, 2012:

	₹
Opening Stock:	
Finished goods 875 units	74,375
Work-in-process	32,000
1.4.01 to 31.3.12	
Raw materials consumed	7,80,000
Direct Labour	4,50,000
Factory overheads	3,00,000
Goodwill	1,00,000
Administration overheads	2,95,000
Dividend paid	85,000
Bad Debts	12,000
Selling and Distribution Overheads	61,000
Interest received	45,000
Rent received	18,000
Sales 14,500 units	20,80,000
Closing Stock: Finished goods 375 units	41,250
Work-in-process	38,667

The cost records provide as under:

- Factory overheads are absorbed at 60% of direct wages.
- Administration overheads are recovered at 20% of factory cost.
- Selling and distribution overheads are charged at ₹ 4 per unit sold.
- Opening Stock of finished goods is valued at ₹ 104 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

(a) Prepare statements for the year ended 31st March, 2012 show

- the profit as per financial records and the profit as per costing records.

(ii)Present a statement reconciling the profit as per costing records with the profit as per Financial Records.

b) What are the essential pre-requisites of integrated accounting system?

Ans: a) **Profit & Loss Account of KP Ltd.** for the year ended March 31, 2012

	₹		₹
To Opening stock of Finished goods	74,375	By Sales	20,80,000
To Work-in-process	32,000	By Closing stock of finished goods	41250
To Raw materials consumed	7,80,000	By Work-in-Process	38,667
To Direct labour	4,50,000	By Rent received	18,000
To Factory overheads	3,00,000	By Interest received	45,000
To Goodwill	1,00,000		
To Administration overheads	2,95,000		
To Selling & distribution overheads	61,000		
To Dividend paid	85,000		
To Bad debts	12,000		
To Profit	33,542		
	22,22,917		22,22,917

Statement of Profit as per Costing Records, for the year ended March 31,2012

	₹
Sales revenue (A) (14,500 units)	20,80,000
Cost of sales:	
Opening stock (875 units x ₹ 104)	91,000
Add: Cost of production of 14,000 units (Refer to working note 2)	17,92,000
Less: Closing stock	48,000

$\left(\frac{Rs.17,92,000 \times 375 \text{ units}}{14,000 \text{ units}}\right)$	_____
Production cost of goods sold (14,500 units)	18,35,000
Selling & distribution overheads (14,500 units x ₹ 4)	58,000
Cost of sales: (B)	18,93,000
Profit: {(A) – (B)}	1,87,000

(iii) Statement of Reconciliation of profit as per Costing Records with the profit as per Financial Records

	₹	₹
Profit as per Cost Accounts		1,87,000
Add: Administration overheads over absorbed (₹ 2,98,667 – ₹ 2,95,000)	3,667	
Opening stock overvalued (₹ 91,000 – ₹ 74,375)	16,625	
Interest received	45,000	
Rent received	18,000	83,292
		2,70,292
Less: Factory overheads under recovery (₹ 3,00,000 – ₹ 2,70,000)	30,000	
Selling & distribution overheads under recovery (₹ 61,000 – ₹ 58,000)	3,000	
Closing stock overvalued (₹ 48,000 – ₹ 41,250)	6,750	
Goodwill	1,00,000	
Dividend	85,000	
Bad debts	12,000	2,36,750
Profit as per financial accounts		33,542

Working notes:

1. Number of units produced

	Units
Sales	14,500
Add: Closing stock	375
Total	14,875
Less: Opening stock	875
Number of units produced	14,000

2. Cost Sheet

	₹
Raw materials consumed	7,80,000
Direct labour	4,50,000
Prime cost	12,30,000
Factory overheads (60% of direct wages)	2,70,000
Factory cost	15,00,000
Add: Opening wori-in-process	32,000
Less: Closing work-in-process	38,667
Factory cost of goods produced	14,93,333
Administration overheads (20% of factory cost)	2,98,667
Cost of production of 14,000 units (Refer to working note 1)	17,92,000

Cost of production per unit:

$$= \frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{Rs.17,92,000}{14,000 \text{ units}} = Rs.128$$

b)

The essential pre-requisites of integrated accounting system include the following:

1. The management's decision about the extent of integration of the two sets of books. Some concerns find it useful to integrate upto the stage of primary cost or factory cost while other prefer full integration of the entire accounting records.
2. A suitable coding system must be made available so as to serve the accounting purposes of financial and cost accounts.
3. An agreed routine, with regard to the treatment of provision for accruals, prepaid expenses, other adjustment necessary for preparation of interim accounts.
4. Perfect coordination should exist between the staff responsible for the financial and cost aspects of the accounts and an efficient processing of accounting documents should be ensured.

Under this system there is no need for a separate cost ledger. Of course, there will be a number of subsidiary ledgers; in addition to the useful Customers Ledger and the Bought Ledger, there will be : (a) Stores Ledger; (b) Stock Ledger and (c) Job Ledger.

18a) Pass journal entries in the cost books, maintained on non-integrated system, for the following:

(i) Issue of materials:	Direct ₹ 5,50,000; Indirect ₹ 1,50,000
(ii) Allocation of wages:	Direct ₹ 2,00,000; Indirect ₹ 40,000
(iii) Under/Over absorbed overheads:	Factory (over) ₹ 20,000; Administration (under) ₹ 10,000

b) ORS Ltd. operates separate cost accounting and financial accounting systems. The following is the list of Opening balances as on 1.04.2011 in the Cost Ledger.

	Debit ₹	Credit ₹
Stores Ledger Control Account	53,375	--
WIP Control Account	1,04,595	--
Finished Goods Control Account	30,780	--
General Ledger Adjustment Account		1,88,750

Transactions for the quarter ended 30.06.2011 are as under:

	₹
Materials purchased	26,700
Materials issued to production	40,000
Materials issued for factory repairs	900
Factory wages paid (including indirect wages ₹ 23,000)	77,500
Production overheads incurred	95,200
Production overheads under-absorbed and written-off	3,200
Sales	2,56,000

The Company's gross profit is 25% on Factory Cost. At the end of the quarter, WIP stocks increased by ₹ 7,500. Prepare the relevant Control Accounts, Costing Profit and Loss Account and General Ledger Adjustment Account to record the above transactions for the quarter ended 30.06.2011.

Ans: a) **Journal Entries in Cost Books (Maintained on non-integrated system)**

		₹	₹
(i) Work-in-Progress Ledger Control A/c	Dr.	5,50,000	
Factory Overhead Control A/c	Dr.	1,50,000	
To Stores Ledger Control A/c			7,00,000
(Being issue of materials)			
(ii) Work-in Progress Ledger Control A/c	Dr.	2,00,000	
Factory Overhead control A/c	Dr.	40,000	
To Wages Control A/c			2,40,000
(Being allocation of wages and salaries)			
(iii) Factory Overhead Control A/c	Dr.	20,000	

To Costing Profit & Loss A/c			20,000
(Being transfer of over absorption of overhead)			
Costing Profit & Loss A/c	Dr.	10,000	
To Administration Overhead Control A/c			10,000
(Being transfer of under absorption of overhead)			

b) **General Ledger Adjustment Account**

Dr.			Cr.
Particulars	₹	Particulars	₹
To Sales	2,56,000	By Balance b/d	1,88,750
To Balance c/d	1,80,150	By Stores ledger control A/c	26,700
		By Wages control A/c	77,500
		By Overheads control A/c	95,200
		By Costing Profit & Loss A/c	48,000
	4,36,150		4,36,150

Stores Ledger Control Account

Dr.			Cr.
Particulars	₹	Particulars	₹
To Balance b/d	53,375	By WIP control A/c	40,000
To General ledger adj. A/c	26,700	By Factory overhead control A/c	900
		By Balance c/d	39,175
	80,075		80,075

Dr. Work-In-Progress Ledger Control Account

Dr.			Cr.
Particulars	₹	Particulars	₹
To Balance b/d	1,04,595	By Finished goods control A/c	2,02,900
To Stores ledger control A/c	40,000	By Balance c/d	1,12,095
To Wages control A/c	54,500		
To Factory, O/H control A/c	1,15,900		
	3,14,995		3,14,995

Finished Goods Ledger Control Account

Dr.			*Cr.*
Particulars	₹	*Particulars*	₹
To Balance b/d	30,780	By Cost of sales A/c *(Refer to note)*	2,04,800
To WIP control A/c	2,02,900	By Balance c/d	28,880
	2,33,680		2,33,680

Note:
Gross profit is 25% of Factory cost or 20% on sales.
Hence cost of sales = ₹ 2,56,000 – 20% of ₹ 2,56,000 = ₹ 2,04,800

Factory Overhead Control Account

Dr.			Cr.
Particulars	₹	Particulars	₹
To Stores ledger control A/c	900	By Costing & profit loss A/c	3,200
To Wages control A/c	23,000	By WIP control A/c	1,15,900
To General ledger adj. A/c	95,200		
	1,19,100		1,19,100

