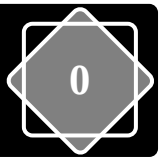
BASIC CONCEPTS



Question 1.

Calculate raw material consumed, direct labour cost, factory overheads, administration overheads, selling and distribution overheads and also prepare the cost sheet on the basis of following information-

	Debit	Credit
	Rs.	Rs.
Inventories:		
Raw materials	1,40,000	
Work-in-Progress	2,00,000	
Finished Goods	80,000	
Office appliances	17,400	
Plant & Building	4,60,500	
Buildings	2,00,000	
Sales		7,68,000
Sales returns and rebates	14,000	
Materials purchased	3,20,000	
Freight on Materials	16,000	
Purchase Return		4,800
Direct Labour	1,60,000	
Direct Expense	50,000	
Indirect Labour	18,000	
Factory supervision	10,000	
Factory repairs and upkeep	14,000	
Heat, light and power	65,000	
Rates and taxes	6,300	
Miscellaneous expenses (Fact)	18,700	
Sales commission	33,600	
Sales traveling	11,000	
Sales promotion	22,500	
Distribution Dept. salaries & Expenses	18,000	
Office Salaries and expenses	8,600	
Interest on borrowed funds	2,000	
Dividend income	20,000	
Bad debts	5,000	

Additional information:

1. Closing inventories : Raw materials Rs. 1,80,000; Work in Process Rs. 1,92,000 and Finished Stock Rs. 1,15,000
2. Accrued Expenses: Direct labour Rs. 8,000; Indirect labour Rs. 1,200 and Interest on borrowed funds Rs. 2,000
3. Depreciation to be provided on: Office Appliances at 5%. Plant and machinery at 10% and Buildings at 4%.
   (a) Heat, light and power; in the ratio of 8 : 1 : 1 to factory, office, and selling and distribution.
   (b) Rates and taxes: two-thirds to factory and one-third to office.
   (c) Depreciation on buildings in the ratio of 8 : 1 : 1 to factory, office, and selling and distribution.

With the help of above information you are required to prepare a condensed profit & loss statement of together company. For the year ended 30th Sep., 1986 along with supporting schedule of

(i) Cost of sales (ii) Selling & distribution expenses. (ii) Administration expenses.

Answer: (i) 764025 (ii) 92400 (iii) 18875 Net profit (10025)

Question 2.

The Margo Company has just completed operations for the year 1999. The company's Assistant Accountant (who is very inexperienced) prepared the following Profit and Loss Statement for the year's activities:

Sales	Rs. 32,00,000	
Operating Expenses:		
Insurance	Rs. 40,000	
Gas, Electricity and Water	1,00,000	
Direct Labour Cost	6,00,000	
Indirect Labour	1,20,000	
Depreciation on factory Equipment	1,60,000	
Raw Materials Purchased during the year	12,00,000	
Rent	4,00,000	
Selling & Administration Overheads	3,20,000	29,40,000
Net Profit		2,60,000

The following adjustments had not been made while preparing the above accounts:-

(i)	**Opening**	**Closing**
Stock of Raw Material	-------	1,50,000
Stock of work – in – progress	4,20,000	4,80,000
Stock of Finished Goods	5,40,000	4,00,000

(ii) 10% of Gas & electricity & water, 30% of Insurance & 20% of Rent are to be apportioned to selling & Administration Overhead.

Answer: Net Profit 3,30,000.

Question 3.

Following data are extracted from Pavan Kishore Industries for the year 1991:

Opening stock of raw materials	Rs. 25,000
Closing stock of raw materials	40,000
Purchases of raw materials	85,000
Carriage inwards	5,000
Wages direct	75,000
Wages indirect	10,000
Other direct charges	15,000
Rent and Rates – factory	5,000
office	500
Indirect consumption-material	500
Depreciation-Plant	1,500
Depreciation-Office furniture	100
Salary-office	2,500
Salary-salesman	2,000
Other office expenses	900
Other factory expenses	5,700
Managing Director's remuneration	12,000

Other selling expenses	1,000
Travelling expenses	1,100
Carriage outwards	1,000
Sales	2,50,000
Advance income tax paid	15,000
Advertisement	2,000

Managing Director's remuneration is to be allocated as Rs. 4,000 to the factory. Rs. 2,000 to the office and Rs. 6,000 to the selling departments. From the above information, prepare:

(a) Prime cost, (b) Works cost, (c) Cost of production, (d) Cost of sales, (e) Net profit.

Answer: (a) Rs. 1.65,000, (b) Rs. 1,91,700, (c) Rs. 1,97,700 (d) Rs. 2,09,800, (e) Rs. 40,200; Advance tax is an item of financial accounting.

Question 4.

A fire occurred in the factory premises on October 31, 2003. The accounting records have been destroyed. Certain accounting records were kept in another building. They reveal the following for the period September 1, 2003 to October 31, 2003:

(i)	Direct materials purchased.	Rs. 250000
(ii)	Work in process inventory, 1.9.2003	Rs. 40000
(iii)	Direct materials inventory, 1.9.2003	Rs. 20000
(iv)	Finished goods inventory, 1.9.2003	Rs. 37750
(v)	Indirect manufacturing costs 40% of conversion cost	
(vi)	Sales revenues	Rs. 750000
(vii)	Direct manufacturing labour	Rs. 222250
(viii)	Prime costs	Rs. 397750
(ix)	Gross margin percentage based on revenues 30%	
(x)	Cost of goods available for sale	Rs. 555775

The loss is fully conversed by insurance. The insurance company wants to know the historical cost of the inventories as a basis for negotiating a settlement, although the settlement is actually to be based on replacement cost, not historical cost.

(i) Finished goods inventory, 31.10.2003

(ii) Work-in-process inventory, 31.10.2003

(iii) Direct materials inventory, 31.10.2003

Answer : 1. 175500 2. 148167 3. (i) 30775 (ii) 67892 (iii) 94500

Question 5.

The following are the Maintenance Costs incurred in a Machine Shop for six months with corresponding machine hours:-

Month	Machine Hours	Maintenance Costs
January	2000	300
February	2200	320
March	1700	270
April	2400	340
May	1800	280
June	1900	290
Total	12000	1800

Analyse the Maintenance Cost which is semi-variable into fixed and variable element.

Answer: Variable cost p.h 0.10; Fixed cost 100

Question 6.

B & Co. has recorded the following data in the two most recent periods:

Total cost of production	Volume of production
Rs.	**(units)**
14600	800
19400	1200

What is the best estimate of the firm's fixed costs per period ?

CA, Inter Nov 1995

Answer: Variable cost p.u- 12 ; Fixed cost 5000

Question 7.

Mr. Ram purchased 1000 units for Rs. 8200. The Normal loss is 10% of the Qty. purchased. The scrap will realise Re 1 p.u. The actual quantity received is 700 units. Calculate normal cost p.u., value of goods received and abnormal loss.

What would have been your answers in above question, if the actual Qty. received were 950 units?

DIRECT MATERIAL

1

Question 1.

You are given the following information-

Annual requirement of raw material	40,000 kg
Ordering cost per order	Rs 100
Carrying cost per annum	2%
Purchase price per kg	Rs 100

You are required to:-

(i) Calculate EOQ

(ii) Calculate total cost of raw material for EOQ

(iii) Calculate total cost of raw material if safety stock is 100 kg.

(iv) Calculate total relevant cost for EOQ.

(v) Calculate frequencies of orders in days, assuming 360 days p.a.

(vi) If supplier has offered 1% discount on the order of 5000 units/ kg at a time. Advice that whether the proposal should be accepted or not.

(vii) If supplier has offered discount on a minimum order of 1000 kgs then find out the minimum discount which we should ask for?

Question 2. **CA Inter May 1994**

The purchase department of your organization has received an offer of quantity discounts on its orders of materials as under:

Price per tonne	**Tonnes**
Rs. 1200	Less than 500
1180	500 and less than 1000
1160	1000 and less than 2000
1140	2000 and less than 3000
1120	3000 and above

The annual requirement for the material is 5000 tonnes. The delivery cost per order is Rs. 1200 and the stock holding cost is estimated at 20 % of material cost per annum.

You are required to advise the Purchase Department the most economical purchase level

Answer : 1000 units is the most economical

Question 3. **CA FINAL MAY 1994 ; ICWA FINAL JUNE 1992**

The annual demand for raw material R is 4000 units and the purchase price is expected to be Rs. 90 per unit. The incremental cost of processing an order is Rs. 135 and the cost of storage is estimated to be Rs. 12 per unit.

a) What is the optimal order quantity and the total relevant cost of this order quantity?

b) Suppose that Rs. 135 estimate of the incremental cost of processing an order is incorrect and should have been Rs. 80. Assume that all the other estimates are correct. What is the cost of this prediction error assuming that the solution to part is implemented for one year?

c) Assume at the start of the period, a supplier offers 4000 units at a price of Rs. 86. The materials will be delivered immediately and placed in the stores. Assume that the incremental cost of placing this order is zero and the original estimate of Rs. 135 for placing an order for the economic batch size is correct. Should the order be accepted?

d) Prepare a Performance Report for the supply manager – the budget is based on the data presented in (a) above and his actual performance was based on (c) above and he accepted the order.

Answer : a) 300 units , Rs.3600 ; b) Rs. 2772 , Rs.95 c) no d) Rs.4400 (adverse)

Question 4. **CA Inter May 2002**

The quarterly production of a company's product which has a steady market is 20000 units. Each unit of a product requires 0.5 kg. of raw material. The cost of placing one order for raw material is Rs. 100 and the inventory carrying cost is Rs. 2 per annum. The lead time for procurement of raw material is 36 days and a safety stock of 1000 kg. of raw materials maintained by the company.

The company has been able to negotiate the following discount structure with the raw material supplier:

Order quantity Kgs.	**Discount Rs.**
Upto 6000	NIL
6000-8000	400
8000-16000	2000
16000-30000	3200
30000-45000	4000

You are required to:

1. Calculate the re-order point taking 30 days in a month. [assume 360 days p.a.]
2. Prepare a statement showing the total cost of procurement and storage of raw materials after considering the discount if the company elects to place one, two, four or six orders in the year.
3. State the number of orders which the company should place to minimize the cost after taking EOQ also into consideration while ignoring the quantity discount.

Answer: (1) ROP: 5000 kg (2) Total cost 38100,19000,10400,8867 respectively (3) No. of orders at EOQ : 20

Question 5. **CA INTER NOV. 1994 ; ICWA INTER DEC.1996**

JP Limited manufacturers of a special product, follows the policy of EOQ (Economic Order Quantity) for one of its components. The component's details are as follows:

Purchase Price Per component Rs. 200

Cost of an order 100

Annual cost of carrying one unit in Inventory 10 % of Purchase Price

Total cost of Inventory and Ordering Per annum 4000

The company has been offered a discount of 2 % on the price of the component provided the lot size is 2000 components at a time.

You are required to :

(a) Compute the EOQ

(b) Advise whether the quantity discount offer can be accepted

(Assume that the inventory carrying cost does not vary according to the discount policy)

(c) Would your advice differ if the company is offered 5 % discount on a single order?

Answer :a) EOQ 200 units b) no it will result in the additional expenditure of Rs. 200 ; c) Yes it will reduce the total cost by Rs. 3900

Question 6.

The following information is available is respect of a particular material:

Re-order quantity	3600	units
Maximum consumption	900	units per week
Minimum consumption	300	units per week
Normal consumption	600	units per week
Re-order period	3 to 5	weeks

Calculate the following:

(a) Re-order level (b) Minimum stock level (c) Maximum stock level (d) Average stock level

Answer : a) 4500 units b) 2100 units c) 7200 units

Question 7.

In manufacturing its product a company uses three raw materials A, B and C in respect of which the following apply:

Raw Material Production	Usage Per unit (lbs)	Re-order of quantity	Price per lb (paise)	Delivery period (weeks)	Order level (lbs)	Minimum level (lbs)
A	10	10000	10	1 to 3	8000	…..
B	4	5000	30	3 to 5	4750	…..
C	6	10000	15	2 to 4	2000	…..

Weekly production varies from 175 to 225 units, averaging 200. What would you expect the quantities of the following to be:

a) Minimum stock of A;
b) Maximum stock of B;
c) Re-order level of C; and
d) Average stock level of A?

Answer : a) 4000 lbs; b) 7650 lbs.; c) 5400 lbs; d) 10125 lbs

Question 8. **CA INTER NOV. 1987**

Shriram Enterprises manufactures a special product 'ZED'. The following particulars are collected for the year 1986:

a) Monthly demand of ZED – 1000 units
b) Cost of placing an order Rs. 100
c) Annual carrying cost per unit Rs. 15
d) Normal usage 50 units per week
e) Minimum usage 25 units per week
f) Maximum usage 75 units per week
g) Re-order period 4 to 6 weeks

Compute from the above

1) Re-order quantity
2) Re-order level
3) Minimum level
4) Maximum level
5) Average stock level

Answer : 1) 186 units ; 2) 450 units ; 3) 200 units ; 4) 536 units ; 5) 368 units

Question 9.

From the details given below, calculate:

i) Re-order level ii) Maximum level
iii) Minimum level iv) Danger level

Re-ordering quantity is to be calculated on the basis of following information:

Cost of placing a purchased order is Rs.20
Number of units to be purchased during the year is 5000
Purchase price per unit inclusive of transportation cost is Rs. 50
Annual cost of storage per unit is Rs. 5

Details of lead time: Average 10 days; Maximum 15 days; Minimum 6 days. For emergency purchase 4 days

Rate of consumption: Average: 15 units per day, Maximum: 20 units per day

Answer : i) 200 units ; ii) 300 units ; iii) 440 units ; iv) 150 units ; v) 60 units

Question 10. **1998 – May (1) {C} (c)**

M/s. Tubes Ltd. Are the manufacturers of picture tubes for T.V. The following are the details of their operation during 1997:

Average monthly market demand	2,000 Tubes
Ordering cost	Rs. 100 per order
Inventory carrying cost	20% per annum
Cost of tubes	Rs. 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 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.

Answer : 1. 102 Units 2. 1,402 Tubes. 3. 900 Units. 4. 1,600 Units.

Question 11.

SK Enterprise manufactures a special product "ZE". The following particulars were collected for the year 2004 :

Annual consumption	12,000 units (360 days)
Cost per unit	Re. 1
Ordering cost	Rs. 12 per order
Inventory carrying cost	24%
Normal lead time	15 days
Safety stock	30 days consumption

Required:

(a) Re-order quantity

(b) Re-order level

(c) What should be the inventory level (ideally) immediately before the material order is received?

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Answer : 1. 100 bags, 80 bags 2. 48000, 44800 3. 20 orders p.a., 16 order p.a.

Question 12.

ZED Company supplies plastic crockery to fast food restaurants in metropolitan city. One of its products is a special bowl, disposable after initial use, for serving soups to its customers. Bowls are sold in pack 10 pieces at a price of Rs. 50 per pack.

The demand for plastic bowl has been forecasted at a fairly steady rate of 40,000 packs every year. The company purchases the bowl direct from manufacturer at Rs. 40 per pack within a three days lead time. The ordering and related cost is Rs. 8 per order. The storage cost is 10% per cent per annum of a average inventory investment.

Required:

(i) Calculate Economic Order Quantity.

(ii) Calculate number of orders needed every year.

(iii) Calculate the total cost of ordering and storage bowls for the year.

(iv) Determine when should the next order to be placed. (Assuming that the company does maintain a safety stock and that the present inventory level is 333 packs with a year of 360 working days.)

2008 – May

Answer : (i) 400 (ii) 100 orders (iii) 1600 (iv) 666

Question 13. **PE-II May 2004**

IPL Ltd. uses a small casting in one of its finished products. The casings are purchased from a foundry. IPL ltd. purchases 54,000 casting per year at a cost of Rs. 800 per casing.

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

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

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

1. Compute the Economic Order Quantity.
2. Assume that the company is willing to take a 15% risk of being out of stock. What would be the safety stock and the Re-order Point?
3. Assume that the Company is willing to take a 5% risk of being out of stock. What would be the safety stock and the Re-order Point?
4. Assume 5% stock-out risk. What would be the total cost of ordering and carrying inventory for one year?
5. Refer to the original data, Assume that using process re-engineering the Company reduces its cost of placing a purchase order to only Rs. 600, In addition, the Company estimates that when the waste and inefficiency caused by inventories are considered, the true cost of carrying a unit in stock is Rs. 720 per Year. (a) Compute new EOQ and (b) How frequently would the Company be placing an order, as compared to the old purchasing policy?

Answer: EOQ = 1800 castings. 15% stock-out risk – Safety stock 150 casting ROP-1050 castings ; 5% stock-out risk – Safety stock 450 casting ROP-1350 castings; Total cost -945000; EOQ- 300 castings ; No. of orders per annum – 30 order(old) and 180 orders (new)

Question 14.

The company distributes a wide range of electrical products. One of its best selling items is a standard electric motor. The management of the star company uses the EOQ decision model to determine th optimal number to order. Management now wants to determine how much safety stock to hold.

The star company estimates annual demand (300 working days) to be 30,000 electric motors. Using the EOQ decision model, the company orders 3,000 motors at a time. The lead time for an order is 5 days. The annual carrying costs of one motor in safety stock are Rs. 10. Management has also estimated that the stock out costs are Rs. 20 for each motor they are short. The star company has analysed the demand during 200 past reorder periods. The records indicate the following patterns:

Demand during Lead time	440	480	520	560	460	500	540
No of times demanded	6	16	20	6	12	130	10

Required:

1. Determine the level of safety stock for electric motors that the star company should maintain in order to minimize expected stock out costs and carrying costs. When computing carrying costs, assume that the safety stock is on hand at all times and that there is no overstocking caused by decreases in expected demand. (consider safety stock levels of 0,2040, and 60 units)
2. What would be the star company's new recorder point?
3. What factors should the star company have considered in estimating the stock out costs?

Answer: (i) Present ROL = 500 motors; required safety stock – 40 units with minimum relevant costs of Rs. 520; (ii) New ROL = 540 motors; (iii) Other consideration (a) Ioss of contribution due to sales foregone; (b) Idle time/stock costs; (c) Loss of market share/ goodwill due to stockouts; (d) Probability of future demand based on past data; (e) Additional administration costs of purchases, if any.

Question 15. **C.A Final – May, 1983**

From the following details, draw a plan of ABC selective control:

Items	Units	Units cost Rs.
1	7000	5.00
2	24000	3.00
3	1500	10.00
4	600	22.00
5	38000	1.50
6	40000	0.50
7	60000	0.20
8	3000	3.50
9	300	8
10	29000	0.40
11	11500	7.10
12	4100	6.20

Question 16. **C.A. Inter November 1997 – Part Question**

The following data are available in respect of material X for the year ended 31st March, 1997:

Opening Stock	Rs.	90000
Purchases during the year		270000
Closing stock		110000

Calculate: (i) Inventory turnover ratio: and (ii) the number of days for which the average inventory is held.

Answer : Inventory turn over ratio-2.5 times ; Inv. Holding pd.- 146 days

Question 17.

A manufacturer of Surat purchased three Chemicals A, B and C from Bombay. The invoice gave the following information:

Chemical A	3000 kg. @ Rs. 4.20 per kg.	Rs.	12600
Chemical B	5000 kg. @ Rs. 3.80 per kg.		19000
Chemical C	2000 kg. @ Rs. 4.75 per kg.		9500
Sales Tax			2055
Railway Freight			1000
Total Cost			44155

A shortage of 200 kg. in Chemical A, of 280 kg. in Chemical B and of 100 kg. in Chemical C was noticed to breakages. At Surat, the manufacturer paid Octroi Duty @ Re. 0.10 per kg. He also paid cartage Rs. 22 for Chemical A, Rs. 63.12 for Chemical B and Rs. 31.80 for Chemical C. Calculate the stock rate that you would suggest for pricing issue of chemicals assuming a provision of 5 % towards further deterioration.

Answer : Normal quantity purchased – 2660, 4486, 1805 resp. ; Cost per unit – 5.20, 4.68, 5.76 resp.

Question 18. **I.C.W.A. Inter, December 1985**

The particulars relating to 1200 kg. of a certain raw material purchased by a company during June, were as follows:

a) Lot prices quoted by supplier and accepted by the company for placing purchase order:

Lot up to 1000 kg.	@ Rs. 22/- per kg.	F.O.R.
Between 1000 and 1500 kg.	@ Rs. 20/- per kg.	Supplier's
Between 1500 and 2000 kg.	@ Rs. 18/- per kg.	Factory

b) Trade discount 20 %

c) Additional charge for containers @ Rs. 10 per drum of 25 kg.

d) Credit allowed on return of container (a) Rs. 8 per drum.

e) Sales Tax at 10 % on raw material and 5 % on drums.

f) Total freight paid by the purchaser Rs. 240

g) Insurance at 2.5 % (on Net Invoice Value) paid by the purchaser.

h) Stores overhead applied at 5 % on total purchase cost of material.

The entire quantity was received and issued to production. The containers are returned in due course. Draw up a suitable statement to show: (a) total cost of material purchased; and (b) unit cost of material issued to production.

Answer : Total cost – 23121.63 ; Cost per unit – 19.27

Question 19. **I.C.W.A Inter, December 1991**

The following details are available in respect of a consignment of 1250 kgs. of material 'X':

a) Invoice price – Rs. 20 per kg.

b) Excise Duty – 25 % of Invoice price

c) Sales Tax – 8 % on Invoice price including Excise Duty

d) Trade Discount – 10 % on Invoice price

e) Insurance – 1 % of aggregate net price

f) Delivery charges – Rs. 250

g) Cost of containers @ Rs. 60 per container for 50 kg. of material. Rebate is allowed @ Rs. 40 per container if returned within six weeks, which is a normal feature.

h) One container load of material was rejected on inspection and not accepted.

i) Cost of unloading and handling @ 0.25 % of the cost of materials ultimately accepted.

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

Answer : Total cost- 31099.95 ; Cost per container – 25.92

Question 20. **I.C.W.A Inter, December 1995; December 1989 - Similar**

The books of Excellent Chemicals Limited reveal the following data regarding imported chemicals used in the manufacture of their products during 1994-95:

Chemicals imported	**Quantity (kg.)**	**Rate (in U.S.$. per kg.)**	**Exchange Rate**
P	3000	3.00	1 U.S.$ = Rs. 32.00
Q	4500	2.40	
R	5000	4.00	

Import duty paid was 25 % of invoice value for chemicals P and Q and 40 % for chemical R. Insurance was paid @ 2.5 % on invoice value and a sum of Rs. 75000 was incurred towards freight and clearing charges. Stores overhead applied was 5 % on the total purchased cost of materials.

During the year 80 % of the material imported were issued to production. Assuming 4 % allowance is provided to cover loss, ascertain (i) value of closing stock of each type of chemicals.

What is the cost of each material charged to production?

Also prepare a statement showing (a) the quantity of material issued, (b) storage loss, and (c) closing stock of each type of chemicals.

Answer : Total cost of material- Rs. 404460, 491022, 989100 respectively; Quantity of material issued 2400, 3600, 4000 respectively; Storage loss 3236, 3928, 7913; Value of closing stock 77656, 94276, 189907 respectively.

Question 21. **I.C.W.A – Inter June, 1986**

The particulars relating to the import of Sealing Ring made by AB & Co. during December, 1985 are given below:

a) Sealing Ring – 1000 pieces invoiced £ 2.00 C.I.F. Bombay Port.

b) Customs duty was paid @ 100 % on Invoice value (which was converted to Indian currency by adopting an exchange rate of Rs. 17.20 per £)

c) Clearing charges – Rs. 1800 for the entire consignment, and

d) Freight charges – Rs. 1400 for transporting the consignment from Bombay Port to factory premises.

It was found on inspection that 100 pieces of the above material were broken, and therefore, rejected. There is no scrap value for the rejected part, no refund for the broken material would be admissible as per the terms of contract. The management decided to treat 60 pieces as normal loss and the rest 40 pieces as abnormal loss. The entire quantity of 900 pieces was issued to production.

Answer : Cost per unit - Rs.76.5957; Cost of material charged to production - 68936 ; Abnormal loss- 3064 ; Total cost of material -72000

Question 22.

At what price per unit would part no. A 32 be entered in the Stores ledger, if the following invoice was received from a supplier

Invoice	Rs.
200 units Part No. A 32 @ Rs. 5	1,000.00
Less: 20% discount	200.00
	800.00
Add: Excise duty @ 15%	120.00
	920.00
Add: packing charges (5 non-returnable boxes)	50.00
	970.00

Notes :

(i) A 2 per cent discount will be given for payment in 30 days.

(ii) Documents substantiating payment of excise duty is enclosed for claiming MODVAT credit.

Answer: Cost per unit 4.25

Question 23.

The following information is provided by SUNRISE INDUSTRIES for the fortnight of April, 1998:

Material Exe:

Stock on 01.04.98	100 units at Rs. 5 per unit.
Purchases	
5.04.98	300 units at Rs. 6
8.04.98	500 units at Rs. 7
12.04.98	600 units at Rs. 8
Issues	
6.04.98	250 units
10.04.98	400 units
14.04.98	500 units

Required:

Calculate using FIFO, LIFO, Simple Avg. and Weighted Avg. Method:

Question 24. **I.C.W.A. (Inter) June, 1991**

Following costs were incurred in producing 800 M.T. of M.S. Rods:

	Rs.
Materials	280000
Labour	100000
Processing charges	100000
	480000

Of the total output, 10 % was defective and had to be sold after a discount of 10 % off the normal price. The scrap arising out of the production realized a sum of Rs. 8760. The sale price is calculated to yield 15 % profit on sales. You are requested to find out the normal price as well as the discount price of per M.T. of M.S. Rods.

Answer : Net cost 471240; Normal selling price Rs. 700; Discounted S.P- Rs. 630

Question 25. **CA Inter May 2001**

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 1000 units. Source – II supplies the lot at a price, which is lower by Rs. 100 as compared to source – I. The defective units of material can be rectified for use at a cost of Rs. 5 per unit.

You are required to find out which of the two sources is more economical.

Answer : Defectives: 2%, 2.8% ; Total additional cost per lot : 200, 140

Recommendation : Procure the material from source 2, since the additional cost per lot is lower.

Question 26. **I.C.W.A Final June, 1987**

A dealer of a perishable product earns a profit of Rs. 3 per kg. if he sell within two days, but incurs a loss of Rs. 2 per kg. if fails to do so. The estimated demand for the product and the relative probabilities are as given below:

Estimated Demand	**Probability**
0 kg.	5 %
1 kg.	20 %
2 kg.	40 %
3 kg.	25 %
4 kg.	10 %

In order to maximise his profit, what should be the quantity of stock that he should hold

Answer : He shall stock 2 kg to earn maxi. Profit.

Question 27. **CA (Inter) May, 1991**

Raw materials 'X' costing Rs. 100 per kilogram and 'Y' costing Rs. 60 per kilogram are mixed in equal proportion for making product 'A'. The loss of materials in processing works out to 25 % of the output. The production expenses are allocated at 50 % of direct material cost. The end product is priced with a margin of 33 ½ % over the total cost. Material 'Y' is not easily available and substitute raw material 'Z' has been found for 'Y' costing Rs. 50 per kilogram. 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 levels and ensure the same quantum of profit as at present.

To compute what should be the ratio of mix of the raw materials X and Z.

Answer : 3:2

FOR YOUR PRACTICE

Question 1.

The Complete Gardener is deciding on the economic order quantity for two brands of lawn fertilizer:

	Fertilizer	
	Super Grow	Nature's Own
Annual Demand	2000 bags	1280 bags
Relevant ordering cost per purchase order	Rs. 1,200	Rs. 1,400
Annual relevant carrying cost per bag	Rs. 480	Rs. 560

Required :

(i) Compute EOQ for Super Grow and Nature's Own.

(ii) For the EOQ, what is the sum of the total annual relevant ordering costs and total annual relevant carrying costs for Super Grow and Nature's Own?

(iii) For the EOQ, Compute the number of deliveries per year for Super Grow and Nature's Own.

Solution

(i) EOQ

(a) **Super grow :** $\frac{2 \times 2000 \times 1200}{480}$

= **100 Bags**

(b) **Natures own :** $\frac{2 \times 1280 \times 1400}{560}$

= **80 Bags**

(ii)

	Super Grow	**Nature own**
Ordering cost	24000 22400	
	$\frac{24000}{100} \times 1200$	$\frac{1280}{80} \times 1400$
Carrying cost	24000 22400	
	$\frac{100}{2} \times 480$	$\frac{80}{2} \times 560$
	48000	44800

(iii) No of orders-

Super grow = $\frac{2000}{100}$ = **20 order**

Natures own = $\frac{1280}{80}$ = **16 order**

Question 2. **CS Inter Dec. 1990**

After inviting tenders, two quotations are received as under:

Supplier A Rs. 2.20 per unit

Supplier B Rs. 2.10 per unit + Rs. 2000 fixed charges irrespective of units ordered.

(i) Calculate the order quantity for which the purchase price per unit will be the same.

(ii) Select the supplier if the purchase officer wants to place an order for 15000 units.

Solution

(i) Let the order quantity be x

If per price per unit is equal then,

$2.2x = 2.1x + 2,000$

$0.1x = 2,000$

$x = 20,000$ units

Report.

The total purchases cost will be same if we are purchasing 20,000 units.

(ii) If order quantity is 15,000 units.

Supplier A's cost = $15,000 \times 2.2 = 33,000$ Rs

Supplier B's cost = $(15,000 \times 2.1) + 2,000 = 33,500$ Rs

Report

We will purchases from supplier A as cost is minimum.

Question 3. **2001 – Nov (3) (c)**

A company manufactures a product from a raw material, which is purchased at Rs. 60 per kg. The company incurs a handing cost of Rs. 360 plus freight of Rs. 390 per order. The incremental carrying cost of inventory of raw material is Re. 0.50 per kg. per month. In addition, the cost of working capital finance on the investment in inventory of raw material is Rs. 9 per kg. per annum. The annual production of the product is 100000 units and 2.5 units are obtained from one kg. of raw material.

Required:

(i) Calculate the economic order quantity of raw materials.

(ii) Advise, how frequently should orders for procurement be placed (assume 360 days per annum).

(iii) In the company proposes to rationalize placement of orders on quarterly basis, what percentage of discount in the price of raw materials should be negotiated?

Solution

Given. Price per unit = Rs. 60

Ordering cost per order = 360 + 390 = Rs. 750

Carrying cost per unit per annum = (0.50 × 12) + 9 = Rs. 15

Annual requirement = $\frac{1 \text{ kg}}{2.5 \text{ units}}$ × 10,000 units = 40,000 kg

(i) EOQ :

$= \sqrt{\frac{2 \times 40{,}000 \times 750}{15}}$ = 2,000 kg

(ii) Frequency of orders (days)

No. of orders p.a. = $\frac{40{,}000}{2{,}000}$ = 20 orders

Frequency = $\frac{360}{20}$ = 18 days/order

(iii) Comparision of cost for different ordering quantities:-

Particulars	2,000 kg	10,000 kg
Purchases cost	24,00,000 [40,000 × 60]	24,00,000 [40,000 × 60]
Ordering cost	15,000 $\frac{40{,}000}{2000} \times 750$	30,000 $\frac{40{,}000}{10{,}000} \times 750$
Carrying cost	15,000 $\frac{2{,}000 \times 15}{2}$	75,000 $\frac{10{,}000 \times 15}{2}$
Total raw material cost	24,30,000	24,78,000

Extra cost = 24,78,000 – 24,30,000 = 48,000

Minimum discount (%) = $\frac{48{,}000}{24{,}00{,}000}$ × 100 = 2%

Report : We should ask for a minimum discount of 2%.

Question 4. **2006 – May (2) (a)**

PQR Limited produces a produce which has a monthly demand of 52000 units. The product requires a component X which is purchased at Rs. 15 per unit. For every finished product, 2 units of component X are required. The ordering cost is Rs. 350 per order and the carrying cost is 12% p.a.

Required:

(i) Calculate the economic order quantity for Component X.

(ii) If the minimum lot size to be supplied is 52000 units, what is the extras cost, the company has to incur.

(iii) What is the minimum carrying cost, the Company has to incur?

Solution

Given. $R = 52,000 \times 12 \times \frac{2}{1} = 12,48,000$

Price per unit = Rs 15

Ordering cost = Rs 350

Carrying cost = (15 × 12%) = 1.80 Rs

(i) EOQ :

$= \frac{2 \times 12,48,000 \times 350}{1.80} = 22,030$ units

(ii)

Particulars	22,030 units	52,000 units
Purchases cost	1,87,20,000 [12,48,000 × 15]	1,87,20,000 [12,48,000 × 15]
Ordering cost	$\frac{12,48,000}{22,030} \times 350$ = 19,828	$\frac{12,48,000}{52,000} \times 350$ = 8,400
Carrying cost	$\frac{22,030}{2} \times 1.80$ = 19,827	$\frac{52,000}{2} \times 1.80$ = 46,800
Total raw material cost	1,87,59,655	1,87,75,200

Extra cost = 1,87,75,200 – 1,87,59,655 = Rs 15,545

(iii) Minimum Carrying cost = Rs 19,827

Question 5.

An engineering company consumes 50000 units of a components per year. The ordering, receiving and handling cost are Rs. 3 per order while the trucking costs are Rs. 12 per order. Further details are as under:

Interest Re. 0.06 per unit per year. Deterioration cost Re. 0.004 per unit per annum. Storage cost Re. 1000 per annum for 50000 units, calculate the E.O.Q.

Solution

Given. R = 50,000 units

Ordering cost = Rs 3 + 12 = Rs 15

Carrying cost = $0.06 + 0.004 + \frac{1000}{50,000}$ = Rs 0.084

EOQ = $\frac{2 \times 50,000 \times 15}{0.084} = 4,226$ units

Question 6. **2004 – Nov CA PE II**

RST Limited has received an offer of quantity discount on its order of materials as under:

Price per tone	Tonnes number
Rs. 9,600	Less than 50
Rs. 9,360	50 and less than 100
Rs. 9,120	100 and less than 200
Rs. 8,880	200 and less than 300
Rs. 8,640	300 and above

The annual requirement for the material is 500 tonnes. The ordering cost per order is Rs. 12,500 and the stock holding cost is estimated at 25% of the material cost per annum.

Required:

(a) Compute the most economical purchase level

(b) Compute EOQ if there are no quantity discounts and the price per tone is Rs. 10,500

Solution

(i)

Order size (Q) (Units)	*No. of order A ÷ Q (Units)	Cost of purchase A X cost per unit	Ordering Cost $\frac{A}{Q}$ X 12500	Carrying Cost $\frac{Q}{2}$ X 25%	Total Cost (3 + 4 + 5)
(1)	(2)	(3)	(4)	(5)	(6)
40	12.5	₹ 48,00,000 (500 X ₹ 9,600)	₹ 1,56,250	₹ 48,000 $\left(\frac{40}{2} \text{ X } 9.600 \text{ X } 0.25\right)$	₹ 50,04,250
50	10	₹ 46,80,000 (500 X ₹ 9,360)	₹ 1,25,000	₹ 58,500 $\left(\frac{50}{2} \text{ X } 9.360 \text{ X } 0.25\right)$	₹ 48,63,500
100	5	₹ 45,60,000 (500 X ₹ 9,120)	₹ 62,500	₹ 1,14,000 $\left(\frac{100}{2} \text{ X } 9.120 \text{ X } 0.25\right)$	₹ 47,36,500
200	2.5	₹ 44,40,000 (500 X ₹ 8,880)	₹ 31,250	₹ 2,22,000 $\left(\frac{200}{2} \text{ X } 8.880 \text{ X } 0.25\right)$	₹ 46,93,250
300	1.67	₹ 43,20,000 (500 X ₹ 8,640)	₹ 20,875	₹ 3,24,000 $\left(\frac{300}{2} \text{ X } 8.640 \text{ X } 0.25\right)$	₹ 46,64,875

A = Annual Requirement

The above table shows that the total cost of 500 units including ordering and carrying cost is minimum (₹ 46,64,875) where the order size is 300 units. Hence the most economical purchase level is 300 units.

(* Note : Practically number of orders should be rounded off to the nearest whole number)

(ii) Calculation of Economic Order Quantity (EOQ), when no discount is available.

$$EOQ = \sqrt{\frac{2AO}{C \text{ X } j}} = \sqrt{\frac{2 \text{ X } 500 \text{ tonne X } 12,500}{10,500 \text{ X } 25\%}} = 69 \text{ tonnes.}$$

Question 7. **ICWA FINAL JUNE 1989**

A company works 50 weeks in a year. For a certain part, included in the assembly of several parts, there is an annual demand of 10000 units. This part may be obtained from either an outside supplier or a subsidiary company. The following data relating to the part are given:

	From outside Supplier Rs.	From subsidiary Company Rs.
Purchase price/unit	12	13
Cost of placing order	10	10

Cost of receiving an order	20	15
Storage and all carrying Costs, including capital cost per unit per annum	2	2

i) What Purchase quantity from which source would you recommend?

ii) What would be the minimum total cost?

Answer : (i) 548 units, from the outside supplier (ii) Rs. 12118

Question 8.

A company is reviewing its stock policy and has the following alternatives available for the purchase of stock number 12789.

a) Purchase stock twice monthly, 100 units; b) Purchase monthly, 200 units;

c) Purchase every three months, 600 units d) Purchase six-monthly, 1200 units

e) Purchase annually 2400 units

It is ascertained that the purchase price per unit is Re. 0.80 for deliveries up to 500 units. A 5 % discount is offered by the supplier on the whole order where deliveries are 501 and up to 1000 and 10 % reduction on the total order for deliveries in excess of 1000

Each purchase order incurs administration costs of Rs. 5

Storage, interest on capital and other costs are Rs. 0.25 pernce per unit of average stock quantity held. You are required to advise management on the optimum order size.

Solution

Particulars	100 units	200 units	600 units	1200 units	2400 units
Purchase cost	1920 [2400 × 0.80]	1920 [2400 × 0.80]	1824 [2400 × 0.76]	1728 [2400 × 0.72]	1728 [2400 × 0.72]
Ordering cost	120 $\frac{2400}{100} \times 5$	60 $\frac{2400}{200} \times 5$	20 $\frac{2400}{600} \times 5$	10 $\frac{2400}{1200} \times 5$	5 $\frac{2400}{2400} \times 5$
Carrying cost	12.5 $\frac{100}{2} \times 0.25$	25 $\frac{200}{2} \times 0.25$	75 $\frac{600}{2} \times 0.25$	150 $\frac{1200}{2} \times 0.25$	300 $\frac{2400}{2} \times 0.25$
Total raw material cost	2052.5	2005	1919	1888	2033

Report:-

The EOQ will be 1200 units because this will give us lowest total raw material cost p.a.

Working Note:-	Ordering Quantity	Price p.u.
	0 - 500	0.80
	501 - 1000	0.76
	1001 - □	0.72

Question 9.

The average annual consumption of a material is 20000 kg. at a price of Rs. 2 per kg. The storage cost is 16% on average inventory and the cost of placing one order is Rs. 50. How much is to be purchased at a time?

Solution

R = 20,000

Purchases price per unit = 22

Ordering cost = Rs 50

Carrying cost = 2 × 16% = 0.32

EOQ = $\frac{2 \times 20{,}000 \times 50}{0.32}$ = 2500 units

Question 10.

XYZ Ltd. is a concern who is manufacturing computer systems. It requires a special component for each unit Produced. The Consumption of such component is 500- 700 components per day. The delivery time of the supplier is 6-10 days for each order. Calculate Re-order level.

Solution

Conservative approach:

Re-order level = Maximum consumption × Maximum Re-order Period

= 700 × 10 = 7000 components

Question 11. **CA INTER NOV. 1987**

P Ltd. uses three types of materials A, B and C for production of 'X' the final product. The relevant monthly data for the components are as given below:

	A	**B**	**C**
Normal usage (units)	200	150	180
Minimum usage (units)	100	100	90
Maximum usage (units)	300	250	270
Reorder quantity (units)	750	900	720
Reorder period (months)	2 to 3	3 to 4	2 to 3

Calculate for each component:

a) Reorder level; b) Minimum level;

c) Maximum level and d) Average stock level

Solution

a) Re-order level:

A = Maximum consumption rate × Maximum Re-order Period

= 300 × 3 = 900 units

B = 250 × 4 = 1000 units

C = 270 × 3 = 810 units

b) Minimum level = Re-order level – Average consumption rate × average re-order period

A = 900 – (200 × 2.5)

= 400 units

B = (900 + 100) – (150 × 3.5)

= 475 units

C = (90 + 720) – (180 × 2.5)

= 360 units.

c) Maximum level = Re-order level – (Minimum consumption rate × Minimum re-order period) + Re-order Quantity

A = 900 – (100 × 2) + 750

= 1450 units.

B = 1000 – (100 × 3) + 900

= 1600 units

C = 810 – (90 × 2) + 720

= 1350 units.

d) Average stock level

A Method A = $\frac{1450 + 400}{2}$ = 925 units

Method B = $\frac{750}{2}$ + 400 = 775 units

B □ Method A = $\frac{475 + 1600}{2}$ = 1038 units

Method B = $\frac{900}{2}$ + 475 = 925 units

C □ Method A = $\frac{360 + 1350}{2}$ = 855 units

Method B = $\frac{720}{2}$ + 360 = 720 units

Question 12.

Zee is product manufactured out of three raw material 'M','N' and 'Q'. Each unit of Zee requires 10 kgs., 8 kgs., and 6 kgs. of M,N and Q respectively. The re-order levels of 'M' and 'N' are 15000 kgs, and 10000 kgs, respectively while the minimum level of 'Q' is 2500 kgs. The weekly production of Zee varies from 300 to 500 units, while the weekly average production is 400 units. You are required to compute: i) the minimum stock level of M, ii) the maximum stock level of N, and iii) the reorder level of Q.

The following additional data are given:

	M	**N**	**Q**
Reorder quantity (in kgs)	20000	15000	20000
Delivery (in weeks)			
Minimum	2	4	3
Average	3	5	4
Maximum	4	6	5

Solution

	M	N	Q
Usage per unit (kgs)	10	8	6
Re-order level (kgs)	15,000	10,000	?
Minimum level	?	?	2,500
Re-order quantity	20,000	15,000	20,000
Minimum (weeks)	2	4	3
Average	3	5	4
Maximum	4	6	5

Raw material consumption / Period		Maximum 500 units	Minimum 300 units	Average 400 units
M	10 kg/pu	5,000 kg	3,000 kg	4,000 kg
N	8 kg/pu	4,000 kg	2,400 kg	3,200 kg
Q	6 kg/pu	3,000 kg	1,800 kg	2,400 kg

(i) Minimum level of M = Re-order level – (Average consumption rate × Average re-order period)

= 15,000 – (4,000 × 3)

= 3,000 kg.

(ii) Maximum level of N = Re-order level – (Minimum consumption rate × Minimum Re-order period) + Re-order Quantity

= 10,000 – (2400 × 4) + 15,000

= 15,400 kgs.

(iii) Re-order level of Q = Maximum consumption rate × Maximum Re-order Period

= 3,000 × 5

= 15,000 kgs.

Question 13. **CA INTER NOV. 96**

About 50 items are required every day for a machine. A fixed cost of Rs. 50 per order is incurred for placing an order. The inventory carrying cost per item amounts to Rs. 0.02 per day. The lead period is 32 days. Compute:

i) Economic order quantity

ii) Re-order level

Solution

Ordering cost = Rs 50

R = 50 items

Carrying cost = Rs 0.02

Re-order Period = 32 days

$EOQ = \frac{2 \times 50 \times 50}{0.02} = 500$ units

Re-order level = 50 × 32 = 1,600 units.

Question 14. **CA FINAL NOV. 86**

Given the following data relating to one of the A-class items, what inventory model do you suggest what would be EOQ, ROL and the average inventory under the suggested model annual demand = 1000 units, cost per item = Rs. 25. Ordering cost per order = Rs. 20 and Holding cost = 40%. Past lead times (days) are 10,8,12,13 and 7.

Solution

R = 1,000 units

Ordering Cost = Rs 20

Carrying cost = 25 × 40% = 10

Re-order Period = Maximum = 13 days

Minimum = 7 days

Average = $\frac{10 + 8 + 12 + 13 + 7}{2} = 10$ days

Consumption rate = $\frac{1000}{365} \times 1 = 2.74$ units per day

(Maximum, Minimum, Average)

(i) EOQ / ROQ = $\frac{2 \times 1000 \times 20}{10} = 63$ units

(ii) Re-order level = Maximum Consumption Rate × Maximum Re-order Period

= 2.74 × 13

= 36 units

(iii) Average Inventory level

Maximum level = Re-order level – (Minimum Consumption rate × Minimum Re-order Period) + Re-order Quantity

= 36 – (2.74 × 7) + 64

= 817 units.

Minimum level = Re-order level – (Average Consumption rate × Average Re-order Period)

= 36 – (2.74 × 10) + 64

= 739 units.

Average stock level"

Method A = $\frac{81 + 9}{2} = 45$ units

Method B = $\frac{64}{2} + 9 = 41$ units

Question 15. **CA Inter CA Nov.1998**

A factory uses 4000 varieties of inventory. In terms of inventory holding and inventory usage, the following information is compiled:

No. of varieties	% Of inventory Holding	% value of inventory	%of inventory usage (in end-product)
3875	96.875	20	5
110	2.750	30	10
15	0.375	50	85
44000	100.000	100	100

Classify the items of inventory as per ABC analysis with reasons.

Solution

No. of varities	% of inventory holding	% value of inventory	% of inventory usage (in end product)	Category	Reason
3875	96.875	20	5	C	Lowest in value
110	2.750	30	10	B	Medium in value
15	0.375	50	85	A	Highest in value
4,000	100	100	100		

Question 16. **I.C.W.A. Inter, December 1989**

A manufacturing organization has imported four types of materials. The invoice reveals the following data:

		Quantity Kgs.	Rate US $ per kg.
Material	A	1000	1.50
	B	2000	1.25
	C	1500	2.00
	D	3000	1.00

Import duty 23 % of invoice value

Insurance 2 % of invoice value

Freight and Clearance Rs. 30000

Exchange Rate US $ 1 = Rs. 16.00

50 % of the materials imported are issued to production centers. While determining the value of closing stock 5 % allowance is provided to cover up storage loss. Determine the value of closing stock of each type of materials.

Solution

Particular	A		B		C		D	
	Qty.	Rs.	Qty.	Rs.	Qty.	Rs.	Qty.	Rs.
Net invoice value	1000	24000	2000	40000	1500	48000	3000	48000
	[1000 × 1.5 × 16]		[2000 × 1.25 × 16]		[1500 × 2 × 16]		[3000 × 1 × 16]	
(+) Import duty @ 23%	-	5520	-	9200	-	11040	-	11040
(+) Insurance @ 2%	-	480	-	800	-	960	-	960
(+) Freight	-	4000	-	8000	-	6000	-	12000
[1000 : 2000 : 1500 : 3000]								
Total purchase cost of raw material	1000	34000	2000	58000	1500	66000	3000	72000

(–) 50% raw material for production	500	17000	1000	29000	750	33000	1500	36000
	500	17000	1000	29000	750	33000	1500	36000
(–) Normal Storage loss @ 5% transfer to production O/H a/c	25	850	50	1450	38	1650	75	1800
	475	16150	950	27550	712	31350	1425	34200

Question 17. **2011, May**

Prepare a Store Ledger Account from the following transactions of XY Company Ltd.:

April, 2011

1 Opening balance 200 units @ Rs 10 per unit.

5 Receipt 250 units costing Rs 2,000

8 Receipt 150 units costing Rs 1,275

10 Issue 100 units

15 Receipt 50 units costing Rs 500

20 Shortage 10 units

21 Receipt 60 units costing Rs 540

22 Issue 400 units

The issues upto 10-4-11 will be priced at LIFO and from 11-4-11 issues will be priced at FIFO.

Shortage will be charged as overhead.

Solution :

(a) **Store Ledger Account**

Name :	**Max. Stock Level :**	**Bin No. :**
Code No. :	**Min. Stock Level :**	**Location Code :**
Description :	**Re-order level :**	**Re-order quantity :**

Date	Receipts			Issues			Balance		
	Qty.	Rate	Amount	Qty.	Rate	Amount	Qty.	Rate	Amount
	Units	(₹)	(₹)	Units	(₹)	(₹)	Units	(₹)	(₹)
April 1							200	10	2,000
April 5	250	8	2,000				200	10	4,000
							250	8	
April 8	150	8.50	1,275				200	10	5,275
							250	8	
							150	8.50	
April 10				100	8.50	850	200	10	4,425
							250	8	
							50	8.50	
April 15	50	10	500				200	10	4,925
							250	8	
							50	8.50	
							50	10	

April 20				10 (shortage)	10	100	190	10	4,825
							250	8	
							50	8.50	
							50	10	
April 21	60	9	540				190	10	5,365
							250	8	
							50	8.50	
							50	10	
							60	9	
April 22				190	10	3,580	40	8	1,785 (Closing Stock)
				210	8		50	8.50	
							50	10	
							60	9	

Question 18.

The annual carrying cost of material 'X' is ₹ 3.6 per unit and its total carrying cost is ₹ 9,000 per annum. What would be the Economic order quantity for material 'X', if there is no safety stock of material X ?