Cost of Sales Account

Dr.			Cr.
Particulars	₹	Particulars	₹
To Finished goods control A/c	2,04,800	By Costing Profit & Loss A/c	2,04,800

Sales Account

Dr.			Cr.
Particulars	₹	Particulars	₹
To Costing Profit & Loss A/c	2,56,000	By GLA A/c	2,56,000

Wages Control Account

Dr.			Cr.
Particulars	₹	Particulars	₹
To General ledger adj. A/c	77,500	By Factory overhead control A/c	23,000
	_____	By WIP control A/c	54,500
	77,500		77,500

Costing Profit & Loss Account

Dr.			*Cr.*
Particulars	₹	Particulars	₹
To Factory O H Control A/c	3,200	By Sales A/c	2,56,000
To Cost of sales A/c	2,04,800		
To General ledger adj. A/c (Profit)	48,000		
	_____		_____
	2,56,000		2,56,000

Trial Balance as on 30.6.2011

	Dr. Balance ₹	*Cr.Balance* ₹
Stores ledger control A/c	39,175	
WIP control A/c	1,12,095	
Finished goods control A/c	28,880	
To General ledger adjustment A/c	_____	1,80,150
	1,80,150	1,80,150

19a) DEF Ltd operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre. The Standard Cost Card of a product is as under:

Standard		Unit cost (₹)
Direct material	5 kgs @ ₹ 4.20	21.00
Direct labour	3 hours @ ₹ 3.00	9.00
Factory overhead	₹ 1.20 per labour hour	3.60
	Total manufacturing cost	33.60

The production schedule for the month of August, 2010 required completion of 40,000 units.
However, 40,960 units were completed during the month without opening and closing work-in-process inventories.
Purchases during the month of August, 2010, 2,25,000 kgs of material at the rate of ₹ 4.50 per kg.Production and Sales records for the month showed the following actual results.
Material used 2,05,600 kgs.; Direct labour 1,21,200 hours; cost incurred ₹ 3,87,840; Total factory overhead cost incurred ₹ 1,00,000 ; Sales 40,000 units
Selling price to be so fixed as to allow a mark-up of 20 per cent on selling price.
Required:
(i) Calculate material variances based on consumption of material.
(ii) Calculate labour variances and the total variance for factory overhead.
(iii) Prepare Income statement for August , 2010 showing actual gross margin.
(iv) An incentive scheme is in operation in the company whereby employees are paid a bonus of 50% of direct labour hour saved at standard direct labour hour rate. Calculate the Bonus amount.

b)Compute the missing data , indicated by question marks in the following table.

Particulars	Product X	Product Y
Standard Sales Quantity(SQ)(units)	?	400
Actual Sales Quantity (AQ)(units)	500	?
Standard Price (SP) per unit(Rs)	12	15
Actual Price(AP) per unit (Rs)	15	20

Sales Price Variance	?	?
Sales Volume Variance	₹ 1200(Favourable)	?
Sales Value Variance	?	?

Sales Mix variance for both the products was ₹450/- Favourable.

Ans: a) **(i) Material variances:**

(I) Direct material cost variance = Standard cost – Actual cost
= (40,960 x 21) – (2,05,600 x 4.50)
= 8,60,160 – 9,25,200 = 65,040 (Adverse)

(II) Material price variance = Actual Quantity (Standard Price – Actual Price)
= 2,05,600 (4.20 – 4.50) = 61,680 (Adverse)

(III) Material usages variance = Standard Price (Standard Quantity – Actual Quantity)
= 4.20 [(40,960 x 5) – 2,05,600] = 3,360 (Adverse)

(ii) Labour variances and overhead variances:

(I) Labour cost variance = Standard cost – Actual cost
= (40,960 x 9) – 3,87,840 = 19,200 (Adverse)

(II) Labour rate variance = Actual Hours (Standard Rate – Actual Rate)
=1,21,200 (3 – 3.20) = 24,240 (Adverse)

(III) Labour efficiency variance = Standard Rate (Standard Hours – Actual Hours)
= 3 (40,960 * 3 – 1,21,200) = 5,040 (Favourable)

(IV) Total factory overhead variance = Factory overhead absorbed – factory overhead incurred
= (40,960 x 3 x 1.20) – 1,00,000 = 47,456 (Favourable)

(iii) (I)Preparation of income statement

Calculation of unit selling price	₹
Direct material	21.00
Direct labour	9.00
Factory overhead	3.60
Factory cost	**33.60**
Margin 25% on factory cost	8.40
Selling price	**42.00**

(II) Income statement

		₹
Sales 40,000 units * 42		16,80,000
Less: Standard cost of goods sold (40,000 units x 33.60)		13,44,000
		3,36,000
Less: Variances adverse		
Material price variance	61,680	
Material quantity variance	3,360	
Labour rate variance	24,240	89,280
		2,46,720
Add: Favourable variance		
Labour efficiency variance	5,040	
Factory overhead	47,456	52,496
Actual gross margin		2,99,216

(iv) Labour hour saved

		₹
Standard labour hours	(40,960 x 3)	1,22,880
Actual labour hour worked		1,21,200
Labour hour saved		1,680
Bonus for saved labour		= .50 (1,680 * 3) = 2,520.

b)i)Sales Volume Variance for X=(SQ*SP)-(AQ*AP)= Rs 1200(F)

or, (SQ*12)-(500*₹12)=-1200
or, 12 SQ =4800
Or, SQ= 400units.

ii)Standard Mix between X and Y = 400: 400, i.e 1: 1

iii)Sales Mix Variance for X and Y =(RAQ*SP)-(AQ*SP)=Rs 450(F)
Let AQ of X be *x* units. Hence, Total AQ=(X+Y)=500+ x
Rewriting in budgeted mix(1:1), RAQ for X and Y are each (500+x)/2
Since Sales Mix Variance is Rs 450(F),
[(500+x)/2*12]+(500+x)/2*15]-(500*12+x*15)=(-)450
On simplifying, we get, 6750+13.5x-6000-15Q=(-)450
On solving the equation, 1.5x=1200
Or, x=800 units.
AQ for Y =800 units.

(iv)Revised Actual Quantity(RAQ) =500+800=1300 units rewritten in ration of 1:1 ie. 650 units each.
(v)**Variance Computation Chart**:

Particulars	SQ*SP(COL.1)	RAQ*SP(COL.2)	AQ*SP(COL.3)	AQ*AP(COL.4)
X	400units(i)*Rs 12 =Rs4800.	650 units(iv)*Rs12 =Rs7800	500units*Rs12 =Rs6000.	500units*Rs15 =Rs7500
Y	400 units*Rs15 =₹6000.	650units*Rs15 =Rs9750.	800units(iii)*Rs15 =Rs12000	800units(iii)*Rs20 =Rs16000

Particulars	X	Y
Standard Sales Quantity(units	400(i)	400
Actual Sales Quantity(units)	500	800(iii)
Standard Price per unit	₹ 12	₹15
Actual Price per unit	₹15	₹ 20
Sales price Variance=COL.(3)- COL.(4)	₹1500(F)	₹4000(F)
Sales volume Variance=COL.(1)-COL.(3)	₹ 1200(F)	₹6000(F)
Sales value Variance=COL.(1)-COL.(4)	₹2700(F)	₹ 10000(F)

20a) MDX Chemicals Ltd. produces CDE. The standard ingredients of 1 kg. of CDE are :

0.65 kg. of ingredient C@ ₹ 4.00 per kg.
0.30 kg. of ingredient D @ ₹ 6.00 per kg.
0.20 kg. of ingredient E @ ₹ 2.50 per kg.
1.15 kg.