Solution :

Calculation of Economic Order Quantity

$$\text{Average Inventory} = \frac{\text{Total Carrying Cost}}{\text{Carrying Cost per Unit}} = \frac{\text{Rs. 9,000}}{\text{Rs. 3.60}} = 2{,}500 \text{ Units}$$

Economic Order Quantity = Average Inventory X 2 = 2,500 units X 2 = 5,000 Units.

Question 19.

Re-order quantity of material 'X' is 5,000 kg.; Maximum level 8,000 kg.; Minimum usage 50 kg. per hour; minimum re-order period 4 days; daily working hours in the factory is 8 hours. You are required to calculate the re-order level of material 'X'.

Solution :

Maximum Level = Re-order level + Re-order Quantity – (Min. Usage X Min. Re-order Period)

Re-order Level = Maximum Level – [Re-order Quantity - (Min. Usage X Min. Re-order Period)]

= 8,000 kg. – [5,000 kg. – (400 kg* X 4 days)] = 8,000 kg. – 3,400 kg. = 4,600 kg.

Hence, Re-order Level is 4,600 kg.

* Minimum usage per day = 50 kg. X 8 hours = 400 kg.

Question 20

KL Limited produces product 'M' which has a quarterly demand of 8,000 units. The product requires 3 kg. quantity of material 'X' for every finished unit of product. The other information are follows :

Cost of material 'X'	:	₹ 20 per kg.
Cost of placing an order	:	₹ 1,000 per order
Carrying Cost	:	15% per annum of average inventory

You are required:

(i) Calculate the Economic Order Quantity for material 'X'.

(ii) Should the' company accept an offer of 2 percent discount by the supplier, if he wants to supply the annual requirement of material 'X' in 4 equal quarterly installments?

Solution :

Annual demand of material 'X'

= 8,000 units (per quarter) X 4 (No. of Quarter in a year) X 3 kg. (for every finished product) = 96,000 kg.

(i) Calculation of Economic Order Quantity (EOQ) for material 'X'

$$EOQ = \sqrt{\frac{2 \times \text{Annual demand} \times \text{Ordering Cost}}{\text{Carrying cost per unit per annum}}} = \sqrt{\frac{2 \times 96{,}000\ \text{kg.} \times \text{Rs.}100}{\text{Rs.}20 \times 15\%}} = 8{,}000 \text{ kg.}$$

(ii) Evaluation of Cost under different options of 'order quantity'.

Particulars	When EOQ is ordered	When discount of 2% is accepted and supply is in 4 equal installments
Order Size	8,000 kg.	24,000 kg. $\left(\frac{96{,}000\ \text{kg.}}{4}\right)$
No. of orders	12 $\left(\frac{96{,}000\ \text{kg.}}{8{,}000\ \text{kg.}}\right)$	4 $\left(\frac{96{,}000\ \text{kg.}}{24{,}000\ \text{kg.}}\right)$
Purchase Cost per kg.	₹20	₹ 19.60 (₹ 20 – (₹ 20 X 2%))
Total Purchase Cost (A)	₹ 19,20,000 (96,000 kg. X ₹ 20)	₹ 18,81,600 (96,000 kg. X ₹ 19.6)
Ordering Cost (B)	₹ 12,000 (12 orders X ₹ 1,000)	₹ 4,000 (4 orders X ₹ 1,000)
Carrying Cost (C)	₹ 12,000 $\left(\frac{8{,}000\ \text{kg.}}{2} \times 15\% \times \text{Rs. } 20\right)$	₹ 35,280 $\left(\frac{24{,}000\ \text{kg.}}{2} \times 15\% \times \text{Rs. } 19.6\right)$
Total Cost (A + B + C)	₹ 19,44,000	₹ 19,20,880

Advice – The total Cost is lower if Company accept an offer of 2 percent discount by the supplier, when supply of the annual requirement of material 'X' is made in 4 equal installments.

Question 21

Assume that the following quantity discount schedule for a particular bearing is available to a retail store:

Order size (unit)	Discount
0 - 49	0%
50 - 99	5%
100 - 199	10%
200 and above	12%

The cost of a single bearing with no discount is ₹ 30. The annual demand is 250 units. Ordering cost is ₹ 20 per order and annual inventory carrying cost is ₹ 4 per unit. Determine the optimal order quantity and the associated minimal total cost of inventory and purchasing costs, if shortages are not allowed.

Solution :

Working Notes

1. EOQ without discount

$$EOQ = \sqrt{\frac{2AO}{Ci}} = \sqrt{\frac{2 \times 250 \text{ units} \times \text{Rs.}20}{\text{Rs.}4}}$$

$= \sqrt{2,500} = 50$ units

2. Prices with discount for different order size

5% Discount = 30 – 5% = ₹ 28.50

10% Discount = 30 – 10% = ₹ 27.00

12% Discount = 30 – 12% = ₹ 26.40

Orders Size (Units)	No. of Orders in a year	Ordering Cost (₹)	Carrying Cost of average inventory (₹)	Purchase Cost (₹)	Total Cost (₹)
(1)	(2)	(3)	(4)	(5)	(3+4+5) = (6)
50	5 $\left(\frac{250 \text{ units}}{50 \text{ units}}\right)$	100 (5 Orders X ₹ 20)	100 $\left(\frac{50 \text{ units}}{2} \text{ X Rs. } 4\right)$	7,125 (250 X ₹ 28.50)	7,325
100	2.5* $\left(\frac{250 \text{ units}}{100 \text{ units}}\right)$	50 (2.5 Orders X ₹ 20)	200 $\left(\frac{100 \text{ units}}{2} \text{ X Rs. } 4\right)$	6,750 (250 X ₹ 27)	7,000
125	2 $\left(\frac{250 \text{ units}}{125 \text{ units}}\right)$	40 (2 Orders X ₹ 20)	250 $\left(\frac{125 \text{ units}}{2} \text{ X Rs. } 4\right)$	6,750 (250 X ₹ 27)	7,040
200	1.25* $\left(\frac{250 \text{ units}}{200 \text{ units}}\right)$	25 (1.25 Orders X ₹ 20)	400 $\left(\frac{200 \text{ units}}{2} \text{ X Rs. } 4\right)$	6,600 (250 X ₹ 26.4)	7,025
250	1 $\left(\frac{250 \text{ units}}{250 \text{ units}}\right)$	20 (1 Orders X ₹ 20)	500 $\left(\frac{250 \text{ units}}{2} \text{ X Rs. } 4\right)$	6,600 (250 X ₹ 26.4)	7,120

Optimal order quantity = 100 units

Minimum total cost of inventory and purchasing cost = ₹ 7,000.

Note : Theoretically it may be 2.5 orders, (250 ÷ 100), however practically 3 orders are required. Therefore ordering cost would be ₹ 60 (3 X 20) and total cost ₹ 7,010 (60 + 200 + 6750).

(* Theoretically orders may be in fraction but in practicality orders shall be in a whole number.)

Question 22

Aditya Ltd. produces a product 'Exe' using a raw material Dee. To produce one unit of Exe, 2 kg of Dee is required. As per the sales forecast conducted by the company, it will able to sale 10,000 units of Exe in the coming year. The following is the information regarding the raw material Dee:

(i) The Re-order quantity is 200 kg. less than the Economic Order Quantity (EOQ).

(ii) Maximum consumption per day is 20 kg. more than the average consumption per day.

(iii) There is an opening stock of 1,000 kg.

(iv) Time required to get the raw materials from the suppliers is 4 to 8 days.

(v) The purchase price is ₹125 per kg.

There is an opening stock of 900 units of the finished product Exe.

The rate of interest charged by bank on Cash Credit facility is 13.76%.

To place an order company has to incur ₹ 720 on paper and documentation work.

From the above information find out the followings in relation to raw material Dee:

(a). Re-order Quantity

(b). Maximum Stock level

(c). Minimum Stock level

(d). Calculate the impact on the profitability of the company by not ordering the EOQ.

[Take 364 days for a year]

Solution :

Working Notes :

(i) Computation of Annual consumption & Annual Demand for raw material 'Dee' :

Sales forecast of the product 'Exe'	10,000 units
Less : Opening stock of 'Exe'	900 units
Fresh units of 'Exe' to be produced	9,100 units
Raw material required to produce 9,100 unit of 'Exe' (9,100 units X 2 kg.)	18,200 kg.
Less : Opening Stock of 'Dee'	1,000 kg.
Annual demand for raw material 'Dee'	17,200 kg.

(ii) Computation of Economic Order Quantity (EOQ) :

$$EOQ = \sqrt{\frac{2 \text{ X Annual demand of 'Dee' X Ordering cost}}{\text{Rs. } 125 \text{ X } 13.76\%}}$$

$$= \sqrt{\frac{2 \text{ X } 17{,}200 \text{ kg. X Rs.} 720}{\text{Rs. } 125 \text{ X } 13.76\%}} = \sqrt{\frac{2 \text{ X } 17{,}200 \text{ kg. X Rs. } 720}{\text{Rs. } 17.2}} = 1{,}200 \text{ Kg.}$$

(iii) Re-Order level :

= (Maximum consumption per day X Maximum lead time)

$$= \left\{\left(\frac{\text{Annual Consumption of 'Dee'}}{364 \text{ days}} + 20 \text{ kg.}\right) \text{X } 8 \text{ days}\right\}$$

$$= \left\{\left(\frac{18{,}200 \text{ kg.}}{364 \text{ days}} + 20 \text{ kg.}\right) \text{X } 8 \text{ days}\right\} = 560 \text{ kg.}$$

(iv) Minimum consumption per day of raw material 'Dee' :

Average Consumption per day = 50 Kg.

Hence, Maximum Consumption per day = 50 Kg. + 20 kg. = 70 kg.

So Minimum consumption per day will be

$$\text{Average consumption} = \frac{\text{Min.Consumption+Max.consumption}}{2}$$

$$\text{Or, 50 kg.} = \frac{\text{Min.Consumption+70 kg.}}{2}$$

Or, Min. consumption = 100 kg. – 70 kg. = 30 kg.

(a) Re-order Quantity :

EOQ – 200 kg. = 1,200 kg. – 200 kg. = 1,000 kg.

(b) Maximum Stock level :

= Re-order level + Re-order Quantity – (Min. consumption per day X Min. lead time)

= 560 kg. + 1,000 kg. – (30kg. X 4days) = 1,560 kg. – 120 kg. = 1,440 kg.

(c) Minimum Stock Level :

= Re-order level– (Average consumption per day X Average lead time)

= 560 kg. – (50 kg. X 6 days) = 260 kg.

(d) Impact on the profitability of the company by not ordering the EOQ.

		When purchasing the ROQ	When purchasing the EOQ
I	Order Quantity	1,000 kg.	1,200 kg.

II	No. of orders a year	$\frac{17,200\ kg.}{1,000\ kg.}$ = 17.2 or 18 orders	$\frac{17,200\ kg.}{1,200\ kg.}$ = 14.33 or 15 orders
III	Ordering Cost	18 orders X ₹ 720 = ₹ 12,960	15 orders X ₹ 720 = ₹ 10,800
IV	Average Inventory	$\frac{1,000\ kg.}{2}$ = 500 kg.	$\frac{1,200\ kg.}{2}$ = 600 kg.
V	Carrying Cost	500 kg. X ₹ 17.2 = ₹ 8,600	600 kg. X ₹ 17.2 = ₹ 10,320
VI	Total Cost	₹ 21,560	₹ 21,120

Extra Cost incurred due to not ordering EOQ = ₹ 21,560 - ₹ 21,120 = ₹ 440

Question 23

Following details are related to a manufacturing concern:

Re-order Level	16,000 units
Economic Order Quality	90,000
Minimum Stock Level	100000 units
Maximum Stock Level	190000 units
Average Lead Time	6 days
Difference between minimum lead time and Maximum lead time	4 days

Calculate:

(i) Maximum consumption per day

(ii) Minimum consumption per day

Solution :

Difference between Minimum lead time Maximum lead time = 4 days

Max. lead time – Min. lead time = 4 days

Or, Max. lead time = Min. lead time + 4 days …….. (i)

Average lead time is given as 6 days i.e.

$\frac{\text{Max. lead time+Min. lead time}}{2}$ = 6 days …….. (ii)

Putting the value of (i) in (ii),

$\frac{\text{Min. lead time+4 days + Min. lead time}}{2}$ = 6 days

Or, Min. lead time + 4 days + Min. lead time= 12 days

Or, 2 Min. lead time = 8 days

Or, Minimum lead time = $\frac{8\ days}{2}$ = 4 days

Putting this Minimum lead time value in (i), we get

Maximum lead time = 4 days + 4 days = 8 days

(i) Maximum Consumption per day :

Re-order level = Max. Re-order period X Maximum Consumption per day

1,60,000 units = 8 days X Maximum Consumption per day

Or, Maximum Consumption per day = $\frac{1,60,000\ units}{8\ days}$ = 20,000 units

(ii) Minimum Consumption per day :

Maximum Stock Level =

Re-order level + Re-order Quantity – (Min. lead time X Min. Consumption per day)

Or, 1,90,000 units = 1,60,000 units + 90,000 units – (4 days X Min. Consumption per day)

Or, 4 days X Min. Consumption per day = 2,50,000 units – 1,90,000 units

Or, Minimum Consumption per days = $\frac{60{,}000 \text{ units}}{4 \text{ days}}$ = 15,000 units

Question 24

Aditya Agro Ltd. produces edible oils of different varieties. The monthly demand pattern for the finished products are as follows:

Mustard oil	45,000 Litre
Soybean oil	15,000 Litre
Olive oil	3,000 Litre

To produce one litre of Mustard oil, Soybean oil and Olive oil, 5 kg. of mustards, 6 kg. of soybeans and 4.5 kg. of olives are required respectively. There is no opening and closing stock of materials.

Aditya Agro Ltd. can purchase the materials either from the farmers directly or from the wholesale market. The company can purchase any quantity of materials from the wholesale market but in case of purchase from the farmers, it has to purchase the minimum specified quantity of materials at a time. Following is the material-wise summary related with the purchase of materials:

	Wholesale Market	**Farmers**
Mustard:		
Minimum Quantity to be purchased	Any quantity	13,50,000 kg.
Purchase price per kg. (₹)	15.00	12.50
Central Sales Tax (CST)*	2%	---
Transportation cost per purchase	6,000	15,000
Sorting and piling cost per purchase	----	1,200
Loading cost per 50 kg.	10.00	5.00
Unloading cost per 50 kg.	2.00	2.00
Soybean:		
Minimum Quantity to be purchased	Any Quantity	2,70,000 kg.
Purchase price per kg. (₹)	11.00	9.00
Value Added Tax (VAT)**	4%	---
Transportation cost per purchase	9,000	12,000
Sorting and piling cost per purchase	---	800
Loading cost per 50 kg.	10.00	3.00
Unloading cost per 50 kg.	2.00	2.00
Olive:		
Minimum Quantity to be purchased	Any Quantity	1,62,000 kg.
Purchase price per kg. (₹)	36.00	28.00
Import duty***	---	10%
Transportation Cost per purchase (₹)	3,000	11,000
Sorting and piling cost per purchase	1,800	---
Loading cost per 50 kg.	10.00	25.00
Unloading cost per 50 kg.	2.00	2.00

The company is paying 12.5% p.a. as interest to its bank for cash credit facility and ₹100 per 100 kg. as rent to the warehouse.

[*CST will be added with the purchase price of mustards; **VAT will not be added with the purchase price of soybeans; ***Import duty will be added with the purchase price of olives.]

You are required to

(i) Calculate the purchase cost of each material

(a) from Wholesale market

(b) from the Farmers

(ii) Calculate Economic Order Quantity of each material under the both options.

(iii) Recommend the best purchase option for the material 'olive'.

Solution :

(i) Calculation of Purchase Cost per Kg. of Materials

	Wholesale Market (₹)	**Farmers (₹)**
Mustard :		
Purchase price	15.00	12.50
Add : Central Sales Tax @ 2%	0.30	--
Add : Loading Cost	0.20 (₹ 10 ÷ 50 kg.)	0.10 (₹ 5 ÷ 50 kg.)
Add : Unloading Cost	0.04 (₹ 2 ÷ 50 kg.)	0.04 (₹ 2 ÷ 50 kg.)
Soybean :		
Purchase Price	11.00	9.00
Add : Loading Cost	0.20 (₹ 10 ÷ 50 kg.)	0.06 (₹ 3 ÷ 50 kg.)
Add : Unloading Cost	0.04 (₹ 2 ÷ 50 kg.)	0.04 (₹ 2 ÷ 50 kg.)
	11.24	9.10
Olive :		
Purchase Price	36.00	28.00
Add : Import duty @ 10	--	2.80
Add : Loading Cost	0.20 (₹ 10 ÷ 50 kg.)	0.50 (₹ 25 ÷ 50 kg.)
Add : Unloading Cost	0.04 (₹ 2 ÷ 50 kg.)	0.04 (₹ 2 ÷ 50 kg.)
	36.24	31.34

(ii) Economic Order Quantity (E.O.Q.) = $\sqrt{\frac{2 \times \text{Annual requirement} \times \text{Ordering Cost}}{\text{Carrying cost per kg.per annum}}}$

Annual Requirement (A) :

Commodity	**Quantity (Kg.)**
Mustard (45,000 Ltr. X 5 Kg. X 12 Months)	27,00,000
Soybean (15,000 Ltr. X 6 Kg. X 12 Months)	10,80,000
Olive (3,000 Ltr. X 4.5 Kg. X 12 Months)	1,62,000

Cost per Order (O) :

	Wholesale Market (₹)	Farmers (₹)
Mustard :		
- Transportation Cost	6,000	15,000
- Sorting and piling cost	---	1,200
	6,000	16,200
Soybean :		
- Transportation Cost	9,000	12,000
- Sorting and piling cost	---	800
	9,000	12,800
Olive :		
- Transportation Cost	3,000	11,000
- Sorting and piling cost	1,800	---
	4,800	11,000

Carrying Cost per Kg. per annum (C X i) :

	Wholesale Market (₹)	Farmers (₹)
Mustard :		
- Interest on cash credit	1.9425 (₹ 15.54 X 12.5%)	1.5800 (₹ 12.64 X 12.5%)
- Warehouse rent*	1.0000	1.0000
	2.9425	2.5800
Soybean :		
- Interest on cash credit	1.4050 (₹ 11.24 X 12.5%)	1.1375 (₹ 9.10 X 12.5%)
- Warehouse rent*	1.0000	1.0000
	2.4050	2.1375
Olive :		
- Interest on cash credit	4.5300 (₹ 36.24 X 12.5%)	3.9175 (₹ 31.34 X 12.5%)
- Warehouse rent*	1.0000	1.0000
	5.5300	4.9175

*Warehouse rent per Kg. = $\frac{\text{Rs. } 100}{100 \text{ kg.}}$ = ₹ 1

Calculation of E.O.Q. for each material under the both options :

	Wholesale Market (Kg.)	Farmers (Kg.)
Mustard	$\sqrt{\frac{2 \text{ X } 27,00,000 \text{ kg. X Rs. } 6,000}{\text{Rs. } 2.9425}}$ = 1,04,933.53	$\sqrt{\frac{2 \text{ X } 27,00,000 \text{ kg. X Rs. } 16,200}{\text{Rs. } 2.5800}}$,84,138.47

Soybean	$\sqrt{\frac{2 \times 10{,}80{,}000 \text{ kg.} \times \text{Rs. } 9{,}000}{\text{Rs. } 2.4050}}$ = 89,906.40	$\sqrt{\frac{2 \times 10{,}80{,}000 \text{ kg.} \times \text{Rs. } 12{,}800}{\text{Rs. } 2.1375}}$ 1,13,730.98
Olive	$\sqrt{\frac{2 \times 1{,}62{,}000 \text{ kg.} \times \text{Rs. } 4{,}800}{\text{Rs. } 5.5300}}$ = 16,769.90	$\sqrt{\frac{2 \times 1{,}62{,}000 \text{ kg.} \times \text{Rs. } 11{,}000}{\text{Rs. } 4.9175}}$ = 26,921.34

(iii) Selection of best purchase option for the purchase of Olives :

	Wholesale Market	**Farmers**
Annual Requirement (A) (Kg.)	1,62,000	1,62,000
Order Quantity (Q)	16,769.90	1,62,000
No. of orders $\left(\frac{A}{Q}\right)$	9.66 or 10	1
Average Inventory $\left(\frac{Q}{2}\right)$ (Kg.)	8,384.95	81,000
Ordering Cost (₹) (I)	48,000 (10 orders X ₹ 4,800)	11,000 (1 orders X ₹ 11,000)
Carrying Cost (₹) (II) (Average Inventory X Carrying cost per Kg.)	46,368.77 (8,384.95 Kg. X ₹ 5.5300)	3,98,317.5 (81,000 Kg. X ₹ 4.9175)
Purchase Cost (₹) (III)	58,70,880 (1,62,000 Kg. X ₹ 36.24)	50,77,080 (1,62,000 Kg. X ₹ 31.34)
Total Cost (₹) (I)+(II)+(III)	59,65,248.77	54,86,397.50

Purchasing olives direct from the formers is the best purchase option for the Aditya Agro Ltd.

DIRECT LABOUR

2

Question 1.

'X' an employee of ABC Co. gets the following emoluments and benefits.

(a)	Basic pay	Rs. 1,000 p.m.
(b)	Dearness allowance	Rs. 200 p.m.
(c)	Bonus	Rs. 20% of salary and D.A.
(d)	Other allowances	Rs. 250 p.m.
(e)	Employee's Contribution to P.F.	10% of salary and D.A

'X' works for 2,400 hours per annum, out of which 400 hours are non-productive and treated as normal idle time. You are required to find out the effective hourly cost of employee 'X'.

Answer : Rs. 21720 p.a ; Rs. 1810 p.m ; Rs. 10.86 p.h

Question 2.

A worker is paid Rs. 100 month and a dearness allowance of Rs. 200 p.m. There is a provident fund @ $8\ ^{1}/_{3}$ % and the employer also contributes the same amount as the employee . The Employees State Insurance Corporation premium is 1½ % of wages of which ½% is paid by the employees. It is the firm's practice to pay 2 month's wages as bonus each year.

The number of working days in a year are 300 of 8 hours each. Out of these the worker is entitled to 15 days leave on full pay. Calculate the wage rate per hour for costing purposes.

Answers: Total labour cost : 4536 Labour cost per hour Rs. 1.989

Question 3. **CA Inter May 1992**

Calculate the earnings of A and B from the following particulars for a month and allocate labour cost to each job X, Y and Z:

			A	**B**
(1)	Basic wages	Rs.	100	160
(2)	Dearness allowance (on basic wages)		50%	50%
(3)	Contribution to provident fund (0n basic wages)		8%	8%
(4)	Contribution to employee's state insurance (on basic wages)		2%	2%
(5)	Overtime		Hours 10	

The normal working hours for the month are 200. Overtime is paid at double the total of normal wages and dearness allowance. Employer's contribution to State Insurance and Provident fund are at equal rates and employee's contributions. The two workers were employed on jobs X.Y and Z in the following proportions:

	Jobs		
	X	**Y**	**Z**
Worker A	40%	30%	30%
Worker B	50%	20%	30%

Overtime was done on job Y:

Answers: Total Labour earning : A : Rs. 155, B: Rs. 224 ; Labour cost A: Rs. 175 , B: Rs.256. ; Labour cost job X: Rs. 192, Job Y Rs. 114.20, Job Z Rs. 124.80.

Question 4.

On a factory working six days in a week and eight hours each day, a worker is paid at the rate of Rs.100 per day basic *plus* D.A. @ 120% of basic. He is allowed to take 30 minutes off during his 8 hours shift for meals-break and a 10 minutes recess for rest. During a week, his card showed that his time was chargeable to:

Job X	15 hrs.
Job Y	12 hrs.
Job Z	13 hrs.

The time not booked was wasted while waiting for a job. In Cost Accounting, how would you allocate the wages of the workers for the week?

Answer : Job X-Rs. 450; Y-Rs. 360; Z-Rs. 390; Costing P/L Rs. 120

Question 5.

Calculate the labour hour rate of a worker X from the following data:

Basic pay	Rs. 1,000 p.m.
D.A.	Rs. 300 p.m.
Fringe benefits	Rs. 100 p.m.

Number of working days in a year 300. 20 days are availed off as holidays on full pay in a year. Assume a day of 8 hours.

Answer : Rs. 7.50 p.h

Question 6. **I.C.W.A INTER, June, 1991**

'A' an employee of XYZ Co. gets the following emoluments and benefits.

(a) Salary
Rs. 250 per month

(b) Dearness allowance:
On 1st Rs. 100 of Salary Rs. 400
On next Rs. 100 of Salary Rs. 100
On balance every Rs. 100 Rs. 50 or part thereof

(c) Employers Contribution to provident Fund 8% Salary and D.A.
E.S.I. 4% of Salary and D.A.

(d) Bonus 20% of Salary and D.A.

(e) Other Allowances Rs. 2,725 per annum.

A works for 2,400 hours per annum, out of which 400 hours are non-productive but treated as normal idle time. A works for 18 effective hours in Job No.15, where the cost of direct materials equals A's wages and the overhead applied is 100% of Prime Cost. The sale value of the job is quoted to earn a profit of 10% on such value.

You are required to find out: (a) Effective hourly cost of A and (b) The expected sale Value of Job No.15.'

Answer: A's hourly cost: Rs. 7.50. Sale value of Job No 15: Rs. 600

Question 7.

Calculate the number of hours worked as overtime by the following workers in a week.

	Ram	**Shyam**
Monday	8	8
Tuesday	7	9
Wednesday	4.5	8
Thursday	8	7
Friday	10	9
Saturday	9	9
	46.5	550

Answer: OT Payable Ram – 1, Shyam- 2

Question 8.

It is seen from the job card for repair of the customer's equipment that a total of 154 labour hours have been put in as detailed below:

	Worker 'A' paid at Rs.2 per day of 8 hours	*Worker 'B' paid at Re.1 per day of 8 hours*	*Supervisory worker 'C' paid of Rs.3 per day of 8 hours*
Monday	10- 1/2 hours	8 hours	10- 1/2 hrs.
Tuesday	8"	8 "	8"
Wednesday	10- 1/2 hours	8 "	10- 1/2 hours
Thursday	9 –1/2 "	8 "	9- 1/2 "
Friday	10- 1/2 "	8 " 1	0- 1/2 "
Saturday	–	8 "	8 "
Total	**49 hours**	**48 hours**	**57 hours**

In terms of an award in a labour conciliation, the workers are to be paid dearness allowance on the basis of cost of living index figures relating to each month which works out @ Rs.96 for the relevant month. The dearness allowance is payable to all workers irrespective of wage rate if they are present or are on leave with wages on all working days.

Sunday is a weekly holiday and each worker has to work for 8 hours on all week days and 4 hours on Saturdays; the workers are however paid full wages for Saturday (8 hours for 4 hours worked).

Workers are paid overtime according to the Factories Act for hours worked in excess of normal working hours on each day. Excluding holidays (including 4 hours work to be put in on Saturday) the total number of hours work out to 192 in the relevant month. The company's contribution to Provident Fund and Employees State Insurance Premium are absorbed into overheads.

Work out the wages payable to each worker.

Answer: A – Normal time -44, Over time- 5, B- Normal Time- 44, Over time 4, C- Normal time- 48 and Over time -9 , Normal Wages Per hour: (A) .75 Over time- 1.50 Rs. (B) Normal Wages Per hour Rs. .625 OT – Rs. 1.25 (C) Normal Wages Per Hour - Rs. .875 , OT Wages per hour Rs. 1.75 Wages (A) Rs. 40.5 (B) Rs. 32.5 (C) Rs. 57.75

Question 9.

In a factory, the basic wages rate is Rs.10 per hour and overtime rates are as follows:

Before and after normal working hours : 175% of basis wage rate

Sundays and holidays : 225% of basis wage rate

During the previous year, the following hours were worked:

Normal time	: 100000 hours
Overtime before and after working hours	: 20000 hours
Overtime on Sundays and holidays	: 5000 hours
Total	125000 hours

The following hours have been worked on job 'Z':

Normal	:	1000 hours
Overtime before and after working hrs.	:	100 hours.

Sundays and holidays : 25 hours.

Total 1125 hours.

You are required to calculate the labour cost chargeable to jobs 'Z' and overhead in each of the following instances:

(a) Where overtime is worked regularly throughout the year as a policy due to the labour shortage.

(b) Where overtime is worked irregularly to meet the requirements of production.

(c) Where overtime is worked at the request of the customer to expedite the job.

Answer: Labour Cost of Z Rs. 13162.50

Question 10.

From the following data provided to you find out the Labour Turnover Rate by applying:

(a) Flux Method (b) Replacement Method (c) Separation Method

No. of workers on the payroll:

At the beginning of the month	500
At the end of the month	600

During the month, 5 workers left, 20 persons were discharged and 75 workers were recruited. Of these, 10 workers were recruited in the vacancies of those leaving, while the rest were engaged for an expansion scheme.

Answer: a) 6.36% ; b) 1.81% ; c) 4.45%

Question 11.

A, B and C were engaged on a group task for which a payment of Rs. 725 was to be made. A's time basis wages are Rs. 8 per day, B's Rs. 6 per day and C's Rs. 5 per day. A worked for 25 Day' B worked for 30 day; and C for 40 days. Distribute the amount of Rs. 725 among the three workers.

Answer: a) 250 ; b) 250 ; c) 225

Question 12.

The cost accountant of Y Ltd. has computed labour turnover rates for the quarter ended 31st March, 1997 as 10%, 5% and 3% respectively under 'Flux method', 'Replacement method' and 'Separation method'. If the number of workers replaced during that quarter is 30, find out the number of (i) Workers recruited and joined and (ii) workers left and discharged.

Answer: i) 12 workers ; ii) 18 Workers

Question 13. I.C.W.A Inter Dec 1994 , June 1984

Your organization is experiencing a high labour turnover in recent years and management would like you to submit a report on the loss suffered by the Company due to such labour turnover. Following figures are available for your consideration:

Sales	Rs. 600 lakhs
Direct Materials	Rs. 150 lakhs
Direct Labour	Rs. 48 lakhs on 480000 man hours
Other Variable Expenses	Rs. 60 lakhs
Fixed Overheads	Rs. 80 lakhs

The direct man hours include 9000 man hours spent on trainees and replacement, only 50% of which were productive. Further, during the year 12000 man hours of potential work could not be availed of because of delayed replacement. The cost incurred due to separations and replacements amounted to Rs.1 lakh.

On the basis of above data, prepare a comparative statement showing actual profit vis-à-vis the profit which would have been realized had there been no labour turnover.

Answer: Loss due to lab. T/o 13.333 lac; Profit, actual -261, If no lab t/o- 274.33

Question 14. **CA Inter May 1998 , Nov 2001**

The management of In and Out Ltd. are worried about their increasing labour turnover in the factory and before analyzing the causes and taking remedial steps, they want to have an idea of the profit forgone as a result of labour turnover in the last year. Last year sales amounted to Rs.83,03,300 and the P/V ratio was 20 per cent. The total number of actual hours worked by the Direct Labour force was 4.45 lakhs. As a result of the delays by the Personnel Department in filling vacancies due to labour turnover, 1,00,000 potentially productive hours were lost. The actual direct labour hours included 30,000 hours attributable to training new recruits, out of which half of the hours were unproductive.

The costs incurred consequent on labour turnover revealed on analysis the following:

Settlement cost due to leaving	Rs. 43,820
Recruitment costs	26740
Selection costs	12750
Training costs	30490

Assuming that the potential production lost as a consequence of labour turnover could have been sold at prevailing prices, find the profit forgone last year on account of labour turnover.

Answer: Loss due to lab. T/o 500000; profit, If lab t/o-1546860 ; If no lab t/o- 2046860

Question 15.

From the following information, calculate Labour turnover rate and Labour flux rate:

No. of workers as on 01.01.2000 = 7,600

No. of workers as on 31.12.2000 = 8,400

During the year, 80 workers left while 320 workers were discharged. 1,500 workers were recruited during the year of these, 300 workers were recruited because of exists and the rest were recruited in accordance with expansion plans.

Answer: Avg. No, of workers = 8,000, Separation Method = 5%,

Replace Method = 3.75%, New workers = 15%, Flux Method = 23.75%

Question 16.

A worker produced 200 units in a week's time. The guaranteed weekly wage payment for 45 hours is Rs. 81. The expected time to produce one unit is 15 minutes which is raised further by 20% under the incentive scheme. What will be the earnings per hour of that worker under Halsey (50 % sharing) and Rowan bonus schemes?

Answer: Halsey- 94.50 ; Rowan- 101.25 ; Effective wages -2.10 , 2.25 resp.

Question 17.

Calculate the earning of a worker under Halsey System. The relevant data is as below :

Time Rate (p.h.)	Re. 0.6
Time allowed	8 hours
Time taken	6 hours
Time saved	2 hours

Answer: Earnings Rs. 4.20

Question 18.

(a) 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 ? (Your answer should contain the proof).

(b) The time allowed for a job is 8 hours. The hourly rate is Rs. 8. Prepare a statement showing :

(i) The bonus earned.

(ii) The total earnings of labour and

(iii) Hourly earnings.

Under the Halsey System with 50% bonus for time saved and Rowan System for each hour saved progressively.

Answer: (a) Bonus under Halsey Rowan plan

(b)

Earnings under Halsey Plan	**Rs.**	**8**	**8.57**	**9.33**	**10.40**	**12**	**14.67**	**20**	**36**
Earnings under Rowan Plans	**Rs.**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**

Question 19. CA Inter Nov 1993

Mr. A is working by employing 10 skilled workers. He is considering the introduction of some incentive scheme – either Halsey Scheme (with 50% bonus) or Rowan Scheme – of wage payment for increasing the labour productivity to cope with the increased demand for the product by 25%. He feels that if the 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 and he has accordingly given this assurance to the workers.

As a result of the assurance, the increase in productivity has been observed as revealed by the following figures for the current month :

Hourly rate of wages (Guaranteed)	Rs. 2.00
Average time for producing 1 piece by one worker at the previous performance (This may be taken as time allowed)	2 hours
No. of working days in the month	25
No. of working hours per day for each worker	8
Actual production during the month	1,250 units

Required :

1. Calculate effective rate of earnings per hour under Halsey Scheme and Rowan Scheme.
2. Calculate the savings to Mr. A in terms of direct labour cost per piece under the schemes.
3. Advise Mr. A about the selection of the scheme to fulfill his assurance.

Answer: Halsey – Effective rate 2.25 p.h & Rowan 2.40 ; Savings Halsey – 3.6 & Rowan 3.84 ; Mr. A will select Rowan plan because only Rowan plan can fulfill his assurance for at least 20% increase in the total earning of the worker.

Question 20.

The existing incentive system of certain factory is :

Normal working week	:	5 days of 9 hours each plus Resorting to overtime of 3 hours for 3 dyas.
Rate of payment	:	For day work – Rs. 20 per hour. For overtime – Rs. 30 per hour.
Additional bonus payable	:	Rs. 25 per day if worker is not resorting to overtime, Rs. 40 per day if worker resorts to overtime.
Average output per operative	:	
For 54 hour week, i.e. normal Working hours plus 3 hours Late sitting for 3 days		120 articles

In order to increase output and eliminate overtime it was decided to switch on to a system of payment by results. The factory considering the introduction of some incentive scheme or to make payment on piece work basis. Assuming that 135 articles are produced in a 45 hour week and the additional bonus under the existing system will be discontinued in the proposed incentive scheme. You are required to calculate:

(i) Weekly earnings;

(ii) Labour cost per article for an operative under the following system :

(a) Existing time-rate system

(b) Straight piece-work system

(c) Rowan system

(d) Halsey system

The following information is obtained.

Time rate (as usual)	:	Rs. 20 per hour
Basic time allowed	:	for 15 articles 5 hours
Piece work rate	:	Add 20% to price
Premium bonus	:	Add 50% to time

Answer: (a) (i) 1340 (ii) 11.17
(b) (i) 1080 (ii) 8.00
(c) (i) 1200 (ii) 8.83
(d) (i) 1125 (ii) 8.83

Question 21. ICWA Inter Dec 1982, Dec 1984, June 1989

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

From the following information you are required to calculate for each employee

(a) The bonus hours and amount of bonus earned ; (b) The total wages cost, and

(c) The wages cost of each good unit produced.

	A	**B**	**C**
Basic wage-rate per hour (Re.)	0.25	0.40	0.30
Units produced	2,500	2,200	3,600
Time allowed per 100 units	2 hrs. 36 min.	3 hrs.	1 hrs. 30 min.
Time taken	52 hours	75 hours	48 hours
Rejects	100 units	40 units	400 units

Answer: Total Wage cost -15.60 , 30 , 16 ; Wage cost per unit of good output 0.0065, 0.0139, 0.0050

Question 22. ICWA Inter Dec 1986

A worker, whose day-work wages is Rs. 2.50 an hour, received production bonus under the Rowan Scheme. He carried out the following work in a 48 hour week :

Job. 1 1,500 items at 4 hours per 1,000

Job. 2 1,800 items at 3 hours per 1,000

Job. 3 9,000 items at 6 hours per 1,000

Job. 4 1,500 items for which no "standard time" was fixed and it was arranged that the worker would be paid a bonus of 25 per cent. Actual time on the job was 4 hours.

Job. 5 2,000 items at 8 hours per 1,000 each item was estimated to be half-finished.

Job. 2 was carried out on a machine running at 90 per cent efficiency and an extra allowance of $1/9^{th}$ of actual time was given to compensate the worker.

4 hours were lost due to power cut.

Calculate the earnings of the worker, clearly stating your assumptions for the treatment given by you for the hours lost due to power cut.

Answer: Wages – Rs. 168.73

Question 23. **CA Inter May 2002**

The finishing shop of a company employs 60 direct workers. Each worker is paid Rs. 400 as wages per week of 40 hours. When necessary, overtime is worked up to a maximum of 15 hours per week per worker at time rate plus one-half as premium. The current output on an average is 6 units per man hour which may be regarded as standard output. If bonus scheme is introduced, it is expected that the output will increase to 8 units per man hour. The worker will, if necessary continue to work Overtime up to the specified limit although no premium on incentives will be paid.

The company is considering introduction of either Halsey Scheme or Rowan Scheme of wage incentive system. The budgeted weekly output is 19,200 units. The selling price is Rs. 11 per unit and the direct Material Cost is Rs. 8 per unit. The variable overheads amount to Rs. 0.50 per direct labour hour and the fixed overhead is Rs. 9,000 per week.

Prepare a statement to show the effect on the Company's weekly Profit of the proposal to introduce (a) Halsey Scheme, and (b) Rowan Scheme.

Answer: Present Rs. 11000 Halsey – Rs. 19400, Rowan – Rs. 17400

Question 24. **1998-Now [1] {C} (b)**

Calculate the earnings of a worker under (i) Halsey Plan and (ii) Rowan Plan from the following particulars:

(i) Hourly rate of wages guaranteed 0.50 paisa per hour.

(ii) Standard time for producing one dozen articles – 3 hour.

(iii) Actual time taken by the worker to produce 20 dozen articles – 48 hours.

Answer: (i) Rs. 27 (ii) Rs. 28.80

Question 25.

Calculate the earnings of worker from the following information under Bedeaux system:

Standard time for a product A-30 seconds *plus* relaxation allowance of 50%

Standard time for a product B-20 seconds *plus* relaxation allowance of 50%

During 8 hours day for :

Actual output of product for A	500 units
Actual output of product for B	300 units
Wage rate	Rs.10 per hour

Answer: Wages – Rs. 85.625

Question 26. **CA Inter May 1999**

During audit of accounts of G Company, your assistant found errors in the calculation of the wages of factory workers and he wants you to verify his work.

He has extracted the following information:

(i) The contract provides that the minimum wages for a worker is his base rate. It is also paid for downtimes i.e. the machine is under repair or the worker is without work. The standard work week is 40 hours. For overtime production, workers are paid 150 percent of base rates.

(ii) *Straight piece work* – The worker is paid at the rate of 20 paisa per piece.

(iii) *Percentage Bonus* – Standard quantities of production per hour are established by the engineering department. The workers average hourly production, is divided by the standard quantity of production to determine his efficiency ratio. The efficiency ratio is then applied to his base rate to determine his hourly earnings for the period.

(iv) *Emerson Efficiency Plan* – A minimum wages is paid for production upto $66^{2/3}$% of standard output or efficiency. When the workers production exceeds $66^{2/3}$% of the standard output, he is paid bonus as per the following table :

Efficiency Level	Bonus
Upto $66^{2/3}$%	Nil
Above $66^{2/3}$% to 79%	10 %

80% - 99%	20 %
100% - 125 %	45 %

Your assistant has produced the following schedule pertaining to certain workers of a weekly pay roll :

Workers	Wages Incentive Plan	Total Hours	Down Time Hours	Units Produced as per	Standard Units Book	Base Rate Rs.	Gross Wages Rs.
Rajesh	Straight piece work	40	5	400	----	1.80	85
Mohan*	Straight piece work	46	---	455	----	1.80	95
John	Straight piece work	44	---	425	----	1.80	85
Harish	Percentage bonus plan	40	4	250	200	2.20	120
Mahesh	Emerson	40	---	240	300	2.10	93
Anil	Emerson	40	---	600	500	2.00	126

(40 hours production)

* Total hours of Mohan include 6 overtime hours, of John 4 hrs. overtime.

Prepare a schedule showing whether the above computation of workers wages are correct or not. Give details.

Answer:	**Excess Pay**	**Deficiency Pay**
Rajesh	**5**	**-**
Mohan	**4**	**-**
John	**-**	**-**
Harish	**10**	**-**
Mahesh	**-**	**7.8**
Anil	**10**	**-**

Question 27.

Wage negotiations are going on with the recognized Labor Union and the Management wants you as the Cost Accountant of the Company to formulate as incentive scheme with a view to increase productivity.

The case of three typical workers Achyuta, Ananta and Govida who produce respectively 180, 120 and 100 units of the company's product in a normal day of 8 hours is taken up for study.

Assuming that day wages would be guaranteed at 75 paisa per hour and the piece rate would be based on a standard hourly output of 10 units, calculate the earnings of each of the three workers and the labour cost per 100 pieces under (i) Day wages, (ii) Piece rate, (iii) Piece rate, (iii) Halsey Scheme, and (iv) The Rowan Scheme.

Also calculate under the above schemes the average cost of labour for the company to produce 100 pieces.

Answer:

1. 18, Aug. labour cost = Rs. 4.50

2. 30, Aug. labour cost = Rs. 7.50

3. 24, Aug. labour cost = Rs. 6.00

4. 24.53, Aug. labour cost = Rs. 6.13

Question 28. **CA Inter May 1998**

Calculate the earnings of workers A,B and C under straight Piece Rate System and Merrick's Multiple Piece Rate System from the following particulars. :

Normal Rate per Hour	Rs. 5.40
Standard Time per Unit	1 Minute

Output per day is as follows :

Worker A – 390 Units

Worker B – 450 Units

Worker C – 600 Units

Working hours per day are 8.

Answer: i) Straight piece rate a) Rs. 35.1 , b) Rs. 40.5 , c) Rs. 54
ii) Merrick's a) Rs. 35.1 b)Rs. 44.55 c) Rs. 64.8

Question 29.

A worker is paid 10% bonus on the hourly rate if he completes his work is the time allotted for it and a further 1% on hourly rate for each 1% in excess of 100% efficiency. His hourly rate is Rs. 5 per hour and he completed a job in 45 hours whereas the time allowed for it was 50 hours. Ascertain the wages earned by this worker.

Answer: Rs. 272.5

Question 30.

Using Taylor's differential piece rate system, find the earnings of the Amar, Akbar and Ali from the following particulars :

Standard time per piece	:	20 minutes
Normal rate per hour	:	Rs. 9.00
In a 8 hour day		
Amar produced	:	23 units
Akbar produced	:	24 units
Ali produced	:	30 units

Answer: Earnings: Amar – 57.27, Akbar – Rs. 90 , Ali – Rs. 112.5

Question 31.

Using Taylor's differential piece rate system, find the earning of A from the following particular:

Standard time per piece	12 munutes
Normal rate per hour (in 8 hours a day)	Rs. 20
A produced	37 units

Answer: Earning from a product = 122.84

Question 32.

In a factory the standard time allowed for completing a given task (50 units), is 8 hours. The guaranteed time wages are Rs. 20 per hour. If a task is completed in less than the standard time, the high rate of Rs. 4 per unit is payable. Calculate the wages of a worker, under the Gantt system, if he completes the task in

(i) 10 hours; (ii) 8 hours, and (iii) in 6 hours. Also ascertain the comparative rate of earnings per hour under the three situations.

Answer: i) Rs. 200 ii) Rs. 192 iii) Rs. 200

Question 33.

From the following information you are required to calculate the bonus and earnings under Emerson Efficiency System. The relevant information is as under :

Standard working hours	:	8 hours a day
Standard output per hours in units	:	5
Daily wage rate	:	Rs. 90
Actual output in units		
Worker A		25 units
Worker B		40 units
Worker C		45 units

Answer: Wages i) Rs. 90 ii) Rs. 108 iii) Rs. 119.25

Question 34. **ICWA Inter June 1980**

Both direct and indirect labour of a department in a factory are entitled to production bonus in accordance with a group incentive scheme, the outline of which is as follows :

(a) For any production in excess of the standard rate fixed at 16,800 tonnes per month (of 28 days) a general incentive of Rs. 15 per tonne is paid in aggregate. The total amount payable to each separate group is determined on the basis of an assumed percentage of such excess production being contributed by it, namely @ 65% by direct labour, @ 15% by inspection staff, @ 12% by maintenance staff and @ 8% by supervisory staff.

(b) Moreover, if the excess production is more than 20% above the standard, direct labour also get a special bonus @ Rs. 5 per tonne for all production in excess of 120% of standard.

(c) Inspection staff are penalized @ Rs. 20 per tonne for rejection by customer in excess of 2% of production.

(d) Maintenance staff are also penalized @ Rs. 20 per hour for breakdown.

From the following particulars for a month, work out production bonus earned by each group :

(a) Actual working days : 25

(b) Production : 21,000 tonnes

(c) Rejection by customer : 500 tonnes

(d) Machine breakdown : 40 hours

Answer: General Bonus Rs. 90000 ; Additional Bonus Rs. 15000 ; Net Bonus Rs. 73500, 11900, 10000, 7200 resp.

Question 35. **May 2008**

Standard output in 10 hours in 240 units; actual output in 10 hours is 264 units. Wages rate is Rs. 10 per hour. Calculate the amount of bonus and total wages under Emerson Plan.

Answer: (i) Total Wages = 130 (ii) Bonus = 30

Question 36. **ICWA Inter Dec 1990**

In a manufacturing concern 20 workmen work in a group. The concern follows a group incentive bonus system whereby each workman belonging to the group is paid a bonus on the excess output over the hourly production standard of 250 pieces, in addition to his normal wages at hourly rate. The excess output over the hourly over the standard is expressed as a percentage and two-thirds of this percentage is considered to be the share of the workman and is applied on the notional hourly rate of Rs.6.00 (considered only for purpose of computation of bonus). The output data for a week are stated below:

Days	***Man-hours worked***	***Output (In pieces)***
Monday	160	48000
Tuesday	172	53000
Wednesday	164	40000
Thursday	168	52000
Friday	160	46000
Saturday	160	42000
	984	281000

You are required to:

(i) Work out the amount of bonus for the week and the average rate at which each workman is to be paid the same.

(ii) Compute the total wages including bonus payable to Ram Jadav who worked for 48 hours at an hourly rate of Rs.2.50 and to Francis Williams who worked for 52 hours at an hourly rate of Rs.3.00.

Answer: Bonus per hour – Rs. .57 p.h ; Ram Jadav – Rs. 147.36; Francis Williams – Rs. 185.64

Question 37. **CA Inter Nov 2000**

The present output details of a manufacturing department are as follows:

Average output per week	48000 units from 160 employees
Saleable value of output	Rs.600000

Contribution made by output towards

fixed expenses and profit Rs.240000

The Board of Directors plans to introduce more mechanization into the department at a capital cost of Rs.160000. The effect of this will be to reduce the number of employees to 120 and increasing the output per individual employee by 60%. To provide the necessary incentive to achieve the increased output, the Board intends to offer a 1% increase on the piece work rate of Re.1 per unit for every 2% increase in average individual output achieved.

To sell the increased output, it will be necessary to decrease the selling price by 4%.

Calculate the extra weekly contribution resulting from the proposed change and evaluate for the Board's information, the desirability of introducing the change.

Answer: Extra Contribution Per Week- Rs. 1920

Question 38.

The unit has a strength of 20 workmen worked for 300 working days of 8 hours each with half an hour break based on the earlier years trend, it is forecast that average absenteeism per workman would be 8 days, in addition to the eligibility of 30 days annual leave.

The following details regarding actual working of the unit are available for the year ending on 31st March, 1998

(i) The factory worked 2 extra days to meet the production targets, but one additional paid holiday had to de declared.

(ii) There was a severe breakdown of a major equipment leading to a loss of 300 man hours.

(iii) Total overtime hours (in addition to 2 extra days worked) amounted to 650 man hours.

(iv) The actual average absenteeism per workman was 8 days.