Production of 4,000 kg. of CDE was budgeted for September,2011. The production of CDE is entirely automated and production costs attributed to CDE production comprise only direct materials and overheads. The CDE production operation works on a JIT basis and no ingredient of CDE inventories are held.
Overheads were budgeted for September, 2011 for the CDE production operation as follows :

Activity	Total amount
Receipt of deliveries from suppliers (standard delivery qty. is 460 kg.)	₹ 4,000
Despatch of goods to customers (standard dispatch qty. is 100 kg.)	₹ 8,000
	₹12,000

In September, 2011, 4,200 kg. of CDE were produced and cost details were as follows :
• Materials used :
2,840 kg. of C, 1,210 kg. of D and 860 kg of E
Total cost ₹ ₹ 20,380
• Actual overhead costs :
12 Supplier deliveries (cost ₹ 4,800) were made, and 38 customer dispatches (cost ₹ 7,800) were processed.
Prepare a variance analysis for CDE production costs in September,2011: separate the material cost variance into price, mixture and yield components; separate the overhead cost variance into expenditure, capacity and efficiency components using consumption of ingredient C as the overhead absorption base.

b) Calculate Efficiency and Capacity ratio from the following figures:

Budgeted production	80 units
Actual production	60 units
Standard time per unit	8 hours
Actual hours worked	500

Ans: a)

Standard costs of material per kg. of output (0.65 kg. x ₹ 4) + (0.3 kg x ₹ 6) + (0.2 kg x ₹ 2.50) = ₹ 4.90

Standard overhead rate = ₹ 12,000/ Budgeted standard qty. of ingredient C(4,000 x 0.65)
= ₹ 4.6154 per kg. of ingredient C

Standard overhead rate per kg of output of CDE = ₹ 0.65 kg x ₹ 4.6154 = ₹ 3

	₹
Standard cost of actual output :	
Materials (4,200 x ₹ 4.90)	20,580
Overheads (4,200 x ₹ 3)	12,600
	33,180
Actual cost of output :	
Materials	20,380
Overheads (₹ 7,800 + ₹ 4,800)	12,600
	32,980

Variance calculations :

Materials price variance = (Standard price – Actual price) x Actual quantity
= (Standard price x Actual quantity) – Actual cost
= (₹ 4 x 2,840) + (₹ 6 x 1,210) + (₹ 2.50 x 860) – ₹ 20,380
= ₹ 20,770 – ₹ 20,380 = ₹ 390 F

Material yield variance = (Actual yield – Standard yield) x Standard materials cost per unit of output
= (4,200 – 4,910 materials used / 1.15) x ₹ 4.90 = ₹ 341 A

Material mix variance = (Actual quantity in actual mix at standard prices) – (Actual quantity in standard mix at standard prices)

C (4,910 x 0.65/1.15 = 2,775 – 2,840) x ₹ 4	=260 (A)	
D (4,910 x 0.30/1.15 = 1,281 – 1210) x ₹ 6	=426 (F)	
E(4,910 x 0.20/1.15 = 854 – 860) x ₹ 2.50	=15 (A)	151 (F)

Overhead efficiency variance = (Standard quantity of ingredient F – Actual quantity) x Standard overhead rate per kg. of ingredient C
= [(4200 x 0.65) – 2840] x ₹ 4.6154
= 508 (Adverse)

Overhead capacity variance = (Budgeted input of ingredient F – Actual input) x standard overhead rate per kg of ingredient C
= [(4000 x 0.65) – 2,840] x ₹ 4.6154 = 1,108 (Favourable)

Overhead expenditure variance = Budgeted cost – Actual cost
= ₹ 12,000 – ₹ 12,600
= 600 (Adverse)

Reconciliation of standard cost and actual cost of output :

	₹	₹
Standard cost of actual production		33,180
Material variances :		
Material price variance	390 (F)	
Material yield variance	341 (A)	
Materials mix variance	151 (F)	200 (F)
Overhead variances :		
Overhead efficiency variance	508 (A)	

Overhead capacity variance	1,108 (F)	
Overhead expenditure variance	600 (A)	Nil
Actual cost		32,980

b) Efficiency Ratio = [(Actual hour worked in terms of standard hours/ Actual Hours worked)] x 100
=[480/500] x 100 = 96%

Capacity Ratio= [(Actual Hours worked/Budgeted hours) x 100]

Workings:

Actual hour worked in terms of standard hours= (Actual production x Standard Time per unit)
=(60 units x 8hours) =480 hours

Budgeted hours=Budgeted production* Standard Time per unit
=(80 units x 8 hours) =640 units.

21a) Product K has a profit-volume ratio of 28%. Fixed operating costs directly attributable to product K during the quarter III of the financial year 2011-12 will be ₹2,80,000. Calculate the sales revenue required to achieve a quarterly profit of ₹ 70,000.

b) A retail dealer in garments is currently selling 24,000 shirts annually. He supplies the following details for the year ended 31st March 2012.
Selling price per shirt: ₹ 800 ; Variable cost per shirt: ₹ 600 ; Fixed Cost:Staff salaries: ₹ 24,00,000;General Office Cost : ₹ 8,00,000 and Advertising Cost: ₹ 8,00,000

You are required to answer the following each part independently:
i)Calculate Break Even Point and margin of safety in sales revenue and number of shirts sold.
ii)Assume that 30,000 shirts were sold during the year, find out the net profit of the firm.
iii)Assuming that in the coming year, an additional staff salary of ₹ 10,00,000 is anticipated, and price of shirt is likely to be increased by 15%, what should be the break- even point in number of shirts and sales?

Ans: a) P/V ratio = 28%
Quarterly fixed Cost = ₹2,80,000
Desired Profit = ₹70,000
Sales revenue required to achieve desired profit
= (Fixed Cost +Desired Profit) / (P / V ratio)
=(2,80,000+70,000)/ (28%)
= ₹12,50,000

b) (i) Break Even Point : [units] = Fixed Cost / Contribution Per Unit
= ₹40, 00, 000/₹200
= 20,000 number of shirts

Note: Contribution per units =selling price – variable cost per unit
= ₹ 800 – ₹ 600 = ₹ 200

Break Even Point [sales value] = 20000 units × ₹ 800 = ₹1,60,00,000

Margin of safety = Actual Sales – Break Even Sales
= (24, 000 shirts × ₹ 800) – ₹ 1,60,00,000
= ₹ 1,92,00,000 – ₹ 1,60,00,000
= ₹ 32, 00, 000

Margin of safety [units] = 24,000 shirts – 20,000 shirts = 4000 shirts

(ii) Amount of profit if 30,000 shirts are sold :
Sales [units] = Fixed Cost + (Profit / Contribution Per Unit)
Or, 30, 000 = ₹40, 00, 000 + (Profit /₹200)
Or, Profit = ₹20, 00, 000

(c) Revised Break Even Point if fixed cost rise by ₹10, 00, 000 and selling price increase by 15% :
New selling price = ₹ 800 + 15% of 800 = ₹ 920,
New fixed cost = ₹40, 00, 000 + ₹ 10,00,000 = ₹ 50,00,000
Revised Break Even Point [number of shirts] = ₹ 50,00,000 / (₹ 920 – ₹ 600)
= 15,625 shirts
Break Even Point (₹) = 15,625 x ₹ 920 = ₹ 1,43,75,000

22a). MC Engineering Ltd has unit costs on a normal costing basis as under:

	₹
Direct material 4 kg @ ₹4	= 16.00
Direct labour 3 hrs @ ₹18	= 54.00
Variable overhead 3 hrs @ ₹4	= 12.00
Fixed overhead 3 hrs @ ₹6	= 18.00
	100.00

Selling and administrative costs:
Variable ₹20 per unit
Fixed ₹7,60,000
During the year the company has the following activity:
Units produced = 24,000
Units sold = 21,500
Unit selling price = ₹168
Direct labour hours worked = 72,000
Actual fixed overhead was ₹48,000 less than the budgeted fixed overhead. Budgeted variable overhead was ₹20,000 less than the actual variable overhead. The company used an expected actual activity level of 72,000 direct labour hours to compute the predetermine overhead rates.
Required :
(i) Compute the unit cost and total income under:
(A) Absorption costing
(B) Marginal costing
(ii) Under or over absorption of overhead.
(iii) Reconcile the difference between the total income under absorption and marginal costing.

b)Write short note on applications of Marginal Costing.

Ans: a) Computation of Unit Cost & Total Income

Unit Cost	Absorption Costing(₹)	Marginal Costing(₹)
Direct Material	16.00	16.00
Direct Labour	54.00	54.00
Variable Overhead	12.00	12.00
Fixed Overhead	18.00	-
Unit Cost	100.00	82.00

Income Statements

Absorption Costing Rs		
Sales (21500*₹168)		36,12,000
Less: Cost of Goods sold(21500*100)	2150000	
Less: Over Absorption	28000	21,22,000
		14,90,000
Less: Selling & Distribution Expenses		11,90,000
Profit		3,00,000

Marginal Costing	
Sales	36,12,000

Less: Cost of goods sold(21500*82)	17,63,000	
Less: Under Absorption	20000	17,83,000
		18,29,000
Less: Selling & Distribution Expenses		4,30,000
Contribution		13,99,000
Less: Fixed Factory and Selling & Distribution OH(384000+760000)		11,44,000
Profit		255000

ii) Under or over absorption of overhead:

Budgeted Fixed Overhead	₹
72,000 Hrs. × ₹6	4,32,000
Less: Actual Overhead was less than Budgeted Fixed Overhead	48,000
Actual Fixed Overhead	3,84,000
Budgeted Variable Overhead	
72,000 Hrs. × ₹4	2,88,000
Add: Actual Overhead was higher than Budgeted	20,000
Budgeted	3,08,000
Both Fixed & Variable Overhead applied	
72,000 Hrs × ₹ 10	7,20,000
Actual Overhead (3,84,000 + 3,08,000)	6,92,000
Over Absorption	28,000

(iii) Reconciliation of Profit

Difference in Profit: ₹3,00,000 – ₹ 2,55,000 = ₹45,000

Due to Fixed Factory Overhead being included in Closing Stock in Absorption Costing not in Marginal Costing.