(v) Basic rate is Rs.10 per hour and overtime is paid at double rate. You are required to calculate:

Actual working hours of the unit.

Answer: (a) Rs. 39800 (b) 486600

Question 39. **ICWA Inter June 1987- Similar**

The company has a suggestion of box scheme and an award equivalent to one and a half months saving in labour cost is passed on to the employee whose suggestion is accepted. Suggestion of an employee to use a Jig for a manufacturing operation of a component is accepted. The cost of the Jig, which has a life of one year is Rs.1000 and the use of the Jig will reduce the standard time by 8 minutes.

Compute from the following data the amount of award payable to the employee who has given the suggestion:

(i) Number of pieces to be produced in the year : 15000

(ii) Standard time per piece before use of Jig : 80 minutes.

(iii) Average wage rate of workmen : Rs. 160 per day of 8 hours.

(iv) Average efficiency of workmen : 80%

Answer: Bonus to worker – Rs. 6125

Question 40. **2011, May**

You are given the following information of a worker :

(i) Name of worker : 'X'

(ii) Ticket No. : 002

(iii) Work started : 1-4-11 at 8 a.m.

(iv) Work finished : 5-4-11 at 12 noon

(v) Work allotted : Production of 2, 160 units

(vi) Work done and approved : 2,000 units

(vii) Time and units allowed : 40 units per hour

(viii) Wage rate : Rs 25 per hour

(ix) Bonus : 40% of time saved

(x) Worker X worked 9 hours a day.

You are required to calculate the remuneration of the worker on the following basis :

(i) Halsey plan and

(ii) Rowan plan

Question 41. **2011, November**

X executes a piece of work in 120 hours as against 150 hours allowed to him. His hourly rate is Rs 10 and he gets a dearness allowance @ Rs 30 per day of 8 hours worked in addition to his wages. You are required to calculate total wages received by X under the following incentive schemes :

(i) Rowan Premium Plan, and

(ii) Emerson's Efficiency Plan

Question 42. **CA Inter Nov, 1999**

A skilled worker in XYZ Ltd's. is paid a guaranteed wages rate of Rs. 30 per hour. The standard time per unit for a particular product is 4 hours. P, a machine man, has been paid wages under the Rowan Incentive Plan and he had earned an effective hourly rate of Rs. 37.50 on the manufacture of that particular product.

What could have been his total earnings and effective hourly rate, had be been put n Halsey Incentive Scheme (50%) ?

Answer: Halsey- Total earning -105 ; earning p.h -35

Question 43. **I.C.W.A Inter June 1995**

A company has its factories at two locations. Rowan plan is in use at location A and Halsey plan at location B. Standard time and basic rate of wages are same for a job which is similar and is carried out on similar machinery. Time allowed is 60 hours.

Job at location 'A' is completed in 36 hours while at B, it has taken 48 hours. Conversion costs at respective places are Rs. 1,224 and Rs. 1,500. Overheads account for Rs. 20 per hr.

Required : (a) To find out the normal wage rate, and (b) To compare respective conversion costs.

Answer: Rs. 10 p.h

Question 44. **CA Inter May 1988 , Nov 1997**

Two workmen, Vishnu and Shiva, produce the same product using the same material. Their normal wage rate is also the same. Vishnu is paid bonus according to the Rowan System, while Shiva is paid bonus according to the Halsey System. The time allowed to make the product is 100 hours, Vishnu takes 60 hours while Shiva takes 80 hours to complete the product. The factory overhead rate is Rs. 10 per man-hour actually worked. The factory cost for the product for Vishnu is Rs. 7,280 and for Shiva it is Rs. 7,600. **You are required** :

(a) To find the normal rate of wages ; (b) To find the cost of material ;

(c) To prepare a statement comparing the factory cost of the products as made by the two workmen.

Answer: NWR – Rs. 20 p.h ; Rs. 5000 ; F.C- of Vishnu 7280 & Shiva 7600

FOR YOUR PRACTICE

Question 1. **May 2004**

ZED 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; if 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 April, 2004.

Hourly rate of wages (guaranteed)	Rs. 30
Average time for producing one unit by one worker at the previous performance (This may be taken as time allowed)	1.975 hours
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 ED Ltd. in terms of direct labour cost per piece.

(iii) Advise ZED Ltd. about the selection of the scheme to fulfill his assurance.

Solution

Given:- Actual product = 6,120 units [in 1 month]

$TA = \frac{1.975 \text{ hr.}}{1 \text{ unit}} \times 6120 \text{ unit} = 12087 \text{ hr.}$

TT = 24 day × 8 day × 50 words = 9600 hr.

TS = 2487 hr.

W/R ph = Rs 30

	Particulars	Present	Halsey plan	Rowan plan
(i)	Total earnings	2,88,000 [9600 × 30]	3,25,305 [19600 × 30] + $\frac{50}{100}$ × 2487 × 30	3,47,258 [9600 × 30] + $\frac{9600}{12087}$ × 2487 × 30
	% Inc in earning	-	12.95% $\frac{37305}{288000} \times 100$	20.58% $\frac{59258}{288000} \times 100$
	Effective earnings ph	Rs 30 $\frac{288000}{9600}$	Rs 33.89 $\frac{325305}{9600}$	Rs 36.17 $\frac{347258}{9600}$
(ii)	Labour cost ph	59.25 [1.975 × 30]	53.15 $\frac{325305}{6120}$	56.74 $\frac{347258}{6120}$
	Savings in labor cost ph	-	6.1	2.51

(iii) ZED Ltd. should select Rowan plan because only Rowan plan fulfil his assurance for at least 20% increase in labour earnings.

Question 2

Corrs Consultancy Ltd. is engaged in BPO industry. One of its trainee executives in the Personnel department has calculated labour turnover rate 24.92% for the last year using Flux method.

Following is the some data provided by the Personnel department for the last year:

Employees	At the beginning	Joined	Left	At the end
Data Processors	540	1,080	60	1,560
Payroll Processors	?	20	60	40
Supervisors	?	60	---	?

Voice Agents	?	20	20	?
Assistant Managers	?	20	---	30
Senior Voice Agents	4	---	---	12
Senior Data Processors	8	---	---	34
Team Leaders	?	---	---	?
Employees transferred from the Subsidiary Company				
Senior Voice Agents	---	8	---	---
Senior Data Processors	---	26	---	---
Employees transferred to the Subsidiary Company				
Team Leaders	---	---	60	---
Assistant Managers	---	---	10	---

At the beginning of the year there were total 772 employees on the payroll of the company. The opening strength of the Supervisors, Voice Agents and Assistant Managers were in the ratio of 3 : 3 : 2.

The company has decided to abandon the post of Team Leaders and consequently all the Team Leaders were transferred to the subsidiary company.

The company and its subsidiary are maintaining separate set of books of account and separate Personnel Department.

You are required to calculate:

(a) Labour Turnover rate using Replacement method and Separation method.

(b) Verify the Labour turnover rate calculated under Flux method by the trainee executive of the Corrs Consultancy Ltd.

Solution :

Working Notes :

(i) Calculation of No. of employees at the beginning and end of the year :

	At the Beginning of the year	**At the end of the year**
Date Processors	540	1,560
Payroll Processors [Left – 60 + Closing – 40 – Joined - 20]	80	40
Supervisors*	30	90
Voice Agents*	30	30
Assistant Managers *	20	30
Senior Voice Agents	4	12
Senior Data Processors	8	34
Team Leaders	60	0
Total	772	1,796

(*) At the beginning of the year :

Strength of Supervisors, Voice Agents and Asst. Managers =

[772 – {540 + 80 + 4 8 + 60} employees] or [772 – 692 = 80 employees]

[{Supervisors – 80 X $\frac{3}{8}$ = 30, Voice Agents – 80 X $\frac{3}{8}$ = 30 & Asst. Managers – 80 X $\frac{2}{8}$ = 20} employees]

At the end of the year :

[Supervisor – (Opening – 30 + 60 Joining) = 90, Voice Agents – (Opening – 30 + 20 Joined – 20 Left) = 30]

(ii) No. of Employees Separated, Replaced and newly recruited during the year :

Particulars	Separations	New Recruitment	Replacement	Total Joining
Data Processors	60	1,020	60	1,080
Payroll Processors	60	--	20	20
Supervisors	--	60	--	60
Voice Agents	20	--	20	20
Assistant Managers	10	10	10	20
Sr. Voice Agents	--	8	--	8
Sr. Data Processors	--	26	--	26
Team Leaders	60	--	--	--
Total	210	1,124	110	1,234

(Since, Corrs Consultancy Ltd. And its subsidiary are maintaining separate Personnel Department, so transfer-in and transfer-out are treated as recruitment and separation respectively.)

(a) Calculation of Labour Turnover :

$$\text{Replacement Method} = \frac{\text{No.of employees replaced during the year}}{\text{Average no.of employees on roll}} \times 100$$

$$= \frac{110}{(772+1,796)/2} \times 100 = \frac{110}{1,284} \times 100 = 8.57\%$$

$$\text{Separation Method} = \frac{\text{No.of employees separated during the year}}{\text{Average no.of employees on roll}} \times 100$$

$$= \frac{210}{1,284} \times 100 = 16.36\%$$

(b) Labour Turnover Under Flux Method :

$$= \frac{\text{No.of employees (Joined+Separated) during the year}}{\text{Average no.of employees on roll}} \times 10$$

$$= \frac{\text{No.of employees (Replaced+New recruited + Separated) during the year}}{\text{Average no.of employees on roll}} \times 100$$

$$= \frac{1,234 + 210}{1,284} \times 10 = 112.46\%$$

Labour Turnover calculated by the executive trainee of the Personnel department is incurred as it has not taken the no. of new recruitment while calculating the labour turnover under Flux method.

Question 3

XYZ Ltd. wants to ascertain the profit lost during the year 2013-14 due to increased labour turnover. For this purpose, they have given you the following information :

(1) Training period of the new recruits is 50,000 hours. During this period their productivity is 60% of the experienced workers. Time required by an experienced worker is 10 hours per unit.

(2) 20% of the output during training period was defective. Cost of rectification of a defective unit was ₹ 25.

(3) Potential productive hours lost due to delay in recruitment were 1,00,000 hours.

(4) Selling price per unit is ₹ 180 and P/V ratio is 20%.

(5) Settlement cost of the workers leaving the organization was ₹ 1,83,480.

(6) Recruitment cost was ₹ 1,56,340.

(7) Training cost was ₹ 1,13,180.

You are required to calculate the profit lost by the company due to increased labour turnover during the year 2013-14.

Solution :

Output by experienced worker in 50,000 hours = $\frac{50,000}{60}$ = 5,000 units

∴ Output by new recruits = 60% of 5,000 = 3,000 units

Less of output = 5,000 – 3,000 = 2,000 units

Total loss of output = 10,000 + 2,000 = 12,000 units

Contribution per unit = 20% of 180 = ₹ 36

Total contribution cost = 36 X 12,000 = ₹ 4,30,000

Cost of repairing defective units = 3,000 X 0.2 X 25 = ₹ 15,000

Profit forgone due to labour turnover

	(₹)
Loss of Contribution	4,32,000
Cost of repairing defective units	15,000
Recruitment cost	1,56,340
Training Cost	1,13,180
Settlement cost of workers leaving	1,83,480
Profit forgone in 2013-14	9,00,000

Question 4

The standard hours of job X is 100 hours. The job has been completed by Amar in 60 hours, Akbar in 70 hours and Anthony in 95 hours.

The bonus system applicable to the job is as follows:-

Percentage of time saved to time allowed	Bonus
Saving upto 10%	10% of time saved
From 11% to 20%	15% of time saved
From 21% to 40%	20% of time saved
From 41% to 100%	25% of time saved

The rate of pay is ₹ 1 per hour, Calculate the total earnings of each worker and also the rate of earnings per hour.

Solution :

Statement of total earnings and rate of earning per hour

	Workers		
	Amar	**Akbar**	**Anthony**
Standard hours of Job	100 hours	100 hours	100 hours

Time taken on the Jobs (i)	60 hours	70 hours	95 hours
Time saved	40 hours	30 hours	5 hours
Percentage of time saved to time allowed	40%	30%	5%
Bonus hours (ii) (See Working Note 1)	6.5 hours	4.5 hours	0.5 hours
Total hours to be paid [(i) + (ii)]	66.5 hours	74.5 hours	95.5 hours
Total earning @ ₹ 1 per hour	₹ 66.5	₹ 74.5	₹ 95.5
Rate of earning per hour (See Working Note 2)	₹ 1.1083	₹ 1.0642	₹ 1.005

Note :

1. Bonus hours as percentage of time saved :

Amar : (10 hours X 10%) + (10 hours X 15%) + (20 hours X 20%) = 6.5 hours

Akbar : (10 hours X 10%) + (10 hours X 15%) + (10 hours X 20%) = 4.5 hours

Anthony : 5 hours X 10% = 0.5 hours

2. Rate of Earning per hour :

$$= \frac{\text{Total earning}}{\text{Total time taken on the job}}$$

Amer : $\frac{\text{Rs. 66.5}}{\text{60 hours}}$ = ₹ 1.1083

Akbar : $\frac{\text{Rs. 74.5}}{\text{70 hours}}$ = ₹ 1.0642

Anthony : $\frac{\text{Rs.95.50}}{\text{95 hours}}$ = ₹ 1.005

Question 5

Standard Time for a job is 90 hours. The hourly rate of guaranteed wages is ₹ 50. Because of the saving in time a worker A gets an effective hourly rate of wages of ₹ 60 under Rowan premium bonus system. For the same saving in time, calculate the hourly rate of wages a worker B will get under Halsey premium bonus system assuring 40% to worker.

Solution :

Increase in hourly rate of wages under Rowan Plan is ₹ 10 i.e. (₹ 60 - ₹ 50)

This is Equal to $\frac{\text{Time Saved}}{\text{Time Allowed}}$ X Rate per Hour (Please refer working Note)

Or, $\frac{\text{Time Saved}}{\text{Time Allowed}}$ X ₹ 50 = ₹ 10

Or, $\frac{\text{Time Saved}}{\text{90 hours}}$ X ₹ 50 = ₹ 10

Therefore, Time Saved = 18 hours and Time Taken is 72 hours i.e. (90 hours – 18 hours)

Effective Hourly Rate under Halsey System :

Time Saved	=	18 hours
Bonus @ 40 %	=	18 hours X 40% X ₹ 50 = ₹ 360
Total Wages	=	(₹ 50 X 72 hours + 360) = ₹ 3,960
Effective Hourly Rate	=	₹ 3,960 ÷ 72 hours = ₹ 55

Working Note :

$$\text{Effective hourly rate} = \frac{(\text{Time Taken X Rate per hour}) + \frac{\text{Time Saved}}{\text{Time Allowed}} \text{ X Time Saved X Rate per hour}}{\text{Time Taken}}$$

$$\text{Or, } ₹\,60 = \frac{\text{Time Taken X Rate per hour}}{\text{Time Taken}} + \frac{\frac{\text{Time Taken}}{\text{Time Allowed}} \text{X Time Saved X Rate per hour}}{\text{Time Taken}}$$

$$\text{Or, } ₹\,60 = \frac{\text{Time Taken X Rate per hour}}{\text{Time Taken}} = \frac{\text{Time Taken}}{\text{Time Allowed}} \text{ X Time Saved X Rate per hour X } \frac{1}{\text{Time Taken}}$$

$$\text{Or, } ₹\,60 - ₹\,50 = \frac{\text{Time Saved}}{\text{Time Allowed}} \text{ X } ₹\,50$$

Question 6

The management of a company wants to formulate an incentive plan for the workers with a view to increase productivity. The following particulars have been extracted from the books of company:

Piece Wage rate ₹ 10

Weekly working hours 40

Hourly wages rate ₹ 40 (guaranteed)

Standard/normal time per unit 15 minutes.

Actual output for a week:

Worker A : 176 pieces

Worker B : 140 pieces

Differential piece rate: 80% of piece rate when output below normal and 120% of piece rate when output above normal.

Under Halsey scheme, worker gets a bonus equal to 50% of Wages of time saved.

Calculate:

(i) Earning of workers under Halsey's and Rowan's premium scheme.

(ii) Earning of workers under Taylor's differential piece rate system and Emerson's efficiency plan.

Solution :

Calculation of earnings for workers under different incentive plans :

(i) Halsey's Premium Plan :

	Worker – A	**Worker – B**
Actual time taken	40 hours	40 hours
Standard time for actual Production	44 hours $\left(\frac{176 \text{ Pcs X 15 Min}}{60 \text{ Min.}}\right)$	35 hours $\left(\frac{140 \text{ Pcs X 15 Min}}{60 \text{ Min.}}\right)$
Minimum Wages	₹ 1,600 (40 hours X ₹ 40)	₹ 1,600 (40 hours X ₹ 40)
Bonus	₹ 80 (50% (44-40, ₹ 40)	No Bonus
	₹ 1,680	₹ 1,600
Rowan's Premium Plan :		
Minimum Wages (as above)	₹ 1,600	₹ 1,600
Bonus	= ₹ 145.45 $\left(\frac{4 \text{ hours}}{44 \text{ hours}} \text{ X 40 hours X Rs. 40}\right)$	No Bonus
Earning	₹ 1,745.45	₹ 1,600

(ii) Taylor's Differential Piece rate

Efficiency	110% $\left(\frac{176 \text{ pcs.}}{160 \text{ pcs.}} \text{ X } 100\right)$	87.5% $\left(\frac{140 \text{ pcs.}}{160 \text{ pcs.}} \text{ X } 100\right)$

Earning	₹ 2,112 (₹ 10 X 120% X 176 pcs.)	₹ 1,120 (₹ 10 X 80% X 140 pcs.)
Emerson's efficiency Plan		
Time Wages	1,600 (₹ 40 X 40 hours)	1,600 (₹ 40 X 40 hours)
Bonus	480 (20 + 10)% of (₹ 40 X 40 hrs)	320 (20% of 1,600)
Time Wages	₹2,080	₹1,920

Question 7

A skilled worker is paid a guaranteed wage rate of ₹ 120 per hour. The standard time allowed for a job is 6 hour. He took 5 hours to complete the job. He is paid wages under Rowan Incentive Plan.

(i) Calculate his effective hourly rate of earnings under Rowan Incentive Plan.

(ii) If the worker is placed under Halsey Incentive Scheme (50%) and he wants to maintain the same effective hourly rate of earnings, calculate the time in which he should complete the job.

Solution :

(i) Effective hourly rate of earnings under Rowan incentive Plan

Earnings under Rowan Inventive plan =

(Actual time taken X wage rate) + $\frac{\text{Time Saved}}{\text{Time Allowed}}$ X Time taken X wage rate

= (5 hours X ₹ 120) + $\left(\frac{1\text{ hour}}{6\text{ hours}} \text{ X } 5 \text{ hours X Rs.} 120\right)$

= ₹ 600 + ₹ 100 = ₹ 700

Effective hourly rate = ₹ 700/5 hours = ₹ 140 / hour

(ii) Let time taken = X

∴ Effective hourly rate = $\frac{\text{Earnings under Halsay Scheme}}{\text{Time Taken}}$

Or, Effective hourly rate under Rowan Incentive plan =

$$\frac{(\text{Time taken X Rate}) + 50\% \text{ Rate X } (\text{Time Allowed} - \text{Time taken})}{\text{Time Taken}}$$

Or, ₹ 140 = $\frac{(X \text{ x Rs.} 120) + 50\% \text{ Rs.} 120 \text{ X } (6 - X)}{X}$

Or, ₹ 140 X = 120 X + 360 – 60 X

Or, 80 X = 360

Or, X = $\frac{360}{80}$ = 4.5 hours

Therefore, to earn effective hourly rate of ₹ 140 under Halsey. Incentive Scheme worker has to complete the work in 4.5 hours.

Question 8

A, B and C are three industrial workers working in Sports industry and are experts in making cricket pads. A, B and C are working in Mahi Sports, Virat Sports and Sikhar Sports companies respectively. Workers are paid under different incentive schemes. Company wise incentive schemes are as follows:

Company	Incentive scheme
Mahi Sports	Emerson's efficiency system
Virat Sports	Merrick differential piece rate system
Sikhar Sports	Taylor's differential piece work system

The relevant information for the industry is as under:

Standard working hours	8 hours a day
Standard output per hour (in units)	2
Daily wages rate	₹ 360
No. of working days in a week	6 days

Actual outputs for the week are as follows:

A	B	C
132 units	108 units	96 units

You are required to calculate effective wages rate and weekly earnings of all the three workers.

Solution :

Calculation of effective wages rate and weekly earnings of the workers A, B and C

Workers	A	B	C
Standard Output	96 Units (8 hrs. X 2 units X 6 days)	96 Units (8 hrs. X 2 units X 6 days)	96 Units (8 hrs. X 2 units X 6 days)
Actual Output	132 units	108 units	96 units
Efficiency (%)	$\frac{132 \text{ units}}{96 \text{ units}} \text{ X } 100 = 137.5$	$\frac{108 \text{ units}}{96 \text{ units}} \text{ X } 100 = 112.5$	$\frac{96 \text{ units}}{96 \text{ units}} \text{ X } 100 = 100$
Daily Wages Rate	₹ 360	₹ 360	₹ 360
Incentive System	Emerson's Efficiency System	Merrick differential piece rate System	Taylor's differential piece work System
Rate of Bonus	57.5% of time rate (20% + 37.5%)	20% of ordinary piece rate	25% of ordinary piece rate
Effective Wage Rate	₹ 70.875 per hour $\left(\frac{\text{Rs. } 360}{8 \text{ hours}} \text{ X } 157.5\%\right)$	₹ 27 per piece $\left(\frac{\text{Rs. } 360}{16 \text{ units}} \text{ X } 120\%\right)$	₹ 28.125 per piece $\left(\frac{\text{Rs. } 360}{16 \text{ units}} \text{ X } 125\%\right)$
Total Weekly Earnings	₹ 3,402 (4 hours X 6 days X ₹ 70.875)	₹ 2,916 (108 units X ₹ 27)	₹ 2,700 (96 nits X ₹ 28.125)

Question 9

Jigyasa Boutiques LLP. (JBL) takes contract on job works basis. It works for various fashion houses and retail stores. It has employed 26 workers and pays them on time rate basis. On an average an employee is allowed 2 hours for boutique work on a piece of garment. In the month of March 2014, two workers Margaret and Jennifer were given 30 pieces and 42 pieces of garments respectively for boutique work. The following are the details of their work:

	Margaret	Jennifer
Work assigned	30 pcs.	42 pcs.
Time taken	28 hours	40 hours

Workers are paid bonus as per Halsey System. The existing rate of wages is ₹ 50 per hour. As per the new wages agreement the workers will be paid ₹ 55 per hour w.e.f. 1st April 2014. At the end of the month March 2014, the accountant of the company has calculated wages to these two workers taking ₹ 55 per hour.

(i) From the above information calculate the amount of loss that the company has incurred due to incorrect rate selection.

(ii) What would be the loss incurred by the JBL due to incorrect rate selection if it had followed Rowan scheme of bonus payment.

(iii) Amount that could have been saved if Rowan scheme of bonus payment was followed.

(iv) Do you think Rowan scheme of bonus payment is suitable for JBL?

Solution :

	Margaret	Jennifer
No. of gaments assigned (Pieces)	30	42
Hour allowed per piece (Hours)	2	2
Total hours allowed (Hours)	60	84
Hours Taken (Hours)	28	40
Hours Saved (Hours)	32	44

(i) Calculation of loss incurred due to incorrect rate selection.

(While calculating loss only excess rate per hour has been taken)

	Margaret (₹)	Jennifer (₹)	Total (₹)
Basic Wages	140 (28 Hrs. X ₹ 5)	200 (40 Hrs. X ₹ 5)	340
Bonus (as per Halsey Scheme) (50% of time Saved X Excess Rate)	80 (50% of 32 Hrs. X ₹ 5)	110 (50% of 44 Hrs. X ₹ 5)	190
Excess Wages Paid	220	310	530

(ii) Amount of loss if Rowan scheme of bonus payment were followed :

	Margaret (₹)	Jennifer (₹)	Total (₹)
Basic Wages	140.00 (28 Hrs. X ₹ 5)	200.00 (40 Hrs. X ₹ 5)	340.00
Bonus (as per Rowan Scheme) $\left(\frac{\text{Time Taken}}{\text{Time Allowed}} \text{ X Time Saved X Excess Rate}\right)$	74.67 $\left(\frac{28}{60} \text{ X } 32 \text{ X Rs. } 5\right)$	104.76 $\left(\frac{40}{84} \text{ X } 44 \text{ X Rs. } 5\right)$	179.43
Excess Wages Paid	214.67	304.76	519.43

(iii) Calculation of amount that could have been saved if Rowan Scheme were followed :

	Margaret (₹)	Jennifer (₹)	Total (₹)
Wages paid under Halsey Scheme	220.00	310.00	530.00
Wages paid under Rowan Scheme	214.67	304.76	519.43
Difference (Savings)	5.33	5.24	10.57

(iv) Rowan Scheme of incentive payment has the following benefits, which is suitable with the nature of business in which Jigyasa Boutique LLP operates :

(a). Under Rowan Scheme of bonus payment, workers cannot increase their earnings or bonus by merely increasing its work speed. Bonus under Rowan Scheme is maximum when the time taken by a worker on a job is half of the time allowed. As this fact is known to the workers, therefore, they work at such a speed which helps them to maintain the quality of output too.

(b). If the rate setting department commits any mistake in setting standards for time to be taken to complete the works, the loss incurred will be relatively low.

Question 10

Arnav Limited manufactures and sales plastic chairs. It pays wages under the differential piece rate system by following F.W. Taylor's System with a standard piece rate of ₹ 12.50 per unit of chair produced by the workers. Standard production per hour is 4 chairs. Each worker is supposed to work 8 hours a day from Monday to Friday and 5 hours on Saturday. Presently, there are 118 workers who are entitled for this plant.

The plant and machinery used to manufacture the chairs was purchased long back and does not match with the efficiency of the workers. Workers appraised their concerns to the management and demanded wages on the time rate basis i.e. ₹ 50 per hour and the incentive under the Halsey Premium plant.

The following production estimates has been made for the month of November, 2015 under the three scenarios :

Scenario	Worst case	Optimal case	Best case
Production (in units)	42,400	84,960	1,27,400

Required :

(a) Calculate total wages and average wages per worker per month, under the each scenario, when

(i). Current system of wages and incentive payment system is followed

(ii). Workers' demand for time rate wages and Halsey premium plant is accepted.

(b) Mr. K, during the month of October 2015, has produced 1,050 units. What will be impact on his earning if he will be able to produce the same number of units in next month also. Should he support the workers' demand?

(Take 4 working weeks in a month)

Solution :

(a). Calculation of Total wages and average wages per worker per month.

(i) When Current system of wages and incentive payment system is followed:

		Worst Case	Optimal Case	Best Case
I	Standard Production (in units) (45 hours X 4 units X 4 weeks X 118 workers)	84,960	84,960	84,960
II	No. of units to be produced	42,400	84,960	1,27,400
III	Efficiency {(II ÷ I) X 100}	49.91%	100%	149.95%
IV	Differential piece rate*	₹ 10 (₹ 12.5 X 0.8)	₹ 15 (₹ 12.5 X 1.2)	₹ 15 (₹ 12.5 X 1.2)
V	Total Wages (II X IV)	₹ 4,24,000	₹ 12,74,400	₹ 19,11,000
VI	Average wages per worker (V ÷ 118)	₹ 3,593.22	₹ 10,800.00	₹ 16,194.92

* For efficiency less than 100%, 83%of piece rate and for efficiency more than or equals to 100%, 125% of piece rate may also be taken.

(ii) When workers' demand for time rate wages and Halsey premium plan is accepted :

		Worst Case	Optimal Case	Best Case
I	No. of units expected to be produced (units)	42,400	84,960	1,27,400
II	Standard no. units in an hour (units)	4	4	4

III	Standard Hours (I ÷ II)	10,600	21,240	31,850
IV	Expected working hours (45 hours X 4 weeks X 118 workers)	21,240	21,240	21,240
V	Hours to be saved (III - IV)	--	--	10,610
VI	Time wages (IV X ₹ 50)	₹ 10,62,000	₹ 10,62,000	₹ 10,62,000
VII	Incentive under Halsey Premium Plan $\left(\frac{1}{2} \text{ X Time saved X Rs. } 50\right)$	--	--	₹ 2,65,250
VIII	Total Wages (VI + VII)	₹ 10,62,000	₹ 10,62,000	₹ 13,27,250
IX	Average wages per worker (VIII ÷ 118)	₹ 9,000	₹ 9,000	₹ 11,247.88

(b). Calculation of gain or less in the current monthly income of Mr. K :

	Wages earned in October 2015 :	
	Standard production unit (40 hours X 4 weeks X 4 units)	720 units
	No. of units produced	1,050 units
	Efficiency	145.83%
	Differential piece rate (refer the above part)	₹ 15
I	Total Wages (1,050 units X ₹ 15)	₹ 15,750
	Expected wages under the new scheme	
	Standard hours (1,050 units ÷ 4units)	262.50 hours
	Expected hours to be taken (45 hours X 4 weeks)	180 hours
	Time saved	82.50 hours
	Time wages (180 hours X ₹ 50)	₹ 9,000
	Incentive $\left(\frac{1}{2} \text{ X Time saved X Rs. } 50\right)$	₹ 2,062.50
II	Total expected wages	₹ 11,062.50
	Loss from the proposed scheme (II - I)	₹ 4,687.50

Supporting the demand of colleague workers will cost ₹ 4,687.50 in the next month to Mr. K.

OVERHEADS

3

Question 1.

A company has four departments L, M and N which are production departments and K which is a service department. Cost of the department K is apportioned on the basis of wages paid.

The costs for the year 1991 were:	**Rs.**
Rent	21000
Repairs to plant	126000
Depreciation of plant	9450
Light and power	2100
Supervision, etc.	31500
Repairs to building	8400

The following information about departments is available and is used as a basis for distribution:

Department	**Area sq. metres**	**No. of employees**	**Wages paid**	**Value of plant**	
L	1500		20	126000	315000
M	1100		55	84000	189000
N	900		10	63000	126000
K	500		5	42000	–

Apportion these costs to producing departments.

Answer: Overheads as per sec. distt – 89163, 70297, 38990.

Question 2. **CA Inter May , 1988**

Deccan Manufacturing Ltd. have three departments which are regarded as production departments. Service departments costs are distributed to these production departments using "Step Ladder Method" of distribution. Estimates of factory overhead costs to be incurred by each department in the forthcoming years are as follows. Data required for distribution is also shown against each department:

Departments	***Factory Overhead (Rs.)***	***Direct Labour Hours***	***No. of Employees***	***Area in sq.mt.***
Production:				
X	193000	4000	100	3000
Y	64000	3000	125	1500
Z	83000	4000	85	1500
Service:				
P	45000	1000	10	500
Q	75000	5000	50	1500
R	105000	6000	40	1000
S	30000	3000	50	1000

The overhead costs of the four service departments are distributed in the same order, viz., P, Q, R and S respectively on the following basis.

Department		***Basis***
P	–	Numberof Employees
Q	–	Direct Labour Hours
R	–	Area in square metres
S	–	Direct Labour Hours

You are required to:

(a) Prepare a schedule showing the distribution of overhead costs of the four service departments to the three production departments; and

(b) Calculate the overhead recovery rate per direct labour hour for each of the three production departments.

Answer: a) Overhead as per sec. distt – 300000 , 135000 , 160000 ; b)Rec. rate : X – Rs. 75, Y – Rs. 45, Z – Rs. 40

Question 3. **May 2005**

An engine manufacturing company has two production departments: (i) Snow mobile engine and (ii) Boat engine and two service departments (i) maintenance and (ii) Factory office, Budgeted cost data and relevant cost drives are as follows:

Departmental costs :

	Rs.
Snow mobile engine	6,00,000
Boat engine	17,00,000
Factory office	3,00,000
Maintenance	2,40,000

Cost drivers :

Factory office department :		**No. of employees**
Snow mobile engine department	1,080	employees
Boat engine department	270	employees
Maintenance department	150	
	1,500	

Maintenance department :	**No. of work orders**
Snow mobile engine department	570 orders
Boat engine department	190 orders
Factory office department	40 orders
	800

Required:

(i) Compute the cost drive allocation percentage and then use these percentage to allocated the service department costs by using direct method.

Compute the cost driver allocation percentage and then use these percentage to allocate the service department costs by using non-reciprocal method/step method.

Answer: (i) Factory office department- Maintenance department

80% 75%

20% 25%

100%

(ii) Factory office department- Maintenance department

72% 75%

18% 25%

10%

Question 4. **2006 Nov.**

RST Ltd. has two production departments : Machining and Finishing. There are three service departments : Human Resource (HR), Maintenance and Design. The budgeted costs in these service department are as follows:

	HR	Mainteanance	Design
	Rs.	Rs.	Rs.
Variable	1,00,000	1,60,000	1,00,000
Fixed	4,00,000	3,00,000	6,00,000
	5,00,000	4,60,000	7,00,000

The usage of these Service Departments output during the year just completed is as follows:

Provision of Service Output (in hours of service)

	Providers of Service		
Users of Service	**HR**	**Maintenance**	**Design**
HR	---	----	---
Maintenance	500	---	---
Design	500	500	---
Machining	4,000	3,500	4,500
Finishing	5,000	4,000	1,500
Total	10,000	8,000	6,000

Required :

(i) Use the direct method to re-apportion RST Ltd's service department cost to its production departments.

(ii) Determine the proper sequence to use in re-apportioning the firm's service department cost by step-down method.

(iii) Use the step-down method to reapportion the firm's service department cost.

Answer: (i) Machining = 961889, Finishing = 698111

(ii) I Rank H.R. Deptt. II Rank Maint. Deptt. III Rank Design Deptt.

(iii) Machining = 978672, Finishing = 681328

Question 5. CA ,PEII, Nov 2003

E-books is an online book retailer. The company has four departments. The two sales departments are corporate sales and consumer sales. The two support-departments are Administrative (Human resources, Accounting), and information systems. Each of the sales departments conducts merchandising and marketing operations independently.

The following data are available for October, 2003 :

Department	Revenue	Number of Employees	Processing Time used (in minutes)
Corporate Sales Rs.	16,67,750	42	2,400
Consumer Sales Rs.	8,33,875	28	2,000
Administrative	----	14	400
Information systems	----	21	1,400

Cost incurred in each of four departments for October, 2003 area as follows :

Corporate sales	Rs. 12,97,751
Consumers sales	Rs. 6,36,818
Administrative	Rs. 94,510
Information systems	Rs. 3,04,720

The company used number of employees as a basis to allocate Administrative cost and processing time as a basis to allocate information systems costs.

Required :

(i) Allocate the support department costs to the sales departments using the direct method.

(ii) Rank the support departments based on percentage of their services rendered to other support departments. Use this ranking to allocate support costs based on the step-down allocation method.

(iii) How could have ranked the support departments differently ?

(iv) Allocate the support department costs to two sales departments using the reciprocal allocation method.

Answer: i) 152639, 813161; ii) 23.077%, 8.33% iii) 1519478 , 814321 ; iv) 1520639, 813161.

Question 6. **CA. Inter Nov 1998**

A company has three production departments and two service departments. Distribution summary of overheads is as follows: Production Departments

A	Rs. 13600
B	Rs. 14700
C	Rs. 12800

Service Departments

X	Rs. 9000
Y	Rs. 3000

The expenses of service departments are charged on a percentage basis which is as follows:

	A	B	C	X	Y
X Dept.	40%	30%	20%	-	10%
Y Dept.	30%	30%	20%	20%	-

Apportion the cost of Service Departments by using the Repeated Distribution method.

Answer: Overhead as per sec. distt – 18712, 18833 , 15555.

Question 7.

Service departments expenses

	Rs.
Boiler House	3000
Pump Room	600
	3600

The allocation is:

	Production Departments	***Boiler***	***House***	***Pump Room***
	A	B		
Boiler House	60%	35%	-	5%
Pump Room	10%	40%	50%	-

Answer: Overhead as per sec. distt – 2109 , 1493

Question 8. **May 2007**

A company has three production departments (M_1, M_2 and A_1) and three service department, one of which Engineering service department, servicing the M_1 and M_2 only. The relevant information are as follows:

	Product X	Product Y
M_1	10 Machine hours	6 Machine hours
M_2	4 Machine hours	14 Machine hours
A_1	14 Direct Labour hours	18 Direct Labour hours

The annual budgeted overhead cost for the year are

	Indirect Wages	Consumable Supplies
	Rs.	Rs.
M_1	46,520	12,600

M_2	41,340	18,200
A_1	16,220	4,200
Stores	8,200	2,800
Engineering Service	5,340	4,200
General Service	7,520	3,200

- Depreciation on Machinery 39,600
- Insurance of Machinery 7,200
- Insurance 3, 240 (Total building insurance cost for M1 is one third of annual premium
- Power 6,480
- Light 5,400
- Rent 12,675 (The general service deptt. Is located in a building owned by the company. It is valued at Rs. 6,000 and is charged into cost at notional value of 8% per annum. This cost is additional to the rent shown above.)
- The value of issues of materials to the production departments are in the same proportion as shown above for the consumable supplies.

Department	**Book value Machinery**	**Area (Sq. ft.)**	**Effective H.P. hours %**	**Production Direct Labour hour**	**Capacity Machine hour**
M1	1,20,000	5,000	50	2,00,000	40,000
M2	90,000	6,000	35	1,50,000	50,000
A1	30,000	8,000	05	3,00,000	
Stores	12,000	2,000	---		
Engg. Service	36,000	2,500	10		
General Service	12,000	1,500	---		

Required :

(i) Prepare a overhead analysis sheet, showing the bases of apportionment of overhead to departments.

(ii) Allocate service department overheads to production department ignoring the apportionment of overhead to department of service department costs among service departments.

(iii) Calculate suitable overhead absorption rate for the production departments.

(iv) Calculate the overheads to be absorbed by two products, X and Y.

Answer: (i)

Production Deptt.			**Service Deptt.**		
M1	**M2**	**A1**	**Store**	**Engineering**	**General**
85775	**80834**	**32072**	**14534**	**17882**	**14318**

(ii)

M1	**M2**	**A1**
103361	**101630**	**40424**

(iii)

M1	**M2**	**A1**
Rate/Machine Hr.	**2.584**	**2.033**
Rate/direct labour	**0.135**	

Question 9. **CA Inter Nov 1996**

A company has two production departments and two service departments. The data relating to a period are as under:

		Production Departments		**Service Departments**	
		PD_1	**PD_2**	**SD_1**	**SD_2**
Direct Materials	(Rs.)	80000	40000	10000	20000

Direct Wages	(Rs.)	95000	50000	20000	10000
Overheads	(Rs.)	80000	50000	30000	20000
Power Requirement at normal capacity operations	(Kwh)	20000	35000	12500	17500
Actual Power Consumption during the period	(Kwh)	13000	23000	10250	10000

The power requirement of these departments are met by a power generation plant. The said plant incurred an expenditure, which is not included above, of Rs. 121875 out of which a sum of Rs. 84375 was variable and the rest fixed.

After apportionment of power generation plant costs to the four departments, the service department overheads are to be redistributed on the following bases:

	PD_1	PD_2	SD_1	SD_2
SD1	50%	40%	-	10%
SD2	60%	20%	20%	-

You are required to:

i) Apportion the power generation plant costs to the four departments.

ii) Re-apportion service department cost to production department.

iii) Calculate the overhead rates per direct labour hour of production departments, given that the direct wages rates of PD1 and PD2 are Rs. 5 and Rs. 4 per hour respectively.

Answer: Overhead as per sec. distt – 206490 , 155386

Question 10.

Trichy Limited has three production departments (A, B and C) and two service departments (D and E). From the following figures extracted from the records of the company. Calculate the overhead rate per labour hour.

Indirect materials	Rs.15000
Indirect wages	10000
Depreciation on machinery	25000
Depreciation on building	5000
Rent, Rates and taxes	10000
Electric power machinery	15000
Electric power for lighting	500
General expenses	15000
	95500

Items	**Total**	**A**	**B**	**C**	**D**	**E**
Direct materials	Rs.60000	20000	10000	19000	6000	5000
Direct wages	40000	15000	15000	4000	2000	4000
Value of machinery	250000	60000	100000	40000	25000	25000
Floor area (sq.ft.)	50000	15000	10000	10000	5000	10000
H.P. of machinery	150	50	60	30	5	5
No. of light points	50	15	10	10	5	10
Labour hours	15000	5000	5000	2000	1000	2000

The expenses of service departments and E are to be apportioned as follows:

	A	*B*	*C*	*D*	*E*
D	40	20	30	–	10
E	30	30	30	10	–

Answer: Overhead as per sec .distt – 35612, 40217, 29483.
General overheads are distt. In the ratio of lab. hours

Question 11.

Atlas Engineering Ltd. accepts a variety of jobs, which require both manual and machine operations. The budgeted Profit and Loss Account for the period 1996-97 is as follows:

		(In lakhs of rupees)
Sales		75
Cost:		
Direct materials	10	
Direct labour	5	
Prime Cost	15	
Production Overhead	30	
Production Cost	45	
Administrative, Selling and Distribution Overhead	15	60
Profit		15

Other budgeted data:

Labour hours for the period	2500
Machine hours for the period	1500
No. of jobs for the period	300

An enquiry has been received recently from a customer and the production department has prepared the following estimate of the prime cost required for the job:

	Rs.
Direct material	2500
Direct labour	2000
Prime cost	4500
Labour hours required	= 80
Machine hours required	= 50

You are required to:

a) Calculate by different methods, six overhead absorption rates for absorption of production overhead and comment on the suitability of each.

b) Calculate the production overhead cost of the order based on each of the above rates.

c) Give your recommendation to the company.

Answer: Direct Lab. Hour rate method – Rs. 1200 per lab hour

Question 12.

From the following data of a textile machine room. Compute the hourly machine rate, assuming that the machine room will work on 90% capacity throughout the year and that a breakdown allowance of 10% is reasonable.

There are 3 holidays at Deepawali, 2 holidays at Holi, 2 holidays at X-mas, exclusive of Sundays. The factory works 8 hours a day on 5 days and 4 hours on Saturdays. There are 40 machines in the room.

		Per annum
Power	Rs.	3120
Lighting		640
Salaries of foremen		1200
Lubricating oil	66	
Repairs of machines		1446
Depreciation		785
Total		7257

Answer: Overhead rate Rs. 0.09 per mach hour

Question 13. CS Inter Dec 1992

A machine is purchased for cash at Rs. 9200. Its working life is estimated to be 18000 hours after which its scrap value is estimated at Rs. 200. It is assumed from past experience that:

i) The machine will work for 1800 hours annually.

ii) The repair charges will be Rs. 1080 during the whole period of life of the machine.

iii) The power consumption will be 5 units per hour at 6 paisa per unit.

iv) Other annual standing charges are estimated to be:

a) Rent of department (machine 1/5 th) Rs. 780

b) Light (12 points in the department – 2 points engaged in the machine) 288

c) Foreman's salary (1/4 th of the his time is occupied in the machine) 6000

d) Insurance premium (fire) for machinery 36

e) Cotton waste 60

Find out the machine hour rate on the basis of above data for allocation of the works expenses to all jobs for which the machine is used.

Answer: Overhead rate Rs. 1.86 per mach.

Question 14. CA Inter Nov 1986 ; ICWA Inter Dec 1990

A machine shop has 8 identical Drilling machines manned by 6 operators. The machine cannot be worked without an operator wholly engaged on it. The original cost of all these machines works out to Rs. 8 lakhs. These particulars are furnished for a 6 months period.

Normal available hours per month	208
Absenteeism (without pay) hours	18
Leave (with pay) hours	20
Normal idle time unavoidable-hours	10
Average rate of wages per worker for 8 hours a day	Rs. 20
Production bonus estimated	15% on wages
Value of power consumed	Rs. 8,050
Supervision and indirect labour	Rs. 3,300
Lighting and electricity	Rs. 1,200

These particulars are for a year

Repair and maintenance including consumables 3% of value of machines.

Insurance Rs. 40,000

Depreciation 10% of original cost

Other sundry works expenses Rs. 12,000

General management expenses allocated Rs. 54,350

You are required to work out a comprehensive machine hour rate for the machine shop.

Answer: 23.87 per hour

Question 15. CA Inter May, 1987

Gemini enterprises undertakes three different jobs a, b and c. all of them required, the use of a special machine and also the use of a computer. The computer is hired and the hire charges work out to Rs. 4,20,000 per annum. The expenses regarding the machine are estimated as follows :

	Rs.
Rent for the quarter	17,500
Depreciation per annum	2,00,000
Indirect charges per annum	1,50,000

During the first month of operation the following details were taken from the job register.

	Job		
	A	**B**	**C**
Number of hours the machine was used :			
(a) Without the use of the computer	600	900	----
(b) With the use of the computer	400	600	1000

You are required to compute the machine hour rate :

(a) For the firm as a whole for the month when the computer was used and when the computer was not used.

(b) For the individual jobs A, B and C.

Answer: Mach. hour rate 10 without comp ; Rs. 27.5 with comp. Job cost Rs. 17000 , 25500 , 27500 resp.

Question 16.

From the details furnished below you are required to compute a comprehensive machine hour rate:

Original purchase price of the machine (subject to depreciation at 10% per annum on original cost)
Rs. 324000

Normal working hours for the month (the mach, works to only 75% of capacity)
200 hours

Wages of machine man Rs. 125 per day (of 8 hours)

Wages for helper (machine attendant) Rs. 75 per day (of 8 hours)

Power cost for the month for the time worked Rs. 15000

Supervision charges apportioned for the machine center for the month
Rs. 3000

Electricity & Lighting for the month Rs. 7500

Repair & maintenance (machine) including Consumable stores per month
Rs. 17500

Insurance of Plant &Building (apportioned) for the year
Rs. 16250

Other general expense per annum Rs. 27500

The worker are paid a fixed dearness allowance of Rs. 1575 per month. Production bonus payable to workers in terms of an award is equal to 33.33% of basic wages and dearness allowance. Add 10% of the basic wage and dearness allowance against leave wages and holidays with pay to arrive at a comprehensive labour - wage for debit to production.

Answer: Fixed cost 16845.84 p.m , 112.31 p.h ; Variable cost Rs. 406.86 p.h ; Effective mach. working hr p.m – 150 hr ; wages per mach. hr Rs. 44.91 , Rs. 32.97

Question 17. **CA, PEII , May 2003**

PQR Ltd. has its own power plant, which has two users, Cutting Department and Welding Department. When the plans were prepared for the power pant, top management decided that its practical capacity should be 1,50,000 machine-hours. Annual budgeted practical capacity fixed costs are Rs. 90,000 and budgeted variable costs are Rs. 4 per machine-hour. The following data are available :

	Cutting Department	**Welding Department**	**Total**
Actual usage In 2002-03 (machine hours)	60000	40000	100000
Practical capacity for each department (machine hours)	90000	60000	150000

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 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 fixed-costs rate is calculated using practical capacity, but fixed costs are allocated to the cutting and welding department based on actual usages. Variable costs are allocated based on actual usages.

(iv) Comment on your results in requirement (i), (ii) and (iii).

Answer: i) 600000 , 400000 ; ii) 780000, 520000 ; iii) 600000 , 400000

Question 18. **Nov. 2007**

A machine shop cost centre contains three machines of equal capacities. Three operators are employed on each machine, payable Rs. 20 per hour each. The factory works for forty – eight hours in a week which includes 4 hours setup time. The work is jointly done by operators. The operators are paid fully for the forty-eight hours. In additions they are paid a bonus of 10 per cent of productive time. Costs are reported for this company on the basis of thirteen four-weekly period.

The company for the purpose of computing machine hour rate includes the direct wages of the operator and also recoups the factory overheads allocated to the machines. The following details of factory overheads applicable to the cost centre are available :

- Depreciation 10% per annum on original cost of the machine. Original cost of the each machine is Rs. 52,000
- Maintenance and repairs per week machine is Rs. 60.
- Consumable stores per week per machine are Rs. 75.
- Power : 20 units per hour per machine at the rate of 80 paise per unit.
- Apportionment to the cost centre: Rent per annum Rs. 5,400, Heat and Light per annum Rs. 9,720, and foreman's salary per annum Rs. 12,960.

Required :

(i) Calculate the cost of running one machine for a four week period.

(ii) Calculate machine hour rate.

Answer:

Question 19. **CA. Inter May 1997**

X Ltd. having fifteen different types of automatic machines furnishes information as under for 1996-97 :

(i) Overhead expenses: Factory rent Rs. 96,000 (Floor area 80,000 sq. ft.), Heat ad gas Rs. 45,000 and supervision Rs. 1,20,000.

(ii) Wages of the operator are Rs. 48 per day of 8 hours. He attends to one machine when it is under set up and two machines while they are under operation. In respect of machine B)one of the above machines) the following particulars are furnished :

(i) Cost of machine Rs. 45,000, Life of machine – 10 years and scrap value at the end of its life Rs. 5,000.

(ii) Annual expenses on special equipment attached to the machine are estimated at Rs. 3,000.

(iii) Estimated operation time of the machine is 3,600 hours while set up time is 400 hours per annum.

(iv) The machine occupies 5,000 sq. ft. of floor area.