Therefore, Difference in Profit = Fixed Overhead Rate (Production – Sale)

= ₹ 18 (24,000 – 21,500) = ₹45,000

b) Marginal costing is a very useful technique of costing and has great potential for management in various managerial tasks and decision- making process. The applications of marginal costing are discussed as follows:

1) **Cost Control:** One of the important challenges in front of the management is the control of cost. In the modern competitive environment, increase in the selling price for improving the profit margin can be dangerous as it may lead to loss of market share. The other way to improve the profit is cost reduction and cost control. Cost control aims at not allowing the cost to rise beyond the present level. Marginal costing technique helps in this task by segregating the costs between variable and fixed. While fixed costs remain unchanged irrespective of the production volume, variable costs vary according to the production volume. Certain items of fixed costs are not controllable at the middle management or lower management level. In such situation it will be more advisable to focus on the variable costs for cost control purpose. Since the segregation of costs between fixed and variable is done in the marginal costing, concentration can be made on variable costs rather than fixed cost and in this way unnecessary efforts to control fixed costs can be avoided.

2) **Profit Planning:** Another important application of marginal costing is the area of profit planning. Profit planning, generally known as budget or plan of operation may be defined as the planning of future operations to attain a defined profit goal. The marginal costing technique helps to generate data required for profit planning and decision-making. For example, computation of profit if there is a change in the product mix, impact on profit if there is a change in the selling price, change in profit if one of the product is discontinued or if there is a introduction of new product, decision regarding the change in the sales mix are some of the areas of profit planning in which necessary information can be generated by marginal costing for decision making. The segregation of costs between fixed and variable is thus extremely useful in profit planning.

3) **Key Factor Analysis***:* The management has to prepare a plan after taking into consideration the constraints, if any, on the various resources. These constraints are also known as limiting factors or principal budget factors as discussed in the topic of 'Budgets and Budgetary Control'. These key factors may be availability of raw material, availability of skilled labour, machine hours availability, or the market demand of the product. Marginal costing helps the management to decide the best production plan by using the scarce resources in the most beneficial manner and thus optimize the profits. For example, if raw material is the key factor and its availability is limited to a particular quantity and the company is manufacturing three products, A, B and C. In such cases marginal costing technique helps to prepare a statement, which shows the amount of contribution per kg of material. The product, which yields highest contribution per kg of raw material, is given the priority and produced to the maximum possible extent. Then the other products are taken up in the order of priority. Thus the resultant product mix will yield highest amount of profit in the given situation

4) **Decision Making:** Managerial decision-making is a very crucial function in any organization. Decision – making should be on the basis of the relevant information. Through the marginal costing technique, information about the cost behaviour is made available in the form of fixed and variable costs. The segregation of costs between fixed and variable helps the management in predicting the cost behaviour in various alternatives. Thus it becomes easy to take decisions. Some of the decisions are to be taken on the basis of comparative cost analysis while in some decisions the resulting income is the deciding factor. Marginal costing helps in generating both the types of information and thus the decision making becomes rational and based on facts rather than based on intuition. Some of the crucial areas of decision-making are mentioned below.

- Make or buy decisions
- Accepting or rejecting an export offer
- Variation in selling price
- Variation in product mix
- Variation in sales mix
- Key factor analysis
- Evaluation of different alternatives regarding profit improvement
- Closing down/continuation of a division
- Capital expenditure decisions.

23a) SP Ltd. manufactures and sells a single product and has estimated a sales revenue of Rs 126 lacs this year based on a 20% profit on selling price. Each unit of the product requires 3 Kg of material X and 1½ Kg. of material Y for manufacture as well as a processing time of 7 hours in the Machine Shop and 2½ hours in the Assembly Section. Overheads are absorbed at a blanket rate of 33-1/3% on Direct Labour. The factory works 5 days of 8 hours a week in a normal 52 weeks a year. On an average statutory holidays, leave and absenteeism and idle time amount to 96 hours, 80 hours and 64 hours respectively, in a year.

The other details are as under

Purchase price	Material X	₹ 6 per Kg	
	Material Y	Rs 4 per Kg	
Comprehensive Labour rate	Machine shop	Rs 4 per hour	
	Assembly	Rs 3.20 per hour	
No. of Employees	Machine shop	600	
	Assembly	180	
	Finished Goods	Material X	Material Y
Opening stock	20,000 units	54,000 Kg	33,000 Kg
Closing stock (Estimated)	25,000 units	30,000 Kg	66,000 Kg.

You are required to calculate:

i)The number of units of the product proposed to be sold.

ii)Purchased to be made of materials X and Y during the year in Rupees.

iii)Capacity utilization of machine shop and Assembly section, along with your comments.

bi)What do you understand by the term Zero Base Budgeting?
ii)What are the components of Budgetary Control System?

Ans: a1) **Statement of selling price per unit of the product**

	₹	
Material cost		
X: 3 lbs x ₹6 = ₹ 18		
Y: 1.5 lbs x ₹4 = ₹ 6	24	
Labour cost		
Machine shop 7 hrs x ₹ 4 = ₹ 28		
Assembly shop 2.5 hrs x ₹3.20 = ₹ 8	36	
Overheads		
33-$^{1}/_{3}$% of Direct Labour Cost	12	
Cost (per unit)	72	
Add: Profit 20% of selling price or 25% on cost	18	
Selling price (per unit)	90	

2. **The comprehensive labour rate has been assumed as direct labour.**

(i) The number of units of the product proposed to be sold

Selling price (per unit) ₹ 90
Total sales revenue ₹ 1,26,00,000
Number of units of the product proposed to be sold 1,40,000 Units

$$\frac{Rs.1,26,00,000}{Rs.90}$$

(ii) Statement of material X and Y to be purchased during the year in Rupees

Materials	Material Consumption (lbs)	Closing balance of material (Kg)	Opening balance of material (lbs)	Material to be purchased (Kg)	Purchase price ₹	Amount ₹
(1)	(2)	(3)	(4)	(2)+(3)-(4)=(5)	(6)	(5)x(6)=(7)
X	*1,45,0000 x 3 = 4,35,000	30,000	54,000	4,11,000	6	24,66,000
Y	1,45,000x1.5 = 2,17,500	66,000	33,000	2,50,500	4	10,02,000
Total						34,68,000

Working Note:

Number of units of finished goods to be manufactured during the year
= Sales (units) during the year + Closing balance – Opening stock
= 1,40,000 units +25,000 units – 20,000 units
= 1,45,000 units

(iii) Capacity Utilisation Statement of Machine shop and Assembly Section

	Machine shop	Assembly Section
Hours available during the year (See working note)	600 persons x 1,840 hrs. =11,04,000	180 Persons x 1,840 hrs. = 3,31,200
Hours required to manufacture 1,45,000 units	1,45,000 x 7 hrs. =10,15,000	1,45,000 x 2.5 hrs. =3,62,500
Surplus/(Deficit) hours	89,000	(31,300)
Capacity utilisation	91.94%	109.45%

Working note:

Hours available during the year: 5 days x 8 hrs x 52 weeks = 2,080 hrs.
Less: Statutory holidays, leave and absenteeism & idle time (96 hrs. + 80 hrs. + 64 hrs.) 240 hrs.
1,840 hrs.

Comments: From the statement of hours required to manufacture 1,45,000 units of the product, it is apparent that the total hours required in machine shop and assembly section would be 10,15,000 and 3,62,500 respectively. Whereas the available hours in machine shop and assembly section are 11,04,000 and 3,31,200

respectively. In this way there are 89,000 surplus hours in the machine shop and also a deficit of 31,300 hours in the assembly section. To resolve the problem of deficit in assembly section, following suggestions are made:

1. If the workers can be interchangeable then the assembly section utilize the services of workers which may be transferred from the machine shop to meet the production target of 1,45,000 units.
2. If the workers are not interchangeable then the assembly section may either resort to overtime or increase the strength of workers to catch up the budgeted production. Under both the ways i.e resorting to overtime or increasing the strength in assembly section, the profit of the concern will be reduced.

bi) Zero Base Budgeting is method of budgeting whereby all activities are revaluated each time budget is formulated and every item of expenditure in the budget is fully justified. Thus the Zero Base Budgeting involves from scratch or zero.

Zero based budgeting [also known as priority based budgeting] actually emerged in the late 1960s as an attempt to overcome the limitations of incremental budgeting. This approach requires that all activities are justified and prioritized before decisions are taken relating to the amount of resources allocated to each activity. In incremental budgeting or traditional budgeting, previous year's figures are taken as base and based on the same the budgeted figures for the next year are worked out. Thus the previous year is taken as the base for preparation of the budget. However the main limitation of this system of budgeting is that an activity is continued in the future only because it is being continued in the past. Hence in Zero Based Budgeting, the beginning is made from scratch and each activity and function is reviewed thoroughly before sanctioning the same and all expenditures are analyzed and sanctioned only if they are justified.