(v) Power costs Rs. 2 per hour while machine is in operation.

Find out the comprehensive machine hour rate of machine B. Also find out machine costs to be absorbed in respect of use of machine B on the following two work-orders :

	Work-order 31	**Work-order 32**
Machine set up time (Hours)	10	20
Machine operation time (Hours)	90	180

Answer: Rs. 12 , Rs. 11 per mach. hour

Question 20. **CA. Inter May 2002**

In a factory, a machine is considered to work for 208 hours in a month. It includes maintenance time of 8 hours and set up time of 20 hours. The expenses data relating to the machine are as under :

- Cost of machine is Rs. 5,00,000. Life 10 years . Estimated scrap value at the end of life is Rs. 20,000.
- Repairs and maintenance per annum Rs. 60,480
- Consumable stores per annum Rs. 47,520
- Rent of building per annum (The machine under reference occupies 1/6 of the area) Rs. 72,000
- Supervisor's salary per month (Common to three machine) Rs. 6,000
- Wages of operator per month per machine Rs. 2,500
- General lighting charges per month allocated to the machine Rs. 1,000
- Power 25 units per hour at Rs. 2 per unit.

Power is required for productive purpose only. Set up time, though productive, does not require power. The supervisor and Operator are permanent. Repairs and maintenance and consumable stores vary with the running of the machine.

Required: Calculate a two-tier machine hour rate for (a) set up time, and (b) running time.

Answer: Rs. 52.5 , Rs. 152.5 per mach. hour.

Question 21. **CA Inter Nov 1999**

ABC Ltd. manufactures a single product and absorbs the production overheads at a pre-determined rate of Rs.10 per machine hour.

At the end of financial year 1998-99, it has been found that actual production overheads incurred were Rs.600000. It included Rs.45000 on account of 'written off' obsolete stores and Rs.30000 being the wages paid for the strike period under an award.

The production and sales data for the year 1998-99 is as under:

Production:

Finished goods	20000 units
Work-in-progress (50% complete in all respects)	8000 units

Sales:

Finished goods	18000 units

The actual machine hours worked during the period were 48000. It has been found that one-third of the under-absorption of production overheads was due to lack of production planning and the rest was attributable to normal increase in costs.

(i) Calculate the amount of under-absorption of production overheads during the year 1998-99; and

(ii) Show the accounting treatment of under-absorption of production overheads.

Answer: Under Rec. Rs. 15000

Question 22. CA. PE II May 2005

A manufacturing unit has purchased and installed a new machine of Rs. 1270000 to its fleet of 7 existing machines. The new machine has an estimated life of 12 year and is expected to realize Rs. 70000 as scrap at the end of its working life. Other relevant data are as follows :

(i) Budgeted working hours are 2592 based on 8 hours per day for 324 days. This includes 300 hours for plant maintenance and 92 hour for setting up of plant.

(ii) Estimated cost of maintenance of the machine is Rs. 25000 p.a .

(iii) The machine requires a special chemical solution, which is replaced at the end of each week (6 days in a week) at a cost of Rs. 400 each time.

(iv) Four operators control operation of 8 machines and the average wages per person amount to Rs. 420 per week plus 15% fringe benefits.

(v) Electricity used by the machine during the production is 16 units per hour at a cost of Rs. 3 per unit. no current is taken during maintenance and setting up.

(vi) Departmental and general works overhead allocated to the operation during last year was Rs. 50000. During the current year it is estimated to increase 10% of this amount.

Calculate machine hour rate , if (a) setting up time is unproductive; (b) setting up time is productive.

Answer: Fixed cost of mach. – 66516 ; Setting up time is unproductive – 123.690 ; Setting up time is productive – 118.724

Question 23. CA, Inter ,Nov 1994

A factory has three production departments. The policy of the factory is to recover the production overheads of the entire factory by adopting a single blanket rate based on the percentage of total factory overheads to total factory wages. The relevant data for a month are given below:

Department	*Direct Materials*	*Direct wages*	*Factory overheads*	*Direct labour hours*	*Machine hours*
	Rs.	*Rs.*	*Rs.*	*Hour*	
Budget					
Machining	650000	80000	360000	20000	80000
Assembly	170000	550000	140000	100000	10000
Packing	100000	70000	125000	50000	–
Actuals					
Machining	780000	96000	390000	24000	96000
Assembly	136000	270000	84000	90000	11000
Packing	120000	90000	135000	60000	–

The details of one of the representative jobs produced during the month are as under:

Job No. CW 7083:

Department	Direct Materials	Direct wages	Direct labour	Machine hours

	Rs.	Rs.	hours	
Machining	1200	240	60	180
Assembly	600	360	120	30
Packing	300	60	40	–

The factory adds 30% on the factory cost to cover administration and selling overheads and profit.

Required:

(i) Calculate the overhead absorption rate as per the current policy of the company and determine the selling price of the Job No. CW 7083

(ii) Suggest any suitable alternative method(s) of absorption of the factory overheads and calculate the overhead recovery rates based on the method(s) so recommended by you.

(iii) Determine the selling price of Job CW 7083 based on the overhead application rates calculated in (ii) above.

(iv) Calculate the department wise and total under or over recovery of overheads based on the company's current policy and the method(s) recommended by you.

Answer: i) Overhead Rec. rate – 125% of DLC , Selling price – Rs. 4661 ; ii) MHR Rs. 4.50 p.h , 1.40 p.h , Rs. 2.5 p.h , selling price Rs. 4989.40 ; iii) 270000(ur) , 253500(or), 22500 (ur) ; iv) 42000 (or) , 15000 (or).

Question 24. **2011, May [2] (a)**

You are given the following information of the three machines of a manufacturing department of X Ltd.:

Preliminary estimates of expenses

(per annum)

	Total	**Machines**		
		A	B	C
	(Rs)	(Rs)	(Rs)	(Rs)
Depreciation	20,000	7,500	7,500	5,000
Spare parts	10,000	4,000	4,000	2,000
Power	40,000			
Consumable stores	8,000	3,000	2,500	2,500
Insurance of machinery	8,000			
Indirect labour	20,000			
Building maintenance expenses	20,000			
Annual interest on capital outlay	50,000	20,000	20,000	10,000
Monthly charge for rent and rates	10,000			
Salary of foreman (per month)	20,000			
Salary of Attendant (per month)	5,000			

(The foreman and the attendant control all the three machines and spend equal time on them.)

The following additional information is also available :

	Machines		
	A	**B**	**C**
Estimated Direct Labour Hours	1,00,000	1,50,000	1,50,000
Ratio of K.W. Rating	3	2	3
Floor space (sq. ft.)	40,000	40,000	20,000

There are 12 holidays besides Sundays in the year, of which two were on Saturdays. The manufacturing department works 8 hours in a day but Saturdays are half days. All machines work at 90% capacity throughout the year and 2% is reasonable for breakdown.

You are required to :

Calculate predetermined machine hour rates for the above machines after taking into consideration the following factors :

- An increase of 15% in the price of spare parts.
- An increase of 25% in the consumption of spare parts for machine 'B' & 'C' only.
- 20% general increase in wages rates.

Question 25. **CA Inter May 1996**

A company is making a study of the relative profitability of the two products A and B. In addition to direct cost , indirect selling and distribution cost to be allocated between the two products are as under :

Insurance charges for inventories (finished)	Rs.	78000
Steerage cost		140000
Packing and forwarding charges		720000
Salesmen salaries		850000
Invoicing cost		450000

Other details are :

		Product A		**Product B**
Selling Price per unit	Rs.	500	Rs.	1000
Cost per unit (exclusive of Indirect selling and Distribution cost)		300		600
Annual sales in units		10000		8000
Average inventory(units)		1000		800
No. of invoices		2500		2000

One unit of product A requires a storage twice as product B. The cost to packing and forwarding one unit is the same for both the products. Salesmen are paid salary plus commission at the rate of 5% on sales and equal amount of efforts are put forth on the sales of the product.

Required :

i) Set up a schedule showing the apportionment of the indirect selling and distribution cost between the two products.

ii) Prepare a statement showing the relative profitability of the two products.

Answer : i) 1455000, 1433000 ii) 10.9%, 22.08%

Question26

M.L. Auto Ltd. is a manufacturer of auto components and the details of its expenses for the year 2014 and given below :

	(₹)
Opening Stock of Material	1,50,000
Closing Stock of Material	2,00,000
Purchase of Material	18,50,000
Direct Labour	9,50,000
Factory Overhead	3,80,000
Administrative Overhead	2,50,400

During 2015, the company has received an order from a car manufacturer where it estimates that the cost of material and labour will be ₹ 8,00,000 and ₹ 4,50,000 respectively. M.L. Auto Ltd. charges factory overhead as a percentage of direct labour and administrative overhead as a percentage of factory cost based on previous year's cost.

Cost of delivery of the components at customer's premises is estimated at ₹ 45,000.

You are required to :

(i) Calculate the overhead recovery rates based on actual cost for 2014.

(ii) Prepare a detailed cost statement for the order received in 2015 and the price to be quoted if the company wants to earn a profit of 10% on sales.

Question 27

A machine was purchased from a manufacturer who claimed that his machine could produce 36.5 tonnes in a year consisting of 365 days. Holidays, break-down, etc., were normally allowed in the factory for 65 days. Sales were expected to be 25 tonnes during the year and the plant actually produced 25.2 tonnes during the year. You are required to state the following figures:

(a) Rated Capacity.

(b) Practical Capacity.

(c) Normal Capacity.

(d) Actual Capacity.

FOR YOUR PRACTICE

Question 1.

The ABC Company has the following account balances and distribution of direct charges on 31st March, 1999

		Production Depts.		Service Depts.	
	Total	**Machine Shop**	**Packing**	**Gen. Plant**	**Store & Main.**
Allocated Overheads:	Rs.	Rs.	Rs.	Rs.	Rs.
Indirect labour	14650	4000	3000	2000	5650
Maintenance material	5020	1800	700	1020	1500
Misc. supplies	1750	400	1000	150	200
Superintendent's salary	4000	-	-	4000	–
Cost & payroll salary	10000	-	-	10000	–
Overheads to be apportioned:					
Power	8000				
Rent	12000				
Fuel and heat	6000				
Insurance	1000				
Taxes	2000				
Depreciation	100000				
	164420	6200	4700	17170	7350

The following data were compiled by means of the factory survey made in the previous year:

	Floor Space	Radiator Sections	No. of Employees	Investment Rs.	H.P. hours
Machine Shop	2000 Sq.ft.	45	20	640000	3500
Packing	800 ””	90	10	200000	500
General Plant	400 ””	30	3	10000	–
Store & Maint.	1600 ””	60	5	150000	1000
	4800 ””	225	38	1000000	5000

Expenses charged to the stores and maintenance departments are to be distributed to the other departments by the following percentages:

Machine shop 50%; Packing 20%; General Plant 30%; General Plant Overheads is distributed on the basis of number of employees:

a) Prepare an overhead distribution statement with supporting schedules to show computations and basis of distribution including distribution of the service department expenses to producing department.

b) Determine the service department distribution by the method of continued distribution carry through 3 cycles. Show all calculations to the nearest rupee.

Solution

				Prod. Dept.		Service Dept.	
Particulars	Amt.	Basis	Ratio	M/S	Packing	GP	S/M
Indirect wages	14650	-	-	4000	3000	2000	5650
Maintenance material	5020	-	-	1800	700	1020	1500
Miscellaneous Supplier	1750	-	-	400	1000	150	200
Superitendent's salary	4000	-	-	-	-	4000	-
Cost & Payroll salary	10000	-	-	-	-	10000	-
Power	8000	Capital × hrs. or H.P. hrs.	7 : 1 : 0 : 2	5600	800	-	1600
Rent	12000	Area	5 : 2 : 1 : 4	5000	2000	1000	4000
Fuel & Heat	6000	Radiator sections	3 : 6 : 2 : 4	1200	2400	800	1600
Insurance	1000	Total Asset. (Investment)	64 : 20 : 1 : 15	640	200	10	150
Taxes	2000	Total assets	64 : 20 : 1 : 15	1280	400	20	300
Dep.	100000	Total assets	64 : 20 : 1 : 15	64000	20000	1000	15000
O/H as per primary dist.	164420			83920	30500	20000	30000
O/H of GP distributed		Services	4 : 2 : 1	11429	5714	(20000)	2857
O/H of S/M distributed		Services	50 : 20 : 30	16429	6571	9857	(32857)
O/H of GP distributed		Services	4 : 2 : 1	5633	2816	(9857)	1408
O/H of S/M distributed		Services	50 : 20 : 30	704	282	422	(1408)
O/H of GP distributed		Services	4 : 2 : 1	241	121	(422)	60
O/H of S/M distributed		Services	50 : 20	43	17	-	(60)
O/H as per secondary distribution				118399	46021	-	-

Question 2.

XL Ltd. has three production departments and four service departments. The expenses for these departments as per Primary Distribution Summary are as follows:

Production Departments:

	Rs.	**Rs.**
A	30000	
B	26000	
C	24000	80000

Service Departments:

	Rs.	**Rs.**
Stores	4000	
Time-keeping and Accounts	3000	
Power	1600	
Canteen	1000	9600

The following information is also available in respect of the production departments:

	Dept. A	*Dept.B*	*Dept. C*
Horse power of Machine	300	300	200
Number of workers	20	15	15
Value of stores requisition in (Rs.)	2500	1500	1000

Apportion the costs of service departments over the production departments.

Solution

Statement for primary & Secondary Distribution of Overheads

				Prod. Dept.			Service Dept.			
Particulars	Amt.	Basis	Ratio	A	B	C	Stores	Time keep.	Power	Canteen
O/H as per primary	89600	-	-	30000	26000	24000	4000	3000	1600	1000
O/H of stores distributed		Value	5 : 3 : 2	2000	1200	800	(4000)	-	-	-
O/H of Timekeeping distributed		No. of workers	4 : 3 : 3	1200	900	900	-	(3000)	-	-
O/H of Power dist.		Horse power	3 : 3 : 2	600	600	400	-	-	(1600)	-
O/H of Cantteen dist.		No. of worker	4 : 3 : 3	400	300	300	-	-	-	(1000)
O/H as per secondary distribution				84200	29000	26400	-	-	-	-

Question 3.

PH Ltd., is a manufacturing company having three production departments, 'A', 'B' and 'C' and two service departments 'X' and 'Y'. The following is the budget for December 1999:-

	Total	**A**	**B**	**C**	**X**	**Y**
	Rs.	**Rs.**	**Rs.**	**Rs.**	**Rs.**	**Rs.**
Direct material		1000	2000	4000	2000	1000
Direct wages		5000	2000	8000	1000	2000
Factory rent	4000					
Power	2500					
Depreciation	1000					
Other overheads	9000					
Additional information:						
Area (Sq.ft.)	500	250	500	250	500	
Capital value (Rs. lacs) of assets	20	40	20	10	10	
Machine hours	1000	2000	4000	1000	1000	
Horse power of mach.	50	40	20	15	25	

A technical assessment of the apportionment of expenses of service departments is as under:

	A	B	C	X	Y
	%	%	%	%	%
Service Dept. 'X'	45	15	30	–	10
Service Dept. 'Y'	60	35	–	5	–

Required:

(i) A statement showing distribution of overheads to various departments.

(ii) A statement showing re-distribution of service departments expenses to production departments.

(iii) Machine hour rates of the production departments 'A', 'B' and 'C'.

Solution

Statement for Primiary & Secondary Distribution of Overheads

				Prod. Dept.			Service Dept.	
Particulars	Amt.	Basis	Ratio	A	B	C	X	Y
Direct material	3000	-	-	-	-	-	2000	1000
Direct wages	3000	-	-	-	-	-	1000	2000
Rent	4000	Area	2 : 1 : 2 : 1 : 2	1000	500	1000	500	1000
Power	2500	Capacity × hours	50 : 80 : 80 : 15 : 25	500	800	800	150	250
Depreciation	1000	Asset value	2 : 4 : 2 : 1 : 1	200	400	200	100	100
Other Overheads	9000	Direct wages	5 : 2 : 8 : 1 : 2	2500	1000	4000	500	1000
O/H as per primary distribution	22500			4200	2700	6000	4250	5350
O/H of X distributed		Services	45 : 15 : 30 : 10	2043	681	1362	(4540)	454
O/H of Y distributed		Services	60 : 35 : 0 : 5	3482	2032	-	290	(5804)
O/H as per secondary distribution				9725	5413	7362	-	-
Machine Hour				1000	2000	4000		
Machine Hour rate /O/H per machine hour				9.725	2.706	1.8405		

Working note:- Equation Method

Let the total overheads of Dept. X be x.

Let the toal overheads of Dept. Y be y.

$x = 4250 + 0.05y$ ___ (1)

$y = 5350 + 0.10x$ ___ (2)

Put the value of 'x' in eq. (2)

$y = 5350 + 0.10 (4250 + 0.05y)$

$y = 5350 + 425 + 0.005y$

$0.995y = 5775$

(Dept. Y) $y = 5804$

Put the value of 'y' in eq. (1)

$x = 4250 + 0.05 (5804)$

$= 4250 + 290$

(Dept. X) $x = 4540$

Question 4.

Modern Manufacturers Ltd. have three Production Departments P1, P2, P3 and two Service Departments S1 and S2 details pertaining to which are as under:

	P_1	P_2	P_3	S_1	S_2
Direct wages (Rs.)	3000	2000	3000	1500	195
Working hours	3070	4475	2419	-	-
Value of machines (Rs.)	60000	80000	100000	5000	5000
H.P. of machines	60	30	50	10	–
Light points	10	15	20	10	5
Floor space (sq.ft.)	2000	2500	3000	2000	500

The following figures extracted from the Accounting records are relevant:

	Rs.
Rent and Rates	5000
General Lighting	600

Indirect Wages	1939
Power	1500
Depreciation on Machines	10000
Sundries	9695

The expenses of the Service Departments are allocated as under:

	P_1	P_2	P_3	S_1	S_2
S_1	20%	30%	40%	-	10%
S_2	40%	20%	30%	10%	-

Find out the total cost of product X which is processed for manufacture in Departments P1, P2 and P3 for 4,5 and 3 hours respectively, given that its Direct Material Cost is Rs. 50 and Direct Labour Cost is Rs. 30.

Solution

Equation Method –

Let the total overheads of S_1 be x.

Let the total overheads of S_2 be y.

$x = 4700 + 0.1y$ __ (1)

$y = 929 + 0.1x$ __ (2)

$y = 929 + 0.1 (4700 + 0.1y)$

$y = 929 + 470 + 0.01y$

$0.99y = 1399$

(Dept. S_2) $y = 1413$

From equation (1)

$x = 4700 + 0.1 (1413)$

(Dept. S_1) $x = 4841$

(i) Statement for Primary & Secondary Distribution of overhead

				Production Dept.			Service Dept.	
Particulars	Amt.	Basis	Ratio	P_1	P_2	P_3	S_1	S_2
Direct wages	1695	-	-	-	-	-	1500	195
Rent & rates	5000	Area	4 : 5 : 6 : 4 : 1	1000	1250	1500	1000	250
Lighting	600	Light points	2 : 3 : 4 : 2 : 1	100	150	200	100	50
Indirect wages	1939	Direct wages	3000 : 2000 : 3000 : 1500 : 195	600	400	600	300	39
Power	1500	Horse power	6 : 3 : 5 : 1	600	300	500	100	-
Dep. on machines	10000	Value of machine	12 : 16 : 20 : 1 : 1	2400	3200	4000	200	200
Sundry overheads	9695	Direct wages	3000 : 2000 : 3000 : 1500 : 195	3000	2000	3000	1500	195
O/H as per primary distribution	30429			7700	7300	9800	4700	929
O/H of S_1, distributed		Service	20 : 30 : 40 : 10	968	1452	1936	(4841)	484
O/H of S_2 distributed		Service	40 : 20 : 30 : 10	565	424	424	141	(1413)
O/H as per secondary distribution				9233	9035	12,160	-	-
Labour hours/working hours				3070	4475	2419	-	-
Labour hour rate/O/H per labour hour				3	2	5	-	-

(ii) Cost sheet

Direct Material	50
(+) Direct Labour	30

Prime cost	80
(+) Factory overheads :	
P_1 [4 hr × Rs 3]	12
P_2 [5 hr × Rs 2]	10
P_3 [3 hr × Rs 5]	15
Total cost	117

Question 5. **Nov. 1997**

SWEET DREAMS Ltd. uses a historical cost system and absorb overheads on the basis of predetermined rate. The following data are available for the year ended 31st March, 1997:

	Rs.
Manufacturing overheads —	
Amount actually spent	1,70,000
Amount absorbed	1,50,000
Cost of goods sold	3,36,000
Stock of finished goods	96,000
Works-in-progress	48,000

Using two method of disposal of under-absorbed overheads show the implication on the profits of the company under each method.

Working Note 1

Calculation of under recovery of fixed overhead:

Actual factory overhead	1,70,000
(-) Recovered factory overhead	1,50,000
Under recovery of fixed overhead	20,000

Solution

Method 1

Supplementary R/R Approach

A. COS A/c Dr. 14,000
FG A/c Dr. 4,000
WIP A/c Dr. 2,000
To FO A/c 20,000
[14 : 4 : 2]

B. Report : This will Reduce profit by Rs. 14,000.

Method 2

Write off Approach

A. Costing P/L 20,000
To Fixed overhead 20,000

B. Report : This will reduce profit by Rs. 20,000

Question 6. **Nov. 2000**

The total overhead expenses of a factory are Rs. 4,46,380. Taking into account the normal working of the factory, overhead was recovered in production at Rs. 1.25 per hour. The actual hours worked were 2,93,104. How would you proceed to close the books of accounts, assuming that besides 7,800 units produced of which 7,000 were sold, there were sold, there were 200 equivalent units in work-in-progress?

On investigation, it was fond that 50% of the unabsorbed overhead was on account of increase in the cost indirect materials and indirect labour and the remaining 50% was due to factory inefficiency. Also give the profit implication of the method suggested.

Solution

A. Calculation of under recovery of factory overhead:

Total factory overhead	4,46,380

(-) Recovered Factory overhead [2,93,104 × 1.25]	3,66,380
Under recovery of factory overhead	80,000

B. Calculation of under recovery due to price level change:

Total under recovery	80,000
(-) Under recovery due to inefficiency	40,000
Under recovery due to price increase	40,000

C. Allocation of under recovery:

	FG Sold	FG Stock	WIP Stock
No. of units	7,000	800	200
Under recovery dist	35,000	4,000	1,000
Transfer to	COS A/c	FG A/c	WIP A/c

Question 7.

In a factory, overheads of a particular department are recovered on the basis of Rs.5 per machine hour. The total expenses incurred and the actual machine hours for the department for the month of August were Rs.80000 and 10000 hours respectively. Of the amount of Rs.80000, Rs.15000 became payable due to an award of the Labour Court and Rs.5000 was in respect pf expenses of the previous year booked in the current month (August). Actual production was 40000 units, of which 30000 units were sold. On analyzing the reasons, it was found that 60% of the under-absorbed overhead was due to defective planning and the rest was attributed to normal cost increase. How would you treat the under-absorbed overhead in the cost accounts?

Solution

A. Calculation of under recovery of factory overhead:

Total factory overhead	80,000
(-) Award due to Labour court order	15,000
(-) Previous year expences	5,000
	60,000
(-) Recovered fixed overhead [10,000 × 5]	50,000
Under recovery	10,000
(-) Defective planning @ 60%	6,000
Under recovery due to price increase	4,000

B. Allocation of of under recovery:

	FG Sold	FG Stock
No. of units	30,000	10,000
Under recovery fixed overhead (Rs)	3,000	1,000
Transfer to	COS A/c	FG A/c

Question 8.

In a manufacturing unit, factory overhead was recovered at a pre-determined rate of Rs.25 per man- day. The total factory overhead expenses incurred and the man-days actually worked were Rs.41.50 lakhs and 1.5 lakh man-days respectively. Out of the 40000 units produced during a period, 30000 were sold.

On analyzing the reasons, it was found that 60% of the unabsorbed overheads were due to defective planning and the rest were attributable to increase in overhead costs.

How would unabsorbed overheads be treated in Cost Accounts?

Solution

Answer : Under Recovery Rs. 4,00,000.

Question 9. **CAPEII CA Nov. 2002**

In the current quarter , a company has undertaken two jobs. The data relating to the jobs are as under:

	Job No. 1102	Job No. 1108
Selling price	107325	157920
Profit as percentage on cost	8%	12%
Direct Materials	37500	54000
Direct Wages	30000	42000

It is the policy of the company to charge the factory overhead as percentage on direct wages and selling and administration overheads on factory cost.

The company has received a new order for manufacturing a similar job. The estimate of direct material and direct wages relating to the new order are Rs. 64000 and 50000 respectively. A profit of 20% on sale is required.

You are required to compute:

i) The rates of factory overheads and selling and administration overheads to be charged.

ii) The selling price of the new order .

Solution

(i) Computation of factory O/H Rates & Selling & Distribution O/H Rates:

Let the factory O/H recovery rate be 'x' &, Selling & Admin. O/H recovery rate be 'y'.

Jobs Cost Sheet

Particulars	***Job No. 1102***	***Job No. 1108***
Direct Materials	37,5000	54,000
Direct wages	30,000	42,000
Prime Cost	67,500	96,000
Factory O/Hs:		
Factory Expenses	30,000 x	42,000 x
Factory Cost	67,500 + 30,000 x	96,000 + 42,000 x
Selling & Distribution O/Hs:		
Selling & Admin. Cost	(67,500 + 30,000 x) y	(96,000 + 42,000 x
	(67,500 + 30,000 x) (1 + y)	(96,000 + 42,000 x) (1 + y)

(ii) **Computation of total cost of Job No. 1102 & 1108**

Job No. 1102:

Total cost when profit is 8% on cost = $\frac{1,07,325}{108} \times 100$

= Rs. 99,375

Job No. 1108:

Total cost when profit is 12% on cost = $\frac{1,57,920}{112} \times 100$

= Rs. 1,41,000

Job No. 1102:

67,500 + 30,000 x + 67,500 y + 30,000 xy = 99,375

or, 30,000 x + 30,000 xy + 67,500 y = 31,875 …….. (1)

Job No. 1108:

96,000 + 42,000 x + 96,000 y + 42,000 xy = 1,41,000

or, 42,000 x + 96,000 y + 42,000 xy = 45,000 ……. (2)

Multiplying equation (1) by 4.2 & equation (2) by 3 we get,

1,26,000 x + 1,26,000 xy + 2,83,500 y = 1,33,875

1,26,000 x + 1,26,000 xy + 2,88,000 y = 1,35,000

(-) (-) (-)

- 4,500 y = -1,125

$\therefore y = 0.25$

Putting the value of 'y' in e.g. (1), we get,

30,000 x + 30,000 x × 0.25 + 67,500 × 0.25 = 31,875

or, 30,000x + 75,000x + 16,875 = 31,875

37,500x = 15,000

$\therefore x = 0.4$

Hence, Factory O/H Recovery Rate on Direct Wages = 40%, & Selling & Admin. O/H Recovery Rate on factory Cost = 25%.

(iii) Computation of Selling Price of New Order:

Direct materials	64,000
Direct Wages	50,000
Prime Cost	1,14,000
Factory O/H (40% on 50,000)	20,000
Factory Cost	1,34,000
Selling & Admin. O/H (25% on 1,34,000)	33,500
Total Cost	1,67,500
(+) Profit 1,67,500 × 20 / 80	41,875
Selling Price	2,09,375

Question 10. **Nov. 2006**

A Manufacturing Company 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 Rs. 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 Rs. 4,000 per annum for increase of every 5% of the capacity utilization or any part thereof) 60,000

The capacity utilization 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.

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

Working Note:-

Calculation of capacity utilization during the whole period:-

Total Capacity 1,50,000 units per annum (12,500 units per month)

First 3 Month [12,500 × 75% × 3] = 28,125

Next 6 Month [12,500 × 80% × 6] = 60,000

Next 3 Month [12,500 × 90% × 3] = 33,750

Total Production 1,21,875

Capacity utilization (%) = 1,21,875 × 100 = 81.25%

1,50,000

In this situation the semi-variable overhead will be Rs. 68,000.

Solution

Direct material	[10 × 1,21,875]	= 12,18,750
Direct labour	[(1,00,000 × 3) + (10,000 × 10 × 6) + (11,250 × 10 × 3)]	= 12,37,500
Variable overhead	[1,21,875 × 4]	= 4,87,500
Fixed overhead		= 1,92,300
Semi-variable overhead		= 68,000
Total cost		= 32,04,050
(+) Profit	20/80 × 32,04,050	= 8,01,012.5
Sales		= 40,05,062.5
Units		= 1,21,875 units
Selling price p.u.		= 32.86

Question 11.

Job No. 198 was commenced on October 10,1998 and completed on November 1,1998. Materials used were Rs.600 and labour charged directly to the job was Rs. 400. Other information is as follows:

Machine No. 215 used for 40 hours, the machine hour rate being Rs. 3.50.

Machine No. 160 used for 30 hours, the machine hour rate being Rs. 4.00. 6 welders worked on the job for five days of 8 hours each: the Direct labour hour per welder is 20 P.

Expenses not included for calculating the machine hour or direct labour hour rate totaled Rs. 2000, total direct wages for the period being Rs. 20000. Ascertain the works costs of job No. 198.

Solution

Working Note:-

Calculation of Recovery rate for other expenses–

Recovery rate = 2000/20,000 × 100 = 10% of direct labour cost

(% of direct labour cost method)

	Workings	**Job 198**
Direct material		600
Direct labour		400
Prime cost		1,000
Factory overhead:		
Machine No.	215 [40 × 3.5]	140
Machine No.	160 [30 × 4]	120
Welding dept	[240 × 0.20]	48
Other dept	[400 × 10%]	40
Works cost		1,348

Question 12. **2011, November**

X Ltd. recovers overheads at a pre-determined rate of Rs 50 per man-day. The total factory overheads incurred and the man-days actually worked were Rs 79 lakhs and 1.5 lakhs days respectively. During the period 30,000 units were sold. At the end of the period 5,000 completed units were held in stock but there was no opening stock of finished goods. Similarly, there was no stock of uncompleted units at the beginning of the period but at the end of the period there were 10,000 uncompleted units which may be treated as 50% complete.

On analyzing the reasons. It was found that 60% of the unabsorbed overheads were due to defective planning and the balance were attributable to increase in overhead cost.

How would unabsorbed overheads be treated in cost accounts ?

Solution :

Absorbed overheads	=	Actual Man-day X Rate per day
	=	1,50,000 days X ₹ 50
	=	₹ 75,00,000
Under absorption of overheads	=	Actual overheads – Absorbed overheads
	=	₹ 79,00,000 - ₹ 75,00,000
	=	₹ 4,00,000

Reasons for under – absorption :

1. Defective Planning ₹ 4,00,000 X 60% = ₹ 2,40,000
2. Increase in overhead cost ₹ 4,00,000 X 40% = ₹ 1,60,000

Treatment in cost Accounts :

(i) The unabsorbed overheads of ₹ 2,40,000 on account of defective planning to be treated as abnormal and thus be charged to Costing profit & loss account.

(ii) The balance of unabsorbed overheads i.e. ₹ 1,60,000 be charged as below on the basis of supplementary overhead absorption rate

Supplementary Rate = ₹ 1,60,000 ÷ {30,000 units + 5,000 units + (50 of 10,000 units) = ₹ 4}

(a).	To Cost of sales Account = ₹ 1,20,000	=30,000 units X ₹ 4
(b).	To Finished stock account = ₹ 20,000	=5,000 units X ₹ 4
(c). ₹ 4	To WIP Account = ₹ 20,000	=50% of 10,000 units X
	₹ 1,60,000	

Question 13

A machine costing ₹ 10 lakhs, was purchased on 01.04.2014. The expected life of the machine is 10 years. At the end of this period its scrap value is likely to be ₹ 10,000. The total cost of all the machines including new one was ₹ 90 lakhs.

The other information is given as follows:

(i) Working hours of the machine for the year was 4,200 including 200 non-productive hours.

(ii) Repairs and maintenance for the new machine during the year was ₹ 5,000.

(iii) Insurance Premium was paid for all the machine ₹ 9,000.

(iv) New machine consumes 8 units of electricity per hour, the rate per unit being ₹ 3.75

(v) The new machine occupies area of the department. Rent of the department is ₹ 2,400 per month.

(vi) Depreciation is charged on straight line basis.

Compute machine hour rate for the new machine.

Solution :

Computation of machine hour rate of new Machine :

	Total (₹)	**Per hour (₹)**
A. Standing Charges	1,000	
I. Insurance Premium ₹ 9,000 X $\frac{1}{9}$		
II. Rent $\frac{1}{10}$ X ₹ 2,400 X 12 months	2,880	

	3,880	0.97*
B. Machine Expenses		
I. Repairs and Maintenance (₹ 5,000 ÷ 4,000 hours)		1.25
II. Depreciation $\left[\frac{Rs.10,00,000 - Rs.10,000}{10\ years \times 4,000\ hours}\right]$		24.75
III. Electricity (8 units X ₹ 3.75)		30.00
Machine hour rate		56.97

Working Note :

1. Calculation of productive Machine hour rate

Total hours	4,200
Less : Non-Productive hours	200
Effective Machine hour	4,000

* ₹ 3,880 ÷ 4,000 hours = ₹ 0.97

Question14

PQR manufacturers – a small scale enterprise produces a single product and has adopted a policy to recover the production overheads of the factory by adopting a single blanket rate based on machine hours. The budgeted production overheads of the factory are ₹ 10,08,000 and budgeted machine hours are 96,000.

For a period of first six months of the financial year 2013-2014, following information were extracted from the books:

Actual production overheads	₹ 6,79,000
Amount included in the production overheads:	
Paid as per court's order	₹ 45,000
Expenses of previous year booked in current year	₹ 10,000
Paid to workers for strike period under an award	₹ 42,000
Obsolete stores written off	₹ 18,000

Production and sales data of the concern for the first six months are as under:

Production:

Finished goods	22,000 units
Works-in-progress (50% complete in every respect)	16,000 units

Sale:

Finished goods	18,000 units

The actual machine hours worked during the period were 48,000 hours. It is revealed from the analysis of information that ¼ of the under-absorption was due to defective production policies and the balance was attributable to increase in costs.

You are required:

(i) to determine the amount of under absorption of production overheads for the period,

(ii) to show the accounting treatment of under-absorption of production overheads, and

(iii) to apportion the unabsorbed overheads over the items.

Solution :

(i) Amount of under absorption of production overheads during the period of first six months of the year 2013-2014 :

	Amount (₹)	Amount (₹)
Total production overheads actually incurred during the period		6,79,000
Less : Amount paid to worker as per court order	45,000	
Expenses of previous year booked in the current year	10,000	
Wages paid for the strike period under an award	42,000	
Obsolete stores written off	18,000	1,15,000
		5,64,000
Less : Production overheads absorbed as per machine hour rate (48,000 hours X ₹ 10.50*)		5,04,000
Amount of under absorbed production overheads		60,000

Budgeted Machine hour rate (Blanket rate) = $\frac{\text{Rs. 10,08,000}}{\text{96,000 hours}}$ = ₹ 10.50 per hour

(ii) **Accounting treatment of under absorbed production overheads :** as, one fourth of the under absorbed overheads were due to defective production policies, this being abnormal, hence should be debited to Costing Profit and Loss Account.

Amount to be debited to Costing Profit and Loss Account=(60,000 * ¼) ₹ 15,000.

Balance of under absorbed production overhead should be distributed over Works in progress, Finished goods and Cost of sales by applying supplementary rate*.

Amount to be distributed = (60,000 * ¾) ₹ 45,000.

Supplementary rate = $\frac{\text{Rs.45,000}}{\text{30,000 units}}$ = ₹ 1.50 per unit

(iii) Apportionment of under absorbed production overheads over WIP, Finished goods and Cost of sales :

	Equivalent Completed units	Amount (₹)
Work in Progress (16,000 units X 50% X 1.50)	8,000	12,000
Finished goods (4,000 units X 1.50)	4,000	6,000
Cost of sales (18,000 units X 1.50)	18,000	27,000
Total	30,000	45,000

Question 15

Arnav Ltd. has three production departments M, N and O and two service departments P and Q. The following particulars are available for the month of September, 2013:

	(₹)
Lease rental	35,000
Power & Fuel	4,20,000
Wages to factory supervisor	6,400
Electricity	5,600
Depreciation on machinery	16,100
Depreciation on building	18,000

Payroll expenses	21,000
Canteen expenses	28,000
ESI and Provident Fund Contribution	58,000

Followings are the further details available:

Particulars	M	N	O	P	Q
Floor space (square meter)	1,200	1,000	1,600	400	800
Light points (nos.)	42	52	32	18	16
Cost of machines (₹)	12,00,000	10,00,000	14,00,000	4,00,000	6,00,000
No. of employees (nos.)	48	52	45	15	25
Direct Wages (₹)	1,72,800	1,66,400	1,53,000	36,000	53,000
HP of Machines	150	180	120	-	-
Working hours (hours)	1,240	1,600	1,200	1,440	1,440

The expenses of service department are to be allocated in the following manner:

	M	N	O	P	Q
P	30%	35%	25%	-	10%
Q	40%	25%	20%	15%	-

You are required to calculate the overhead absorption rate per hour in respect of the three production departments.

Solution :

Primary Distribution Summary

Item of cost	Basis of apportionment	Total (₹)	Production Dept.			Service Dept.	
			M (₹)	N (₹)	O (₹)	P (₹)	Q (₹)
Lease rental	Floor space (6 : 5 : 8 : 2 : 4)	35,000	8,400	7,000	11,200	2,800	5,600
Power & Fuel	HP of Machines X Working hours (93 : 144 : 72)	4,20,000	1,26,408	1,95,728	97,864	-	-
Supervisor's wages*	Working hours (31 : 40 : 30)	6,400	1,964	2,535	1,901	-	-
Electricity	Light points (21 : 26 : 16 : 9 : 8)	5,600	1,470	1,820	1,120	630	560
Depreciation on machinery	Value of machinery (6 : 5 : 7 : 2 : 3)	16,100	4,200	3,500	4,900	1,400	2,100
Depreciation on building	Floor Space (6 : 5 : 8 : 2 : 4)	18,000	4,320	3,600	5,760	1,440	2,880
Payroll expenses	No. of employees (48 : 52 : 45 : 15 : 25)	21,000	5,448	5,903	5,108	1,703	2,838
Canteen expenses	No. of employees (48 : 52 : 45 : 15 : 25)	28,000	7,265	7,870	6,811	2,270	3,784
ESI and PF contribution	Direct wages (864 : 832 : 765 : 180 : 265)	58,000	17,244	16,606	15,268	3,593	5,289
		6,08,100	**1,76,719**	**2,44,562**	**1,49,932**	**13,836**	**23,051**

* Wages to supervisor is to be distributed to production departments only.

Let ‘P’ be the overhead of service department P and ‘Q’ be the overhead of service department Q.

P = 13,836 + 0.15 Q

Q = 23,051 + 0.10 P

Substituting the value of Q in P we get

P = 13,836 + 0.15 (23,051 + 0.10 P)

P = 23,051 + 3,457.65 + 0.015 P

0.985 P = 17,293.65

∴ P = ₹ 17,557

∴ Q = 23,051 + 0.10 X 17,557

= ₹ 24,806.70 or ₹ 24,807

Secondary Distribution Summary

Particulars	Total (₹)	M (₹)	N (₹)	O (₹)
Allocated and Apportioned over-heads as per primary distribution	5,71,213	1,76,719	2,44,562	1,49,932
P (90% of ₹ 17,557)	15,801	5,267	6,145	4,389
Q (85% of ₹ 24,807)	21,086	9,923	6,202	4,961
		1,91,909	**2,56,909**	**1,59,282**

Overhead rate per hour

	M	N	O
Total overheads cost (₹)	1,91,909	2,56,909	1,59,282
Working hours	1,240	1,600	1,200
Rate per hour (₹)	154.77	160.57	132.74

NON INTEGRATED ACCOUNTS

4

Question 1.

The following balances are shown in cost ledger at Ist January 1993.

		Dr.	Cr.
Finished goods ledger control account	Rs.	20000	Rs.
Work in progress ledger control account		40000	
Stores ledger control A/c		100000	160000
General ledger adjustment account		160000	160000

Transactions for the year ended 31st December, 1993 were:

Purchase of materials		590000
Purchase of materials for special jobs		36000
Returns to suppliers from stores		4000
Wages/salaries paid :		
Direct	410000	
Factory indirect	90000	
Administration staff	78000	
Selling & distribution	48000	
Abnormal idle time	6000	632000
Expenses (direct)		44000
Production expenses		102000
Administration expenses		82000
Selling & distribution expenses		52000
Material issued to production		610000
Material lost by fire from stores		8000
Stores issued to maintenance		26000
Production overhead applied to production		20% on prime cost
Administration overhead recovered from finished goods		156000
Selling & distribution overhead recovered from cost of sales at 6.5% on sales value		
Finished goods produced		1320000
Finished goods sold at cost		1400000
Sales		1600000

Write up the necessary accounts in the cost ledger to record the above transactions and prepare a Trial Balance as at 31st December, 1993.

Answer: Net Profit Rs.84000

Question 2.

On 31st March, 1989 the following balances were extracted from the books of the Supreme Manufacturing Company:

	Dr.	Cr.
	Rs.	Rs.
Stores ledger Control A/c	35000	
Work in Progress Control A/c	38000	

Finished Goods control A/c	25000	
Cost ledger control A/c		98000
	98000	98000

The following transactions took place in April, 1989:

Raw Materials:	
Purchased	95000
Returned to suppliers	3000
Issued to production	98000
Returned to stores	3000
Productive wages	40000
Indirect labour	25000
Factory overhead expenses incurred	50000
Selling and Administrative expenses	40000
Cost of finished goods transferred to warehouse	213000
Cost of goods sold	210000
Sales	300000

Factory overheads are applied to production at 150% of direct wages, any under/over absorbed overhead being carried forward for adjustment in the subsequent months. All administrative and selling expenses are treated as period costs and charged off to the Profit and Loss Account of the month in which they are incurred.

Show the following Accounts:

(a) Cost Ledger A/c; (b) Stores Ledger Control A/c; (c) Work in Progress Control A/c; (d) Finished Goods Stock Control A/c; (e) Factory Overhead Control A/c; (f) Costing Profit and Loss Account; (g) Trial Balance as at 30th April, 1989.

Answer: Net Profit Rs.50000

Question 3.

A company operates on historic job cost accounting system, which is not integrated with the financial accounts. At the beginning of a month, the opening balances in cost ledger were:

	Rs.(in lakhs)
Stores Ledger Control Account	80
Work-in-Progress Control Account	20
Finished Goods Control Account	430
Building construction Account	10
Cost Ledger Control Account	540
During the month, the following transactions took place:	
Materials – Purchased	40
Issued to production	50
Issued to general maintenance	6
Issued to building construction	4
Wages – Gross wages paid	150
Indirect wages	40
For building construction	10
Works Overheads – Actual amount incurred (excluding items shown above)	160
Absorbed in building construction	20

Under absorbed	8
Royalty paid	5
Selling, distribution and administration overheads	25
Sales	450

At the end of the month, the stock of raw material and work-in-progress was Rs.55 lakhs and Rs.25 lakhs respectively. The loss arising in the raw material account is treated as factory overheads. The building under construction was completed during the month. Company's gross profit margin is 20% on sales.

Prepare the relevant control accounts to record the above transactions in the cost ledger of the company.

Answer: Net Profit Rs. 57 Lacs.

Question 4.

Acme Manufacturing Co. Ltd. opens the costing records, with the balances as on 1st July, 1998 as follows:

	Rs.	*Rs.*
Materials control A/c	124000	
Work-in-Progress A/c	62500	
Finished Goods A/c	124000	
Production Overheads A/c	8400	
Administration Overhead		12000
Selling and Distribution Overhead A/c	6250	
General Ledger Control A/c		313150
	325150	325150

The following are the transactions for the quarter ended 30th September 1998:

	Rs.
Materials purchased	480100
Materials issued to jobs	477400
Materials to works maintenance	41200
Materials to administration office	3400
Materials to selling department	7200
Wages direct	149300
Wages indirect	65000
Transportation for incoming materials	8400
Production overheads	242250
Absorbed overheads production	359100
Administration overheads	74000
Administration allocation to production	52900
Administration allocation to sales	14800
Sales overheads	64200
Sales overheads absorbed	82000
Finished goods produced	958400
Finished goods sold	977300
Sales Realisation	1443000

Make up the various accounts as you envisage in the Cost Ledger and Prepare a Trial Balance as at 30th September 1998.

Answer: Net Profit Rs.368900

Question 5.

As of 31st March, 2014, the following balances existed in a firm's cost ledger, which is maintained separately on a double entry basis:

	Debit(₹)	Credit(₹)
Stores Ledger Control A/c	3,00,000	--
Work-in-progress Control A/c	1,50,000	--
Finished Goods Control A/c	2,50,000	--
Manufacturing Overhead Control A/c	--	15,000
Cost Ledger Control A/c	--	6,85,000
	7,00,000	7,00,000

During the next quarter, the following items arose:

	(₹)
Finished Product (at cost)	2,25,000
Manufacturing overhead incurred	85,000
Raw material purchased	1,25,000
Factory wages	40,000
Indirect labour	20,000
Cost of sales	1,75,000
Materials issued to production	1,35,000
Sales returned (at cost)	9,000
Materials returned to suppliers	13,000
Manufacturing overhead charged to production	85,000

You are required to prepare the Cost Ledger Control A/c, Stores Ledger Control A/c, Work-in-progress Control A/c, Finished Stock Ledger Control A/c, Manufacturing Overhead Control A/c, Wages Control A/c, Cost of Sales A/c and the Trial Balance at the end of the quarter.

Answer:

Cost ledger control a/c	**9,42,000**	
Stores ledger control a/c		**2,77,000**
WIP control a/c		**1,85,000**
Finished stock ledger control a/c		**3,09,000**
Manufacturing overhead control a/c		**5,000**
Cos a/c		**1,66,000**

Question 6. **2011, May**

You are given the following information of the cost department of a manufacturing company :

Stores :

	Rs
Opening Balance	12,60,000
Purchases	67,20,000
Transfer from work-in-progress	33,60,000
Issue to work-in-progress	67,20,000
Issue to repairs and maintenance	8,40,000
Shortage found in stock taking	2,52,000

Work-in-Progress :

Opening Balance	25,20,000
Direct wages applied	25,20,000
Overhead applied	90,08,000
Closing Balance	15,20,000

Finished products :

Entire output is sold at a profit of 12% on actual cost from work-in-progress.

Other information :

	Rs
Wages incurred	29,40,000
Overhead incurred	95,50,000
Income from Investment	4,00,000
Loss on sale of fixed assets	8,40,000

Shortage in stock taking is treated as normal loss.

You are required to prepare :

(i) Stores control account;

(ii) Work-in-progress control account;

(iii) Costing Profit and Loss account;

(iv) Profit and Loss account and

(v) Reconciliation statement

FOR YOUR PRACTICE

Question 1.

The following balances were extracted from a company's ledger as on 31st December, 1997:

	Rs.	Rs.
Raw materials control A/c	48836	
Work-in-progress control A/c	14745	
Finished stock control A/c	21980	
Nominal ledger control A/c		85561
	85561	85561

Further transactions took place during the following quarter as follows:

	Rs.
Factory overhead – allocated to WIP	11786
Goods finished – at cost	36834
Raw materials purchased	22422
Direct wages – allocated to WIP	18370
Cost of goods sold	42000
Raw materials – issued to production	17000
Raw materials – credited by suppliers	1000
Inventory audit – raw material losses	1300
WIP rejected (with no scrap value)	1800
Customer's returns (at cost) of finished goods	3000

Prepare all the Ledger Accounts in Cost Ledger.

Solution

Raw materials control A/c

Dr.			*Cr.*
Particulars	***Amount Rs.***	***Particulars***	***Amount Rs.***
To Balance b/d	48,836	By W.I.P. control A/c	17,000
To Nominal ledger control a/c	22,422	By Nominal ledger control A/c	1,000
		By Nominal ledger control A/c	1,300
		By Balance c/d	51,958
	71,258		71,258
To Balance b/d	51,958		

Work-in-progress control A/c

Dr.			*Cr.*
Particulars	***Amount Rs.***	***Particulars***	***Amount Rs.***
To Balance b/d	14,745	By Finishing stock control A/c	36,834
To Nominal ledger control a/c	11,786	By Nominal ledger control A/c	1,800
To Raw material control A/c	17,000	By Balance c/d	23,267
To Nominal ledger control A/c	18,370		
	61,901		61,901
To Balance b/d	23,267		

Finished stock control A/c

Dr.			*Cr.*
Particulars	***Amount Rs.***	***Particulars***	***Amount Rs.***
To Balance b/d	21,980	By Nominal ledger control A/c	42,000
To W.I.P. Control A/c	36,834	By Balance c/d	19,814
To Nominal ledger control A/c	3,000		
	61,814		61,814
To Balance b/d	19,814		

Nominal ledger control A/c

Dr.			*Cr.*
Particulars	***Amount Rs.***	***Particulars***	***Amount Rs.***
To Raw material control A/c	1,000	By Balance b/d	85,561
To Raw material control A/c	1,300	By Raw material control A/c	22,422
To Finished stock control A/c	42,000	By W.I.P. control A/c	11,786
To W.I.P. control A/c	1,800	By W.I.P. control A/c	18,370
To Balance c/d	95,039	By Finished stock control A/c	3,000
	1,41,139		1,41,139
		By Balance c/d	95,039

Question 2.