Besides adopting a 'Zero Based' approach, the Zero Based Budgeting also focuses on programs or activities instead of functional departments based on line items, which is a feature of traditional budgeting. It is an extension of program budgeting. In program budgeting, programs are identified and goals are developed for the organization for the particular program. By inserting decision packages in the system and ranking the packages, the analysis is strengthened and priorities are determined.

ii) **Components of budgetary control system**

The policy of a business for a defined period is represented by the master budget the details of which are given in a number of individual budgets called functional budgets. The functional budgets are broadly grouped under the following heads:

(A) Physical Budgets – Sales Qty, Product Qty., Inventory, Manpower budget.
(B) Cost Budgets – Manufacturing Cost, Administration Cost, sales & distribution cost, R & D Cost.
(C) Profit Budget

24a) A company has established the following relationship of costs with sales at 100% capacity utilization :

Factory cost	66.67 % of sales
Prime cost	75% of factory cost
Selling cost (75% is variable)	20% of sales

The factory overhead at different capacity levels are estimated as under :

Capacity utilization	Factory overheads (₹)
120%	2,50,000
100%	2,00,000
80%	1,80,000
60%	1,65,000

Presently the company operates at 60% capacity utilization and the sales value at this level is ₹ 7,20,000 per annum.

The management receives an offer at a sales value of ₹ 1,65,000 per annum from a Government department. This offer will occupy 40% of the company's capacity. The prime cost of this order is ₹ 1,00,000 and there will be an increase of selling costs of ₹ 8,000 only per annum on account of this order. The sales department claims that the company's own sales will increase to 80% of capacity by the time the aforesaid Government department's order materializes.

Required :

(i) Present statements to show the profitability of the company at 60% and 80% operating levels.
(ii) Show the calculation of the profitability of the order of the Government department and advise whether it should be accepted or not.

b) X Ltd. manufactures two products E and F .The manufacturing division consists of two production departments P1and P2 and two services S1 and S2.

Budgeted overhead rates are used in the production departments to absorb factory overheads to the products. The rate of Department P1 is based on direct machine hours, while the rate of Department P2 is based on direct labour hours. In applying overheads, the pre-determined rates are multiplied by actual hours.

For allocating the service department costs to production departments, the basis adopted is as follow:

(i) Cost of Department S1 to Department P1 and P2 equally, and

(ii) Cost of Department S2 to Department P1 and P2 in the ratio 2:1 respectively.

The following budgeted and actual data are available:

Annual profit plan data:

Factory overhead budgeted for the year:

		₹		₹
Departments	P1	25,50,000	S1	6,00,000
	P2	21,75,000	S2	4,50,000

Budgeted output in units:

Product E– 50,000; F – 30,000.

Budgeted raw material cost per unit:

Product E – ₹ 120 ; Product F–₹ 150.

Budgeted time required for production per unit:

Department P1: Product E: 1.5 machine hours

Product F: 1.0 machine hour

Department P2: Product E: 2 Direct labour hours

Product F: 2.5 Direct labour hours

Average wage rates budgeted in Department P2 are: Product E –Rs72 per hour and Product F – ₹ 75 per hour.

All materials are used in Department P1 only. Actual data (for the month of December ,2011)

Units actually produced: Product E: 4,000 units; Product F: 3,000 units

– Actual direct machine hours worked in Department P1
  On product E – 6,100 hours, Product F-4,150 hours
– Actual direct labour hours worked in Department P2
  On product E– 8,200 hours, Product F-7,400 hours

Cost actually incurred:

		Product E		Product F
Raw materials:		₹ 4,89,000		₹ 4,56,000
Wages:		₹ 5,91,900		₹ 5,52,000
		₹		₹
Overheads: Department	P1	₹ 231,000	S1	₹ 60,000
	P2	₹ 2,04,000	S2	₹ 48,000

You are required to:

(i) Compute the predetermined overhead rate for each production department.

(ii) Prepare a performance report for December 2011 that will reflect the budgeted costs and actual costs.

Ans: a) Present sales at 60% operating capacity = ₹ 7,20,000

Total sales at 100% capacity = ₹720000/60*100

= ₹ 12,00,000

Costs at 100% capacity :

Factory cost (66.67% of sales) = ₹ 12,00,000 x 66.67/100 = ₹ 8,00,000

Prime cost (75% of Factory cost) = ₹ 8,00,000 x 75/100 = ₹ 6,00,000

Selling cost (20% of sales) = ₹ 12,00,000 x 20/100 = ₹ 2,40,000

Profitability Statement	₹
Prime cost	6,00,000
Add : Factory overheads (balancing figure)	2,00,000
Factory cost	8,00,000

Add : Selling cost			
Variable (75%)		1,80,000	
Fixed		60,000	2,40,000
Total cost			10,40,000
Profit			1,60,000
Sales			12,00,000

Variable selling overhead at 100% capacity

At 100% capacity		=	₹ 1,80,000
At 60% capacity	₹180000/100*60	=	₹ 108000
At 80% capacity	₹180000/100*80	=	₹144000

i) Profitability Statement at 60% and 80% operating levels

Capacity level	60%	80%
Sales (I) (₹)	7,20,000	9,60,000
Costs : (₹)		
Prime Cost(50% of Sales)	3,60,000	4,80,000
Factory overhead (₹)	1,65,000	1,80,000
	5,25,000	6,60,000
Add: Selling cost (₹)		
Variable	1,08,000	1,44,000
Fixed	60,000	6,00,00
Total cost (II) (₹)	6,93,000	8,64,000
Profit (I)- (II) (₹)	27,000	96,000

(iv) **Profitability statement of special order**

	₹
Sales (I)	1,65,000
Prime cost	1,00,000
Factory overheads (Rs 250000-₹180000)	70,000
Factory cost	1,70,000
Add : Selling cost	8,000
Total cost (II)	1,78,000
Loss (I)- (II)	13,000

Analysis : There is an incremental loss of ₹ 13,000 by accepting special order. Hence it is suggested to reject the special order.

b) **(i) Computation of predetermined overhead rate for each production department from budgeted data**

	Production Deptts.		Service Deptts.	
	P1	P2	S1	S2
Budgeted factory overheads for the year in (₹)	25,50,000	21,75,000	6,00,000	4,50,000
Allocation of service department S1's costs to production departments P1 and P2 equally in (₹)	3,00,000	3,00,000	- 6,00,000	_
Allocation of service department S2's costs to production department P1 and P2 in ratio of 2:1 in (₹)	3,00,000	1,50,000	_	- 4,50,000
Total (₹)	31,50,000	26,25,000	Nil	Nil
Budgeted machine hours in department P1 *(*Refer to working Note1*)*	1,05,000			
Budgeted machine hours in department P2 (Refer to working Note 1)	–	1,75,000		

Budgeted machine hour rate (₹ 31,50,000/1,05,000)	₹ 30
Budgeted machine hour rate (₹ 26,25,000/1,75,000)	₹ 15

(ii) Performance report for December, 2011

(When 4,000 and 3,000 units of products E and F respectively were actually produced)

	Budgeted ₹	Actual ₹
Raw material used in department P1		
E: 4,000 units ×₹ 120	4,80,000	4,89,000
F : 3,000 units ×₹ 150	4,50,000	4,56,000
Direct Labour		
Cost on the basis of labour hours worked in department P2		
E:4,000 × 2 hrs. × ₹72	5,76,000	5,91,900
F:3,000 × 2.5 hrs. ×₹75	5,62,500	5,52,000
Overhead absorbed		
On machine hour basis in department P1		
E: 4,000 × 1.5 hrs. × ₹30	1,80,000	1,74,400*
F. 3,000 × 1 hr.× ₹30	90,000	1,18,649
Overhead absorbed		
On machine hour basis in department P2		
E: 4,000 × 2 hrs. × ₹15	1,20,000	1,31,364**
F: 3,000 × 2.5 hrs.× ₹15	1,12,500	1,18,548
	25,71,000	26,31,861

* (Refer to working Note 4)

**(Refer to Working Note 5)

Working Notes:

	Product E	Product F	Total
1. Budgeted output (in units)	50,000	30,000	
Budgeted machine hours In department P1	75,000 (50,000 ×1.5 hrs.)	30,000 (30,000 ×1 hrs.)	1,05,000
Budgeted labour hours In department P2	1,00,000 (50,000 × 2 hrs.)	75,000 (30,000 × 2.5 hrs.)	1,75,000

	Product E	Product F	Total
2. Actual output (in units)	4,000	3,000	
Actual machine hours utilised in department P1	6,100	4,150	10,250
Actual labour hours utilised in department P2	8,200	7,400	15,600

3. Computation of actual overhead rate for each production department from actual data

	Production Deptts.		Service Deptts.	
	P1	*P2*	*S1*	*S2*
Actual factory overheads for the month of December,2011in (₹)	2,31,000	2,04,000	60,000	48,000
Allocation of service department S1's costs in (₹) over production departments P1 and P2 equally.	30,000	30,000	–60,000	–
Allocation of service department S2's costs in (₹) over production departments P1 and P2 in the ratio	32,000	16,000	–	–48,000

of 2:1	_____	_____	___	___
Total (₹)	2,93,000	2,50,000	Nil	Nil
Actual machine hours in department P1 *(*Refer to Working Note 2*)*	10,250	—	—	—
Actual labour hours in department P2 *(*Refer to Working Note 2*)*	—	15,600	—	—
Machine hour rate *(*₹ 2,93,000/10,250*)*	₹ 28.59			
Labour hour/ rate *(*₹ 2,50,000/15,600*)*		₹ 16.02		

4. Actual overheads absorbed (based on machine hours):
   E: 6,100 hrs.× ₹ 28.59 = ₹ 1,74,400 (say)
   F: 4,150 hrs.× ₹ 28.59 = ₹ 1,18,649 (say)
5. Actual overheads absorbed (based on labour hours):
   E: 8,200 hrs.× ₹ 16.02 = ₹ 1,31,364
   F: 7,400 hrs.× ₹ 16.02 = ₹ 1,18,548

25a)DEF Ltd is tendering for a six months contract which would require the use of specialized machine. The Machine was purchased 4 years ago for ₹ 90000 whose net book value as on date is ₹ 35000. The Company was about to sell the Machine for ₹ 40000 but if it is used in the given contract, it may be sold after 6 months for ₹ 25000. The variable operating cost of the machine for 6 months would be ₹ 45000. Identify the relevant cost of using the machine on contract.(Ignore interest costs.)

b)PQR Ltd. engaged in manufacturing activities has received a request from one of its customers to supply a product 'F' which would require conversion of Material M, a non-moving item. Details of material M are as follows:

Book Value of material M Rs 600
Realisable value of Material M ₹800
Replacement cost of Material M ₹ 1000

It is estimated that conversion of one unit of M into one unit of the Finished Product will require 1 Labour Hour. At present Labour is paid at the rate of ₹ 20 per hour. Other Costs are as follows:

Out of pocket expenses ₹ 300 per unit
Allocated Overheads ₹ 100 per unit.

The Labour will be redeployed from other activities. It is estimated that the temporary redeployment will not result in loss of contribution.. The employees redeployed are permanent employees of the Company.
Estimate the Minimum Price to be charged from customer so that the Company is not worse off by executing the order.

c)Fixed Costs are irrelevant in decision making. List out the exceptions.

d)Mr. H , the Sales manager of WBD Ltd. Has been asked by a potential customer to sell 10,000 units of a certain Gear for Rs 1000 per unit. WBD Ltd normally sells this item for ₹ 1500/- per unit, but it is having some excess manufacturing capacity in recent months. It is anticipated that this would be one time order of the customer. The unit cost of the product is as under.

Particulars	₹
Direct Materials	300
Direct Labour	250
Variable Factory OH	125
Fixed Factory OH	250
Variable Selling and Administrative Expense	175
Fixed Selling and Administrative Expense	225
Total per unit cost	1325

The Sales Manger is of the opinion that accepting the order would amount to loss of ₹132/- per unit.
In this context , decide-
i)The relevant costs to the decision to sell at Special Price.
ii)Amount of relevant costs.

iii)Differential income(Loss) if this order is accepted.
iv)Non –financial factors relevant in this decision.
Ans: a)**Relevant Cost of operating the Machine on contract for six months:**

Variable operating costs	₹45000
Reduction in realizable Value during use(₹40000-₹25000)	₹15000
Total relevant cost	**₹60000**

Note: The original cost of ₹90000 and Net Book Value are irrelevant Sunk Costs.

b) ₹

For a slow moving material , Realizable Value is relevant opportunity cost. So realizable value of M is relevant.	800
Labour is permanent. Assuming that there is no retrenchment policy, this cost is committed and irrelevant	-
Out of pocket cost specifically incurred. Hence relevant	300
Allocated OH is not specifically incurred. Hence irrelevant.	-
Minimum price to be charged	1100

c)In the following circumstances , Fixed Costs become relevant in decision making:
i) Fixed Costs are specifically incurred for any Contract;
ii)When Fixed costs are incremental in nature;
iii)When fixed portion of semi variable costs increases due to change in level of activity consequent to acceptance of a contract;
iv)When Fixed Costs are avoidable or discretionary;
v)When Fixed cost are such that one cost is incurred in lieu of the another.

di)The relevant cost of the Special Order are those which will change if the order is accepted, i.e(1) Direct Material, (2)Direct Labour, (3)Variable factory OH and (4) Variable Selling and Administrative Expenses.
ii)Relevant Cost per unit= Direct Material, +Direct Labour, +Variable factory OH + Variable Selling and Administrative Expenses.
=Rs 300+Rs 250+Rs 125+Rs 175=₹ 850/-
iii)Differential Income/(Loss) on acceptance of Special Order=10000 units*(Rs 1000-Rs850)=₹ 1500,000
iv)Non- Financial factors to be considered include:
A)Availability of sufficient Excess Capacity to produce 10000 units without reducing present sales are ₹1500/p.u
B) Effect of Special Order price on regular customers who may demand similar lowering of prices.
C)Possibility of repeat orders and effect of such lower price in long run.

26a)HAD is engaged in the manufacture of Sunflower Oil. The three divisions are :
Harvesting – it produces Oilseeds and transports the same to Oil Mill,
Oil Mill- process Oilseeds and manufactures Edible Oil,
Marketing Division- packs Edible Oil in 2 Kg containers for sale at ₹150 per container.
The Oil Mill has a yield of 1000 kg of oil from 2000 kg of Oilseeds during a period. The Marketing Division has a yield of 500 cans of Edible Oil of 2 Kg of Oil.
The cost data for each division for the 3rd Quarter of 2011 are as under-

Harvesting Division:	Variable Cost per kg of Oilseed	₹2.50
	Fixed cost per Kg of Oilseed	₹5.00
Oil Mill Division:	Variable Cost of Processed Edible Oil	₹ 10 per Kg
	Fixed Cost of Processed Edible Oil	₹7.50 per Kg
Marketing Division:	Variable Cost per Can of 2 Kg of Oil	₹3.75
	Fixed Cost per Can of 2 Kg of Oil	₹8.75

Fixed Costs are calculated on the basis of estimated quantity of 2000 kg of Oilseeds harvested, 1000 kg of processed oil and 500 cans of Edible Oil packed by the aforesaid divisions respectively during the period under review.The other oil mills buy the oilseeds of same quantity at Rs 12.50 per Kg in the market. The market price of Edible oil processed by the Oil Mill, if sold without being packed by Marketing Division is ₹62.50 per Kg.

i) Compute the Overall Profit of the Company of harvesting 2000 kg of Oilseeds, processing it into edible oil and selling the same in 2 cans as estimated for the period under review.
ii) Compute transfer prices using Shared Contribution Method in relation to Variable Costs and Market Pricing Method from (I) Harvesting Division to Oil Mill Division(II) Oil Mill Division to Marketing Division.
iii)Which method is preferable. Advice the divisional Manager.
bi)Explain the concept of Goal Congurence.
ii) Write short note on "Negotiated Transfer Pricing'.

Ans: ai) Statement of Company's Profit:

	Harvesting	Oil Mill	Marketing	Total(Rs)
A) Sales(150*500)				75,000
B)Production(Qty)	2000Kg(oilseeds)	1000 kg(oil)	500 Cans	
C) Variable Cost (VC) per unit	₹ 2.50	₹ 10.00	₹ 3.75	
D)Total VC	₹ 5,000	₹10,000	₹1,875	16,875
E)Contribution(A-D)				58,125
F)Total Fixed Cost	₹10,000	₹ 7,500	₹4,375	21,875
G)Profit(E-F)				36,250

ii)Computation of Transfer prices under different methods:

	Harvesting	Oil Mill	Marketing
A) Shared Contribution in relation to Variable Cost, i.e Rs 58125 shared in ratio of 5000:10000:1875	₹17,222	₹ 34,444	₹6,459
B)Own Variable Costs	₹ 5,000	₹ 10,000	₹ 1,875
C) Transfer in Variable Costs	-	₹ 22,222	₹ 66,666
D)Transfer Price under shared Contribution method(A+B+C)	₹ 22,222	₹ 66,666	₹ 75,000(market price)
E)Transfer Price under Market Price Method	Rs 12.50 *2000=₹ 25,000	₹ 62.50 *1,000=₹ 62,500	MP=₹ 75,000

iii) Computation of Divisional Profits under different Transfer Pricing Methods:

	Harvesting	Oil Mill	Marketing	Total(Rs)
(1) Shared Contribution Method(WN ii)	₹ 22,222	₹ 66,666	₹ 75,000	
Less:Own Variable Costs	₹ 5,000	₹ 10,000	₹ 1,875	
Less: Transfer in Costs	-	₹ 22,222	₹ 66,666	
Less:Fixed Costs	₹ 10,000	₹ 7,500	₹ 4,375	
Profits	**₹ 7,222**	**₹ 26,944**	**₹ 2,084**	**₹ 36,250**
(2) Market Price Method				
Transfer Price(WN ii)	₹ 25,000	₹ 62,500	MP=₹ 75,000	
Less: Own Variable Costs	₹ 5,000	₹ 10,000	₹ 1,875	
Less: Transfer in Costs	-	₹ 25,000	₹ 62,500	
Less: Fixed Costs	₹ 10,000	₹ 7,500	₹ 4,375	
Profits	**₹ 10,000**	**₹ 20,000**	**₹ 6,250**	Rs 36250

Preferences	Market Price	Shared Contribution	Market Price	

bi)Division functioning as profit centers strive to achieve maximum divisional profits, either by internal transfers or from outside purchase. This may not match with the organization's objective of maximum overall profits. Divisions may be commercial to advice overall objects objectives , where divisional decisions are in line with the overall best for the company , and this is goal congruence. Divisions at a disadvantage may be given due weightage while appraising their performance. Goal incongruence defeats the purpose of divisional profit centre system.

ii) The transfer prices may be fixed on the basis of 'Negotiated Prices' which are fixed through negotiations between the selling and the buying division. Sometimes it may happen that the concerned product may be available in the market at a cheaper price than charged by the selling division. In this situation the buying division may be tempted to purchase the product from outside sellers rather than the selling division. Alternatively the selling division may notice that in the outside market, the product is sold at a higher price but the buying division is not ready to pay the market price. Here, the selling division may be reluctant to sell the product to the buying division at a price, which is less than the market price. In all these conflicts, the overall profitability of the firm may be affected adversely. Therefore it becomes beneficial for both the divisions to negotiate the prices and arrive at a price, which is mutually beneficial to both the divisions. Such prices are called as 'Negotiated Prices'. In order to make these prices effective care should be taken that both, the buyers and sellers should have access to the available data including about the alternatives available if any.

Similarly buyers and sellers should be free to deal outside the company, but care should be taken that the overall interest of the organization is not jeopardized.

- The main limitation of this method is that lot of time is spent by both the negotiating parties in fixation of the negotiated prices.
- Negotiating skills are required for the managers for arriving at a mutually acceptable price, otherwise there is a possibility of conflicts between the divisions.

27a)AW Ltd. manufactures and sells 15000 units of a product . The Full Cost per unit is Rs 200/- The Company fixed its price so as to earn a 20% return on investment of Rs 18,00,000.

Required:

i)Calculate the Selling Price per unit from the above. Also, calculate the Mark-up % on the Full Cost per unit.

ii)If the Selling Price as calculated above represents a Mark-up % of 40% on Variable Cost per unit. iii)Calculate the Company's Income if it had increased the selling price to Rs 230/- At this price , the Company would have sold 13500 units. Should the Company increase Selling Price to Rs 230/-?

iv) In response to competitive pressures, the company must reduce the price to Rs 210 next year, in order to achieve sales of 15000 units. The Company plans to reduce its investment to Rs 16,50,000. If a 20% Return on Investment should be maintained, what is the Target Cost per unit for next year?

b)Discuss the scope of Cost Reduction in area of Works Services.

Ans: a)

A) Target Sale Price per unit =Full Cost + target Profit=Rs 200+Rs 1800000/15000 units*20%	Rs .224
So, mark –up on full cost =Rs 24/Rs 200	12%
B) Sale Price =Rs 224= VC+ 40% i.e 140% on VC. Hence Variable Cost =Rs 224/140%	₹ 160
C)Present Contribution at 15000 units =(Rs 224- Rs 160)*15000 units= Revised Contribution at 13500 units=(Rs 230- Rs 160)*13500 units= Hence , Increase in Sale Price is not beneficial, due to reduction in Contribution by	Rs 960,000 Rs 945,000 Rs 15000
D)Target Profit for next year=Rs 1650000/15000*20%=Rs 22 So Target Cost for next year= New Sale Price less Target Profit= Rs210-Rs 22	Rs 188

b) The scope of cost reduction in the area of Works Services are-

i) Keeping records of consumption and fuel to analyze the potential cost reduction.

ii) Study of the influence of Power Factor and maximum demand upon electricity charges and avoidance of waste by power generation etc.
iii) Boiler House Instrumentation as an aid to efficient utilization of energy resources.
iv) Preventive maintenance plans to avoid frequent breakdown and consequent production losses.
v)Comparison of Maintenance cost bill vis-à-vis Plant replacement cost bill to effect long run economies.
vi) Quality Control techniques to ensure quality of products.
vii)Study and review of procedures and systems to avoid duplication of work, elimination of unnecessary reports and making effective use of information recorded for formulating policies, planning and control.

28a) A company has the option to procure a particular material from two sources:
Source I assures that defectives will not be more than 2% of supplied quantity.
Source II does not give any assurance, but on the basis of past experience of supplies received from it, it is observed that defective percentage is 2.8%.
The material is supplied in lots of 1,000 units. Source II supplies the lot at a price, which is lower by ₹ 100 as compared to Source I. The defective units of material can be rectified for use at a cost of ₹ 5 per unit.
Advice which of the two sources is more economical?

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

The castings are used evenly throughout the year in the 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 high 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 tabulation:

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

Required:
(I) Compute the economic order quantity (EOQ).
(ii) Assume the company is willing to assume a 15% risk of being out of stock. What would be the safety stock? The re-order point?
(iii) Assume the company is willing to assume a 5% risk of being out of stock. What would be the safety stock? The 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 order to only ₹600. In addition company estimates that when the waste and inefficiency caused by inventories are considered, the true cost of carrying a unit in stock is ₹ 720 per year.
(I)Compute the new EOQ.
(II) How frequently would the company be placing an order, as compared to the old purchasing policy?

Ans:a) **Comparative Statement of procuring material from two sources**

	Material source I	Material source II
Defective (in %)	2 (Future estimate)	2.8 (Past experience)
Units supplied (in one lot)	1,000	1,000
Total defective units in a lot	20 (1,000 units ×2%)	28 (1,000 units ×2.8%)
Additional price paid per lot (₹) (A)	100	–
Rectification cost of defect (₹) (B)	100 (20 units ₹ 5)	140 (28 units × ₹ 5)
Total additional cost per lot (₹): [(A)+(B)]	200	140

Decision:
On comparing the total additional cost incurred per lot of 1,000 units, we observe that it is more economical, if the required material units are procured from material source II.

b) **(i) Computation of economic order quantity (EOQ)**

(A)Annual requirement	=	54,000 castings
(C) Cost per casting	=	₹ 800
(O)Ordering cost	=	₹ 9,000 / order
(c × i)Carrying cost per casting p.a	=	₹ 300

$$EOQ = \sqrt{\frac{2AO}{c \times i}} = \sqrt{\frac{2 \times 54000 \times 9000}{300}} = 1800 \text{ casting}$$

(ii) Safety stock

*(*Assuming a 15% risk of being out of stock*)*

Safety stock for one day = 54,000/360 days = 150 castings

Re-order point = Minimum stock level + Average lead time × Average consumption

= 150 + 6 × 150 = 1,050 castings.

(iii) Safety stocks

*(*Assuming a 5% risk of being out of stock*)*

Safety stock for three days = 150× 3 days = 450 castings

Re-order point = 450 casting + 900 castings = 1,350 castings

(iv) Total cost of ordering = (54,000/1,800) × ₹ 9,000 = ₹ 2,70,000

Total cost of carrying = (450 + ½ × 1,800) ₹ 300 = ₹ 4,05,000

(v) (I) Computation of new EOQ:

$$EOQ = \sqrt{\frac{2 \times 54{,}000 \times 600}{720}} = 300 \text{ castings}$$

(II) Total number of orders to be placed in a year are 180. Each order is to be placed after 2 days (1 year = 360 days). Under old purchasing policy each order is placed after 12 days.

29a) What do you understand by Uniform Costing? State the essential pre-requisites for the installation of uniform costing system in an industry.

b) What is meant by 'Inter-firm comparison'? State the prerequisites and limitations of such system.

Ans: a) Uniform Costing is not a distinct method of costing, In fact when several undertaking start using the same costing principles and / or practices, they are said to be following uniform costing. The basic idea behind uniform costing is that the different concerns in an industry should adopt a common method of costing and apply uniformly the same principles and techniques for better cost comparison and common good. The principles and methods of compilation, analysis, apportionment and absorption of overheads differ from one concern to the other in the same industry, but if a common or uniform pattern is adopted by all, it helps mutually in cost control and cost reduction.