A company operates separate cost accounting and financial accounting systems. The following is the list of Opening balances as on 01.04.2001 in the Cost Ledger:

	Debit	Credit
	Rs.	Rs.
Stores Ledger Control Account	53375	–
WIP control Account	104595	–
Finished Goods control Account	30780	–
General Ledger Adjustment Account	–	188750

Transactions for the quarter ended 30.06.01 are as under:	Rs.
Materials purchased	26700
Materials issued to production	40000
Materials issued for factory repairs	900
Factory wages paid (including indirect wages Rs.23000)	77500
Production overheads incurred	95200
Production overheads under-absorbed and written-off	3200
Sales	256000

The Company's gross profit is 25% on Factory Cost. At the end of the quarter, WIP stocks increased by Rs.7500.

Prepare the relevant Control Accounts, Costing Profit and Loss Account and General Ledger Adjustment Account to record the above transactions for the quarter ended 30.06.2001.

Solution

Cost Ledger Control a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Costing P & L	2,56,000	By Balance b/d	1,88,750
To Balance c/d	1,80,150	By store ledger control	26,700
		By wage control	77,500
		By production overhead	95,200
		By costing P/L	48,000
	4,36,150		4,36,150

Store Ledger Control a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	53,375	By WIP	40,000
To Cost ledger control	26,700	By production overhead	900
		By Balance c/d	39,175
	80,075		80,075

WIP Ledger Control a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	1,04,595	By FG (BF)	2,02,900
To Store ledger control	40,000		
To Wage control	54,500		

To Production overhead	1,15,900		
		By Balance c/d	
	_____	[104595 + 7500]	1,12,095
	3,14,995		3,14,995

FG Ledger Control a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Balance b/d	30,780	By Cost of sale	2,04,800
To WIP Ledger control	2,02,900	100 × 2,56,000	
		125	
	_____	By Balance c/d	28,880
	2,33,680		2,33,680

Wage Control a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Cost ledger control	77,500	By WIP ledger	54,500
	_____	By Production overhead	23,000
	77,500		77,500

Production overhead a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Store ledger control	900	By WIP (B/F)	1,15,900
To Wage control	23,000	By Costing P&L	3,200
To Cost ledger control	95,200		_____
	1,19,100		1,19,100

Cost of sale a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To FG ledger control	2,04,800	By Costing P/L	2,04,800

Costing P&L a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Production overhead	3,200	By Cost ledger control	2,56,000
To Cost of sale	2,04,800		
To GLA	48,000		_____
	2,56,000		2,56,000

Question 3.

From the following details show the necessary accounts in the Cost Ledger:

	Materials	***Work-in-Progress***	***Finished Stock***
	Rs.	***Rs.***	***Rs.***
Opening Balance	8000	5000	10000

Closing Balance	11000	9000	12000

Transactions during the period:	**Rs.**
Materials purchased	25000
Wages paid	10000
(including Rs.2000 indirect)	
Overheads incurred	8000
Overheads absorbed	9000
Sales	50000

Solution

Store ledger control a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Balance b/d	8,000	By WIP (B/F)	22,000
To GLA	25,000		
		By Balance c/d	11,000
	33,000		33,000

WIP ledger control a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Balance b/d	5,000	By FG (B/F)	35,000
To Wage Control	8,000		
To Production overhead	9,000		
To Store ledger control	22,000		
		By Balance c/d	9,000
	44,000		44,000

FG ledger control a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Balance b/d	10,000	By Cost of sale	33,000
To WIP	35,000		
		By Balance c/d	12,000
	45,000		45,000

GLA a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Costing P&L	50,000	By Balance b/d	23,000
To Balance c/d	32,000	By Store ledger control	25,000
		By Wage control	10,000
		By Production overhead	8,000
		By Costing P&L	16,000
	82,000		82,000

Production overhead a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Wage Control	2,000	By WIP	9,000
To GLA	8,000	By Costing P&L (B/F)	1,000
	10,000		10,000

Costing P&L

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Cost of sale	33,000	By GLA	50,000
To Production overhead	1,000		
To N/P transfer to GLA (B/F)	16,000		
	50,000		50,000

Cost of sale A/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To FG	33,000	By Costing P&L	33,000

Wage control a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To GLA	10,000	By WIP Ledger control	8,000
		By Production overheads	2,000
	10,000		10,000

Trial Balance

	Dr.	*Cr.*
Store ledger control	11,000	
WIP	9,000	
FG	12,000	
GLA		32,000
	32,000	32,000

Question 4.

In the course of physical verification of stores as on 31st March, 1991, following differences are vealsed in case of AB Ltd.

Material	Unit Rate (Rs.)		Physical Balance	Ledger	Remarks
A	Nos.	7.00	600	680	Wrong Counting
	Liters	12.00	1100	1155	Normal evaporation loss.
C	Nos.	6.00	350	400	Material issues not accounted for
D	Kgs.	22.00	900	930	Shortage due to pilferage and theft

E	Nos.	15.00	1475	1325	150 nos. received but not entered in ledger.
F	Metres	10.00	291	291	Obsolete materials. Realised sale Value Rs. 1650. awaiting dispatch.

Prepare journal entries in the Cost Ledger to give effect to the above adjustments as called for.

Solution

Raw Material	**Journal Entry**			**Remarks / Working**
A	No entry			Recount
B	Production overhead	660		[55 × 12]
	To Store ledger control		660	
C	WIP	300		[50 × 6]
	To Store ledger control		300	
D	Costing P&L	660		[30 × 22]
	To Store ledger control		660	
E	Store ledger control	2,250		[150 × 15]
	To GLA		2,250	
F	GLA	1,650		
	Control P&L	1,260		[290 × 1,650]
	To Store ledger control		2,910	

[These goods have been sold but still they are in the stores ledger which means that we have omitted to pass sales entry. ∴ Sales entry has been made.]

Question 5.

The stock checkers report for the week ended 4th May 1992 showed the following items and explanations:

Part No.	Physical Stock	Stores Ledger	Explanation
1234	510	540	Requisition for job 819 not recorded
2317	486	492	Breaking bulk
4186	295	300	Requisition for factory consumable stores not recorded.
1982	309	289	Materials returned from Job 312 not documented
3123	623	423	Supplier's invoice not recorded
5028	210	220	Issue of components for servicing salesman's car not documented.

Assuming that all parts are valued at Rs. 2 a unit, write up the materials control account (pre adjustment balance Rs. 9834) including the double entry in each case. Also pass necessary journal entries.

Solution

R/M No.	Journal Entry			
1234	WIP	60		
	To Store ledger control		60	
2317	Production overhead	12		
	To Store ledger control		12	[Assumed Normal Loss]
4186	Production overhead	10		
	To Store ledger control		10	
1982	Store ledger control	40		(20 × 2)
	To WIP		40	

3123	Store ledger control	400		(200 × 2)
	To GLA		400	
5028	Selling & Distribution O/H	20		(10 × 2)
	To Store ledger control		20	

Store ledger control a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/c	9,834	By Selling & Distribution O/H	20
To GLA	40	By Production overhead	10
To WIP	400	By Production overhead	12
		By WIP	60
	_____	By Balance c/d	10,172
	10,274		10,274

Question 6. **2000 – Nov CA PE II**

Pass Journal entries in the cost books, maintained on non-integrated system for the following :

(a) Issue of materials : Direct Rs. 5,50,000; Indirect Rs. 1,50,000.

(b) Allocation of wages : Direct Rs. 2,00,000; Indirect Rs. 40,000.

(c) Under/over absorbed overheads: Factory (over Rs. 20,000;

(d) Overheads Administration (under) Rs. 10,000.

Solution

(a)	WIP ledger control a/c	5,50,000		
	Production overhead a/c	1,50,000		
	To Store ledger control		7,00,000	
(b)	WIP ledger control a/c	2,00,000		
	Production overhead a/c	40,000		
	To Wage control a/c		2,40,000	
(c)	Production overhead a/c	20,000		
	To costing P&L		20,000	
(d)	Costing P&L a/c	10,000		
	To administration overhead		10,000	

Question 7

The following information have been extracted from the cost records of a manufacturing company:

		(₹)
Stores		
✶	Opening balance	9,000
✶	Purchases	48,000
✶	Transfer from WIP	24,000
✶	Issue to work-in-progress	48,000
✶	Issue for repairs	6,000
✶	Deficiency found in stock	1,800
Work-in-Progress:		
✶	Opening balance	18,000
✶	Direct Wages applied	18,000

✶	Overhead charged	72,000
✶	Closing balance	12,000
Finished Production :		
✶	Entire production is sold at a profit of 10% on cost from work-in-progress	
✶	Wages paid.	21,000
✶	Overhead incurred	75,000

Draw the Stores Leger Control A/c, Work-in-Progress Control A/c, Overheads Control A/c and Costing Profit and Loss A/c.

Solution :

Stores Ledger Control A/c

Particulars	(₹)	Particulars	(₹)
To Balance b/d	9,000	By Work in Process	48,000
To General Ledger Adjustment A/c	48,000	By Overhead Control A/c	6,000
To Work in Process A/c	24,000	By Overhead Control A/c (Deficiency)	1,800*
		By Balance c/d	25,200
	81,000		**81,000**

* Deficiency assumed as normal (alternatively can be treated as abnormal loss)

Work in Progress Control A/co

Particulars	(₹)	Particulars	(₹)
To Balance b/d	18,000	By Stores Ledger Control A/c	24,000
To Stores Ledger Control A/c	48,000	By Costing P/L A/c (Balancing Figures being Cost of finished goods)	1,20,000
To Wages Control A/c	18,000	By Balance c/d	12,000
To Overheads Control A/c	72,000		
	1,56,000		**1,56,000**

Overheads Control A/c

Particulars	(₹)	Particulars	(₹)
To Stores Ledger Control A/c	6,000	By Work in Process A/c	72,000
To Stores Ledger Control A/c	1,800	By Balance c/d (Under absorption)	13,800
To Wages Control A/c (₹ 21,000 – ₹ 18,000)	3,000		
To Gen. Ledger Adjust. A/c	75,000		
	85,800		**85,800**

Costing Profit & Loss A/c

Particulars	(₹)	Particulars	(₹)
To Work in progress	1,20,000	By Gen. Ledger Adjust. A/c (Sales) (1,20,000 + 12,000)	1,32,000
By Gen. Ledger Adjust. A/c (Profit)	12,000		
	1,32,000		**1,32,000**

5

INTEGRATED ACCOUNTS

Question 1.

Messrs Essbee Ltd. maintain Integrated Account of Cost and Financial Accounts. From the following details write control accounts in the general ledger of the factory and prepare a trial balance:

Share Capital	Rs.	300000
Reserve		200000
Sundry Creditors		500000
Plant & Machinery		575000
Sundry Debtors		200000
Closing Stock		150000
Bank and Cash Balance		75000
Transactions during the year were as follows:		
Stores purchased		1000000
Stores issued to production		1050000
Stores in hand		95000
Direct wages incurred		650000
Direct wages charged to production		600000
Manufacturing expenses incurred		300000
Manufacturing expenses charged to production		275000
Selling at distribution expenses		100000
Finished stock production (at cost)		1800000
Sales at selling price		2200000
Closing stock		95000
Payment to Creditors		1100000
Receipt from Debtors		2100000

Answer: Net Profit Rs. 315000.

Question 2.

In the absence of the Chief Accountant, you have been asked to prepare a month's cost accounts for a company which operates a batch costing system fully integrated with the financial accounts. The following relevant information is provided to you:

<u>Balances at the beginning of the month:</u>		Rs.
Stores Ledger Control Account		25000
Work in Progress Control Account		20000
Finished Goods Control Account		35000
Prepaid Production Overheads brought forward from Previous month		3000
<u>Transactions during the month:</u>		
Materials Purchased		75000
Materials Issued:	Rs.	
To Production	30000	

To Factory Maintenance	4000	34000
Materials transferred between batches	5000	
Total wages paid:	Rs.	
To Direct workers	25000	
To Indirect workers	5000	30000
Direct wages charged to batches	20000	
Recorded non-productive time of direct workers	5000	
Selling and Distribution Overheads Incurred	6000	
Other Production Overheads Incurred	12000	
Sales		100000
Cost of Finished Goods Sold		80000
Cost of Goods completed and transferred into finished Goods during the month		65000
Physical value of work in progress at the end of the month		40000

The production overhead absorption rate is 150% of direct wages charged to work in progress.

Required:

Prepare the following accounts for the month:

a) Stores Ledger Control Account
b) Work in Progress Control Account
c) Finished Goods Control Account
d) Production Overhead Control Account
e) Profit and Loss Account

Answer: Net Profit Rs. 20000

Question 3.

Bangalore Petrochemicals Co. keeps books on integrated accounting system. The following balances appear in the books as on 1st January, 1998.

	Dr.	Cr.
	Rs.	Rs.
Stores control A/c	18000	
Work in progress A/c	17000	
Finished goods A/c	13000	
Bank A/c	10000	
Creditors A/c		8000
Fixed assets A/c	55000	
Debtors A/c	12000	
Share capital A/c		80000
Depreciation provision A/c		5000
Profit and Loss A/c		32000
	125000	125000

Transaction for the year ended 31st Dec., 1998 were as given below:

	Rs.	Rs.
Wages direct	87000	

Wages indirect	5000	92000
Purchase of materials (on credit)		100000
Materials issued to production		110000
Materials for repairs		2000
Goods finished during the year (at cost)		215000
Sales (credit)		300000
Cost of goods sold		220000
Production overhead absorbed		48000
Production overhead incurred		40000
Administration overhead incurred		12000
Selling overhead incurred		14000
Payment of creditors		101000
Payments of debtors		290000
Depreciation of machinery		1300
Prepaid rent (included in factory overheads)		300

Write up accounts in the integrated ledger and prepare a trial balance.

Answer: Net Profit Rs. 66000.

Question 4.

A fire destroyed some accounting records of a company. You have been able to collect the following from the spoilt papers/records and as a result of consultation with accounting staff in respect of January 1997:

(i) Incomplete Ledger Entries:

Raw Materials A/c

	Rs.		Rs.
Beginning Inventory	32000		

Work in Progress A/c

	Rs.		Rs.
Beginning Inventory	92000	Finished Stock	151000

Creditors A/c

	Rs.		Rs.
		Opening Balance	16400
Closing Balance	19200		

Manufacturing Overheads A/c

	Rs.		Rs.
Amount spent	29600		

Finished Goods A/c

	Rs.		Rs.

Opening Inventory	24000		
		Closing Inventory	30000

(ii) Additional Information:

1. The cash book showed that Rs. 89200 have been paid to creditors for raw materials.
2. Ending inventory of work in progress included material Rs. 5000 on which 300 direct labour hours have been booked against wages and overheads.
3. The job card showed that workers have worked for 7000 hours. The wage rate is Rs. 10 per labour hour.
4. Overhead recovery rate was Rs. 4 per direct labour hour.

You are required to complete the above accounts in the cost ledger of the company.

Answer :

Question 5.

The following incomplete accounts are furnished to you for the month ended 31st October, 2005.

	Stores Control Account	
1.10.05 To Balance		Rs. 54000
	Work in Progress Control Account	
1.10.05 To Balance		Rs. 6000
	Finished Goods Control Account	
1.10.05 To Balance		Rs. 75000
	Factory Overheads Control Account	
Total debits for October, 2005		Rs. 45000
	Factory Overheads Applied Account	
	Cost of Goods Sold Account	

Additional Information:

(i) The factory overheads are applied by using a budgeted rate bsed on Direct Labour Hours. The budged for overhead for 2005 is Rs. 675000 and the budged of direct labour hours is 450000.

(ii) The balance in the account of creditors for purchases on 31.10.05 is Rs. 15000 and the payments made to creditors in October, 2005 amount to Rs. 105000.

(iii) The finished goods inventory as on 31st October, 2005 is Rs. 66000.

(iv) The cost of goods sold during the month was Rs. 195000.

(v) On 31st October, 2005 there was only one unfinished job in the factory. The cost records show that Rs. 3000 (1200 direct labour hours) of Direct Labour Cost and Rs. 6000 of direct material cost.

(vi) A total of 28200 direct labour hours were worked in October, 2005. All factory workers earn same rte of pay.

(vii) All actual factory overheads incurred in October, 2005 have been posted.

You are required to find:

(a) Materials purchased during October, 2005.

(b) Cost of goods completed in October, 2005.

(c) Overheads applied to production in October, 2005.

(d) Balance of work in progress on 31st October, 2005.

(e) Direct materials consumed during October, 2005.

(f) Balance of Stores Control Account on 31st October, 2005.

Over absorbed or under absorbed overheads for October, 2005.

Answer : (a) 90,000 (b) 1,86,000 (c) 42,300 (d) 10,800 (e) 78,000 (f) 66,000 (g) 2,700.

FOR YOUR PRACTICE

Question 1.

Journalise the following transactions assuming that cost and Financial transactions are integrated:

	Rs.
Raw materials purchased	200000
Direct materials issued to production	150000
Wages paid (30% indirect)	120000
Wages charged to production	84000
Manufacturing expenses incurred	84000
Manufacturing overhead charged to production	92000
Selling and distribution costs	20000
Finished products (at cost)	200000
Sales	290000
Closing stock	Nil
Receipts from debtors	69000
Payment to creditors	110000

Solution

(1)	Store ledger control	2,00,000	
	To Bank		2,00,000
(2)	WIP ledger control	1,50,000	
	To Store ledger control		1,50,000
(3)	Wage control	1,20,000	
	To Bank		1,20,000
(4)	WIP ledger control	84,000	
	Production overhead	36,000	
	To wage control		1,20,000
(5)	WIP ledger control	84,000	
	To Production overhead		84,000
(6)	Production overheads	84,000	
	To Bank		84,000
(7)	WIP ledger control	92,000	
	To production overhead		92,000
(8)	S & D overhead	20,000	
	To Bank		20,000
(9)	Cost of Sale	20,000	
	To S & D overhead		20,000
(10)	FG ledger control	2,00,000	
	To WIP		2,00,000
(11)	Debtors	2,90,000	
	To Sales		2,90,000
(12)	Sales	2,90,000	
	To P&L		2,90,000
(13)	Bank	69,000	
	To Debtors		69,000
(14)	Creditor	1,10,000	
	To Bank		1,10,000

Question 2.

Dutta Enterprises operates an integral system of accounting. You are required to pass the Journal Entries for the following transactions that took place for the year ended 30th June, 1998. (Narrations are not required)

	Rs.
Raw materials purchased (50% on credit)	600000
Materials issued to production	400000
Wages paid (50% direct)	200000
Wages charged to production	100000
Factory overheads incurred	80000
Factory overheads charged to production	100000
Selling and Distribution overheads incurred	40000
Finished goods at cost	500000
Sales (50% credit)	750000
Closing stock	Nil
Receipts from debtors	200000
Payments to creditors	200000

Solution

(1)	Store ledger control	6,00,000	
	To Bank		3,00,000
	To Creditor		3,00,000
(2)	WIP ledger control	4,00,000	
	To Store ledger control		4,00,000
(3)	Wage control	2,00,000	
	To Bank		2,00,000
(4)	WIP ledger control	1,00,000	
	PO overheads	1,00,000	
	To Wage control		2,00,000
(5)	Production overhead	80,000	
	To Bank		80,000
(6)	WIP ledger control	1,00,000	
	To Production overhead		1,00,000
(7)	S & D overhead	40,000	
	To Bank		40,000
(8)	Cost of Sale	40,000	
	To S & D overheads		40,000
(9)	FG ledger control	5,00,000	
	To WIP ledger control		5,00,000
(10)	Bank	3,75,000	
	Debtors	3,75,000	
	To Sales		7,50,000
(11)	Bank	2,00,000	
	To Debtors		2,00,000
(12)	Creditor	2,00,000	
	To Bank		2,00,000

Question 3.

BPR Limited keeps books on integrated accounting system. The following balances appear in the books as on April 1,2002 :

	Dr. (Rs.)	Cr. (Rs.)
Stores Control A/c	40950	---
Work-in-progress A/c	38675	---
Finished Goods A/c	52325	---
Bank A/c	---	22750
Creditors A/c	---	18200
Fixed Assets A/c	147875	---
Debtors A/c	27300	---
Share Capital A/c	---	182000
Provision for Depreciation A/c	---	11375
Provision for Doubtful Debts A/c	---	3725
Factory Overheads Outstanding A/c	---	6250
Pre-paid administration Overheads A/c	9975	---
Profit & Loss A/c	---	72800
	317100	317100

The transactions for the year ended March 31,2003 were as given below :

	Rs.	Rs.
Direct Wages	197925	----
Indirect Wages	11375	209300
Purchase of materials (on credit)		227500
Materials issued to production		250250
Materials issued for repairs		4550
Goods finished during the year (at cost)		489125
Credit Sales		682500
Cost of Goods sold		500500
Production overheads absorbed		109200
Production overheads paid during the year		91000
Production overheads outstanding at the end of year		7775
Administration overheads paid during the year		27300
Selling overheads incurred		31850
Payment to Creditors		229775
Payment received from Debtors		659750
Depreciation of Machinery		14789
Administration overheads outstanding at the end of year		2225
Provision for doubtful debts at the end of the year		4590

Required :

Write up accounts in the integrated ledger of BPR Limited and prepare a Trial Balance.

Solution

Stores control a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	40,950	By WIP	2,50,250
To Creditors	2,27,500	By Production overhead	4,550
		By Balance c/d	13,650
	2,68,450		2,68,450

WIP Ledger control a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	38,675	By FG	4,89,125
To Wage control	1,97,925	By Balance c/d	1,06,925
To Store ledger control	2,50,250		
To Production overhead	1,09,200		
	5,96,050		5,96,050

FG Ledger control a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	52,325	By Cost of Sale	5,00,500
To WIP	4,89,125	By Balance c/d	60,450
To Administration overhead	39,500		
	5,80,950		5,80,950

Bank a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Debtors	6,59,750	By Balance b/d	22,750
		By Wages control	2,09,300
		By Production overhead	91,000
		By Administration overhead	27,300
		By Creditors	2,29,775
		By S & D	31,850
		By Balance c/d	47,775
	6,59,750		6,59,750

Creditor a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Bank	2,29,775	By Balance b/d	18,200
To Balance c/d	15,925	By Store ledger control	2,27,500
	2,45,700		2,45,700

Fixed Asset

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	1,47,875	By Balance c/d	1,47,875

Debtors a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	27,300	By Bank	6,59,750
To Sales	6,82,500	By Balance c/d	50,050
	7,09,800		7,09,800

Share Capital a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance c/d	1,82,000	By Balance b/d	1,82,000

Provision for Depreciation

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance c/d	26,164	By By Balance b/d	11,375
		By Depreciation	14,789
	26,164		26,164

Provision for Doubtful devets

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance c/d	4,590	By Balance b/d	3,725
		By P&L	865
	4,590		4,590

Production overhead a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Wage control	11,375	By WIP	1,09,200
To Store ledger control	4,550	By Outstanding P/O	6,250
To Bank	91,000	By P/L	14,039
To Outstanding P/O	7,775		
To Depreciation	14,789		
	1,29,489		1,29,489

Prepaid Administration overhead

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	9,975	By Administration overhead	9,975
	9,975		9,975

Wage Control

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Bank	2,09,300	By WIP	1,97,925
		By Production overhead	11,375
	2,09,300		2,09,300

Outstanding Production overhead a/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Production overhead	6,250	By Balance b/d	6,250
To Balance c/d	7,775	By Production overhead	7,775
	14,025		14,025

Outstanding Administration overhead A/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance c/d	2,225	By Administration overhead	2,225
	2,225		2,225

Administration overhead A/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To P/P	9,975	By FG	39,500
To Bank	27,300		
To O/S overheads	2,225		
	39,500		39,500

Cost of sale A/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To S & D overheads	31,850	By P & L	5,32,350
To FG	5,00,500		
	5,32,350		5,32,350

S & D overheads A/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Bank	31,850	By Cost of sale	31,850

P&L A/c

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Cost of goods sold	5,32,350	By Sales	6,82,500
To Provision for Doubtful debts	865		
To Production overhead	14,039		
To N/P	1,35,246		
	6,82,500		6,82,500

Working Note:-

Journal Entries

(1)	Wage Control	2,09,300	
	To Bank		2,09,300
(2)	WIP	1,97,925	
	Production overhead a/c	11,375	
	To Wage control		2,09,300
(3)	Store ledger control	2,27,500	
	To Creditor		2,27,500
(4)	WIP	2,50,250	
	Production overhead	4,550	
	To Store ledger control		2,54,800
(5)	FG	4,89,125	
	To WIP		4,89,125
(6)	Debtors	6,82,500	
	To Sales		6,82,500
(7)	Sales	6,82,500	
	To P & L		6,82,500
(8)	Cost of sale	5,00,500	
	To FG		5,00,500
(9)	WIP	1,09,200	
	To Production overhead		1,09,200
(10)	Production overhead	91,000	
	To Bank		91,000
(11)	Production overhead	7,775	
	To Outstanding Production overhead		7,775
(12)	Administration overhead	27,300	
	To Bank		27,300
(13)	Selling & Distibution overhead	31,850	
	To Bank		31,850
(14)	Cost of sale	31,850	
	To Selling & Distribution overhead		31,850
(15)	Creditor	2,29,775	
	To Bank		2,29,775
(16)	Bank	6,59,750	
	To Debtors		6,59,750
(17)	Production overhead	14,789	
	To Provision for Depreciation		14,789
(18)	Administration overhead	2,225	
	To Outstanding Administration overhead		2,225
(19)	Outatanding Production overhead	6,250	
	To Production overhead		6,250
(20)	Administration overhead	9,975	
	To Prepaid Administration overhead		9,975

Question 4.

ABC Limited operates an integrated accounting system and the following details are given for the year ended 31st March, 1986 :-

Trial Balance as on 31st March 1986

	Debit	Credit
	Rs.	Rs.
Share Capital	2000000	
Reserves		200000
Creditors for purchase		150000
Expenses Creditors		20000
Freehold building at cost	500000	
Plant and Machinery, at cost	1300000	
Provision for depreciation on plant and machinery		100000
Stock of :		
Raw Material	220000	
Work in progress	40000	
Finished Goods	60000	
Debtors	200000	
Bank	150000	
	2470000	2470000

The following data for the month of April 1986 are given :-

	Rs.
Raw material purchased on credit	990000
Raw material returned to suppliers	40000
Material issued to production	850000
Material returned from shop floor	20000
Factory wages paid :	
Productive	250000
Non-productive	50000
Salaries paid :	
Administration	100000
Selling & Distribution	75000
Overhead expenses incurred but not paid :	
Production	300000
Administration	50000
Selling & Distribution	100000
Depreciation for the month on plant & machinery	50000
Sales on Credit	2000000
Cash received from debtors	1950000
Paid the following by cheque :	
Creditors for Purchase	1000000
Creditors for expenses	430000
Production overhead applied to production	390000

Administrative overhead applied to finished goods	145000
Selling and distribution overhead applied to cost of sales	180000
Closing Stocks :	
Work-in-progress	210000
Finished goods	215000

Required:

Show the appropriate ledger accounts.

Prepare the income statement for April 1986

Prepare the Balance Sheet as at 30th April, 1986.

Solution

Share capital

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Balance c/d	2,00,000	By Balance b/d	2,00,000

Reserves

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Balance c/d	2,00,000	By Balance b/d	2,00,000

Creditors a/c (Purchase)

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Store ledger control	40,000	By Balance b/d	1,50,000
To Bank	10,00,000	By Store ledger control	9,90,000
To Balance c/d	1,00,000		
	11,40,000		11,40,000

Expenses Creditor a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Bank	4,30,000	By Balance b/d	20,000
To Balance c/d	40,000	By Production overhead	3,00,000
		By Administration overhead	50,000
		By S & D	1,00,000
	4,70,000		4,70,000

Freehold Building a/c

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Balance b/d	5,00,000	By By Balance c/d	5,00,000

Plant & Machinery

Dr. *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Balance b/d	13,00,000	By Balance c/d	13,00,000

Provision on Plant & Machinery

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance c/d	1,50,000	By Balance b/d	1,00,000
		By Production overhead	50,000
	1,50,000		1,50,000

Store ledger control

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	2,20,000	By Creditor	40,000
To Creditor	9,90,000	By WIP	8,50,000
To WIP	20,000	By Balance c/d	3,40,000
	12,30,000		12,30,000

WIP ledger control

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	40,000	By Store ledger control	20,000
To Store ledger control	8,50,000	By FG (B/F)	13,00,000
To Wage control	2,50,000		
To Production overhead	3,90,000	By Balance c/d	2,10,000
	15,30,000		15,30,000

FG ledger control

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	60,000	By Cost of sale (B/F)	12,90,000
To Administration overhead	1,45,000		
To WIP	13,00,000	By Balance c/d	2,15,000
	15,05,000		15,05,000

Debtors

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	2,00,000	By Bank	19,50,000
To Sales	20,00,000		
		By Balance c/d	2,50,000
	22,00,000		22,00,000

Bank

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	1,50,000	By Wage control	4,75,000
To Debtors	19,50,000	By Creditor for pur.	10,00,000
		By Creditor for Exp.	4,30,000
		By Balance c/d (B/F)	1,95,000
	21,00,000		21,00,000

Production overhead

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Wage control	50,000	By WIP	3,90,000
To Creditor	3,00,000	By P & L (B/F)	10,000
To Provision for Depreciation	50,000		
	4,00,000		4,00,000

Administration overhead

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Wage control	1,00,000	By FG	1,45,000
To Creditor	50,000	By P & L	5,000
	1,50,000		1,50,000

Selling & Distribution overhead

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Wage control	75,000	By Cost of sale	1,80,000
To Creditor	1,00,000		
To P&L	5,000		
	1,80,000		1,80,000

Cost of sale

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To S & D overheads	1,80,000	By P & L	14,70,000
To FG	12,90,000		
	14,70,000		14,70,000

P&L

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Cost of sale	14,70,000	By Sales	20,00,000
To Production overhead	10,000	By S & D	5,000
To Administration overhead	5,000		
To N/P (B/F)	5,20,000		
	20,05,000		20,05,000

Wage control

Dr. *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
To Bank	4,75,000	By WIP	2,50,000
		By Production overhead	50,000
		By Administration overhead	1,00,000
		By S & D O/H	75,000
	4,75,000		4,75,000

Working Note:-

Journal Entries

(1)	Store ledger control	9,90,000	
	To Creditor		9,90,000
(2)	Creditor	40,000	
	To Store ledger control		40,000
(3)	WIP	8,50,000	
	To Store ledger control		8,50,000
(4)	Store ledger control	20,000	
	To WIP		20,000
(5)	Wage control	4,75,000	
	To Bank		4,75,000
(6)	WIP	2,50,000	
	Production overhead	50,000	
	Administration overhead	1,00,000	
	S & D overhead	75,000	
	To Wage control		4,75,000
(7)	Production overhead	3,00,000	
	Administration overhead	50,000	
	S & D overhead	1,00,000	
	To Creditor for Expenses		4,50,000
(8)	Production overhead	50,000	
	To Provision for Depreciation		50,000
(9)	Debtor	20,00,000	
	To Sales		20,00,000
(10)	Sales	20,00,000	
	To P & L		20,00,000
(11)	Bank	19,50,000	
	To Debtors		19,50,000
(12)	Creditor for Purchase	10,00,000	
	Creditor for Expenses	4,30,000	
	To Bank		14,30,000

RECONCILIATION OF COST AND FINANCIAL ACCOUNTS

6

Question 1.

From the following figures prepare a statement reconciling the profits as per the cost accounts and the profits as per the financial accounts.

	Rs.
Net profit as per the financial accounts	128755
Net profit as per the cost accounts	172400
Works overheads under – recovered	3120
Administrative overheads over – recovered	1700
Depreciation charged in the financial accounts	11200
Depreciation charged in the cost accounts	12500
Interest received but not included in the cost accounts	8000
Loss due to obsolescence charged in the financial accounts	5700
Income – tax provided in the financial accounts	40300
Stores adjustment credited in the financial accounts	475
Depreciation of stock charged in the financial accounts	6750
Bank interest credited in the financial accounts	750

Question 2.

The following is a summary of the trading and profit and loss account of a manufacturing company for the year ended 31st march, 1988.

	Dr. (Rs.'000)			Cr. (Rs.'000)
To material Consumed	2740	By Sales (120000 units)		6000
To Wages	1510	By Finished stock		
To Factory Expenses	830	(4000 units)		160
To Administration exp.	382	By Work-in-progress:		
To Selling & distribution		Materials	64	
Expenses	450	Wages	36	
To Preliminary expenses		Factory exp.	20	120
(written off)	40	By Dividend received		18
To Goodwill (written off)	20			
To Net Profit	326			
	6298			6298

In the cost accounts the following allocations have been made.

Factory expenses at 20% on prime cost.

Administration expenses at Rs.3 per unit of production.

Selling and distribution expenses at Rs.4 per unit of sales.

You are required to prepare a costing profit and loss a/c of the company and to reconcile the profit disclosed with that shown in the financial account.

Answer : Net Profit Rs. 341

Question 3.

The following figures are extracted from the Financial Accounts of Sewell Ltd. for the year ending 31.12.1984:-

		Rs.
Sales (20000 units)		5000000
Materials		2000000
Wages		1000000
Factory Overheads		900000
Administrative Overheads		520000
Selling and Distribution Overheads		360000
Finished Goods (1230 units)		300000
Work in process:		
Materials	60000	
Labour	40000	
Factory overhead	40000	140000
Goodwill written off		400000
Interest paid on capital		40000

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

Prepare a statement reconciling the profit as per Cost Records with the profit as per Financial records.

Answer : Costing Profit Rs. 6 Lacs.; Financial Profit Rs. 2.20 Lacs

Question 4.

The following information is available from the financial books of a company having a normal production capacity of 60000 units for the year ended 31st March 1999 :

Sales Rs. 1000000 (50000 units)

There was no opening and closing stock of finished units.

Direct material and direct wages cost were Rs. 500000 and Rs. 250000 respectively.

Actual factory expenses were Rs. 150000 of which 60% are fixed.

Actual administrative expenses were Rs. 45000 which are completely fixed.

Actual selling and distribution expenses were Rs. 30000 of which 40% are fixed.

Interest and dividends received Rs. 15000.

You are required to :

Find out profit as per financial books for the year ended 31st March 1999.

Prepare the cost sheet and ascertain the profit as per cost accounts for the year ended 31st March 1995 assuming that the indirect expenses are absorbed on the basis of normal production capacity; and

Prepare a statement reconciling profits shown by financial and cost books.

Answer : Costing Profit Rs. 49500; Financial Profit Rs. 40000.

Question 5.

The financial books of a company reveal the following data for the year ended 31st March 2002 :

Opening Stock :	Rs.
Finished goods 875 units	74375
Work-in-process	32000
1.4.01 to 31.3.02	
Raw materials consumed	780000

Direct Labour	450000
Factory overheads	300000
Goodwill	100000
Administration overheads	295000
Dividend paid	85000
Bad Debts	12000
Selling and Distribution Overheads	61000
Interest received	45000
Rent received	18000
Sales 14500 units	2080000
Closing Stock : Finished goods 375 units	41250
Work-in-process	38667

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 Rs. 4 per unit sold.
- Opening Stock of finished goods is valued at Rs. 104 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required :

(i) Prepare statements for the year ended 31st March 2002 to 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.

Answer : Costing Profit Rs.187000;Financial Profit Rs.33542.

Question 6.

The profit & loss account as shown in the financial books of a company for the year ended 30-9-89 together with a statement of reconciliation between the profit as per financial and cost accounts is given below :

Profit and loss account for the year ended 30-9-89.

	Rs.	Rs.		Rs.	Rs.
Opening Balance			Sales		500000
Raw Material	90000		Closing Stock:		
Works in progress	50000		Raw material	98000	
Finished Goods	70000	210000	Work in progress	53000	
			Finished Goods	72000	223000
Raw material		500000	Miscellaneous receipts		45000
Direct Wages		200000			
Factory overheads		200000			
Administration expenses		170000			
Selling & Distribution expenses		220000			
Preliminary expenses written off		75000			
Debenture Interest		30000			
Net Profit		163000			
		1768000			1768000

Statement of reconciliation of Profit as per financial and cost accounts :

Profit as per financial accounts Rs. 163000

(a) Difference in valuation of stock :

Add : Raw Material Opening Stock	1200	
Work in progress – Opening Stock	1300	
Finished Goods – Opening Stock	2000	
Closing Stock	1000	
Total (A)	5500	
Less : Raw Material Closing Stock	1650	
Work in progress – Closing Stock	750	
Total (B)	2400	
A – B		3100

(b) Other items

Add : Preliminary expenses written off	75000	
Debenture interest	30000	
	105000	
Less : Miscellaneous receipts	45000	60000
Profit on per cost account		226100

You are required to prepare the following accounts as they would appear in the costing Ledger :

(i) Raw material controls A/c; (ii) Work in progress control A/c;

(iii) Finished goods control A/c; Cost of Sales A/c; Costing Profit & Loss A/c

Answer : Net Profit Rs. 226100

Question 7. **2005 – May CA PE II**

The following figures have been extracted from the cost records of a manufacturing unit:

Stores : Opening balance	32,000
Purchases of material	1,58,000
Transfer from work-in-progress	80,000
Issues to work-in-progress	1,60,000
Issues to repair and maintenance	20,000
Deficiencies found in stock-taking	6,000
Work-in-progress : Opening balance	60,000
Direct wages applied	65,000
Overheads applied	2,40,000
Closing balance of W.I.P.	45,000

Finished products : Entire output is sold at a profit of 10% on actual cost from work-in-progress. Wages incurred Rs. 70,000, overhead incurred Rs. 2,50,000.

Items not included in cost records : Income from investment Rs. 10,000, Loss on sale of capital assets Rs. 20,000.

Draw up Store Control Account, Work-in-progress Control Account, Costing Profit and Loss Account, profit and Loss Account and Reconciliation statement.

Answer:

Draw up Store Control Account	**= 84,000**
Work-in-progress Control Account	**= 45,000**
Costing Profit and Loss Account	**= 4,000**
Profit and Loss Account and	**= 11,000**
Reconciliation statement.	**= 11,000**

Question 8. **2010, November**

A manufacturing company has disclosed a net loss of Rs 8,75,000 as per their cost accounting records for the year ended March 31,2010. However, their financial accounting records disclosed a net loss of Rs 7,91,250 for the same period. A scrutiny of the data of both the sets of books of accounts revealed the following information :

		Rs
(i)	Factory overheads over-absorbed	47,500
(ii)	Administration overheads under-absorbed	32,750
(iii)	Depreciation charged in Financial Accounts	2,25,000
(iv)	Depreciation charged in Cost Accounts	2,42,250
(v)	Interest on investments not included in Cost	62,750
(vi)	Income Tax provided in Financial Accounts	7,250
(vii)	Transfer fees (credit in Financial Accounts)	12,500
(viii)	Preliminary expenses written off	27,500
(ix)	Under-valuation of opening stock in Cost Accounts	6,250
(x)	Under valuation of closing stock in Cost Accounts	17,500

Required :

Prepare a Memorandum Reconciliation A/c.

FOR YOUR PRACTICE

Question 1.

The following figures have been extract from the financial accounts of a manufacturing firm for the first year of its operation.

	Rs.
Direct material consumption	5000000
Direct wages	3000000
Factory overheads	1600000
Administrative overheads	700000
Selling & distribution overheads	960000
Bad debts	80000
Preliminary Expenses written off	40000
Legal charges	10000
Dividends received	100000
Interest on deposit received	20000
Sales – 120000 units	12000000
Closing Stock :-	
Finished stock – 4000 units	320000
Work in progress	240000

The cost accounts for the same period reveal that the Direct material consumption was Rs. 5600000 ; Factory overheads is recovered at 20% on Prime cost ; Administration Overhead is recovered @ Rs. 6 per unit of production ; and selling and distribution overheads are recovered at Rs. 8.00 per unit sold.

You are required to prepare costing and Financial Profit & Loss Account and reconcile the different in the Profit as arrived at in the two sets of accounts.

Solution:

Profit and Loss Account

(As per financial records)

	Rs.		Rs.
To Direct Material	50,00,000	By Sales(1,20,000 units)	1,20,00,000
To Direct Wages	30,00,000	By Closing Stock	
To Factory Overheads	16,00,000	WIP	2,40,000
To Gross Profit	29,60,000	Finished Goods (4,000 units)	3,20,000
	1,25,60,000		1,25,60,000
To Administration Overheads	7,00,000	By Gross Profit b/d	29,60,000
To Selling and Distribution		By Dividend	1,00,000
Overheads	9,60,000	By Interest	20,000
To Bad Debts	80,000		
To Preliminary Expenses written off	40,000		
To Legal Charge	10,000		
To Net profit	12,90,000		
	30,80,000		30,80,000

Statement of Cost and Profit

(As per Cost Records)

	Rs.
Direct Material	56,00,000
Direct Wages	30,00,000
Prime Cost	86,00,000
Factory Overhead	17,20,000
Gross Works Cost	1,03,20,000
Less: Closing Stock (WIP)	(2,40,000)
Works Cost (1,24,000 units)	1,00,80,000
Administration overhead (1,24,000 units @ Rs. 6 p.u.)	7,44,000
Cost of production (1,24,000 units)	1,08,24,000
Less: Finished Goods (4,000 units @ Rs. 87.29)	3,49,160
Cost of goods sold (1,20,000 units)	1,04,74,840
Selling and Distribution Overhead (1,20,000 @ Rs. 8 p.u.)	9,60,000
Cost of Sales	1,14,34,840
Net profit (Balancing figure)	5,65,160
Sales Revenue	1,20,00,000

Statement of Reconciliation of profit as obtained under Cost and Financial Accounts

	Rs.	Rs.
Profit as per Cost Records		5,65,160
Add: Excess of Material Consumption	6,00,000	
Factory Overhead	1,20,000	
Administration Overhead	44,000	
Dividend Received	1,00,000	
Interest Received	20,000	8,84,000
		14,49,160

Less: Bad debts	(80,000)	
Preliminary expenses written off	(40,000)	
Legal charges	(10,000)	
Over – Valuation of stock in cost	(29,160)	(1,59,160)
Profit as per financial Records		12,90,000

Question 2.

M/s H.K. Piano Company showed a net loss of Rs. 416000 as per their financial accounts for the year ended 31st March 1998. The cost accounts, however, disclosed a net loss of Rs. 328000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of books :

	Rs.
(i) Factory overheads under-recovered	6000
(ii) Administration overheads over-recovered	4000
(iii) Depreciation charged in financial accounts	120000
(iv) Depreciation recovered in costs	130000
(v) Interest on investment not included in costs	20000
(vi) Income-tax provided	120000
(vii) Transfer fees (credit in financial books)	2000
(viii) Stores adjustment (credit in financial books)	2000

Prepare a memorandum reconciliation account.

Solution:

Memorandum Reconciliation Account

Dr.			**Cr.**
Particulars	**Rs.**	**Particulars**	**Rs.**
To Net loss as per costing books	3,28,000	By Administration overhead over recovered in costs	4,000
To Factory overheads under recovered in costs	6,000	By Interest on investments not included in cots	20,000
To Income Tax not provided in costs	1,20,000	By depreciation overcharged in costs	10,000
		By transfer fees in financial books	2,000
		By Stores adjustment	2,000
		By Net loss as per financial books	4,16,000
	4,54,000		4,54,000

Question 3. **May 2003**

A manufacturing company disclosed a net loss of Rs. 3,47,000 as per their cost accounts forth year ended March 31, 2003. The financial revealed as a result of scrutiny of the figures for both the sets of accounts.

		Rs.
(i)	Factory overheads under-absorbed	40,000
(ii)	Administration Overheads over-absorbed	60,000
(iii)	Depreciation charged in Financial Accounts	3,25,000
(iv)	Depreciation charged in Cost Accounts	2,75,000
(v)	Interest on investments not included in Cost Accounts	96,000
(vi)	Income-tax provided	54,000
(vii)	Interest on loan funds in Financial Accounts	2,45,000
(viii)	Transfer fees (credit in financial books)	24,000
(ix)	Stores adjustment (credit in financial books)	14,000

(x) Dividend received 32,000

Prepare a Memorandum Reconciliation Account.

Solution:

Memorandum Reconciliation Account

	Rs.		Rs.
To Net as per Costing Books	3,47,000	By Administration overheads over Recovered in cost accounts	60,000
To Factory overheads under-Absorbed in Cost Accounts	40,000	By Interest on investment not Included in Cost Accounts	96,000
To Depreciation under charged In Cost Accounts	50,000	By Transfer fees in Financial books	24,000
To Income-Tax not provided in Cost Accounts	54,000	By Stores adjustment (Credit in Financial books)	14,000
To Interest on Loan Funds in Financial Accounts	2,45,000	By Dividend received in Financial books	32,000
		By Net Loss as per Financial books	5,10,000
	7,36,000		7,36,000

Question 4. **Nov. 2005**

The following is the Trading and Profit & Loss Account of Omega Limited:

	Dr.			Cr.
Particulars	Rs.	Particulars		Rs.
To Materials consumed	23,01,000	By Sales (30,000 units)		48,75,000
To Direct wages	12,05,750	By Finished goods stock		1,30,000
To Production Overheads	6,92,250	(1,000 units)		
To Administration Overheads	3,10,375	By Work-in-progress:		
To Selling and Distribution	3,68,875	Material	55,250	
Overheads		Wages	26,000	
To preliminary Exp. Written off	22,750	Production overhead	16,250	97,500
To Goodwill written off	45,500	By Dividends Received		3,90,000
To Fines	3,250	By Interest on bank deposits		65,000
To Interest on Mortgage	13,000			
To Loss on sale of machine	16,250			
To Taxation	1,95,000			
To Net Profit for the year	3,83,500			
	55,57,500			55,57,500

Omega Ltd. manufactures a standard unit.

The cost Accounting records of Omega Ltd. show the following:

(i) Production overheads have been charged to work-in-progress at 20% on prime cost.

(ii) Administration overheads have been recovered at Rs. 9.75 per finished unit.

(iii) Selling & distribution overheads have been recovered at Rs/13 per unit sold.

(iv) The Under-or Over-absorption of overheads have not been transferred to costing P/L A/c.

Required:

(i) Prepare a proforma costing Profit & Loss Account, indicating net profit.

(ii) Prepare control accounts for production overheads, administration overheads and selling & distribution overhead.

Prepare a statement reconciling the profit disclosed by cost records with that show in Financial Accounts.

Solution:

Costing P & L A/c

To Material Consumed	23,01,000	By Sales	48,75,000
To Direct Wages	12,05,750		
Prime Cost	35,06,750		
To Production Overheads (20% × Rs. 35,06,750)	7,01,350		
Gross Factory Cost	42,08,100		
Less: Clsoing WIP	(97,500)		
Net Works Cost	41,10,600		
To Administration Overheads (31,000 units × Rs. 9.75)	3,02,250		
Cost of Production	44,12,850		
Less: Closing Stock of Finished goods (44,12,850 / 31,000 × 1,000)	(1,42,350)		
Cost of Goods Sold	42,70,500		
To Selling & Distribution Overheads (30,000 units × Rs. 13)	3,90,000		
To Profit	46,60,500		
	2,14,500		
	48,75,000		48,75,000

(ii) **Production Overheads Control A/c**

To General Ledger Adjustment a/c	6,92,250	By WIP Ledger Control a/c	7,01,350
To balance c/d (overabsorbed)	9,100		
	7,01,350		7,01,350

Administration Overheads Control A/c

To General Ledger Adjustment a/c	3,10,375	By Finished Goods Ledger Control a/c	3,02,250
		By balance c/d (under absorbed)	8,125
	3,10,375		3,10,375

Selling & Distribution Overheads A/c

To General Ledger Adjustment a/c	3,68,875	By WIP Ledger Control a/c	3,90,000
To balance c/d (overabsorbed)	21,125		
	3,90,000		3,90,000

Reconciliation Statement

	Rs.
N.P. as per Costing P & L a/c	2,14,500
Less: Over valuation of Clsoing Stock of Finished Goods	(12,350)
Less: Underabsorbed Administration Overheads	(8,125)

Less: Preliminary expenses written off	(22,750)
Less: Goodwill written off	(45,500)
Less: Fines	(3,250)
Less: Interest on Mortgage	(13,000)
Less: Loss on Sale of Machine	(16,250)
Less: Taxation	(1,95,000)
Add: Overabsorbed Production overheads	9,100
Add: Overabsorbed Selling Overheads	21,125
Add: Dividends received	3,90,000
Add: Interest on bank deposits	65,000
N.P. as per Financial Accounts	3,83,500

Question 5.

The following records of Modern Manufacturers Ltd. reveal the following for the year ended 30.06.1986.