The essential requisites for the installation of uniform costing system

A successful system of uniform costing requires the following essential requisites for its installation:

1. The firms in the industry should be willing to share /furnish relevant data /information.
2. A spirit of co-operation and mutual trust should prevail among the participating firms.
3. Mutual exchange of ideas, methods used, special achievements made, research and know-how etc. should be frequent.
4. Bigger firms should take the lead towards sharing their experience and know-how with the smaller firms to enable the latter to improve their performance.
5. Uniformity must be established with regard to several points before the introduction of uniform costing in an industry. In fact, uniformity should be with regard to following points :

i)Size of the various units covered by uniform costing.

ii)Production methods.

iii)Accounting methods, principles and procedures used.

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

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

The following requisites should be considered while installing a system of inter-firm comparison:

1. Centre for Inter-firm Comparison:

For collection and analysing data received from member units for doing a comparative study and for dissemination of the results of study a Central body is necessary. The functions of such a body may be:

i)Collection of data and information from its members;

ii)Dissemination of results to its members;

iii)Undertaking research and development for common and individual benefit of its members;

organising training programmes and publishing magazines.

2. Membership:

Another requirement for the success of inter-firm comparison is that firms of different sizes should become members of the Centre entrusted with the task of carrying out inter-firm comparison.

3. Nature of information to be collected

Although there is no limit to information, yet the following information, useful to the management is in general collected by the center for inter firm comparison.

i)Information regarding costs and cost structures.

ii)Raw material consumption

iii)Stock of raw material, wastage of materials etc.

iv)Labour efficiency and labour utilisation.

v)Machine utilisation and machine efficiency.

vi)Capital employed and return on capital

vii)Liquidity of the organisation.

viii)Reserve and appropriation of profit.

ix)Creditors and debtors.

x)Methods of production and technical aspects.

4. Method of Collection and presentation of information:

The centre collects information at fixed intervals in a prescribed form from its members. Sometimes a questionnaire is sent to each member, the replies of the questionnaire received by the Centre constitute the information/data. The information is generally collected at the end of the year as it is mostly related with final accounts and Balance Sheet. The information supplied by firms is generally in the form of ratios and not in absolute figures. The information collected as above is stored and presented to its members in the form of a report. Such reports are not made available to non-members.

The following are the limitations in the implementation of a scheme of inter-firm comparison:

1. Top management feels that secrecy will be lost.
2. Middle management is usually not convinced with the utility of such a comparison.
3. In the absence of a suitable cost accounting system, the figures supplied may not reliable for the purpose of comparison.
4. Suitable basis of comparison may not be available

30a) FEG Bank is examining the profitability of its Subidha Account, a combined Savings and Current account. Depositors receive a 7% annual interest on their average deposit. ABC Bank earns an interest rate spread of 3% (the difference between the rate at which it lends money and rate it pays to depositors) by lending money for home loan purpose at 10%.

The Subidha Account allows depositors unlimited use of services such as deposits, withdrawals, cheque facility, and foreign currency drafts. Depositors with Subidha Account balances of ₹ 50,000 or more receive unlimited free use of services. Depositors with minimum balance of less than ₹ 50,000 pay ₹ 1,000-a-month service fee for their Subidha Account.

FEG Bank recently conducted an activity-based costing study of its services. The use of these services in 2011-12 by three customers is as follows:

	Activity-Based Cost Per Transaction	Customer A	Customer B	Account Usage Customer C
Deposits/withdrawal with teller	**₹ 125**	40	50	5
Deposits/withdrawal with automatic teller machine (ATM)	₹ 40	10	20	16
Deposits/withdrawal on pre-arranged monthly basis	₹ 25	0	12	60
Bank Cheques written	₹ 400	9	3	2
Foreign Currency drafts	₹ 600	4	1	6
Inquiries about Account balance	₹ 75	10	18	9
Average Premier Account balance for 2011-12		₹ 55,000	₹ 40,000	₹ 12,50,000

Assume Customer A and C always maintains a balance above ₹ 50,000, whereas Customer B always has a balance below ₹ 50,000.

Required:

(i) Compute the 2011-12 profitability of the customers A, B and C Premier Account at FEG Bank.

(ii) What evidence is there of cross-subsidisation among the three Premier Accounts? Why might ABC Bank worry about this Cross-subsidisation, if the Premier Account product offering is Profitable as a whole?

(iii) What changes would you recommend for ABC Bank's Subidha Account?

b) HGB Ltd. has an installed capacity of 1,50,000 units per annum. Its cost structure is given below:

		₹
(i)	Variable cost per unit	
	Materials	10
	Labour (subject to a minimum of ₹ 1,00,000 per month)	10
	Overheads	4
(ii)	Fixed overheads per annum	1,92,300
(iii)	Semi-variable overheads per annum at 75% capacity (It will increase by ₹ 4,000 per annum for increase of every 5% of the capacity utilisation or any part thereof)	60,000

The capacity utilisation for the next year is budgeted at 75% for first three months, 80% for the next six months and 90% for the remaining three months.

Required:

If the company is planning to have a profit of 20% on the selling price, calculate the selling price per unit for the 2012-13.

Ans: a) **Customer Profitability Analysis**

			FEG Bank – Subidha Account	
Activity	**Activity based cost**	**Customers**		
		A	**B**	**C**
	₹	**₹**	**₹**	**₹**
Deposits/withdrawal with teller	125	5,000	6,250	625

		(40 × 125)	(40 × 125)	(5 × 125)
Deposits/withdrawal with ATM	40	400 (10 × 40)	800 (20 × 40)	640 (16 × 40)
Deposits/withdrawal on prearranged monthly basis	25	0 (0 × 25)	300 (12 × 25)	1,500 (60 × 25)
Bank cheques written	400	3,600 (9 × 400)	1,200 (3 × 400)	800 (2 × 400)
Foreign currency drafts	600	2,400 (4 × 600)	600 (1 × 600)	3,600 (6 × 600)
Inquiries about Account balance	75	750 (10 × 75)	1,350 (18 × 75)	675 (9 × 75)
Customer cost (I)		**12,150**	**10,500**	**7,840**
Spread on Average balance maintained	3%	1,650 (3% × 55,000)	1,200 (3% × 40,000)	37,500 (3% × 12,50,000)
Service fee	₹ 1,000 p.m.		12,000	
Customer benefit(II)		**1,650**	**13,200**	**37,500**

	Customers		
	A	**B**	**C**
Customer Profitability (Benefits – Costs)	₹ (10,500)	₹ 2,700	₹ 29,660

(ii) Customer C is most profitable and is cross-subsidising the most demanding customer A. Customer B is paying for the services used, because of not being able to maintain minimum balance. No doubt, 'Subidha Account' product offering is profitable as a whole, but the worry is of not finding customers like customer C who will maintain a balance higher than the stipulated minimum. It appears, the minimum balance stipulated is inadequate considering the services availed by depositors in 'Subidha Account'.

(iii) The changes suggested to FEG Bank's 'Subidha Account' are as follows:

- Increase the requirement of minimum balance from ₹ 50,000 to ₹ 1,00,000.
- Charge for value added services like Foreign Currency Drafts.
- Do not allow deposits/withdrawal below ₹ 10,000 at the teller. Only ATM machine withdrawal be allowed.
- Inquiries about account balance to be entertained only through Phone Banking/ATM.

b) **Working Notes:**

(i) Installed capacity per month $\frac{1,50,000}{12}$ =12,500 units

(ii) **Capacity utilisation**	75%	80%	90%
Production per month (units)	9,375	10,000	11,250
Total production (units)	3×9,375 = 28,125	10,000 ×6 = 60,000	11,250 ×3 = 33,750
Total		1,21,875 units	

(iii) **Calculation of labour cost:**

Capacity	**75%**	**80%**	**90%**
Production per month (units)	9,375	10,000	11,250
Labour @ 10 (subject to minimum 1,00,000)	93,750 i.e. minimum 1,00,000	1,00,000	1,12,500
Total labour cost	3×1,00,000 = 3,00,000	6 ×1,00,000 = 6,00,000	3 ×1,12,500 = 3,37,500
Total		Rs 12,37,500	

(iv) **Calculation of semi variable overheads:**

	75%	**80%**	**90%**
Semi variable Overhead per month	$\frac{60,000}{12} = 5,000$	$\frac{60,000 + 4,000}{12} = 5333.66$	$\frac{60,000 + 12,000}{12} = 6,000$
Total Semi-variable	3×5,000 = 15,000	6 ×5333.66 = 32,000	3 ×6,000 = 18,000

Total overhead ₹ 65,000

Calculation of selling price per unit:

	₹
Material costs 1,21,875 @ 10	12,18,750
Labour cost	12,37,500
Overheads 1,21,875 @ 4	4,87,500
Semi-variable Overheads	65,000
Fixed Overheads	1,92,300
Total cost	32,01,050
Profit 20% on selling price i.e., 25% on cost	8,00,262.50
Sales	40,01,312.50
Selling price/unit = $\frac{40,01,312.50}{1,21,875}$	₹ 32.83