		In thousands Rs.
Sales (20000 units)		4000
Materials		1600
Wages		800
Factory overheads		720
Office and Administrative overheads		416
Selling and Distribution overheads		288
Finished Goods (1230 units)		240
Work in Progress:		
Materials	48	
Labour	32	
Overhead (Factory)	32	112
Goodwill written off		320
Interest on capital		32

In the costing records, factory overhead is charged at 100% wages, administration overhead 10% of factory cost and selling and distribution overhead at the rate of Rs.16 per unit sold.

Prepare a statement reconciling the Profit as per cost records with the Profit as per financial records of the Company.

Solution:

First of all it is necessary to find out profit as per financial accounts and as per cost accounts.

Profit & Loss A/c of Modern Manufacturers Ltd.

(for the year ended 30th June, 1996)			**(Rs. '000)**
To Materials	Rs. 1,600	By Sales (20,000)	4,000
To Wages	800	By Closing stock:	
To Factory overheads	720	Finished Stock (1,230 units)	240
To Office & Admn. overheads	416	W.I.P.	112
To Selling & distribution overhead	288		
To Goodwill written off	320		
To Interest on capital	32		
To Net profit	176		
	4,352		4,352

Profit as per cost accounts

	(Rs. in 000)
Materials	1,600.00
Wages	800.00
Prime cost	2,400.00
Factory overheads (100% of wages)	800.00
Factory cost (Gross)	3,200.00
Less: Closing W.I.P	(112.00)
Net Factory cost (21,230 units)	3,088.00
Office and admn. Overheads (10% of Factory cost)	308.80
Total cost of production	3,396.80
Less: Closing Stock (Finished Goods)	(196.80*)
Cost of production (20,000 units)	3,200.00
Selling & Distribution overheads @ Rs. 16 per unit	320.00
Cost of Sales	3,520.00
Sales realization for 20,000 units	4,000.00
Profit	480.00

*Total cost of production (Rs. 33,96,800)

Total number of units produced (21,230 units, i.e., units sold plus closing stock of finished goods) = Rs. 160 per unit.

Cost of 1,230 units = 1,230 × 160 = Rs. 1,96,800.

Reconciliation Statement

	Rs. '000	Rs. '000
Profit as per cost accounts		480.00
Add : Over-absorbed overheads:		
Factory overheads (800-720)	80.00	
Selling & Distribution overheads (320-288)	32.00	
Over-valuation of closing stock in financial accounts		
(240-196.20)	43.20	155.20
Less : Under-absorbed office and administration overhead		635.20
(416.308.80)	107.20	
Goodwill debited in financial accounts only	320.00	
Interest of capital charged financial accounts	32.00	459.20
Profit as per financial accounts		176.00

Question 6. **2009 – June CA PCC**

A manufacturing company has disclosed a net loss of Rs. 2,13,000 as per their cost accounting records for the year ended March 31, 2009. However, their financial accounting records disclosed a net loss of Rs. 2,58,000 for the same period. A scrutiny of data of both he sets of books of Accounts revealed the following information:

	Rs.
Factory overheads under absorbed	5,000
Administration overheads over absorbed	3,000
Depreciation charged in financial accounts	70,000
Depreciation charged in cost accounts	80,000
Interest on investments not included in cost accounts	20,000
Income-tax provided in financial accounts	65,000

Transfer fees (credit in financial accounts)	2,000
Preliminary expenses written off	3,000
Over-valuation of closing stock of finished goods in cost accounts	7,000

Prepare a Memorandum Reconciliation Account.

Solution:

Memorandum Reconciliation Account

Particulars	*Rs.*	*Particulars*	*Rs.*
To Net loss as per costing books	2,13,000	By Administrative overhead	
To Factory overheads under absorbed	5,000	over absorbed in costs	3,000
To Income tax not provided in cost	65,000	By Depreciation over charged in	
books		cost books (80,000 – 70,000)	10,000
To Preliminary expenses written	3,000	By Interest on investments not	
off in financial books		included in cost books	20,000
To Over-valuation of Closing	7,000	By Transfer fees not considered	
Stock of finished goods in cost		In cost books	2,000
Books		By Net loss as per financial books	2,58,000
	2,93,000		2,93,000

Question 7

ABC Ltd. has furnished the following information from the financial books for the year ended 31st March, 2014:

Profit & Loss Account

	(₹)		(₹)
To Opening stock (500 units at ₹ 140 each)	70,000	By Sales (10,250 units)	28,70,000
To Material consumed	10,40,000	By Closing stock	
To Wages	6,00,000	(250 units at ₹ 200 each)	50,000
To Gross profit c/d	12,10,000		
	29,20,000		29,20,000
To Factory overheads	3,79,000	By Gross profit b/d	12,10,000
To Administration overheads	4,24,000	By Interest	1,000
To Selling expenses	2,20,000	By Rent received	40,000
To Bad debts	16,000		
To Preliminary expenses	20,000		
To Net profit	1,92,000		
	12,51,000		12,51,000

The cost sheet shows the cost of materials at ₹ 104 per unit and the labour cost at ₹ 60 per unit. The factory overheads are absorbed at 60% of labour cost and administration overheads at 20% of factory cost. Selling expenses are charged at ₹ 24 per unit. The opening stock of finished goods is valued at ₹ 180 per unit.

You are required to prepare:

(i). A statement showing profit as per Cost accounts for the year ended 31st March, 2014; and

(ii). A statement showing the reconciliation of profit as disclosed in Cost accounts with the profit shown in Financial accounts.

Solution :

(i) **Statement of Profit as per Cost Accounts**

	Units	(₹)
Opening stock @ ₹ 180 per unit	500	90,000
Cost of production @ ₹ 240 per unit	10,000	24,00,000
Total	10,500	24,90,000
Less : Closing Stock @ ₹ 240 per unit	(250)	(60,000)
	10,250	24,30,000
Selling expenses @ ₹ 24 per unit		2,46,000
Cost of sales		26,76,000
Profit (Balancing figure)		1,94,000
Sales	10,250	28,70,000

Working Notes :

i. Statement of cost (10,000 units)

	Total cost (₹)	Cost per Unit (₹)
Materials	10,40,000	104.00
Wages	6,00,000	60.00
Factory Overhead 60% of wages	3,60,000	36.00
Factory cost	20,00,000	200.00
Administrative overhead 20% of factory cost	4,00,000	40.00
Total Cost	24,00,000	240.00

ii. Statement of Differences between the two set of accounts :

	Financial A/c (₹)	Cost A/c (₹)	Difference (₹)	Remarks (₹)
Factory overhead	3,79,000	3,60,000	19,000	Under recovery
Administrative overhead	4,24,000	4,00,000	24,000	Under recovery
Selling expenses	2,20,000	2,46,000	26,000	Over recovery
Opening Stock	70,000	90,000	20,000	Over recovery
Closing Stock	50,000	60,000	10,000	Over recovery

(ii) Reconciliation Statement

		(₹)
Profit as per cost accounts		1,94,000
Add : Over-recovery of selling overhead in Cost A/c		26,000
Add : Over-valuation of opening stock in Cost A/c		20,000
Add : Income excluded from Cost A/c		
Interest	1,000	
Rent	40,000	41,000
Less : Under recovery of Overhead in Cost A/c		
Factory Overhead	19,000	

Administrative Overhead	24,000	(43,000)
Less : Over-valuation of closing stock in Cost A/c		(10,000)
Less : Expenses excluded from Cost A/c		
Bad debts	16,000	
Preliminary expenses	20,000	(36,000)
Profit as per Financial Account		1,92,000

Question 8

R Limited showed a net loss of ₹ 35,400 as per their cost accounts for the year ended 31st March, 2014. However, the financial accounts disclosed a net profit of ₹ 67,800 for the same period. The following information were revealed as a result of scrutiny of the figures of cost accounts and financial accounts:

		(₹)
(i)	Administrative overhead under recovered	25,500
(ii)	Factory overhead over recovered	1,35,000
(iii)	Depreciation under charged in Cost Accounts	26,000
(iv)	Dividend received	20,000
(v)	Loss due to obsolescence charged in Financial Accounts	16,800
(vi)	Income tax provided	43,600
(vii)	Bank interest credited in Financial Accounts	13,600
(viii)	Value of opening stock:	
	In Cost Accounts	1,65,000
	In Financial Accounts	1,45,000
(ix)	Value of closing stock:	
	In Cost Accounts	1,25,500
	In Financial Accounts	1,32,000
(x)	Goodwill written-off in Financial Accounts	25,000
(xi)	Notional rent of own premises charged in Cost Accounts	60,000
(xii)	Provision for doubtful debts in Financial Accounts	15,000

Prepare a reconciliation statement by taking costing net loss as base.

Solution :

Statement of Reconciliation

S. No.	Particulars	Amount (₹)	Amount (₹)
	Net loss as per Cost Accounts		(35,400)
	Additions		
1.	Factory O/H over recovered	1,35,000	
2.	Dividend Received	20,000	
3.	Bank Interest received	13,600	
4.	Difference in Value of Opening Stock	20,000	

	(1,65,000 – 1,45,000)		
5.	Difference in Value of Closing Stock (1,32,000 – 1,25,500)	6,500	
6.	Notional Rent of own Premises	60,000	2,55,100
	Deductions		
1.	Administration O/H under recovered	25,500	
2.	Depreciation under charged	26,000	
3.	Loss due to obsolescence	16,800	
4.	Income tax Provided	43,600	
5.	Goodwill written-off	25,000	
6.	Provision for doubtful debts	15,000	(1,51,900)
	Net Profit as per Financial A/c.		67,800

UNIT COSTING

7

Question 1.

The books of A Ltd. presents the following data for the month of January 2004:

1. Balance.	Jan.1st	Jan.31st
Raw material	8000	8600
Work in progress	8000	12000
Finished goods	14000	18000

2. Raw material purchased Rs.36000.

3. Direct labour cost Rs. 16000 (160% of factory overheads).

4. Selling expenses Rsa.3400.

5. Administration expenses Rs. 2600 (including Rs.600 as abnormal cost).

6. Sales Rs.75000.

Question 2.

The following figures are extracted from the Trial Balance of ABC Co. on 30th Sept., 2004:

Inventories :

	Rs.
Finished stock	80000
Raw material	140000
Work in process	200000
Office appliances	17400
Plant and Machinery	460500
Buildings	200000
Sales	768000
Sales return and rebates	14000
Material purchased	320000
Freight incurred on material	16000
Purchase Return	4800
Direct labour	160000
Indirect Labour	18000
Factory Supervision	10000
Repairs and up keep of factory	114000
Heat , light and power	65000
Rates and taxes	6300
Miscellaneous Factory expenses	18700
Sales commission	33600
Sales travelling	11000
Sales promotion	22500
Salaries & expenses of distribution Dept.	18000
Office salaries and expenses	8600
Interest on borrowed funds	2000

Further details are available as follows:

a) Closing inventories:

Finished goods	115000
Raw materials	180000
Work in progress	192000
b) Accrued expenses:	
Direct labour	8000
Indirect labour	1200
Interest on borrowed funds	2000
c) Depreciation to be provided on :	
Office appliances	5%
Plant and machinery	10%
Buildings	4%

d) Distribution of the following costs:

Heat, light and power to the factory, office and distribution in the ratio 8;1;1. Rates and taxes two thirds to factory and one third to office. Depreciation on buildings to factory. Office and selling in the ratio 8;1;1.

With the help of the above information, you are required to prepare a Profit and loss statement for the company for the year ended 30th September, 2004 alongwith supporting schedules of :

1. Cost of Sales
2. Selling and distribution expenses
3. Office and administration expenses.

Question 3.

A Ltd. Co. has a capacity to produce 100000 units of the product every month. Its work costs at varying levels of productions is as under :

Levels	Work costs per unit (Rs.)
10%	400
20%	390
30%	380
40%	370
50%	360
60%	350
70%	340
80%	330
90%	320
100%	310

Its fixed administration expenses amount to Rs. 150000 p.m. and fixed marketing expenses amount to Rs. 250000 p.m. respectively. The variable selling cost amounts to Rs. 30 per unit.

It can market 100% of its output at Rs. 500 per unit provided it incurs the following further expenditure:

a) It gives gift item costing Rs. 30 per unit of sale ;

b) It has lucky draw every month giving the first prize of Rs. 50000 ; 2nd prize of Rs. 25000 ; 3rd price of Rs. 10000 and three conciliation prize of Rs. 5000 each to customers buying the product .

c) It spends Rs. 100000 on refreshment served every month to its customers .

d) It sponsors a television program every week at the cost of Rs. 2000000 per month.

It can market 30% of its output at Rs. 550 per unit without incurring any of the expenses referred to in (a) to (d) above . Prepare cost sheets to compute the amount of profit at 30% and 100% capacity.

Question 4.

From the following particulars prepare the production account showing all details of cost and their break up .

	1.04.2003	30.04.2003
Stock of raw material	75000	91500
Stock of Work in Progress	28000	35000
Stock of finished goods	54000	31000

Direct expenses	1500	Sales	211000
Raw Material	66000	Salesmen sal.& commi.	6500
Direct wages	52500	Office rent, rates etc.	2500
Indirect wages	2750	Sundry off. Exp.	6500
Dep. on P&M	3500	Carriage outwards	2500

Question 5.

Tronics Ltd. furnishes the following information for 10000 TVs valves manufactured during the last year:

Material	450000
Direct wages	300000
Power and consumable stores	60000
Lighting of factory	117500
Clerical salaries and management expenses	168000
Selling expenses	27000
Sakes proceeds of factory scrap	10000
Plant, repairs, maintenance and dep.	57500

The net selling price was Rs.158 per unit and all units were sold.

From 1st January, of the current year, the selling price was reduced to Rs.150 per unit. It was estimated that production could be increased in the current year by 50% due to spare capacity . Rates for materials and direct wages will be increased by 10%.

Required :

1. Prepare a cost sheet for last year showing various elements of cost per unit.
2. Compute estimated cost and profit for the current year assuming that 15000 units will be produced and sold during the year and factory overheads will be recovered as a percentage of direct wages and office and selling expenses as percentage of works cost.

Question 6.

The following particulars related to the year have been taken from the books of a chemical works, manufacturing and selling chemical mixture:

	Kgs.	Rs.
Stock on 1st April, year beginning		
Raw materials	2000	2000
Finished mixture	500	1750
Factory stores		7250
Purchases :		
Raw materials	160000	180000
Factory stores		24250
Sales :		
Finished mixture	153050	918300
Factory scrap		8170

Direct wages		178650
Power		30400
Depreciation of machinery		18000
Salaries:		
Factory		72220
Office		37220
Selling		41500
Expenses:		
Direct		18500
Office		18200
Selling		18000
Stock on 31st March each year	Kgs.	Rs.
Raw Material	1200	
Finished mixture	450	
Factory stores		5500

The stock of the finished mixture at the end of the year is to be valued at the factory cost of the mixture for that year.

Prepare a statement giving the maximum possible information about the cost and its break up for the year.

Question 7.

M.K. Works can produce 60000 units per annum at its optimum (100%) capacity. The estimated costs of production are as follows :

Direct material	Rs. 3 per unit
Direct labour	Rs. 2 per unit
Indirect expenses :	
Fixed	Rs. 150000 per annum
Variable	Rs. 5 per unit
Semi variable	Rs. 50000 per annum upto 50% capacity and an extra expense of Rs. 10000 for every 25% increase in capacity or part thereof .

The factory produced only against orders and not for own stock. If the production program of the factory is as indicated below and the management desires to ensure a profit of Rs. 100000 per year , work out the average selling price at which each unit should be quoted .

First three months of the year	50% of capacity
Remaining 9 moths of the year	80% of the capacity

Question 8.

A manufacturing company has an installed capacity of 120000 units per annum. The cost structure of the product is mentioned below:

i) Variable cost per unit

Material	Rs. 8
Labour	Rs. 8
(Subject to minimum of Rs. 56010 per month)	
Overheads	Rs. 3

ii) Fixed Overheads Rs. 168750 per annum

iii) Semi variable overheads Rs. 48000 per annum at 60 % capacity which increases by Rs. 6000 per annum for increase of every 10% of the capacity utilization or part thereof for the year as a whole.

The capacity utilization for the next year is estimated at 60% for two month , 75% for six month and 80% for remaining part of the year. If the company is planning to have a profit of 25% on the selling price , calculate the selling price per unit.

Question 9.

The cost structure of an article the selling price of which is Rs. 45000 is as follows :

Direct material	50%
Direct labour	20%
Overheads	30%

An increase of 15% in the cost of material and of 25% in the cost of labour is anticipated. These increased costs in relation to the present selling price would cause a 25% decrease in the amount of present profit per article.

You are required to calculate:

i) Present cost and profit per article and

ii) The revised selling price to produce the same percentage of profit to sales as before.

Question 10.

M/s AB shoes manufactures two types of shoes A and B. Production cost for the year ended 31st March 2004 were:

Direct material	1500000
Direct wages	840000
Production overheads	360000

There was no work in progress at the beginning or at the end of year. It is ascertained that :

a) Direct material cost per unit in type A shoes consist twice as much as that in type B shoes .

b) The direct wages cost per unit for type B shoes were 60% of those of type A shoes .

c) Production overheads was same per unit of A and B type.

d) Administrative overheads for each type was 150% of the direct wages .

e) Selling cost was Rs. 1.50 per pair .

f) Production during the year were : Type A 40000 pairs of which 36000 were sold ; Type B 120000 pairs of which 100000 were sold.

g) Selling price was Rs. 44 for type A and Rs. 28 for type B per pair . Prepare a statement showing cost and profit. A unit consist of a pair of shoes

Question 11.

On June 30 ,2004 a flood damaged the warehouse of a company completely destroying the work in progress inventory. There was no damage to raw material and finished goods inventory. A physical verification taken after the flood reveals the following:

i) Raw material inventory = Rs.62000

ii) Finished goods inventory = Rs.119000

The inventory on January 1, 2004 consisted the following:

1. Raw material Rs.30000 2. Work in progress inventory Rs.100000 3. Finished goods inventory Rs. 140000

Additional Information :

1) Gross profit is 25% of sales.

2) Sales from January to June 2004 = Rs.340000

3) Raw material purchased from January to June 2004 = Rs.115000.

4) Direct labour cost from January to June 2004 = Rs.80000.

5) Manufacturing overheads = 50% of labour cost.

Compute the stock of work in progress as on June 30, 2004.

Question 12.

The following is the summarized Trading and Profit and Loss A/c of K. Waterproof Manufactures Ltd. for the year ending 31st March, 2004 in which year 800 waterproofs were sold by the said company:

Trading and Profit and Loss Account

To cost of materials	32000	By sales	160000
To direct wages	48000		
To manufacturing charges	20000		
To gross profit c/d	60000		
	160000		160000
To office salaries	24000	By G/P b/d	60000
To rent and taxes	4000		
To selling expenses	8000		
To general expenses	12000		
To general reserve	2000		
To net profit	1000		
	60000		60000

Following estimates were made by the costing department of the company for the year ending 31st March 2005:

a) The output and the sales will be of 1000 waterproofs.

b) The price of materials will rise by 25% on the previous year's level.

c) Wages during the year will rise by 12 ½ %.

d) Manufacturing cost will rise in proportion to the combined cost of materials and wages.

e) Selling cost per unit will remain unchanged.

f) Other expenses will remain unaffected by the rise in output.

From the above information prepare a cost statement showing the price at which the waterproofs would be marketed so as to show a profit of 10% on the selling price.

Question 13:

Prepare an estimated cost sheet based on the following data and consider the price that you would quote for an export order of 25000 pieces.

Raw material – 1000 kgs. @ 6.95 per kg.

Direct labour – 15000 hours normal at Rs.2.00 per hour.

25% overtime at double the normal rate.

Factory overheads – normally covered at k80% of direct wages.

Selling & distribution cost – normally recovered at 60% of direct wages.

Fixed capital investment to be made – Rs. 50000.

Normal net return on capital employed expected – 25%.

Investment in working capital – 205 of the sales value.

Question 14.

While preparing the cost sheet, how will you deal with the following situation:

Situation 1

Opening stick of raw material = Rs.5000

Purchases of raw material = Rs.50000

Normal loss = Rs.2000

Abnormal loss = Rs.3000

Closing stock = Rs.10000

Situation 2

Suppose in situation 1, normally lost units realize Rs.200 and abnormally lost units realize Rs.300.

Situation 3

Actual bad debts are Rs.8000 on annual sales of Rs.500000. Under the normal circumstances, 1% of sales is not recoverable.

Situation 4

Sales are Rs.1000000 before any discount . As per business policy , 20% trade discount is allowed to all the customers but 30% discount is allowed to one customer (relative of businessman) on sales level of Rs.10000 before discount.

Situation 5

Suppose in situation 4, some of the customers pay their amount very early and as such we allowed them cash discount of Rs.8000.

Question 15.

A fire occurred in the factory premises on October 31, 2003 . The accounting records have been destroyed. Certain accounting records were kept in another building. They reveal the following for the period September 1, 2003 to October 31,2003:

a. direct materials purchased	Rs.250000
b. work in process inventory, 1.9.2003	Rs. 40000
c. direct materials inventory, 1.9.2003	Rs. 20000
d. finished goods inventory, 1.9.2003	Rs. 37750
e. indirect manufacturing cost	40% of conversion cost
f. sales revenues	Rs.750000
g. direct manufacturing labour	Rs.222250
h. prime cost	Rs. 397750
i. gross margin percentage based on revenues	30%
j. cost of goods available for sale	Rs.555775

Required :

i) Finished goods inventory, 31.10.2003 ii) Direct materials inventory , 31.10.2003

iii) Factory overheads iv) Work in process inventory, 31.10.2003.

JOB AND BATCH COSTING

8

Question 1.

Given below are the cost details for the organization during 1999:

Direct material	Rs. 500000	Direct Factory expenses	Rs. 300000
Direct labour	Rs. 1000000	factory overheads	Rs. 500000
WIP at the beginning	Rs.400000	Selling Expenses	Rs.200000
WIP at the end	Rs.300000	Sales	Rs.3500000
Office & Admn. Overheads	Rs.200000		

During March, 2000 there is an enquiry for a job requiring Direct Materials cost of Rs.5000. Direct labour cost of Rs.10000 and direct factory expenses of Rs.1000. Factory overheads are recovered as percentage to prime cost, office & admn. , overheads as percentage to works cost and selling and distribution overheads as percentage to cost of production. However it is felt that this year there is higher office and admn. Costs to the extent of 10% and selling cost have gone up by about 15% . What should be the quotation for the job if the same rate of profit on sale is to be maintained as during 1999.

Question 2.

From the records of a manufacturing company, the following budgeted details are available:

	Rs.	Rs.
Direct materials		199000
Direct wages:		
Machine shop (12000 hours)	63000	
Assembly shop (10000 hours)	48000	111000
Work overhead:		
Machine shop	88200	
Assembly shop	51800	140000
Administrative overhead	90000	
Selling overhead	81000	
Distribution overhead	62100	233100

Assuming that the company follows absorption method of costing, you are required to :

a) Prepare a schedule of overhead rates from the figures available stating the basis of overhead recovery rates used under the given circumstances.

b) Work out a cost estimate for the following job based on overhead computed.

Direct material: 25 kg. @ Rs. 16.80 per kg. Direct labour : Machine shop 30 hours

15 kg. @ Rs. 20.00 per kg. Assembly shop 42 hours

Question 3:

The following budgeted cost information is available from the records of a manufacturing concern for a particular year:

	(Rs. in lakhs)
Direct material	61.20
Direct wages	
- Rolling shop (120000hours)	6.00
- Milling shop (240000hours)	14.40

Works overheads

- Rolling shop	9.60
- Milling shop	28.80
Administration overheads	24.00
Selling overheads	43.20

The works overheads are recovered on the basis of labour hours, the administration overheads on the basis of works cost and selling overheads on the basis of cost of production.

You are required to –

1) Prepare annual cost statements so as to compute the budgeted cost of sales.

2) Compute overhead recovery rates.

Compute total cost of a job which requires the following-

a. Direct material Rs.7560

b. Labour cost

- Rolling shop 40 hours @ Rs.6 per hour
- Milling shop 70 hours @ Rs. 5 per hour.

Question 4:

In an engineering company, the factory overheads are recovered on fixed percentage basis on direct wages and administration overheads are absorbed on fixed percentage basis on factory cost.

The company has furnished the following data relating to two jobs undertaken by it in a period:

	Job 101	Job 102
Direct material	Rs. 54000	Rs. 37500
Direct wages	Rs.42000	Rs.30000
Selling price	Rs.166650	Rs. 128250
Profit percentage on total cot	10%	20%

Required :

(i) Computation of percentage recovery rates of factory and administration overheads.

(ii) Calculation of amount of factory overheads, administration overheads and profit for each of the two jobs.

(iii) Using the above recovery rates, fix the selling price of Job 103. The additional data being:

Direct material Rs.24000

Direct wages Rs.20000

Profit percentage on selling price 12 ½%

Question 5:

The following information for the year ended December 31st, 1998 is obtained from the books and records of a factory:

	Completed jobs	Work in progress
	Rs.	Rs.
Raw materials supplied from stores	90000	30000
Wages	100000	40000
Chargeable expenses	10000	4000
Materials transferred to WIP	2000	2000
Materials returned to stores	1000	

Factory overhead is 80% of wages and office overhead 25% of factory cost.

The price of the executed contracts during 1998 was Rs.410000.

Prepare (i) consolidated completed jobs account showing the profit made or loss incurred, and also (ii) consolidated WIP account.

Question 6.

A manufacturing unit has predetermined the overhead recovery rates as 40% on direct wages, 20% on works cost and 25% on cost of production for works expenses, management expenses and commercial expenses respectively.

At the end of the year, it has been found that the works overheads show under recover of one eighth of the absorbed amount, and the recovery of commercial expenses result in an over absorption of one third of the total amount absorbed.

If the prime costs of three jobs are as under, find the profit/loss on the respective selling prices (both on the basis of standard cost and on the basis of full absorption of overheads):

	Job A	Job B	Job C
	Rs.	Rs.	Rs.
Direct materials	45.50	32.60	26.80
Direct wages	15.20	8.60	7.20
	60.70	41.20	34.00
Selling price	200.00	130.00	90.00

Question 7.

Component 893-X is made entirely in cost centre 476. Material cost is 6 paise per component and each component takes 10 minutes to produce. The machine operator is paid 72 paise per hour and the machine hour rate is Rs.1.50. The setting up of the machine to produce component 893-X takes 2 hours 20 minutes.

On the basis of this information, prepare cost sheet showing the production and setting up cost, both in total and per component, assuming a batch of (a) 10 components, (b) 100 components, and (c) 1000 components is produced.

Question 8.

Units to be produced in year are 24000. The set up cost of one batch is Rs.324. The inventory carrying cost per unit per annum is Rs.31.20. compute Economic Batch Quantity.

OPERATING COSTING AND SERVICE COSTING

9

Question 1.

A truck starts with a load of 10 tonnes of goods from station P. It unloads 4 tonnes at station Q and rest of the goods at station R. It reaches back directly to station P after getting reloaded with 8 tonnes of goods at station R. The distances between P to Q, Q to R and then from R to P are 40 kms., 60 kms. and 80 kms. respectively. Compute 'Absolute tonne-km'. and 'Commercial tonne-km'.

Answer : 1400 Tonne – km; 1440 Tonne km.

Question 2.

Mr. Jai owns fleet of taxis and the following information is available from the records maintained by him.

Number of taxies	10	
Cost of each taxies	Rs.20000	
Salary of manager	600	p.m.
Salary of accountant	500	p.m.
Salary of cleaner	200	p.m.
Salary of mechanic	400	p.m.
Garage rent	600	p.m.
Insurance premium	5%	p.a.
Annual tax	600	per taxi
Driver's salary	200	p.m. per taxi
Annual repair	1000	per taxi

Total life of a taxi is about 200000 kms. A taxi runs in all 3000 kms in a month of which 30% it runs empty.

Petrol consumption is one litre for 10 kms. @ Rs.1.80 per litre. Oil and other sundries are Rs.5 per 100 kms.

Calculate the cost of running a taxi per km.

Answer : Rs. 0.779 per taxi per km.

Question 3.

A Transport Co. charges Rs.120 per ton for a 5 tons lorry load from A station to B station.

The charges for return trip are Rs.110 per ton. In the month of July, 1991, a truck has made 10 outward journeys with full load out of which 3 tons were unloaded twice at C station on the way. It returned without any load once only form C station to A station. The expenses incurred were:

Annual fixed charges Rs.38400; annual maintenance Rs.19200; and monthly running charges Rs.2404. You are required to find the cost per ton-kilometer (absolute) and the profit for the month of July, 1991, assuming that no concession is made for delivery at the intermediate stations.

Distance from A station to B station is 210 kms. and from A to C station 120 kms. The truck carried a load of 8 tons 5 times in the month while returning from B station but was once caught by the police and was fined Rs.2000.

Answer : Total Tonne kms.-23010 & Cost per tonne- km. 0.31 per Tonne km.

Question 4. **2000 – Nov [4] (b)**

A Mineral is transported from two mines – 'A' and 'B' and unloaded at plots in a Railway Station. Mine A is at a distance of 10 kms. And B is at a distance of 15 kms. From railhead plots. A fleet of lorries of 5 tonne carrying capacity is used for the transport of mineral from the mines. Records reveal that the lorries average a speed of 30 kms. Per hour, when running and regularly take 10 minutes to unload at the railhead. AT mine 'A' loading time averages 30 minutes per load while at mine 'B' loading time averages 20 minutes per load.

Drivers' wages, depreciation, insurance and taxes and found to cost Rs. 9 per hour operated. Fuel, oil, tyres, repairs and maintenance cost Rs. 1.20 per km.

Draw up a statement, showing the cost per tonne-kilometre of carrying mineral from each mine.

Answer : (i) Rs. 0.72 (ii) 0.66

Question 5.

SHANKAR has been promised a contract to turn a tourist car on a 20 km. long route for the chief executive of a multinational firm. He buys a car costing Rs. 150000. The annual cost of insurance and taxes are Rs. 4500 and Rs. 900 respectively. He has to pay Rs. 500 per month for a garage were he keeps the car when it is not in use. The annual repair costs are estimated at Rs. 4000. The car is estimated to have a life of 10 years at the end of which the scrap value is likely to be Rs. 50000.

He hires a driver who is to be paid Rs. 300 per month plus 10% of the taking as commission. Other incidental expenses are estimated at Rs. 200 per month.

Petrol and oil will cost Rs. 100 per 100 kms. The car will make 4 round trips each day. Assuming that a profit of 15% on taking is desired and that the car will be on the road for 25 days on an average per month, what should he charge per round-trip ?

Answer :Rs.88.22 per round trip

Question 6.

The Union Transport Company has been given a twenty kilometer long route to ply a bus. The bus costs the company Rs. 100000. It has been insured at 3% per annum. The annual road tax amount to Rs. 2000. Garage rent is Rs. 400 per month. Annual repair is estimated to cost Rs. 2360 and the bus is likely to last for five years.

The salary of the driver and the conductor is Rs. 600 and Rs. 200 per month respectively in addition to 10% of taking as commission to be shared equally by them. The manager's salary is Rs. 1400 per month and stationery will cost Rs. 100 per month. Petrol and oil will cost Rs. 50 per 100 kilometers. The bus will make three round trips per day carrying on an average 40 passengers in each trip. Assuming 15% profit on taking and that the bus will ply on an average 25 days in a month, prepare operating cost statement on a full year basis and also calculate the bus fare to be charged from each passenger per kilometer.

Answer :Rs.0.072 per Pass.-km.

Question 7.

A company is considering three alternative proposals for conveyance facilities for its sales personnel who have to do considerable traveling approximately 20000 kilometers every year. The proposal are as follows :

Purchase and maintain its own fleet of card. The average cost of a car is Rs. 100000.

Allow the Executive to use his own car and reimburse expenses at the rate of Rs. 160 paise per kilometer and also bear insurance costs.

Hire cars from an agency at Rs. 20000 per year per car. The Company will have to bear costs of petrol, taxed and tyres.

The following further details are available :

Petrol Rs. 0.60 per km.

Repairs and maintenance Rs. 0.20 per km.

Tyre Rs. 0.12 P. per km.

Insurance Rs. 1200 per car per annum.

Taxes Rs. 800 per car per annum.

Life of the car : 5 years with annual mileage of 20000 kms.

Resale value : Rs. 20000 at the end of the fifth year.

Work out the relative costs of three proposals and rank them.

Answer :Rs. 36400 ;Rs.33200;Rs.35200

Question 8.

In order to develop tourism, ABCL airline has been given permit to operate three flights in a week between X and Y cities (both side). The airline operates a single aircraft of 160 seats capacity. The normal occupancy is estimated at 60% through out the year of 52 weeks. The one way fare is Rs. 7200. The cost of operation of flights are:

Fuel cost (variable)	Rs. 96000 per flight
Fuel served on board on non-chargeable	
Basis	Rs. 125 per passenger
Commission	5% of fare applicable for all booking
Fixed cost :	Rs. 350000 per flight
Aircraft lease	Rs. 72000 per flight

Required:

(i) Calculate the net operating income per flight.

(ii) The airline expects that its occupancy will increase to 108 passengers per flight if the fare is reduced to Rs. 6720. A devise whether this proposal should be implemented or not.

Answer : Increase by 31332, Proposal is acceptable.

Question: 9.

Prakash Automobiles distributes its goods to a regional dealer using a single Lorry. The dealer's premises are 40 kilometres away by road. The lorry has a capacity of 10 tonnes and makes the journey twice a day fully loaded on the outward journeys and empty on return journeys. The following information is available for a Four Weekly Period during the year 1990 :-

Petrol consumption	8 kilometres per litre
Petrol cost	Rs. 13 per litre
Oil	Rs. 100 per week
Driver's wages	Rs. 400 per week
Repairs	Rs. 100 per week
Garage rent	Rs. 150 per week
Cost of Lorry (Excluding Tyres)	Rs. 450000
Life of Lorry	80000 kilometres
Insurance	Rs. 6500 per annum
Cost of Tyres	Rs. 6250
Life of Tyres	Rs. 25000 kilometres
Estimate sale value of Lorry at the end of its life	Rs. 50000
Vehicle Licence Cost	Rs. 1300 per annum
Other overhead cost	Rs. 41600 per annum

The Lorry operates on a five day week.

Required :

A statement to show the total cost of operating the vehicle for the four weekly period analysis into running costs and fixed costs .

Calculate the vehicle cost per kilometer and per tonne kilometer.

Answer :Rs 9 per km. & Rs.1. 80 per tonne –km.

Question 10.

A transport company has a fleet of three trucks of 10 tonnes, capacity each plying in different directions for transport of customers goods. The trucks run loaded with goods and return empty. The distance traveled, number of trips made and the load carried per day by each truck are as under :

Truck no.	One way Distance Km.	No. of trips per day	Load carried per trip
1	16	4	6
2	40	2	9
3	30	3	8

The analysis of maintenance cost and the total distance traveled during the last two years is as under

Year	Total distance Travelled (kms)	Maintenance Cost Rs.
1	160200	46050
2	156700	45175

The following are the details of expenses for the year under review :

Diesel : Rs. 10 per litre. Each litre gives 4 km. per Litre of diesel on an average.

Drivers salary : Rs. 2000 per month

License and taxes : Rs. 5000 per annum per truck.

Insurance : Rs. 5000 per annum for all the three vehicles.

Purchase price per truck : Rs. 300000 Life 10 years. Scrap value at the end Of life is Rs. 10000.

Oil and sundries : Rs. 25 per 100 km. run.

General Overhead : Rs. 11084 per annum.

The vehicle operate 24 days per month o an average.

Required :

Prepare an Annual Cost Statement covering the fleet of three vehicles.

Calculate the cost per km. run.

Determine the freight rate per tonne km. to yield a profit of 10% on freight.

Answer :Cost per km. :Rs.4.45 & Freight :Rs.1. 27 per tonne-km.

Question 11.

Mr. X owans a bus which runs according to the following schedule :

(i) Delhi to Chandigarh and back, the same day.

Distance covered : 150 kms. one way

Number of days run each month : 8

Seating capacity occupied 90%.

(ii) Delhi to Agra and back the same day.

Distance covered : 120 kms. one way.

Number of days run each month : 10

Seating capacity occupied 85%.

(iii) Delhi to Jaipur and back the same day.

Distance covered : 270 kms. one way.

Number of days run each month : 6

Seating capacity occupied 100%.

Following are the other details :

Cost of the bus	Rs. 600000
Salary of the driver	Rs. 2800 p.m.
Salary of the conductor	Rs. 2200 p.m.
Salary of the part-time Accountant	Rs. 200 p.m.
Insurance of the bus	Rs. 4800 p.a.
Diesel consumption 4 kms. per liter at	Rs. 6 per liter
Road tax	Rs. 1500 p.a.
Lubricant oil	Rs. 10 per 100 kms.
Permit fee	Rs. 315 p.m.
Repairs and maintenance	Rs. 1000 p.m.
Depreciation and maintenance	@ 20% p.a.
Seating capacity of the bus	50 persons.

Passenger tax is 20% of the total takings. Calculate the bus fare to be charged from each passenger to earn a profit of 30% on total takings. The fares are to indicated per passenger for the journeys :

i) Delhi to Chandigarh.

ii) Delhi to Agra.

iii) Delhi to Jaipur.

Answer :i)Rs.24 ii)Rs.19.2 iii)Rs. 43.2

Question 12.

EPS is a Public School having 25 buses each plying in different directions for the transport of its school students. In view of large number of students availing of the bus service, the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The workload of the students has been so arranged that in the morning, the first trip picks up senior students and the second trip plying an hour later picks up junior students. Similarly , in the afternoon, the first trip takes the junior students and an hour later the second trip takes the senior student home.

The distance traveled by each bus, one way is 16 kms. The school works 24 days in a month and remain closed for vacation in May and June. The bus fee, in charged for 12 months details of expenses for the year 2003-2004 are as under

Driver's salary payable for all the months	Rs. 5000 per month per cleaner
Cleaner's salary payable for all the 12 months (one cleaner has been employed for every five buses)	Rs. 3000 per month per cleaner
Licence Fees, Taxes etc.	Rs. 2300 per bus per annum
Insurance Premium	Rs. 15600 per bus per annum
Repairs and Maintenance	Rs. 16400 per bus per annum
Purchase price of the bus	Rs. 1650000 each
Life of the bus	16 years
Scrap value	Rs. 150000

Diesel Cost Rs. 18.50 per liter

Each bus gives an average of 10 kms per liter of diesel. The seating capacity of each bus is 60 students. The seating capacity is fully occupied during the whole year.

The school follows differential bus fees based on distance traveled as under :

Student picked up and Dropped within the range of distance from the school	Bus Fee	Percentage of Students availing this facility
4 kms	25 % of Full	15%
8 kms	50 % of Full	30 %
16 kms	Full	55%

Ignore interest. Since the bus fees has to be based on average cost, you are required to :

Prepare a statement showing the expenses of operating a single bus and the fleet of 25 buses for a year.

Work out a average cost per students per month in respect of :

(a) Students coming from a distance of upto 4 kms from the school ;

(b) Students coming from a distance of upto 8 kms from the School; and

(c) Students coming from a distance of upto 16 kms from the School.

Answer :i) Rs.59.32 ii) 118.65 iii) Rs.237.29

Question 13.

The data given relates to 'Vasanth Talkies', a mini theatre, for the year ending 31st March,1976:

Salaries

1	Manager	Rs. 800 p.m.	Carbon	Rs.	7235
10	Gate-Keepers	200 p.m. each	Misc.expenditure		5425
2	Operators	400 p.m. each	Advertisement		34710
4	Clerks	250 p.m. each	Administration expenses		18000
Electricity and oil		11655	Hire of print		1470700

The premises are valued at Rs. 600000 and the estimated life is 15 years. Projector and other equipment cost Rs. 320000 on which 10% depreciation to be charged.

Daily 3 shows are run throughout the year. The total capacity is 625 seats which is divided into three classes as follows:

Janata circle	250 seats
Sanman circle	250 seats
Lord's circle	125 seats

Ascertain cost per man-show assuming that:

a) 20 % of the seats remain vacant, and

b) Weightage to be given to the three classes in the ration 1:2:3

Determine the rates for each class if the management expects 30% return on gross proceeds. Ignore entertainment taxes.

Answer :Rs.2.43 ;Rs.4.86 ;Rs..7.29

Question 14

A transport company has 20 vehicles, which capacities are as follows:

No. of Vehicles	Capacity per vehicle
5	9 tonne
6	12 tonne
7	15 tonne
2	20 tonne

The company provides the goods transport service between stations 'A' to station 'B'. Distance between these stations is 200 kilometres. Each vehicle makes one round trip per day an average. Vehicles are loaded with an average of 90 per cent of capacity at the time of departure from station 'A' to station 'B' and at the time of return back loaded with 70 per cent of capacity. 10 per cent of vehicles are laid up for repairs every day. The following information are related to the month of October, 2013 :

Salary of Transport Manager	₹ 30,000
Salary of 30 drivers	₹ 4,000 each driver
Wages of 25 Helpers	₹ 2,000 each helper
Wages of 20 Labourers	₹ 1,500 each labourer
Consumable stores	₹ 45,000
Insurance (Annual)	₹ 24,000
Road Licence (Annual)	₹ 60,000
Cost of Diesel per litre	₹ 35
Kilometres run per litre each vehicle	5 Km.
Lubricant, Oil etc.	₹ 23,500
Cost of replacement of Tyres, Tubes, other parts etc.	₹ 1,25,000
Garage rent (Annual)	₹ 90,000
Transport Technical Service Charges	₹ 10,000
Electricity and Gas charges	₹ 5,000
Depreciation of vehicles	₹ 2,00,000

There is a workshop attached to transport department which repairs these vehicles and other vehicles also. 40 per cent of transport manager's salary is debited to the workshop. The transport department is charged ₹ 28,000 for the service rendered by the workshop during October, 2013. During the month of October, 2013 operation was 25 days.

You are required:

(i) Calculate per ton-km operating cost.

(ii) Find out the freight to be charged per ton-km, if the company earned a profit of 25 per cent on freight.

Question 15

Gopal Milk Co-Operative Society (GMCS) collects raw milk from the farmers of Ramgarh, Pratapgarh and Devgarh panchayats and processes these milk to make various dairy products. GMCS has its own vehicles (tankers) to collect and bring the milk to the processing plant. Vehicles are parked in the GMCS's garage situated within the plant compound.

Following are the some information related with the vehicles:

	Ramgarh	Pratapgarh	Devgarh
No. of vehicles assigned	4	3	5
No. of trips a day	3	2	2
One way distance from the processing plant	24 k.m.	34 k.m.	16 k.m.
Toll tax paid p.m. (₹)	2,850	3,020	---

All the 5 vehicles assigned to Devgarh panchayat, were purchased five years back at a cost of ₹ 9,25,000 each. The 4 vehicles assigned to Ramgarh panchayat, were purchased two years back at a cost of ₹ 11,02,000 each and the remaining vehicles assigned to Pratapgarh were purchased last year at a cost of ₹ 13,12,000 each. With the purchase of each vehicle a two years free servicing warranty is provided. A vehicle gives 10 kmpl mileage

in the first two year of purchase, 8 kmpl in next two years and 6 kmpl afterwards. The vehicles are subject to depreciation of 10% p.a. on straight line basis irrespective of usage. A vehicle has the capacity to carry 25,000 litres of milk but on an average only 70% of the total capacity is utilized.

The following expenditure is related with the vehicles:

Salary of Driver (a driver for each vehicle)	₹ 18,000 p.m.
Salary to Cleaner (a cleaner for each vehicle)	₹ 11,000 p.m.
Allocated garage parking fee	₹ 1,350 per vehicle per month
Servicing cost	₹ 3,000 for every complete 5,000 k.m. run.
Price of diesel per litre	₹ 58.00

From the above information you are required to calculate

(i) Total operating cost per month for each vehicle. (Take 30 days for the month)

(ii) Vehicle operating cost per litre of milk.

Question 16

A 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	₹ 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

Question 17

A company runs a holiday home. For this purpose, it has hired a building at a rent of ₹ 10,000 per month along with 5% of total taking. It has three types of suites for its customers, viz., single room, double rooms and triple rooms.

Following information is given:

Type of suite	Number	Occupancy percentage
Single room	100	100%
Double rooms	50	80%
Triple rooms	30	60%

The rent of double rooms suite is to be fixed at 2.5 times of the single room suite and that of triple rooms suite as twice of the double rooms suite.

The other expenses for the year 2013 are as follows:

	(₹)
Staff salaries	14,25,000
Room attendants' wages	4,50,000
Lighting, heating and power	2,15,000
Repairs and renovation	1,23,500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000

Provide profit @ 20% on total taking and assume 360 days in a year.

You are required to calculate the rent to be charged for each type of suite.

FOR YOUR PRACTICE

Question 1.

A lorry starts with a load of 20 tonnes of goods from station A. It unloads 8 tonnes at station B and rest of goods at station C. It reaches back directly to station A after getting reloaded with 16 tonnes of goods at station C. The distance between A to B, B to C and then from C to A are 80 kms, 120 kms and 160 kms respectively. Compute 'Absolute tones – kms' and 'Commercial tones – kms'.

Solution:

Absolute tonne – km

= (80 × 20) + (12 × 120) + (16 × 160)

= 5600 tonne – km

Commercial tonne km

$$= \frac{20 + 16 + 12}{3} \times (80 + 120 + 160)$$

= 5760 tonne - km

Question 2.

A transport service company is running five buses between two towns which are 50 kms. apart. Seating capacity of each bus is 50 passengers. The following particulars were obtained from their books for April, 1998 :

	Rs.
Wages of drivers, conductors and cleaners	24000
Salaries of office staff	10000

Diesel oil and other oil	35000
Repairs and maintenance	8000
Taxation, insurance etc.	16000
Depreciation	26000
Interest and other expenses	20000
	139000

Actually, passengers carried were 75 percent of seating capacity. All buses ran on all days of the month. Each bus made one round trip per day.

Find out he cost per passenger km.

Solution:

Total operating cost = Rs. 1,39,000

Total passenger km = (50 + 50) × 37.5* × 5 × 30

= 5,62,500

* Total number of passenger = $\frac{50 \times 75}{100}$

∴ Total cost passenger km

= $\frac{1,39,000}{5,62,500}$

= 0.24

Question 3.

Global Transport Ltd. charges Rs. 90 per ton for its 5 tonnes truck lorry load from city 'A' to city 'B'. The charges for the return journey are Rs. 84 per tonnne. No concession or reduction in these rates is made for any delivery of goods at intermediate section 'C' in January, 1997 the truck made 12 outward journeys for city 'B' with full load out of which 2 tons were unloaded twice in the way at city 'C'. The truck carried a load of 8 tons in its return journey for 5 times but once caught by police and Rs. 1200 was paid as fine. For the remaining trips the truck carried full load out of which all the goods on load were unloaded once at city 'C'.

The distance from city 'A' of city 'C' and city 'B' are 140 kms. and 300 kms. respectively.

Annual fixed costs and maintenance charges are Rs. 60000 and Rs. 12000 respectively. Running charges spent during January, 1997 are Rs. 2944.

You are required to find out the cost per absolute tonnne -kilometre and the profit for January, 1997.

Solution:

(i) Calculation of Tonne-kms:

			Tonne-kms	Tons carried
A.	Outward			
	A □ C □ B	[(5 × 2 × 140) + (3 × 2 × 160)]	2,360	(5 × 2)
	A □ B	[(5 × 10 × 300)]	15,000	(5 × 10)
			17,360	60
B.	Return			
	B □ A	(8 × 5 × 300)	12,000	(8 × 5)
		(6 × 5 × 300)	9,000	(6 × 5)
	B □ C	(1 × 5 × 160)	800	(1 × 5)
			21,800	75
		Total (A + B)	39,160	

(ii) Calculation of operating cost per tonne-kms:

Particulars	**Workings**	**Amount**
Fixed cost	60,000	5,000

	12	
Maintainance	12,000	1,000
	12	
Running charges		2,944
		8,944
∴ Cost per tonne km	8,944	0.228
	39,160	

(iii) Calculation of profit:

Freight revenue	(90 × 60) + (84 × 75) =	11,700
(–) Operating cost		8,944
(–) Penalty		1,200
		Rs 1,556

Question 4.

A chemical factory runs its boiler on furnace oil obtained from Indian oil and Bharat Petroleum, whose depots are situated at a distance of 12 and 8 miles from the factory site. Transportation of Furnace Oil is made by the company's own tank lorries of 5 tons capacity each. Onward trips are made only on full load and the lorries return empty. The filling-in time takes an average 40 minutes for Indian Oil and 30 minutes for Bharat Petroleum. But he emptying time in the factory is only 40 minutes for all. From the records available, it is seen that the average speed of the company's lorries work out to 24 miles per hour. The varying operating charges average 60 paisa per mile covered and fixed charges give an incidence of Rs. 7.50 per hour of operation. Calculate the cost per ton mile for each source.

Given :

Variable Cost = 0.60 Rs per mile

Fixed Cost = 7.5 Rs per hour

Tanker's Speed = 24 miles /hour

Solution

A. Calculate of total distance per trip

IOC = 12 miles + 12 miles = 24 miles

BP = 8 miles + 8 miles = 16 miles

B.

Total duration per trip :	IOC	BP
Filling time	40 Min	30 Min
Emptying time	40 Min	40 Min
Travelling time	60 Min	40 Min
	60 × 24	60 × 16
	24	24
Total	140 Min	110 Min

C. Calculate of operating cost per Tonne mile –

	IOC	BP
Variable cost	14.40	9.60
	(0.60 × 24)	(060 × 16)
Fixed cost	17.5	13.75
	7.5 × 140	7.5 × 110
	60	60
Total operating cost	31.90	23.35
Total tonne – Mile	60 Tonne- Mile	40 Tonne- Mile
	[(12 × 0) + (12 × 5)]	[(8 × 0) + (8 × 5)]
Operating cost per ton mile (Rs)	0.53	0.58

Question 5.

SMC is a public school having five buses each plying in different directions for the transport of its school students. In view of a large number of students availing of the bus service the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The work-load of the students has been so arranged that in the morning the first trip picks up senior students and the second trip plying an hour later picks up the junior students. Similarly in the afternoon the first trip takes the junior students and an hour later the second trip takes the senior students for all 12 months in a year. The distance troubled by each bus one way is 8 km. The school works 25 days in a month 8 remains closed for vacation in May, June December. Bus fees however is payable by the students for all 12 months in a year.

The details of expenses for a year are as under :-

Driver's salary	Rs. 450 per month per driver
Cleaner's salary	Rs. 350 per month
(Salary payable for all 12 months)	
(one cleaner employed for all the five buses)	
License fee, taxes etc.	Rs. 860 per bus per annum
Insurance	Rs. 100 per bus per annum
Repairs & maintenance	Rs. 3500 per bus per annum
Purchase price of the bus	Rs. 150000 each
Life 12 years	
Scrap value	Rs. 30000
Diesel cost	Rs. 2.00 per liter

Each bus gives an average mileage of 4 km. liter of diesel.

Seating capacity of each bus is 50 students.

The seating capacity is fully occupied during the whole year.

Students picked up and dropped within a range upto 4 kms. of distance from the school are charged half fare and fifty per cent of the student's traveling in each trip are in this category. Ignore interest. Since the charges are to be based on average cost you are required to :

Prepare a statement showing the expenses of operating a single bus and the fleet of five buses for a year.

Work out the average cost per student per month in respect of -

i) Students coming from a distance of upto 4 kms. from the school and

ii) Students coming from a distance beyond 4 kms. from the school.

Answer : Rs. 16 and Rs. 32, Operating cost per Bus 28,800, Total Operating cost for all Buses 1,44,000.

Solution :

(i) Statement of Expenses of operating bus/buses for a year

Particulars	Rate (₹)	Per Bus per annum (₹)	Fleet of 5 buses p.a. (₹)
(i) Standing Charges :			
Driver's Salary	4,500 p.m.	54,000	2,70,000
Cleaner's Salary	3,500 p.m.	8,400	42,000
Licence Fee, Taxes etc.	8,600 p.a.	8,600	43,000
Insurance	10,000 p.a.	10,000	50,000
Depreciation (15,00,000 – 3,00,000) ÷ 12 yrs	1,00,000 p.a.	1,00,000	5,00,000
(ii) Maintenance Changes :			
Repairs & Maintenance	35,000 p.a.	35,000	1,75,000

(iii) Operating Charges :			
Diesel (Working Note 1)		1,62,000	8,10,000
Total Cost [(i) + (ii) + (iii)]		3,78,000	18,90,000
Cost per month		31,500	1,57,500
Total no. of equivalent students		150	750
Total Cost per half fare equivalent student		₹ 210	₹ 210

(ii) Average cost per student per month :

A. Students coming from distance of upto 4 km. from school

$$= \frac{\text{Total cost per month}}{\text{Total no.of equivalent students}} = \frac{\text{Rs. 31,500}}{\text{150 students}} = ₹\ 210$$

B. Students coming from a distance beyond 4 km. from school

= Cost of per half fare student X 2 = ₹ 210 X 2 = ₹ 420

Working Notes :

1. Calculation of diesel cost per bus :

Distance travelled in a year : (8 round trip X 8 km. X 25 days X 9 months)

Distance travelled p.a. : 14,400 km.

Cost of diesel (per bus p.a.) : $\frac{\text{14,400 km.}}{\text{4 kmpl}}$ X ₹ 45 = ₹ 1,62,000

2. Calculation of Equivalent number of students per bus :

Seating capacity of a bus	50 students
Half fare students (50% of 50 students)	25 students
Full fare students (50% of 50 students)	25 students
Total number of students equivalent to half fare students	
Full fare students (25 students X 2)	50 students
Add : Half fare students	25 students
Total Equivalent number of students in a trip	75 students
Total number of equivalent students in two trips (Senior + Junior)	150 students

Question 6.

The Iron and Steel Works which generates its own electricity for the purpose of using the same for running the factory. Gives the following information:

Fuel Coal consumed during the month 1000 quintals @ Rs. 12 per quintal.

Oil 15 quintals @ Rs. 1000 per quintal.

Water 200000 liters @ Rs. 1.00 per 100 liters

Cost of Steam Boiler Rs. 50000 which has the residual value of Rs. 2000. The life of steam boiler is 10 years.

Salaries and wages for the Boiler House:

20 men @ Rs. 150 per month

40 women @ Rs. 60 per month

Share of Administration charges Rs. 1050 per month

Sale of ash Rs. 300

Generating plant cost Rs. 150000 Depreciation @ 10%

Repair and Maintenance of Steam Boiler and Generating Plant Rs. 1000

Salaries and wages for Generating Plant:

10 skilled workers @ Rs. 300 per month

15 unskilled workers @ Rs. 100 per month

No. of units generated 200000

1/10 of units generated were used by Generating Department itself.

Calculate cost per unit for electricity generated.

Solution

Cost Sheet of Iron and Steel Works

		Per Month	***Total***
Coal : Consumed: 1000 × 12		Rs. 12,000	
Oil : 15 × Rs. 1000		15,000	
Water : 2,00,000 litres @ Re. 1 per 1000 litres		200	
Depreciation of steam boiler : {(50,000 – 2,000) ÷ 10 year} ÷ 12 months		400	
			27,600
Less Sale of ash (for the month-assumed)			300
			27,300
Salaries and wages of Boiler House:			
20 man × Rs. 150 per month	3,000		
40 women × Rs. 60 per month	2,400		
		5,400	
Salaries and wages of Generating Plant:			
10 skilled workers × Rs. 300 p.m.	= 3,000		
15 unskilled workers × Rs. 100 p.m.	= 1,500	4,500	
Repair and maintenance		1,000	
Depreciation of Generating Plant {(1,50,000 × 0.10) ÷ 12}		1,250	
Share of Administration charges		1,050	13,200
			40,500
Add Cost of electricity used in generation *(Note 1)*			4,500
			45,000

No of units generated (net output) = 2,00,000 – 20,000 = 1,80,000 units

Cost per unit = Rs. 45,000 ÷ 1,80,000 = Re. 0.25

Note 1 - *Cost of electricity used in generators*

Suppose cost of electricity used in generator = x and total cost of generator = y

$\therefore$ x = 1/10 of y …(i)

y = Rs. 40,500 + 1/10 (40,500 + x) …(ii)

Putting the value of (*ii*) in (*i*)

$x = \frac{1}{10}\{40{,}500 + \frac{1}{10}(40{,}500 + x)\}$ = Rs. 4,500

Question 7.

The boiler house is one of the service departments of company. Steam is raised and then transferred to production departments and other service departments as required.

The basic monthly budget figures for 1997 are as follows:

Boiler operating hours 480

Steam raised	8000000 kg
Costs:	
Fuel (V)	Rs. 19200
Chemicals (V)	Rs. 960
Wages (F)	Rs. 2400
Sundry Overheads (F)	Rs. 3000

The actual figures for February 1997 are as follows:

Boiler Operating hours:	432
Steam raised	6750000 kg.
Costs:	
Fuel (V)	Rs. 18000
Chemicals (V)	Rs. 990
Wages (F)	Rs. 2200
Sundry overhead (F)	Rs. 3000

It is expected that the price of chemicals for all output will fall by 2%. Where the boiler operates in excess of 480 hours per month. Sundry fixed costs are expected to fall by Rs. 200 where the boiler is operated for less than 425 hours and to increase from the normal level by Rs. 250 where the boiler is operated for more than 480 hours.

Variable costs vary in proportion to boiler hours.

Required:

a) Prepare a budget summary which shows the cost of the boiler house in total and per '000 kg steam for boiler operating levels of 400,432,480, and 540 hours.

b) Prepare a control statement which compares budget with actual cost of the boiler house for February where a flexible budgeting system is in operation. Comment on the variances in the statement.

Solution

(a) **Flexible Budget Summary**

Boiler operating hours:	400	432	480	540
Steam raised ('000 kg)	6,667	7,200	8,000	9,000
Costs				
Fuel (V)	Rs. 16,000	Rs. 17,280	Rs. 19,200	Rs. 21,600.0
Chemicals (V)	800	864	960	1,058.4
Wages (F)	2,400	2,400	2,400	2,400.0
Sundry overheads (F)	2,800	3,000	3,000	3,250.0
Total	22,000	23,544	25,560	28,308.4
Cost/'000 kg	3.30	3.27	3.195	3.145

(b) **Control statement for the month**

	Budget	*Actual*	*Variances*	
Boiler operating hours	432	432		
Steam raised ('000)	7,200	6,750	450	(A)
Costs:	Rs.	Rs.	Rs.	
Fuel (V)	17,280	18,000	720	(A)
Chemical (V)	864	990	126	(A)
Wages (F)	2,400	2,200	200	(F)
Sundry overhead (F)	3,000	3,000	nil	
	23,544	24.190	646	(A)

Question 8. **2010, May**

A Transport company has been given a 40 kilometre long route to run 5 buses. The cost of each bus is Rs 6,50,000. The buses will make 3 round trips per day carrying on an average 80 percent passengers of their seatng capacity. The seating capacity of each bus is 40 passengers. The buses will run on an average 25 days in a month. The other information for the year 2010-11 are given below :

Garage rent	Rs 4,000 per month
Annual repairs and maintenance	Rs 22,500 each bus
Salaries of 5 drivers	Rs 3,000 each per month
Wages of 5 conductors	Rs 1,200 each per month
Manager's salary	Rs 7,500 per month
Road tax, permit fee, etc.	5,000 for a quarter
Office expenses	Rs 2,000 per month
Cost of diesel per litre	Rs 33
Kilometre run per litre for each bus	6 kilometres
Annual depreciation	15% of cost
Annual Insurance	3% of cost

You are required to calculate the bus fare to be charged from each passenger per kilometer, if the company wants to earn a profits of 33⅓ percent on taking (total receipts from passengers).

Solution :

Operating Cost Sheet for the year 2013-14

	Particulars	Total Cost (₹)
A.	**Fixed Charges :**	
	Garage rent (₹ 4,000 X 12 months)	48,000
	Salary of drivers (₹ 3,000 X 5 drivers X 12 months)	1,80,000
	Wages of Conductors (₹ 1,200 X 5 conductors X 12 months)	72,000
	Manager's salary (₹ 7,500 X 12 months)	90,000
	Road Tax, Permit fee, etc. (₹ 5,000 X 4 quarters)	20,000
	Office expenses (₹ 2,000 X 12 months)	24,000
	Insurance (₹ 6,50,000 X 5 buses X 3%)	97,500
	Total (A)	5,31,500
B.	**Variable Charges :**	
	Repairs and Maintenance (₹ 22,500 X 5 buses)	1,12,500
	Depreciation (₹ 6,50,000 X 5 buses X 15%)	4,87,500
	Diesel {(3,60,000 km. ÷ 6 km.) X ₹ 33}	19,80,000
	Total (B)	25,80,000
	Total Cost (A + B)	31,11,500
	Add : 33 1/3% Profit on takings or 50% on cost	15,55,750
	Total Takings (Total bus fare collection)	46,67,250
	Total Passenger – Km. (Working Note 2)	1,15,20,000
	Bus fare to be charged from each passenger per km.	0.405

Working Notes :

1. Total Kilometers to be run during the year 2013-14

   = 40 km. X 2 sides X 3 trips X 25 days X 12 months X 5 buses = 3,60,000 kilometers

2. Total Passenger Kilometers

   = 3,60,000 km. X 40 passengers X 80% = 1,15,20,000 Passenger – km.

Question 9

The following information relates to a bus operator:

Cost of the bus	₹	18,00,000
Insurance charges		3% p.a.
Manager-cum accountant's salary	₹	8,000 p.m.
Annual Tax	₹	50,000
Garage Rent	₹	2,500 p.m.
Annual repair & maintenance	₹	1,50,000
Expected life of the bus		15 years
Scrap value at the end of 15 years	₹	1,20,000
Driver's salary	₹	15,000 p.m.
Conductor's salary	₹	12,000 p.m.
Stationery	₹	500 p.m.
Engine oil, lubricants (for 1200 km.)	₹	2,500
Diesel and oil (for 10 km.)	₹	52
Commission to driver and conductor (shared equally)		10% of collections
Route distance		20 km long

The bus will make 3 round trips for carrying on the average 40 passengers in each trip. Assume 15% profit on collections. The bus will work on the average 25 days in a month.

Calculate fare for passenger-km

Solution :

Working Notes :

(i) Calculation of depreciation of Bus (Per month)

$$= \frac{\text{Cost of the bus – Scrap value at theend of the 15 years}}{\text{Expected life of the bus}}$$

$$= \frac{\text{Rs. 18,00,000 –Rs. 1,20,000}}{\text{15 years}}$$

= ₹ 1,12,000 p.a.

$$\text{Depreciation per month} = \frac{\text{Rs. 1,12,000}}{\text{12 months}} = ₹\ 9,333.33$$

(ii) Calculation of total distance travelled and Passenger – km. per month

Total distance = 3 trips X 2 X 20 X m. X 25 days = 3,000 k.m.

Total distance = 3 trips X 2 X 20 X m. X 25 days X 40 passengers

= 1,20,000 Passenger – k.m.

(iii) Cost of Engine oil, Lubricants =

$$\frac{\text{Total distance travelled}}{\text{1,200 k.m.}} \text{ X ₹ 2,500}$$

$= \frac{3{,}000\ \text{k.m.}}{1{,}200\ \text{k.m.}} \times ₹\ 2{,}500 = ₹\ 6{,}250$

Diesel and Oil $= \frac{\text{Total distance travelled}}{10\ \text{k.m.}} \times ₹\ 52$

$= \frac{3{,}000\ \text{k.m.}}{10\ \text{k.m.}} \times ₹\ 52 = ₹\ 15{,}600$

Statement showing the Operating Cost per Passenger – km.

		(₹)	(₹)
(i)	Standing Charges :		
	Depreciation {Working Note – (i)}	9,333.33	
	Insurance Charge $\left(\frac{Rs.\ 18{,}00{,}000}{12} \times 3\%\right)$	4,500	
	Manager-cum-accountant's salary	8,000	
	Insurance Charge $\left(\frac{Rs.\ 50{,}000}{12}\right)$	4,166.67	
	Garage Rent	2,500	28,500
	Maintenance Charges :		
	Repair & Maintenance per month $\left(\frac{Rs.\ 1{,}50{,}000}{12}\right)$		12,500
	Running Cost :		
	Driver's Salary	15,000	
	Conductor's	12,000	
	Stationery	500	
	Engine Oil & Lubricants {Working Note – (iii)}	6,250	
	Diesel and oil {Working Note – (i)}	15,600	
	Total running cost before deducting commission to driver and conductor	49,350	49,350
	Total cost excluding commission to driver and conductor		90,350
	Driver's commission on collection*		6,023.34
	Conductor's commission on collection*		6,023.33
	Total Cost (i) + (ii) + (iii)		1,02,396.67
	Add : Profit**		18,070
	Total Collection		1,20,466.67

Working Note :

Total costs before commission on collection and net profit is ₹ 90,350.

Commission on collection to driver and conductor is 10% of collection and Profit is 15% of collection means.

100% - (10% + 15%) i.e. 75% = ₹ 90,350

So, Total collection $= \frac{Rs.\ 90{,}350}{75} \times 100 = ₹\ 1{,}20{,}466.67$

* Total Commission on collection = 10% X ₹ 1,20,466.67 = ₹ 12,046.67

Driver's share = 50% X ₹ 12.046.67 = ₹ 6,023.34

Conductor's share = 50% X ₹ 12,046.67 = ₹ 6,023.33

** Profit on collection = ₹ 1,20,466.67 X 15% = ₹ 18,070

Fare per Passenger – km. $= \frac{\text{Total Collection}}{\text{Total Passenger–km.\{Working Note (ii)\}}}$

$= \frac{\text{Rs. } 1,20,466.67}{1,20,000}$

= ₹ 1.004 (appx.)

Question 10

Voyager Cabs Pvt. Ltd. is a New Delhi based cab-renting company, provides cab facility on rent for cities Delhi, Agra and Jaipur to the tourists. To attract more tourists it has launched a new three days tour package for Delhi-Jaipur-Agra-Delhi. Following are the relevant information regarding the package:

Distance between Delhi to Jaipur (Km.)	274
Distance between Delhi to Agra (Km.)	242
Distance between Agra to Jaipur (Km.)	238
Price of diesel in Delhi	₹ 54 per litre
Price of diesel in Jaipur	₹ 56 per litre
Price of diesel in Agra	₹ 58 per litre
Mileage of cab per litre of diesel (Km.)	16
Chauffeur's salary	₹ 12,000 per month
Cost of the cab	₹ 12,00,000
Expected life of the cab	24,00,000 kms.
Servicing cost	₹ 30,000 after every 50,000 kilometres run.
Chauffeur's meal allowance	₹ 50 for every 200 kilometres of completed journey
Other set up and office cost	₹ 2,400 per month.

Voyager Cabs has made tie-up with fuel service centres at Agra, Jaipur and Delhi to fill diesel to its cabs on production of fuel passbook to the fuel centre. Company has a policy to get fuel filled up sufficient to reach next destination only.

You are required to calculate the price inclusive of service tax @ 12.36% to be quoted for the package if company wants to earn profit of 25% on its net takings i.e. excluding service tax.

Solution :

Calculation of Price of the Delhi-Jaipur-Agra-Delhi tour package

Particulars	**Amount (₹)**	**Amount (₹)**
Diesel Cost (Working Note-2)		2,635.00
Servicing Cost $\left(\frac{\text{Rs.30,000}}{\text{50,000 kms}} \text{ X } 754 \text{ kms.}\right)$		452.40
Chauffeur's meal cost (three 200 km. completed journey X ₹ 50)		150.00
Other Allocable costs :		
Depreciation $\left(\frac{\text{Rs. } 12,00,000}{24,00,000 \text{ kms.}} \text{ X } 754 \text{ kms.}\right)$	377.00	
Other set-up and office cost $\left(\frac{\text{Rs.2,400}}{24,00,000 \text{ kms.}} \text{ X } 754 \text{ kms.}\right)$	240.00	

Chauffeur's salary $\left(\frac{\text{Rs. } 12,00,000}{30 \text{ days}} \text{ X } 3 \text{ days}\right)$	1,200.00	1,817.00
Total Cost		5,054.40
Add : Profit (25% of net takings or 1/3rd of total cost)		1,684.00
		6,739.20
Add : Service Tax @ 12.36%		832.97
Price of the package (inclusive of service tax)		**7,572.17**

Working Notes :

(1) Total distance of journey

From	To	Distance (in Km.)
Delhi	Jaipur	274
Jaipur	Agra	238
Agra	Delhi	242
Total Distance		754

(2) Cost of Diesel

From	To	Distance (in Km.)	Price of diesel per liter (₹)	Total Diesel Cost (₹)
I	**II**	**III**	**IV**	**V = (III ÷ 16 km) X IV**
Delhi	Jaipur	274	54	924.75
Jaipur	Agra	238	56	833.00
Agra	Delhi	242	58	877.25
Total Cost				2,635.00

Question 11

A mini-bus, having a capacity of 32 passengers, operates between two places – 'A' and 'B'. The distance between the place 'A' and place 'B' is 30 km. The bus makes 10 round trips in a day for 25 days in a month. On an average, the occupancy ratio is 75% and is expected throughout the year.

The details of other expenses are as under :

	Amount (₹)	
Insurance	15,600	per annum
Garage Rent	2,400	per quarter
Road Tax	5,000	per annum
Repairs	4,800	per quarter
Salary of operating staff	7,200	per month
Tyres and Tubes	3,600	per quarter
Diesel : (One litre is consumed for every 5 km)	13	per litre
Oil and Sundries	22	per 100 km run
Depreciation	68,000	per annum

Passenger tax @ 22% on total taking is to be levied and bus operator requires a profit of 25% on total taking.

Prepare operating cost statement on the annual basis and find out the cost per passenger kilometer and one way fare per passenger.

Solution :

Operating Cost Statement

	Particulars	Total Cost Per Annum (₹)
A.	**Fixed Charges :**	
	Insurance	15,600
	Garage Rent (₹ 2,400 X 4 Quarters)	9,600
	Road Tax	5,000
	Salary of operating staff (₹ 7,200 X 12 months)	86,400
	Depreciation	68,000
	Total (A)	1,84,600
B.	**Variable Charges :**	
	Repairs (₹ 4,800 X 4 Quarters)	19,200
	Tyres and Tubes (₹ 3,600 X 4 Quarters)	14,400
	Diesel {(1,80,000 km. ÷ 5 km.) X ₹ 13}	4,68,000
	Oil and Sundries {(1,80,000 km. ÷ 100 km.) X ₹ 22}	39,600
	Total (B)	5,41,200
	Total Operating Cost (A + B)	7,25,800
	Add : Passenger tax (Refer to WN-1)	3,01,275
	Add : Profit (Refer to WN-1)	3,42,359
	Total Takings	13,69,434

Calculation of cost per passenger kilometer and one way fare per passenger :

$$\text{Cost per Passenger – Km.} = \frac{\text{Total Operating Cost}}{\text{Total Passenger–Km.}}$$

$$= \frac{\text{Rs. } 7,25,800}{40,32,000 \text{ Passenger–km.}} = ₹\ 0.18$$

$$\text{One way fare per passenger} = \frac{\text{Total Takings}}{\text{Total Passenger–km.}} \text{ X 30 km}$$

$$= \frac{\text{Rs. } 13,69,434}{40,32,000 \text{ Passenger – km.}} \text{ X 30 km} = ₹\ 10.20$$

Working Notes :

1. Let total taking be X then Passenger tax and profit will be as follows :

   X = ₹ 7,25,800 + 0.22 X + 0.25X

   X – 0.47 X = ₹ 7,25,800

   $X = \frac{\text{Rs. } 7,25,800}{0.53} =$ ₹ 13,69,434

   Passenger tax = ₹ 13,69,434 X 0.22 = ₹ 3,01,275

   Profit = ₹ 13,69,434 X 0.25 = ₹ 3,42,359

2. Total kilometers to be run during the year

   = 30 km. X 2 sides X 10 trips X 25 days X 12 months = 1,80,000 Kilometres

3. Total passenger Kilometres

   = 1,80,000 km. X 32 passengers X 70% = 40,32,000 Passenger – km.

CONTRACT COSTING

10

Question 1.

Modern construction company with a paid up share capital of Rs. 50 lakhs undertook a contract to construct LIG houses. The contract work commenced on 1.1.94 and the contract price was Rs. 50 lakhs. Cash received on account of contract on 31.12.94 was Rs. 18 lakhs (90% of the work certified). Work completed but not certified was estimated at Rs. 100000. As on 31.12.94, material at site was estimated at Rs. 30000 and machinery at site costing Rs. 200000 was returned to stores. Plant and machinery at site is to be depreciated at 5%. Wages outstanding on 31.2.94 was Rs. 5000.

	Rs.
Land and Building	1500000
Plant and Machinery at cost (60% at site)	2500000
Lorries and other vehicles	800000
Furniture	50000
Office equipment	10000
Materials sent to site	1400000
Fuel and power	125000
Site expenses	5000
Postage and telegrams	4000
Office expenses	8000
Rates and taxes	15000
Cash at Bank	133000
Wages	250000

Prepare the Contract Account to ascertain the profit from the contract and show the WIP in the balance sheet.

Answer : Notional profit243000;, WIP:170100

Question 2.

A company undertook a contract for construction of large building complex. The construction work commenced on 1st April,1993 and the following data are available for the year ended 31st March,1994.

	(Rs.'000)
Contract Price	35000
Work certified	20000
Progress payments received	15000
Material issued to site	7500
Planning and estimating costs	1000
Direct wages paid	4000
Materials returned from site	250
Plant hire charges	1750
Wage related costs	500
Site office costs	678
Head office expenses apportioned	375
Direct expenses incurred	902
Work not certified	149

The contractors own a plant which originally cost Rs. 20 lacs has continuously in use in this contract throughout the year. The residual value of the plant after 5 years of life is expected to be Rs. 5 lacs. Straight line method of depreciation is in use.

As on 31st March, 1994 the direct wages due and payable amounted to Rs. 270000 and the materials at site were estimated at Rs. 200000.

Required:

Prepare the contract account for the year ended 31st March,1994.

Show the calculation of profit to be taken to the profit and loss account of the year.

Show the relevant balance sheet entries.

Answer : Notional profit:3324 ; Net WIP:3487

Question 3.

The following is the Trial Balance of Cosmos Construction Limited, engaged in the execution of Contract No. 303 for the year ended 31st December 1981:

Contractee's Account 75% of work certified		Rs. 360000
Accumulated depreciation account		50000
Creditors		12000
Buildings	Rs. 200000	
Bank balance	45000	
Share capital		500000
Materials	200000	
Wages	180000	
Expenses	47000	
Plant	250000	
	Rs. 922000	922000

The work on contract no. 303 was commenced on 1st January, 1981.Materials costing Rs. 170000 were sent to the site of the contract but those costing Rs. 6000 were destroyed in an accident. Plant costing Rs. 50000 was used on the contract all through the year. Plant with a cost of Rs. 2 lakhs was used from 1st January to 30th September,1981 and was then returned to the stores.

The contract was for Rs. 600000 and the contractee pays 75% of the work certified. The cost of the work uncertified was estimated to be Rs. 15000 on 31st December, 1981, on which date materials costing Rs. 4000 were at the site of the contract.

Expenses are charged to the contract at 25% of wages. Plant is to be depreciated at 10% according to the straight fine method for the entire year.

Prepare Contract No. 303 Account for the year 1981 and make out the Balance Sheet of Cosmos Construction Limited as on 31st December, 1981.

Answer : Transferred to P/L:45000 ; Reserve:45000 ;

Question 4.

A contractor prepares his accounts for the year ending 31st December each year. He commenced contract on 1st April, 1998. The following information relates to the contract as on 31st December, 1998:

	Rs.
Material issued	251000
Labour charges	565600
Salary to foreman	81300

A machine costing Rs. 260000 has been on the site for 146 days, its working life is estimated at 7 years and its final scrap value at Rs. 15000.

A supervisor, who is paid Rs. 8000 p.m. has devoted one-half of his time to this contract.

All other expenses and administration charges amount to Rs. 136500. Material in hand at site costs Rs. 35400 on 31st December, 1998. The contract price is Rs. 2000000. On 31st December,1998 two-third of the contract was completed. The architect issued certificates covering 50% of the contract price, and the contractor had been paid Rs. 750000 on account.

Prepare contract A/c and show how much profit or loss should be included in financial accounts to 31st December, 1998.

Answer :Notional profit213250; WIP reserve:106625

Question 5.

Compute a conservative estimate of profit on a contract (which has been 80% complete) from the following particulars. Illustrate four methods of computing the profit:

	Rs.
Total expenditure to date	170000
Estimated further expenditure to complete the contract (including contingencies)	34000
Contract price	306000
Work certified	200000
Work not certified	17000
Cash received	163200

Answer :Estimated Profit:102000

Question 6.

A contractor commenced a building contract on October 1, 1997. The contract price is Rs. 440000. The following data pertaining to the contract for the year 1998-99 has been compiled from his books and is as under:

	Rs.
April 1, 1998	
Work in progress not certified	55000
Materials at site	2000
1998-99	
Expenses incurred :	
Materials issued	112000
Wages paid	108000
Hire of Plant	20000
Other expenses	34000
March 31,1999:	
Materials at site	4000
Work in progress : Not certified	8000
Work in progress : Certified	405000

The cash received represents 80% of work certified. It has been estimated that further costs to complete the contract will be Rs. 23000 including the materials at site as on 31st March, 1999.

Required:

Determine the profit on the contract for the year 1998-99 on prudent basis, which has to be credited to P/L A/c.

Answer : Profit on prudent basis:66273 ; WIP reserve:19727

Question 7.

A construction company under-taking a number of contracts, furnished the following data relating to its uncompleted contracts as on 31st March, 1996:

				(Rs. in lacs)
	Contract Numbers			
	723	726	729	731
Total Contract Price	23.20	14.40	10.08	28.80
Estimated Costs on completion of contract	20.50	11.52	12.60	21.60
Expenses for the year ended 31.3.96:				
Direct Materials	5.22	1.80	1.98	0.80
Direct Wages	2.32	4.32	3.90	2.16
Overheads (Excluding Depreciation)	1.06	2.60	2.62	1.05
Profit Reserve as on 1.4.95	1.50	–	–	–
Plant issued at Cost	5.00	3.50	2.75	3.00
Materials at Site on 1.4.95	0.75	–	–	–
Materials at Site on 31.3.96	0.45	0.20	0.08	0.05
Work Certified till 31.3.95	4.65	–	–	–
Work Certified during the year 1995-96	12.76	13.26	7.56	4.32
Work Uncertified as on 31.3.96	0.84	0.24	0.14	0.18
Progress payments received during the year	9.57	9.0	5.75	3.60

Depreciation @ 20% per annum is to be charged on plant issued. While the Contract No. 723 was carried over from last year, the remaining contracts were started in the 1st week of April, 1995. Required:

i) Determine the profit/loss in respect of each contract for the year ended 31st March, 1996.

ii) State the profit/loss to be carried to Profit & Loss A/c for the year ended 31st March, 1996.

Answer : Contract no.	**723**	**726**	**729**	**731**
Notional profit:	**5.20**	**4.28**	**(1.27)**	**(0.06)**
Profit taken to P/L ;	**2.60**	**1.80**	**(2.52)**	**(0.06)**

Question 8.

MNP Construction a contract on April 1, 1999. The total contract was for Rs.1750000. It was decided to estimate the total profit and to take to the credit of P/L A/c the proportion of estimated profit on cash basis which work completed bore to the total contract. Actual expenditure in 1999-2000 and estimated expenditure in 2000-2001 are given below:

	1999-2000	*2000-2001*
	(Actual)	*(Estimated)*
	Rs.	Rs.
Materials issued	300000	550000
Labour : Paid	200000	250000
: Outstanding at end	20000	30000
Plant purchased	150000	–
Expenses : Paid	75000	150000
: Prepaid at end	15000	–
Plant returns to store (historical cost)	50000	100000
		(On Dec. 31,2000)

Material at site	20000	50000
Work certified	800000	Full
Work uncertified	25000	–
Cash received	600000	Full

The plant is subject to annual depreciation @ 25% of WDV Cost. The contract is likely to be completed on Dec.31, 2000. Prepare the Contract A/c. Determine the Profit on the contract for the year 1999-2000 on prudent basis, which has to be credited to P/L A/c.

Answer :Profit credited to P/L A/C: 66321.43 ; WIP reserve:161179

Question 9.

One of the building contracts currently engaged in by a construction company commenced 15 months ago and remain unfinished. The following information relating to the work on the contract has been prepared for the year just ended:

	Rs. '000
Contract Price	2500
Value of work certified at the end of year	2200
Cost of work not yet certified at the end of year	40
Costs incurred:	
Opening balances:	
Cost of work completed	300
Materials on site (physical stock)	10
During the year:	
Materials delivered to site	610
Wages	580
Hire of plant	110
Other expenses	90
Closing balance:	
Materials on site (physical stock)	20

As soon as materials are delivered to the site, they are charged to the contract account. A record is also kept of materials as they are actually used on the contract. Periodically a stock check is made and any discrepancy between book stock and physical stock is transferred to a general contract material discrepancy account. This is absorbed back to each contract, currently at the rate of 0.5% of materials booked. The stock check at the year end revealed a stock shortage of Rs.5000.

In addition to the direct charges listed above, general overheads are charged to contracts at 5% of the value of work certified. General overheads of Rs.15000 had been absorbed into the cost of work completed at the beginning of the year.

It has been estimated that further costs to complete the contract will be Rs.220000. This estimate includes the cost of materials on site at the end of the year just finished and also a provision for rectification.

Required:

i) Explain briefly the distinguishing features of contract costing.

ii) Determine the profitability of the above contract and recommend how much profit (to the nearest Rs.'000) should be taken for the year just ended. (Provide a detailed schedule of costs).

iii) State how your recommendation in (ii) would be affected if the contract price was Rs.4000000 (rather than Rs.2500000) and if no estimate has been made of costs to completion. (If required, suitable assumption should be made by the candidate).

Answer : Notional profit:467 ; WIP reserve:15.97

Question 10.

Deluxe Limited undertook a contract for Rs. 500000 on 1st Jyly 1986. On 30th June , 1987 when the accounts were closed, the following details about the contract were gathered :

	Rs.
Materials Purchased	100000
Wages paid	45000
General Expenses	10000
Plant Purchase	50000
Materials on Hand 30-6-87	25000
Wages Accrued 30-6-87	5000
Work Certified	200000
Cash Received	150000
Work Uncertified	15000
Depreciation of plant	5000

The above contract contained as escalator clause which read as follows :

"In the event of priced of materials ad rates of wages increase by more than 5% the contract price would be increased accordingly by 25% of the rise in the cost of materials and wages beyond 5% in each case".

It was found that since the date of signing the agreement the prices of materials and wage rates increased by 25%. The value of the work certified does not take into account the effect of the above clause.

Prepare the contract account. Working should from part of the answer.

Answer :Profit transferred to P/L A/C:20000 ; Increase in contract price:5000

Question 11.

The escalation clause of a long term contract stipulates the following quantities and rates of materials of A.B and C and following number of labour hours of X, Y and Z and their rates of pay. The actuals are shown below :

	Standard		**Actual**	
Materials	**Qty Tonnes**	**Rate Rs.**	**Qty. Tonnes**	**Rate Rs.**
A	500	50	750	45
B	1000	30	900	35
C	20	1000	21	1010
	Standard		**Actual**	
Labour	**Hours**	**Hourly Rate**	**Hours**	**Hours Rate**
X	4800	2.00	4500	2.25
Y	2400	1.00	3000	1.50
Z	9600	1.50	10000	1.50

Compute the amount of the final claim so far as rate is concerned.

Answer :Escalation clause: 5100.

Question 12.

A contract for construction of building is governed by an escalation clause in respect of prices of steel, cement and stone aggregate. The prices ruling on the date of tender for the building and the actual prices paid by the contractor were as follows :

	On the date of tender	Actual
Steel per ton	Rs. 610	Rs. 675
Cement per ton	100	105
Stone aggregate per 100 cft.	40	38

300000 cft. Reinforced cement concrete was laid in the building. If 100 lbs. of steel, 2400 lbs. of cement and 90 cft. Stone are the net quantities required to cast 100 cft. of RCC and the wastages are 5, 3 and 10 per cent respectively. **Calculate** the difference in selling price according to the escalation clause (1 ton = 2240 lbs.). Assume that the wastage percentage is based on the net quantity of material.

Answer :Net difference: 19754.20

FOR YOUR PRACTICE

Question 1.

The following details are available from the books of accounts (for the year ended 31st March, 1994) of a contractor with respect to a particular contract (No. 1113) he has undertaken for a manufacturing organization:

Materials sent to site	Rs.	511800
Labour engaged at site		466100
Cost of plant installed at site		100000
Direct expenses		24000
Establishment expenses		29000
Materials returned to stores		2120
Work certified		1070000
Cost of work not certified		31000
Materials in hand (as on 31st March,1994)		12220
Accrued wages (as on 31st March,1994)		11160
Accrued direct expenses		1330
Value of plant (as revalued on 31st March,1994)		88000

The contract price agreed upon with the contractee is Rs. 1300000. Payment of Rs. 990000 has been received from the contractee.

You are required to prepare the Contract Account No.113, computing an incorporating in the said account the profit to be taken to the Profit and Loss Account for the year ended 31st March,1994.

Solution

Dr. **Contract A/c** *Cr.*

Particulars		***Amount***	***Particulars***		***Amount***
To Material at site	5,11,800		By WIP c/d		
(-) Mat. sent to site	2,120	5,09680	W. Certified	10,70,000	
To Labour	4,66,100		W. Uncertified	31,000	11,01,000
(+) O/S Lab.	11,160	4,77,260			
To Direct Expenses		24,000			
To Established Expenses		29,000	By closing material at site		12,220
To Accrued direct Expenses		1,330			
To Depn on Plant		12,000			
To Notional Profit		59,950			

	11,13,220		**11,13,220**
To P/L	36,978	By notional Profit	59,950
To WIP Reserve	22,972		
	59,950		**59,950**

LOC = 10,70,000 × 100 = 82.31%
1,30,000

Transfer to P&L a/c = 2 × 59950 × 9,90,000 = 36,978.
3 10,70,000

Question 2.

M/s Contractor and Engineer undertook a contract for Rs. 250000 for constructing a college building. The following is the information concerning the contract during the year 1989:

Materials sent to site	Rs.	85349
Labour engaged on site		74375
Plant installed at site at cost		15000
Direct expenditure		3167
Establishment charges		4126
Materials returned to store		549
Work certified		195000
Cost of work not certified		4500
Materials at site on 31.12.1989		1883
Wages accrued on 31.12.1989		2400
Direct expenditure accrued on 31.12.1989		240
Value of plant on 31.12.1989		11000
Cash received from contractee		180000

Prepare the Contract Account, the contractee's account and show how the work in progress will appear in the Balance Sheet of M/s Contractor and Engineer as on 31st December, 1989.

Solution

Dr. **Contract A/c** *Cr.*

Particulars		***Amount***	***Particulars***		***Amount***
To Material sent to site	85,349		By WIP c/d		
(-) Return material	549	84,800	W. certified	1,95,000	
			W. Uncertified	4,500	1,99,500
To Labour	74,375				
(+) O/S	2,400	76,775			
To Depreciation on plant		4,000	By closing material at site		1,883
To Direct Expenses	3,167				
(+) O/S	240	3,407			
To Establishment charge		4,126			
To Notional profit		28,275			
		2,01,383			**2,01,383**
To P/L		17,400	By Notional Profit		28,275
To WIP reserve		10,875			
		28,275			**28,275**

LOC = 1,95,000 × 100 = 78%

2,50,000

Transfer to P&L a/c = 2 × 2,8275 × 1,80,000 = 17,400

3 1,95,000

Balance Sheet

		WIP:		
		Work certified	1,95,000	
		Work uncertified	4,500	
			1,99,500	
		(-) Contract A/c	18,000	
		(-) WIP Reserve	17,400	2,100

Question 3.

The following expenses were incurred on a contract :

	Rs.
Material purchased	600000
Material drawn from stores	100000
Wages	225000
Plant issued	75000
Chargeable expenses	75000
Apportioned indirect expenses	25000

The contract was for Rs. 2000000 and it commenced on January 1, 1998. The value of the work completed and certified upto 30th November, 1998 was Rs. 1300000 of which Rs. 1040000 was received in cash, the balance being held back as retention money by the contractee. The value of work completed subsequent to the architect's certificate but before 31st December, 1998 was Rs. 60000. There were also lying on the site materials of the value of Rs. 40000. It was estimated that the value of plant as at 31st December, 1998 was Rs. 30000.

Solution

Dr. **Contract A/c** *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Material	7,00,000	By WIP c/d	
To Wages	2,25,000	Work certified	13,00,000
To Chargeable Expenses	75,000	Work uncertified	60,000
To Indirect Expenses	25,000	By closing material at site	40,000
To Depnon plant	45000		
To Notional Profit	3,30,000		
	14,00,000		**14,00,000**
To P/L	1,76,000	By Notional Profit	3,30,000
To WIP Reserve	1,54,000		
	3,30,000		**3,30,000**

LOC = 13,00,000 × 100 = 65%

20,00,000

Transfer to P&L a/c = 2 × 3,30,000 × 10,40,000 = 1,76,000

3 13,00,000

Question 4.

A contract is estimated to be 80% complete in its first year of construction as certified. The contractee pays 75% of value of work certified, as and when certified and makes the final payment on the completion of contract. Following information is available for the first year :

	Rs.
Cost of work-in-progress uncertified	8,000
Profit transferred to Profit & Loss A/c at the end of year I on incomplete contract	60,000
Cost of work to date	88,000

Calculate the value of work-in-progress certified and amount of contract price

Solution

Dr. Contract A/c Cr.

Particulars	*Amount*	*Particulars*	*Amount*
To cost to date	88,000	By W/P c/d	
To notional profit c/d	1,20,000	Work certified (B/F)	2,00,000
		Work uncertified	8,000
	2,08,000		**2,08,000**
To P/L a/c	60,000	By notional profit b/d	1,20,000
To W/P Reserve c/d	60,000		
	1,20,000		**1,20,000**

Working Note:-

Transfer to P/L = $\frac{2}{3}$ × notional profit × $\frac{75}{100}$ × $\frac{\text{Work certified}}{\text{Total contract price}}$

60,000 = $\frac{2}{3}$ × notional profit × $\frac{75}{100}$

Notional profit = 1,20,000

Report: Work certified 2,00,000

Total contract price

LOC = $\frac{\text{Work certified}}{\text{Total contract price}}$ × 100

80 = $\frac{2,00,000}{\text{Total contract price}}$ × 100

Total contract price = $\frac{2,00,000 \times 100}{80}$ = 2,50,000

Question 5. **2008 Nov.**

A contract expected to be completed in year 4, exhibits the following information:

End of Year	Value of work Certified (Rs.)	Cost of work to date (Rs.)	Cost of work not yet certified (Rs.)	Cash received (Rs.)
1.	0	50,000	50,000	0
2.	3,00,000	2,30,000	10,000	2,75,000
3.	8,00,000	6,60,000	20,000	7,50,000

The contract price is Rs. 10,00,000 and the estimated profit is 20%.

Your are required to calculate, how much profit should have been credited to the profit and Loss A/c by the end of years 1, 2, and 3.

Solution

Dr. **Contract A/c** *Cr.*

Particulars	*Amount*	*Particulars*	*Amount*
I Year			
To cost	50,000	By WIP:	
		Work uncertified	50,000
	50,000		**50,000**
II Year			
To WIP b/d:		By WIP:	
Work uncertified	50,000	Work certified	3,00,000
To cost of work	1,80,000	Work uncertified	10,000
To notional profit	80,000		
	3,10,000		**3,10,000**
To Trans. to P/L	24,444	By Notional Profit	80,000
To WIP reserve c/d	55,556		
	80,000		**80,000**
III Year			
To WIP b/d:		By WIP reserve b/d	55,556
Work certifid	3,00,000	By WIP:	
Work Uncertified	10,000	Work certified	8,00,000
To cost	4,30,000	Work uncertified	20,000
To Notional Profit	1,35,556		
	8,75,556		**8,75,556**
To P & L A/c	1,35,556	By Notional Profit	1,35,556
To WIP reserve	-		
	1,35,556		**1,35,556**

W/N 1: II Year

(1) LOC :- 2nd year :

$\frac{3,00,000}{10,00,000} \times 100 = 30\%$

(2) Transfer to P/L

$80,000 \times \frac{1}{3} \times \frac{2,75,000}{3,00,000} = 24,444$

W/N 1: III Year

(1) **LOC** = $\frac{8,00,000}{10,00,000} \times 100 = 80\%$

The LOC is 80% and it is a situation of nearly complete contract but estimated profit is given.

Estimated Profit = 10,00,000 × 20% = 2,00,000

Transfer to P/L = $2,00,000 \times \frac{7,50,000}{10,00,000} = 1,50,000$

But maximum Profit is 135556 so transfer to P/L us 135556.

Question 6. **2006 May.**

RST Contraction Ltd. commenced a contract on April 1, 2005. The total contract was for Rs. 49,21,875. It was decided to estimate the total Profit on the contract and to take to the credit of P/L A/c that proportion of estimated profit on cash basis, which work completed bore to total Contract. Actual expenditure for the period April 1, 2005 to March 31, 2006 and estimated expenditure for April 1, 2006 to September 30, 2006 are given below:

	April 1, 2005 to March 31, 2006 (Actual) (Rs.)	April 1, 2006 to September 30, 2006 (Estimated) (Rs.)
Material Issued	7,76,250	12,99,375
Labour : Paid	5,17,500	6,18,750
: Prepaid	37,500	-
: Outstanding	12,500	5,750
Plant Purchased	4,00,000	-
Expenses : Paid	2,25,000	3,75,000
: Outstanding	25,000	10,000
: Prepaid	15,000	-
Plant returns to Store (historical cost)	1,00,000 (On September 30, 2005)	3,00,000 (On September 30, 2006)
Work certified	22,50,000	Full
Work uncertified	25,000	-
Cash received	18,75,000	-
Materials at site	82,500	42,500

The plant is subject to annual depreciation @ 25% on written down value method. The contract is likely to be completed on September 30, 2006.

Required:

(i) Prepare the contract A/c.

(ii) Determine the profit on the contract for the year 2005-06 on prudent basis, which has to be credited to P/L A/c.

Solution

Dr. **Contract A/c** *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Material issued	7,76,250	By WIP c/d	
To Labour 5,17,500		Work Certified 22,50,000	
(–) Closing Prepaid 37,500		Work Uncertified 25,000	22,75,000
(+) Closing Outstanding 12,500	4,92,500	By Closing Material at site	82,500
To Expenses 2,25,000			
(–) Closing Prepaid 15,000			
(+) Closing O/S 25,000	2,35,000		
To Depreciation on Plant A	12,500		
[1,00,000 × 25/100 × 6/12]			
To Depreciation on Plant B	75,000		
[3,00,000 × 25/100]			

To Notional Profit c/d	7,66,250		
	23,57,500		**23,57,500**
To P/L	3,89,000	By Notional Profit b/d	7,66,250
To WIP Reserve c/d	3,77,250		
	7,66,250		**7,66,250**

Working Note:-

A. Calculation of estimated profit :

Total contract Price		49,21,875
(-) Current year expenses:		
Raw Material : Issue	7,76,250	
(-) Closing stock	82,500	6,93,750
Labour		4,92,500
Expenses		2,35,000
Depreciation		87,500
(-) Next year:		
Raw material : Opening stock	82,500	
(+) Issue	12,99,375	
(-) Closing stock	42,500	13,39,375
Labour : Paid	6,18,750	
(+) Opening prepaid	37,500	
(+) Closing outstanding	5,750	
(-) Opening outstanding	12,500	6,49,500
Expenses : Paid	3,75,000	
(+) Opening prepaid	15,000	
(+) Closing outstanding	1,000	
(-) Opening outstanding	25,000	3,75,000
Depreciation on Plant B [2,25,000 × 25/100 × 6/12]		28,125
Estimated Profit		10,21,125

B. Transfer to P/L :

10,21,125 × 18,75,000 / 49,21,875 = 3,89,000

Question 7. **May – 2007 CA PCC**

AKP Builders Ltd. Commenced a contract on April 1, 2005. The total contract was for Rs. 500000. Actual expenditure for the period April 1, 2005 to March 31, 2006 and estimated expenditure for April 1, 2006 to December 31, 2006 are given below:

	2005-06 (Actuals) Rs.	2006-07 (9 months) (Extimated) Rs.
Materials Issued	90000	85750
Labour : Paid	75000	87325
Outstanding at the end	6250	8300
Plant	25000	-

Sundry Expenses : Paid	7250	6875
Prepaid at the end	625	-
Establishment charges	14625	-

A part of the material was unsuitable and was sold for Rs. 18125 (Cost being Rs. 15000) and as part of plant was scrapped and disposed of for Rs. 2875. The value of plant at site on 31 March, 2006 was Rs. 7750 and the value of material at site was Rs. 4250. Cash received on account to date was Rs. 175000, representing 80% of the work certified. The cost of work uncertified was valued at Rs. 27375. The contractor estimated further expenditure that would be incurred in completion of the contract.

- The contract would be completed by 31st December, 2006.
- A further sum of Rs. 31250 would have to be spent on the plant and the residua value of the plant on the completion of the contract would be Rs. 3750.
- Establishment charges would cost the same amount per month as in the previous year.
- Rs. 10800 would be sufficient to provide for contingencies.

Required:

Prepare Contract account and calculate estimated total profit on this contract. Profit transferable to Profit and Loss account is to be calculated by reducing estimated Profit in proportion of work certified and contract price.

Solution

Dr. **Contract A/c** *Cr.*

Particulars		*Amount*	*Particulars*	*Amount*
To Material issued	90,000		By WIP c/d	
(-) Cost of Mat. Disposed	15,000	75,000	Work certified [1,75,000 × 100/80]	2,18,750
To Labour	75,000			
(+) Closing Outstanding	6,250	81,250	Work Uncertified	27,375
To Depreciation on Plant :			By Closing material at site	4,250
Opening balance	25,000			
(-) Sold	2,875			
(-) Closing balance	7,750	14,375		
To Sundry Expenses :				
Paid	7,250			
(-) Closing prepaid	625	6,625		
To Establishment charges		14,625		
To Notional Profit c/d		58,500		
		2,50,375		**2,50,375**
To P/L		29,960	By Notional profit b/d	58,500
To WIP Reserve c/d		28,540		
		58,500		**58,500**

A. Calculate estimate profit :

Total Contract Price			5,00,000
(-) Current year expenses : Material : Issue		75,000	
	(-) Closing stock	4,250	70,750
	Labour		81,250
	Expenses		6,625
	Depreciation		14,375
	Establishment charges		14,625

(-) Next year expenses :

Material : Opening stock	4,250	
(+) Purchase	85,750	
(-) Closing stock	–	90,000
Labour : Paid	87,325	
(+) Closing Outstanding	8,300	
(-) Opening Outstanding	6,250	89,375
Expenses : Paid	6,875	
(+) Opening Prepaid	625	7,500
Depreciation : Opening Balance	7,750	
(+) Addition	31,250	
(-) Closing Balance	3,750	35,250
Establishment charges	[14,625 × 9/12]	10,969
Contract charges		10,800
Estimated Profit		68,481

B. Transfer to P/L :

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

$$= 68{,}481 \times \frac{2{,}18{,}750}{5{,}00{,}000} = 29{,}960$$

Question 8.

Paramount Engineers are engaged in construction and erection of a bridge under a long-term contract. The cost incurred upto 31.03.2001 was as under:

Fabrication	**Rs. in Lakhs**
Direct Materials	280
Direct Labour	100
Overheads	60
	440
Erection costs to date	110
	550

The contract price is Rs.11 crores and the cash received on account till 31.03.2001 was Rs.6 crores.

A technical estimate of the contract indicates the following degree of completion of work:

Fabrication – Direct Material – 70%, Direct Labour and Overheads 60%, Erection – 40%.

You are required to estimate the profit that could be taken to Profit and Loss Account against this partly completed as at 31.03.2001.

Solution

Dr. **Contract A/c** *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Raw material	280	By WIP c/d	
To Labour	100	Work certified	642.51
To Overhead	60	Work uncertified	-
To Erection cost	110		

To Notional Profit	92.51		
	642.51		**642.51**
To P/L	57.59	By Notional Profit	92.51
To WIP reserve c/d	34.92		
	92.51		**92.51**

Working Note 1.

Calculation of work certified–

(i) Calculation of LOC:-

Item	***Cost to date***	***Loc***	***Estmate T/C***
R/M	280	70%	400
Wage	100	60%	166.67
Overhead	60	60%	100
Erection	110	40%	275
	550		**941.67**

(ii) Work certified:-

$$LOC = \frac{\text{Work certified}}{\text{Total Contract Price}} \times 100$$

$$58.41 = \frac{\text{Work certified}}{1100} \times 100$$

Work certified = 642.51

Working Note 2.

$$\frac{2}{3} \times 92.51 \times \frac{600}{642.51} = \text{Rs. } 57.59$$

Question 9.

A construction company undertook a contract at an estimated price of Rs.108 lacs, which includes a budgeted profit of Rs.18 lacs. The relevant data for the year ended 31.3.2002 are as under:

	(Rs.000's)
Materials issued to site	5000
Direct wages paid	3800
Plant hired	700
Site office costs	270
Materials returned from site	100
Direct expenses	500
Work certified	10000
Progress payments received	7200

A special plant was purchased specifically for this contract at Rs.800000 and after use on this contract till the end of 31.2.2002, it was valued at Rs.500000. The cost of materials at site at the end of the year was estimated at Rs.1800000. Direct wages accrued as on 31.3.2002 was Rs.110000.

Required:

Prepare the Contract Account for the year ended 31st March, 2002 and compute the profit to be taken to the Profit and Loss Account.

Solution

Dr. **Contract A/c** *Cr.*

Particulars		*Amount*	*Particulars*		*Amount*
To Material Issue	5,000		By WIP c/d		
(-) return material	100	4,900	W. Certified	10,000	10,000
To Dirct wages	3,800				
(+) O/S wages	110	3,910			
To Plant hired		700	By closing material at site		
To Site office cost		270			1,800
To Direct expenses		500			
To Depreciation on plant		300			
To Notional Profit		1,220			
		11,800			**11,800**
To P/L A/c		1,200	By Notional Profit b/d		1,220
To WIP Reserve		20			
		1,220			**1,220**

LOC = $\frac{10000}{10800} \times 100 = 92.59\%$

Transfer to P/L : $18000 \times \frac{7,200}{10800} = 1,200$

Question 10.

Brock Construction Ltd. Commenced a contract on November 1, 2003. The total contract was for Rs. 3937500. It was decided to estimate the total profit on the contract and to take to the credit of P/L A/c that proportion of estimated profit on cash basis, which work completed bore to the total contract. Actual expenditure of the period November 1, 2003 to October 31, 2004 and estimate expenditure for November 1, 2004 to March 31, 2005 are given below:

	November 1, 2003 To October 31, 2004 (Actuals) Rs.	November 1, 2004 To March 31, 2005 (Actuals) Rs.
Materials issued	675000	1237500
Labour : Paid	450000	562500
Prepaid	25000	-
Outstanding	-	2500
Plant purchased	375000	-
Expenses: Paid	200000	350000
Outstanding	50000	25000
Plant returns to store	75000	300000
(historical cost)	(on March 31, 2004)	(on March 31, 2005)
Work Certified	2000000	Full
Work Uncertified	75000	
Cash received	1750000	
Material at site	75000	37500

The plant is subject to annual depreciation @33% on written down value method. The contract is likely to be completed on March 31, 2005.

Required:

(i) Prepare the contract A/c. Determine the profit on the contract for the year November, 2003 to October, 2004 on prudent basis, which has to be credited to P/L A/C.

Answer : Profit on prudent basis = 104136.

Question 11.

M/s Bansals Construction Company Ltd. took a contract for Rs. 6000000 expected to be completed in three years. The following particulars relating to the contract are available:

	1996	1997	1998
	Rs.	Rs.	Rs.
Materials	675000	1050000	900000
Wages	620000	900000	750000
Cartage	30000	90000	75000
Other expenses	30000	75000	24000
Cumulative work certified	1350000	4500000	6000000
Work uncertified	15000	75000	---

Plant costing Rs. 300000 was bought at the commencement of the contract. Depreciation was to be charged at 25% per annum, on the written down value method. The contractee pays 75% of the value of work certified as and when certified, and makes the final payment on completion of the contract.

You are required to make a contract account and contractee account as they would appear in each of the three years. Also show how the work in progress and other items should appear in the balance sheet.

Solution

Dr. **Contract A/c (1996)** *Cr.*

Particulars	***Amount***	***Particulars***		***Amount***
To Material sent to site	6,75,000	By WIP		
To Wages	6,20,000	Work Certified	13,50,000	
To Cartage	30,000	Work Uncertified	15,000	13,65,000
To Other Expenses	30,000	By Notional Profit c/d		65,000
To Depreciation on Plant	75,000			
	14,30,000			**14,30,000**
To Notional Profit b/d	65,000	By P/L		65,000

Dr. **Contract A/c (1997)** *Cr.*

Particulars		***Amount***	***Particulars***		***Amount***
To WIP :			By WIP c/d		
Work Certified	13,50,000		By Work Certified	45,00,000	
To Under	15,000	13,65,000	By Work Uncertified	75,000	45,75,000
To Material sent		10,50,000			
To Wages		9,00,000			
To Cartage		90,000			
To Other Expenses		75,000			
To Depreciation		56,250			

To Notional Profit	10,38,750		
	45,75,000		**45,75,000**
To P/L	5,19,375	By Notional Profit	10,38,750
To WIP Reserve	5,19,375		
	10,38,750		**10,38,750**

Dr. **Contract A/c (1998)** *Cr.*

Particulars		***Amount***	***Particulars***	***Amount***
To WIP b/d			By WIP Reserve	5,19,375
W. Certified	45,00,000		By Contracte	60,00,000
To Under	75,000	45,75,000		
To Material		9,00,000		
To Wages		7,50,000		
To Cartage		75,000		
To Other Expenses		24,000		
To Depreciation		42,188		
To Notional Profit transfer to P/L		1,53,187		
		65,19,375		**65,19,375**

Working Note : LOC = $\frac{45\text{ Lac}}{60,00,000} \times 100 = 75\%$

Transfer to P/L = $\frac{2}{3} \times 10,38,750 \times \frac{33,75,000}{45,00,000} = 5,19,375$

Dr. **Contractee A/c** *Cr.*

Particulars	***Amount***	***Particulars***	***Amount***
To Balance c/d	10,12,500	I Year	
		By Bank	10,12,500
		II Year	
To Balance c/d	33,75,000	By Balance b/d	10,12,500
		By Bank	23,62,500
		(31,35,000 × 75%)	
To Contract A/c	60,00,000	III Year	
		By balance b/d	33,75,000
		By bank (B/F)	26,25,000

(i) **Balance Sheet**

as on 31 December 1996

		Plant at site		2,25,000
		WIP		
		Work Certified	13,50,000	
		Work uncertified	15,000	
			13,65,000	
		(-) WIP Reserve	-	
		(-) Contractee	10,12,500	3,52,500

(ii) **Balance Sheet**

as on 31 December 1997

		Plant at site		1,68,750
		WIP		
		Work Certified	45,00,000	
		Work uncertified	75,000	
			45,75,000	
		(-) WIP Reserve	5,19,375	
		(-) Contractee	33,75,000	6,80,625

(iii) **Balance Sheet**

as on 31 December 1998

		Plant at site	1,26,563

Question 12. **2010, November**

PQR Construction Ltd. commenced a contract on April 1, 2009. The total contract was for Rs 27,12,500. It was decided to estimate the total profit and to take to the credit of P/L A/c the proportion of estimated profit on cash basis which work completed bear to the total contract. Actual expenditure in 2009-10 and estimated expenditure in 2010-11 are given below :

	2009-10 Actuals (Rs)	2010-11 Estimated (Rs)
Materials issued	4,56,000	8,14,000
Labour : Paid	3,05,000	3,80,000
: Outstanding at end	24,000	37,500
Plant purchased	2,25,000	—
Expenses		
: Paid	1,00,000	1,75,000
: Outstanding at the end	—	25,000
: Prepaid at the end	22,500	—
Plant returned to stores (at historical cost)	75,000	1,50,000 (on Dec. 31, 2010)
Material at site	30,000	75,000
Work-in-progress certified	12,75,000	Full
Work-in-progress uncertified	40,000	—
Cash received	10,00,000	Full

The plant is subject to annual depreciation @ 20% of WDV cost. The contract is likely to be completed on December 31, 2010.

Required :

(i) Prepare the Contract A/c for the year 2009-10.

(ii) Estimate the profit on the contract for the year 2009-10 on prudent basis which has to be credited to P/L A/c.

Solution

Dr. **Contract A/c** *Cr.*

Particulars		***Amount***	***Particulars***		***Amount***
To Material sent to site		4,56,000	By WIP c/d		
To Labour	3,05,000		Work certified	12,75,000	

(+) Closing O/S	24,000	3,29,000	Work Uncertified	40,000	13,15,000
To Depreciation on Plant A [75,000 × 20%]		15,000			
To Depreciation on Plant B [1,50,000 × 20%]		30,000	By closing material at site		30,000
To Expenses	1,00,000				
(-) Closing Prepaid	22,500	77,500			
To Notional Profit c/d		4,37,500			
		13,45,000			**13,45,000**
To P/L		1,59,263	By Notional profit b/d		4,37,500
To WIP Reserve c/d		2,78,237			
		4,37,500			**4,37,500**

(ii) (a) Calculation of estimated profit :

Total Contract Price			27,12,500
(-) Current year cost : Raw material :			
Issue :		4,56,000	
(-) Closing stock :		30,000	4,26,000
Labour			3,29,000
Depreciation			45,000
Expenses			77,500
(-) Estimated next year cost : Raw material :			
Opening Stock :		30,000	
Issue :		8,14,000	
(-) Closing Stock :		75,000	7,69,000
Labour		3,80,000	
(+) Closing Outstanding		37,500	
(-) Opening Outstanding		24,000	3,93,500
Depreciation on Plant B [1,20,000 × 20% × 9/12]			18,000
Others Expenses		1,75,000	
(+) Closing Outstanding		25,000	
(+) Opening Prepaid		22,500	2,22,500
Estimated Profit			4,32,000

(b) **Transfer to P/L :**

= 4,32,000 × 10,00,000 / 27,12,500 = 1,59,263

Question 13

Modern Construction Ltd. obtained a contract No. B-37 for ₹ 40 lakhs. The following balances and information relate to the contract for the year ended 31st March, 2014:

	01.04.2013(₹)	**31.03.2014 (₹)**
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 2013-2014 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.

(iii) Balance Sheet

Solution :

Books of Modern Constructions Ltd.

Contract No. B-37 Account for the year ended 31st March, 2014

Particulars		(₹)	Particulars		(₹)
To WIP b/d :			By Materials returned to Store		25,000
- Work certified		9,40,000	By Material returned to suppliers		15,000
- Work uncertified		11,200	By WIP c/d :		
To Stock (Materials) b/d		8,000	Work certified	30,00,000	
To Materials issued		4,00,000	Uncertified work	32,000	30,32,000
To Materials purchased		1,50,000	By Materials stock c/d		20,000
To wages paid	6,00,000				
Less : Opening O/s	(5,000)				
Add : Closing O/s	3,000	5,98,000			
To Architect's fees					
To Plant Hire charges					
To Indirect expenses					
To General overheads					
To Notional profit c/d					
To Profit and Loss A/c $\left(\frac{2}{3} \text{ X Rs. } 8,55,800 \text{ X } \frac{80}{100}\right)$		4,56,427	By Notional Profit b/d		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

Particulars	(₹)	Particulars	(₹)
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 31.03.2014

		(₹)			(₹)
P & L 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	30,00,000	
			Work Uncertified	32,000	
				30,32,000	
			Less : Advance	24,00,000	
			6,32,000		
			Less : WIP Reserve	3,99,373	2,32,627

Question 14

Z Limited obtained a contract No. 999 for ₹ 50 lacs. The following details are available in respect of this contract for the year ended March 31, 2014:

	(₹)
Materials purchased	1,60,000
Materials issued from stores	5,00,000
Wages and salaries paid	7,00,000
Drawing and maps	60,000
Sundry expenses	15,000
Electricity charges	25,000
Plant hire expenses	60,000
Sub-contract cost	20,000
Materials returned to stores	30,000
Materials returned to suppliers	20,000

The following balances relating to the contract No. 999 for the year ended on March 31, 2013 and March 31, 2014 are available:

	as on 31st March, 2013	as on 31st March, 2014
Work certified	12,00,000	35,00,000
Work uncertified	20,000	40,000
Materials at site	15,000	30,000
Wages outstanding	10,000	20,000

The contractor receives 75% of work certified in cash.

Prepare Contract Account and Contractee's Account.

Solution:

Contract No. 999 Account for the year ended 31st March, 2014

Dr. Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Work in progress b/d:		By Material returned to store	30,000
- Work certified	12,00,000	By Material returned to suppliers	20,000
- Work uncertified	20,000	By Stock (Material) c/d	30,000
To Stock (Materials) b/d	15,000	By Work in progress c/d:	
To Material purchased	1,60,000	- Work certified	35,00,000
To Material issued	5,00,000	- Work uncertified	40,000
To Wages paid 7,00,000			
Less: Opening O/s (10,000)			
Add: Closing O/s 20,000	7,10,000		
To Drawing and maps*	60,000		
To Sundry expenses	15,000		
To Electricity charges	25,000		
To Plant hire expenses	60,000		
To Sub- contract cost	20,000		
To Notional profit c/d (balancing figure)	8,35,000		
	36,20,000		36,20,000
To Costing P& L A/c (W.N.-1)	4,17,500	By Notional profit b/d	8,35,000
To WIP Reserve (balancing figure)	4,17,500		
	8,35,000		8,35,000

*Assumed that expenses incurred for drawing and maps are used exclusively for this contract only.

Dr. **Contractee's Account** Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance c/d (₹ 35,00,000 × 75%)	26,25,000	By Balance b/d (75% of ₹ 12,00,000)	9,00,000
		By Bank A/c	17,25,000
	26,25,000		26,25,000

Working Note:

1. Profit to be Transferred to Costing Profit & Loss account:

(a) Percentage of completion = $\frac{\text{Workcertfied}}{\text{Valueof contract}} \text{ X } 100$

$= \frac{35,00,000}{50,00,000} \text{ X } 100 = 70\%$

(b) Profit to be transferred to Costing Profit & Loss Account

$$= \frac{2}{3} \text{ X Notional profit X } \frac{\text{Cash received}}{\text{Work certified}}$$

$$= \frac{2}{3} \text{ X } 8,35,000 \text{ X } \frac{75}{100} = 4,17,500$$

Question 15

Dream house (P) Ltd. is engaged in building two residential housing projects in the city. Particulars related to two housing projects are as below:

	HP-1 (₹)	HP-2 (₹)
Work in Progress on 1st April 2013	7,80,000	2,80,000
Materials Purchased	6,20,000	8,10,000
Land purchased near to the site to open an office	-	12,00,000
Brokerage and registration fee paid on the above purchase	-	60,000
Wages paid	85,000	62,000
Wages outstanding as on 31st March, 2014	12,000	8,400
Donation paid to local clubs	5,000	2,500
Plant hire charges paid for three years effecting from 1st April 2013	72,000	57,000
Value of materials at site as on 31st March, 2014	47,000	52,000
Contract price of the projects	48,00,000	36,00,000
Value of work certified	20,50,000	16,10,000
Work not certified	1,90,000	1,40,000

A concrete mixture machine was bought on 1st April 2013 for ₹ 8,20,000 and used for 180 days in HP-1 and for 100 days in HP-2. Depreciation is provided @ 15% p.a. (this machine can be used for any other projects)

As per the contract agreement contractee shall retain 20% of work certified as retention money.

Prepare contract account for the two housing projects showing the profit or loss on each project for the year ended 31st March, 2014.

Solution :

Dr. **Contract Account for the year ended 31st March, 2014** **Cr.**

Particulars	HP-1 (₹)	HP-2 (₹)	Particulars	HP-1 (₹)	HP-2 (₹)
To Balance b/d : W-I-P	7,80,000	2,80,000	By Closing material at site	47,000	52,000
To Material Purchased	6,20,000	8,10,000	By W-I-P :		
To Wages :			Value of work certified	20,50,000	16,10,000
(₹ 85,000 + ₹ 12,000)	97,000		Cost of work not certified	1,90,000	1,40,000
(₹ 62,000 + ₹ 8,400)		70,400			
To Donation to local club*	5,000	2,500			
To Plant hire charges :					
(₹ 72,000 X 1/3)	24,000				
(₹ 57,000 X 1/3)		19,000			
To Depreciation on concrete mixture** :					

(8,20,000 X 15% X 180/365)	60,658				
(8,20,000 X 15% X 100/365)		33,699			
To Notional Profit (Balance c/d)	7,00,342	5,86,401			
	22,87,000	18,02,000		22,87,000	18,02,000
To costing P & L A/c (WN-2)	1,86,758	1,56,374	By National profit (Balance b/d)	7,00,342	5,86,401
To Costing P & L Reserve A/c	5,13,584	4,30,027			
	7,00,342	5,86,401		7,00,342	5,86,401

* Assuming donation paid to local club was exclusively for the above projects, ence included in the contract account.

** Depreciation on concrete mixture machine is charged on the basis of number of days used for the projects, as it is clearly mentioned in the question that this machine can be used for other projects also.

Working Notes :

1. Computation of Stage of completion of the projects :

$$\frac{\text{Value of work certified}}{\text{Value of contract}} \text{ X } 100$$

$$\text{HP} - 1 = \frac{\text{Rs. } 20,50,000}{\text{Rs. } 48,00,000} \text{ X } 100 = 42.71\%$$

$$\text{HP} - 2 = \frac{\text{Rs. } 16,10,000}{\text{Rs. } 36,00,000} \text{ X } 100 = 44.72\%$$

2. Computation of profit to be recognized in the Costing profit & loss A/c.

$$\frac{1}{3} \text{ X Notional profit X } \frac{\text{Cash Received}}{\text{Value of work certified}}$$

$$\text{HP} - 1 = \frac{1}{3} \text{ X ₹ } 7,00,342 \text{ X } 80\% = ₹ \ 1,86,758$$

$$\text{HP} - 2 = \frac{1}{3} \text{ X ₹ } 5,86,401 \text{ X } 80\% = ₹ \ 1,56,374$$

(Land purchased and brokerage and registration fee paid for this purpose cannot be charged to contract account, hence not included in the contract account.)

Question 16

PVK Constructions commenced a contract on 1st April, 2014. Total contract value was ₹ 100 lakhs. The contract is expected to be completed by 31st December, 2016. Actual expenditure during the period 1st April, 2014 to 31st March, 2015 and estimated expenditure for the period 1st April, 2015 to 31st December, 2016 are as follows :

	Actual (₹)	Estimated (₹)
	1st April, 2014 to 31st March, 2015	1st April, 2015 to 31st Dec. 2016
Material issued	15,30,000	21,00,000
Direct Wages paid	10,12,500	12,25,000
Direct wages outstanding	80,000	1,15,000
Plant purchased	7,50,000	-
Expenses paid	3,25,000	5,40,000

Prepaid Expenses	68,000	-
Site office expenses	3,00,000	-

Part of the material procured for the contract was unsuitable and was sold for ₹ 2,40,000 (cost being ₹ 2,55,000) and a part of plant was scrapped and disposed of for ₹ 80,000. The value of plant at site on 31st March, 2015 was ₹ 2,50,000 and the value of material at site was ₹ 73,000. Cash received on account to date was ₹ 36,00,000, representing 80% of the work certified. The cost of work uncertified was valued at ₹ 5,40,000.

Estimated further expenditure for completion of contract is as follows :

- An additional amount of ₹ 4,62,500 would have to be spent on the plant and the residual value of the plant on the completion of the contract would be ₹ 67,500.
- Site office expenses would be the same amount per month as charged in the previous year.
- An amount of ₹ 1,57,500 would have to be incurred towards consultancy charges.

Required :

Prepare Contract Account and calculate estimated total profit on this contract.

Solution :

PVK Constructions

Contract Account for the year 2014-15

Particulars		**(₹)**	**Particulars**		**(₹)**
To Materials issued		15,30,000	By Material sold		2,40,000
To Direct wages	10,12,500		By Costing P & L Account (Loss on sale of material)		15,000
Add : Outstanding	80,000	10,92,500	By Plant sold		80,000
To Plant Purchased		7,50,000	By Plant at site		2,50,000
To Expenses	3,25,000		By Material at site		73,000
Less : Prepaid	(68,000)	2,57,000	By Work-in-progress :		
To Site office expenses		3,00,000	- Work certified	45,00,000	
To National Profit c/d		17,68,500	- Work uncertified	5,40,000	50,40,000
		56,98,000			56,98,000
To Costing P & L A/c (transfer) (Refer Working note)		4,11,967*	By Notional Profit b/d		17,68,500
To work-in-progress (reserve)		13,56,533#			
		17,68,500			**17,68,500**

Calculation of Estimated Profit (April 2014 to December 2016)

Particulars	**Amount (₹)**	**Amount (₹)**	**Amount (₹)**
Total Value of the Contrast (A)			1,00,000.00
(i) Materials Costs :			
- Materials Consumed in 2014-2015:			
- Materials issued in 2014-15	15,30,000		
- Less : Closing Materials at site	(73,000)		

	- Less : Unsuitable Materials Sold	(2,55,000)	12,02,000	
	Add : Materials to be Consumed			
	- Materials to be issued	21,00,000		
	- Add : Opening materials at site	73,000	21,73,000	33,75,000
(ii)	Direct Wages Cost :			
	Direct wages for 2014-15 :			
	- Wages Paid	10,12,500		
	- Add : Outstanding at closing	80,000	10,92,500	
	Direct wages to be incurred :			
	- Wages to be paid	12,25,000		
	- Less : Outstanding at opening	(80,000)		
	- Add : Outstanding at closing	1,15,000	12,60,000	23,52,500
(iii)	Plant Cost			
	Plant used during 2014-15 :			
	- Plant purchased	7,50,000		
	- Less : Plant disposed off	(80,000)		
	- Less : Closing plant at site	(2,50,000)	4,20,000	
	Plant to be used			
	- Additional amount to be spent	4,62,500		
	- Add : Opening plant at side	2,50,000		
	- Less : Residual value of plant	(67,500)	6,45,000	10,65,000
(iv)	Expenses			
	Expenses incurred during 2014-15:			
	- Expenses paid	3,25,000		
	- Less : Prepaid at closing	(68,000)	2,57,000	
	Expenses to be incurred			
	- Expenses to be paid	5,40,000		
	- Add : Prepaid at opening	68,000	6,08,000	8,65,000
(v)	Site office expenses paid in 2014-15		3,00,000	
	- Add : to be paid {(3,00,000÷12) X 21 months}		5,25,000	8,25,000
(vi)	Consultancy charges to be paid			1,57,500
Total Estimated cost of the Contract				86,40,000
Estimated Profit (A - B)				13,60,000

***** The profit to be transferred can be calculated using various formulae given in the working note, however, in this solution following the conservative approach, the lowest amount has been taken.

Profit transferred to the reserve will vary depending upon the formula of profit calculation adopted.

Workings :

Profit to be transferred to Costing Profit and Loss Account

$$= \text{Estimated Profit X } \frac{\text{Work Certified}}{\text{Contract Price}} \text{ X } \frac{\text{Cash received}}{\text{Work Certified}}$$

$$= ₹\ 13{,}60{,}000 \text{ X } \frac{\text{Rs. } 45{,}00{,}000}{\text{Rs. } 1{,}00{,}00{,}000} \text{ X } \frac{\text{Rs. } 36{,}00{,}000}{\text{Rs. } 45{,}00{,}000} = ₹\ 4{,}89{,}600$$

Or

$$= \text{Estimated Profit X } \frac{\text{Cost of work to date}}{\text{Estimated total cost}} \text{ X } \frac{\text{Cash received}}{\text{Work Certified}}$$

$$= ₹\ 13{,}60{,}000 \text{ X } \frac{\text{Rs. } 32{,}71{,}500*}{\text{Rs. } 86{,}40{,}000} \text{ X } \frac{\text{Rs. } 36{,}00{,}000}{\text{Rs. } 45{,}00{,}000} = ₹\ 4{,}11{,}967$$

Or

$$= \text{Estimated Profit X } \frac{\text{Cost of work to date}}{\text{Estimated total cost}} = ₹\ 13{,}60{,}000 \text{ X } \frac{\text{Rs.}32{,}71{,}500*}{\text{Rs.}86{,}40{,}000} = ₹\ 5{,}14{,}958.33$$

Or

$$= \text{Estimated Profit X } \frac{\text{Value of work certified}}{\text{Value of Contract}} = ₹13{,}60{,}000 \text{ X } \frac{\text{Rs.}45{,}00{,}000}{\text{Rs.}1{,}00{,}00{,}000} = ₹\ 6{,}12{,}000$$

* [Material Consumed + Direct Wages + Plant used + Expenses + Site office expenses]

[₹ 12,02,000 + ₹ 10,92,500 + ₹ 4,20,000 + ₹ 2,57,000 + ₹ 3,00,000 = ₹ 32,71,500]

Since, in the question estimated cost information is given, hence, the profit to be transferred in the Costing Profit & Loss account for the year 2014-15, will be on the basis of estimated profit calculated as above.

Profit to be transferred in Costing Profit & Loss account for the year 2014-15 on percentage of completion method as below :

$$\text{Notional Profit X } \frac{1}{3} \text{ X } \frac{\text{Cash Received}}{\text{Value of Work Certified}} = ₹\ 17{,}68{,}500 \text{ X } \frac{1}{3} \text{ X } \frac{\text{Rs. } 36{,}00{,}000}{\text{Rs. } 45{,}00{,}000} = ₹\ 4{,}71{,}600$$

The detailed calculations have been shown for better understanding of the students.

PROCESS COSTING

11

Question 1.

A product is completed in three consecutive processes. During a particular month the input to Process 1 of the basic raw material was 5000 units at Rs.2 per unit. Other information for the month was as follows:

	Process 1	*Process 2*	*Process 3*
Output (units)	4700	4300	4050
Normal loss as % of input	5	10	5
Scrap value per unit (Rs.)	1	5	6
Direct wages (Rs.)	3000	5000	8000
Direct expenses (Rs.)	9750	9910	15560

Overhead, Rs.32000 total, chargeable as percentage of direct wages.

There were no opening or closing work-in-progress stocks. Compile three process accounts and finished stock account with details of abnormal loss and gain, where applicable.

Answer :		**F/G**	**A/L**	**A/G**
Process I	**Rs.**	**28200**	**300**	**-**
Process II	**Rs.**	**51600**	**-**	**840**
Process III	**Rs.**	**89100**	**770**	**-**

Question 2. **CA Inter May1996**

The input to a purifying process was 16000 kgs. of basic material purchased @ RS. 1.20 per Kg. Process wages amounted to Rs. 720 and overhead was applied @ 240% of the labour cost sundry material of Rs. 336. The actual output from the process weighted 15000 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 @ Rs. 0.50 per kg.

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

Prepare:

(i) Purifying Process Account

(ii) Normal Wastage Account

(iii) Abnormal Wastage/Yield Account

(iv) Royalty Payable Account.

Answer: (i) Transferred to purified stock 15000 units @ Rs. 1.60 per unit; (ii) Cash sale of wastage 1000 units @ 0.50 per unit; (iii) Credit balance Rs. 266; (iv) Balance 15000 units @ 0.15 per unit.

Question 3. **2003 – May [4] (a)**

RST Ltd. Manufactures plastic molded chairs. Three models of molded chairs, all variation of the same design are Standard, Deluxe and Executive. The company uses an operation-costing system.

RST Ltd. Has extrusion, form trim and finish operations. Plastic sheets are produced by the extrusion operation. During the forming operation, the plastic sheets are molded into chairs seats and the legs are added. The standard model is sold after this operation. During the trim operation, the arms are added to the Deluxe and Executive models and the chair edges are smoothed. Only the executive model enters the finish operation, in which padding is added. All of the units produced receive the same step within each operation In April, 2003 units of production and direct material cost incurred are as follows:

	Units Produced	Extrusion Materials (Rs.)	Form Materials (Rs.)	Trim Materials (Rs.)	Finish Materials (Rs.)
Standard Model	10500	126000	42000	0	0
Deluxe Model	5250	63000	21000	15750	0
Executive Model	3500	42000	14000	10500	21000
	19250	231000	77000	26250	21000

The total conversion costs for the month of April, 2003 are:

	Extrusion Operation	Form Operation	Trim Operation	Finish Operation
Total	Rs. 606375	Rs. 297000	Rs. 155250	Rs. 94500

Conversion Costs

1. For each product produced by RST Ltd. during April, 2003. determine the units cost and the total cost.
2. Now consider the following information for May. All unit costs in May are identical to the April units costs calculate each above in (i). At the end of May, 1500 units of the Deluxe model remain in work-in-progress. These units are 100% complete as to materials and 65% complete in the trim operation. Determine the cost of

Answer: 1. 62.93, 83.67, 116.67

Question 4.

A Ltd. produces 'AXE' which passes through two processes before it is completed and transferred to finished stock. The following data related to October 2005:

	Process I	Process II	Finished stock
	Rs.	Rs.	Rs.
Opening stock	7,500	9,000	22,500
Direct materials	15,000	15,750	
Direct wages	11,200	11,250	
Factory overheads	10,500	4,500	11,250
Closing stock	3,700	4,500	
Inter-process profit			
Included in opening stock		1,500	8,250

Output of Process I is transferred Process II at 25% profit on the transfer price.

Output of Process II is transferred to finished stock at 20% profit on the transfer price. Stock in process is valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales during the period are Rs. 1,40,000.

Prepare Process cost accounts and finished goods account showing the profit element at each stage.

Question 5.

The product of a company passes through three distinct process A, B and C. It is ascertained that wastage in these processes is 2%, 5% and 10% respectively. In each case, the percentage of wastage is computed on the number of units entering the process concerned. The wastage of each possesses a scrap value. The wastage of process A and B is sold at

Rs.5 per 100 units and that of process C at Rs.20 per 100 units. The following. information is obtained:

	Process		
	A	*B*	*C*
Material consumed (Rs.)	4000	2000	1000
Direct labour (Rs.)	6000	4000	3000
Manufacturing expenses (Rs.)	1000	1000	1500

20000 units have been issued to process A at a cost of Rs.8000. The output of process A, B and C is 19500, 18800 and 16000 units respectively. There is no stock or work in process in any process. Show the process account.

Question 6

A product passes through two processes A and B. During the year 2013, the input to process A of basic raw material was 8,000 units @ ₹ 9 per unit. Other information for the year is as follows:

	Process A	**Process B**
Output units	7,500	4,800
Normal loss (% to input)	5%	10%
Scrap value per unit (₹)	2	10
Direct wages (₹)	12,000	24,000
Direct expenses (₹)	6,000	5,000
Selling price per unit (₹)	15	25

Total overheads ₹ 17,400 were recovered as percentage of direct wages. Selling expenses were ₹ 5,000. These are not allocated to the processes. 2/3rd of the output of Process A was passed on to the next process and the balance was sold. The entire output of Process B was sold.

Prepare Process A and B Accounts.

FOR YOUR PRACTICE

Question 1. **CA Inter Nov. 2002**

A product passes through two processes. The output of Process I becomes the input of Process II and the output of Process II is transferred to warehouse. The quantity of raw materials introduced into Process I is 20000 kg at Rs. 10 per kg. The cost and output data for the month under review are as under:

	Process I	**Process II**
Direct materials	Rs. 60000	Rs. 40000
Direct labour	Rs. 40000	Rs. 30000
Production overheads	Rs. 39000	Rs. 40250
Normal loss	8%	5%
Output	18000	17400
Loss realization Rs./Unit	2.00	3.00

The company's policy is to fix the Selling price of the end product in such a way as to yield a Profit of 20% on Selling price.

Required:

Prepare the Process Accounts

Determine the Sellings price per unit of the end product.

Solution

Dr. **Process I** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Direct material	20,000	2,00,000	By Normal loss	1,600	3,200
To Sundry material	-	60,000	By Abnormal loss	400	7,300
To Direct labour	-	40,000			
To Production overhead	-	39,000	By Process II	18,000	3,28,500
	20,000	**3,39,000**		**20,000**	**3,39,000**

Dr. **Process II** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process I	18,000	3,28,500	By Normal loss	900	2,700
To Direct material	-	40,000			
To Direct labour	-	30,000			
To Production overhead	-	40,250			
To Abnormal gain	300	7,650	By FG	17,400	4,43,700
	18,300	**4,46,400**		**18,300**	**4,46,400**

Dr. **Normal Loss** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process I	1,600	3,200	By Bank	1,600	3,200
To Process II	900	2,700	By Bank	600	1,800
			By Abnormal gain	300	900
	2,500	**5,900**		**2,500**	**5,900**

Dr. **Abnormal Loss** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process I	2,000	36,500	By Bank	2,000	4,000
			By P/L		32,500
	2,000	**36,500**		**2,000**	**36,500**

Dr. **Abnormal Gain** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Abnormal loss	300	900	By Process II	300	7,650
To P/L		6,750			
	300	**7,650**		**300**	**7,650**

Calculation of Normal cost p.u.

I. $\frac{3,39,000 - 3,200}{20,000 - 1,600}$ 18.25

II. $\frac{4,38,750 - 2,700}{18,000 - 900}$ 25.5

- Selling Price = $\frac{100}{80} \times 25.50 = 31.875$

Question 2.

Product B is obtained after it passes through three distinct processes. The following information is obtained from the accounts for the week ending May 30,1980.

Process	*Total*	*I*	*II*	*III*
	(Rs.)	*(Rs.)*	*(Rs.)*	*(Rs.)*
Direct material	7542	2600	1980	2962
Direct Wages	9000	2000	3000	4000
Production overhead	9000			

1000 units at Rs.3 each were introduced to Process-I. There was no stock of materials or work-in-process at the beginning or end of the period. The output of each process passes direct to the next process and finally to finished stores.

Production overhead is recovered on 100% of direct wages.

The following additional data are obtained:

Process	*Output during the week*	*Percentage of normal loss of input*	*Value of scrap per unit (Rs.)*
I	950	5%	2
II	840	10%	4
III	750	15%	5

Prepare process cost accounts and abnormal loss or gain account.

Solution

Dr. **Process I** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Direct material	1,000	3,000	By Normal loss	50	100
To Sundry material	-	2,600			
To Direct wages	-	2,000			
To Production overhead	-	2,000	By Process II	950	9,500
	1,000	**9,600**		**1,000**	**9,600**

Dr. **Process II** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process I	950	9,500	By Normal loss	95	380
To Direct material	-	1,980	By Abnormal loss	15	300
To Direct wages	-	3,000			
To Production overhead	-	3,000	By Process III	840	16,800
	950	**17,480**		**950**	**17,480**

Dr. **Process III** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process II	840	16,800	By Normal loss	126	630
To Direct material	-	2,962			
To Direct wages	-	4,000			
To Production overhead	-	4,000			
To Abnormal gain	36	1,368	By FG	750	28,500
	876	**29,130**		**876**	**29,130**

Dr. **Normal Loss** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process I	50	100	By Bank	50	100
To Process II	95	380	By Bank	95	380
To Process III	126	630	By Bank	90	450
			By P/L	36	180
	271	**1,110**		**271**	**1,110**

Dr. **Abnormal Loss A/c** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process II	15	300	By Bank	15	60
			By P/L	-	240
	15	**300**		**15**	**300**

Dr. **Abnormal Gain A/c** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To N/L	36	180	By Process III	36	1,368
To P/L		1,188			
	36	**1,368**		**36**	**1,368**

Calculation of normal Loss p.u.

I $\frac{9600 - 100}{1000 - 50}$ 10

II $\frac{17480 - 380}{950 - 95}$ 20

III $\frac{27762 - 630}{840 - 126}$ 38

Question 3.

A product which uses 100 tonnes as input per month passes through two processes. The details of cost in Process I for April, 1987 are:

Process I	***Cost per tonne (Rupees)***
Direct material cost	26100
Direct labour cost	7800
Overhead	13500

The total loss in Process I is 2% of input, and the scrap is 8% of input with a value of Rs.12000 per tonne.

The material is transferred to Process II at cost. The process direct labour cost at Process II is Rs.9000 per tonne of input. The overhead is 60% of direct labour cost. The scrap at Process II is at 20% of input with a value of Rs.12000 per tonne. Draw up a cost sheet to present the manufacturing cost of the product showing clearly the cost of scrap and waste at each stage of manufacture.

Solution

Dr. **Process I A/c** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Direct material	100	26,10,000	By Normal Loss	10	96,000
To Direct labour		7,80,000		[100 × 10%]	[12000 × 8]
To Overhead		13,50,000	By Process II	90	46,44,000
				(b/f)	
	100	**47,40,000**		**100**	**47,40,000**

Normal cost p.u. = $\frac{47,40,000 - 96,000}{100 - 10}$

= 51,600

Dr. **Process II A/c** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process I	90	46,44,000	By Normal Loss	18	2,16,000
To Direct labour		8,10,000			
To Overhead		4,86,000	By FG A/c	72 (b/f)	57,24,000
	90	**59,40,000**		**90**	**59,40,000**

Normal cost p.u. = $\frac{59,40,000 - 2,16,000}{90 - 18}$

= 79,500

Dr. **Normal Loss A/c** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process I	10	96,000	By Bank	10	96,000
To Process II	18	2,16,000	By Bank	18	2,16,000
	28	**3,12,000**		**28**	**3,12,000**

Question 4.

Product X is obtained after it is processed through three distinct processes. The following cost information is available for the operation.

PROCESS

	Total Rs.	**I Rs.**	**II Rs.**	**III Rs.**
Materials	5625	2600	2000	1025
Direct Wages	7330	2250	3680	1400
Production Overheads	7330	–	–	–

500 Units @ Rs.4/- per unit were introduced in Process I. Production Overheads are absorbed as a percentage of Direct Wages.

The actual output and normal loss of the respective processes are:

	Output Units	**Normal loss on Input**	**Value of scrap per unit Rs.**
Process I	450	10%	2
Process II	340	20%	4
Process III	270	25%	5

There is no stock or work-in-progress in any process. Show:-

a) The three process accounts.

b) The abnormal loss and abnormal gain accounts.

Solution

Dr. **Process I** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Direct material	500	2,000	By Normal loss	50	100
To Sundry material	-	2,600			
To Direct wages	-	2,250			
To Production overhead	-	2,250	By Process II	450	9,000
	500	**9,100**		**500**	**9,100**

Dr. **Process II** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process I	450	9,000	By Normal loss	90	360
To Direct material	-	2,000	By Abnormal loss	20	1,000
To Direct wages	-	3,680			
To Production overhead	-	3,680	By Process III	340	17,000
	450	**18,360**		**450**	**18,360**

Dr. **Process III** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process III	340	17,000	By Normal loss	85	425
To Direct material	-	1,025			
To Direct wages	-	1,400			
To Production overhead	-	1,400			
To Abnormal gain	15	1,200	By FG.	270	21,600
	355	**22,025**		**355**	**22,025**

Dr. **Normal Loss** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process I	50	100	By Bank	50	100
To Process II	90	360	By Bank	90	360
To Process III	85	425	By Bank	70	350
			By Abnormal gain	15	75
	225	**885**		**225**	**885**

Dr. **Abnormal Loss** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process II	20	1,000	By Bank	20	80
			By P/L		920
	20	**1,000**		**20**	**1,000**

Dr. **Abnormal Gain** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Normal loss	15	75	By Process III	15	1,200
To P/L		1,125			
	15	**1,200**		**15**	**1,200**

Working Note:- Calculation of normal cost p.u.

I $\frac{9100 - 100}{}$ Rs 20

	500 – 50	
II	18,360 – 360	Rs 50
	450 – 90	
III	20825 – 424	Rs 80
	340 – 85	

Question 5.

In a manufacturing unit, raw material passes through four processes I, II, III & IV and the output of each process is the input of the subsequent process. The loss in the four process I, II, III & IV are respectively 25%, 20%, 20% and 16- 2/3 % of the input. If the end product at the end of Process IV is 40000 kg., what is the quantity of raw material required to be fed at the beginning of Process I and the cost of the same at Rs. 5 per kg.?

Find out also the effect of increase or decrease in the material cost of the end-product for variation of every rupee in the cost of the raw material.

Working Note:-

	I	II	III	IV
Input	100 kg	75 kg	60 kg	48 kg
Output	75 kg	60 kg	48 kg	40 kg
	[100 – 25%]	[75 – 20%]	[60 – 20%]	[48 – 16.6667%]

Solution

(i) RM Input in Process I = $\frac{100}{40} \times 40{,}000 = 1{,}00{,}000$ kg.

(ii) The finished goods of 1 kg required 2.5 kg raw material. ∴, if raw material cost changes by Rs. 1 per kg then the cost of finished goods will aoutomatically change by Rs 2.5.

Question 6.

A factory uses a particular raw material. There are three process I, II and III.

The data relating to inputs, outputs and rejections during the month of April,1993 are given below:

Process	**Inputs (in pieces)**	**Rejections (in pieces)**	**Outputs (in pieces) (including opening W.I.P.)**
I	18000	6000	12000
II	19800	1800	18000
III	20400	3400	17000

Determine what should be inputs in Process I when the final product transferred from Process III is 1000 pieces.

Calculate the cost of raw materials to produce one piece of the finished product when (a) the weight of the finished product is 10 gms. and (b) the price of raw material is Rs. 1 per kg.

Solution

	I	II	III
Input	1980 units	1320 units	1200 units
	$[\frac{18000}{12000} \times 1320]$	$[\frac{19800}{18000} \times 1200]$	$[\frac{20400}{17000} \times 1000]$
Output	1320 units	1200 units	1000 units

Report: We would require 1,980 pieces of raw materials to produce 1,000 pieces of finished goods.

(ii) RM Cost p.u.

$$\frac{(1980 \times 10) \times 1}{1000 \text{ pieces}} = \text{Rs } 0.0198 \text{ p.u.}$$

Question 7. **Nov. 2008 CA PCC**

A product passes from Process I and Process II. Materials issued to Process I amounted to Rs. 40,000, Labour Rs. 30,000 and manufacturing overheads were Rs. 27,000. Normal Loss was 3% of input as estimated. But 500 more units of output of Process I were lost due to the carelessness of worker. Only 4,350 units of output were transferred to process II. There were no opening stocks. Input raw material issued to Process I were 5,000 units. You are required to show Process I account.

Solution

Dr. **Process I** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Direct material	5,000	40,000	By Normal loss	150	–
To Direct labour	–	30,000	By Abnormal loss	500	10,000
To Production overhead	–	27,000	By Process II	4,350	87,000
	5,000	**97,000**		**5,000**	**97,000**

Calculation of normal loss p.u. = $\frac{97,000}{4,850} = 20$

Question 8. **May 2008 CA PCC**

JK Ltd. produces a product "AZE" which passes through two processes, viz, process I and process II. The output of each process is treated as the raw material of the next process to which it is transferred and output of the second process is transferred to finished stock. The following data related to December, 2007 :

	Process I	**Process II**
25,000 units introduced at a cost of	2,00,000	-
Material consumed	1,92,000	96,020
Direct labour	2,24,000	1,28,000
Manufacturing expenses	1,40,000	60,000
Normal wastage of input	10%	10%
Scrap value of normal wastage (per unit)	Rs. 9.90	Rs. 8.60
Output in units	22,000	20,000

Required :

(i) Prepare Process I and Process II account.

(ii) Prepare abnormal effective/wastage account as the case may be each process.

Solution

Dr. **Process I A/c** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Direct Material	25,000	2,00,000	By Normal Loss	2,500	24,750
To Direct Labour		2,24,000	[25,000 × 10%]		
To Manufacture expenses		1,40,000	By Abnormal Loss (b/f)	500	16,250
To Material Consumed		1,92,000	By FG produced c/d	22,000	7,15,000
	25,000	**7,56,000**		**25,000**	**7,56,000**

Normal cost p.u. = $\frac{756000 - 24750}{25000 - 2500}$

= 32.5

Dr. **Process II A/c** *Cr.*

Particulars	*Units*	*Amount*	*Particulars*	*Units*	*Amount*
To Process I	22,000	7,15,000	By Normal Loss	2,200	18,920
To Material Consumed		96,020	By FG produced	20,000	9,90,000
To Direct Labour		1,28,000			

To Manufacture Expenses		60,000			
To Abnormal Gain	200	9,900			
	22,200	**10,08,920**		**22,200**	**10,08,920**

Normal cost p.u. = $\frac{999020 - 18920}{22,000 - 2,200}$

= 49.5

Dr. **Normal Loss A/c** *Cr.*

Particulars	***Units***	***Amount***	***Particulars***	***Units***	***Amount***
To Process I	2,500	24,750	By Abnormal gain	200	1,720
To Process II	2,200	18,920	By Bank	2,500	24,750
			By Bank	2,000	17,200
	4,700	**43,670**		**4,700**	**43,670**

Dr. **Abnormal Loss A/c** *Cr.*

Particulars	***Units***	***Amount***	***Particulars***	***Units***	***Amount***
To Process I	500	16,250	By Bank	500	4,950
			By Costing P & L	-	11,300
	500	**16,250**		**500**	**16,250**

Dr. **Abnormal gain A/c** *Cr.*

Particulars	***Units***	***Amount***	***Particulars***	***Units***	***Amount***
To Normal Loss	200	1,720	By Process II	200	9,900
To Costing P & L		8,180			
	200	**9,900**		**200**	**9,900**

Question 9

A product passes through three processes 'X', 'Y' and 'Z'. The output of process 'X' and 'Y' is transferred to next process at cost plus 20 per cent each on transfer price and the output of process 'Z' is transferred to finished stock at a profit of 25 per cent on transfer price. The following information are available in respect of the year ending 31st March, 2014:

	Process-X (₹)	**Process-Y (₹)**	**Process-Z (₹)**	**Finished Stock (₹)**
Opening stock	15,000	27,000	40,000	45,000
Material	80,000	65,000	50,000	--
Wages	1,25,000	1,08,000	92,000	--
Manufacturing Overheads	96,000	72,000	66,500	--
Closing stock	20,000	32,000	39,000	50,000
Inter process profit included in Opening stock	NIL	4,000	10,000	20,000

Stock in processes is valued at prime cost. The finished stock is valued at the price at which it is received from process 'Z'. Sales of the finished stock during the period was ₹ 14,00,000.

You are required to prepare:

(i) Process accounts and finished stock account showing profit element at each stage.

(ii) Costing Profit and Loss account.

(iii) Show the relevant items in the Balance Sheet.

Solution

(i) **Process 'X' Account**

Dr. Cr.

Particulars	Cost (₹)	Profit (₹)	Total (₹)	Particulars	Cost (₹)	Profit (₹)	Total (₹)
To Opening Stock	15,000	-	15,000	By Process 'Y' A/c (Transfer)	2,96,000	74,000	3,70,000
To Material	80,000	-	80,000				
To Wages	1,25,000	-	1,25,000				
Total	2,20,000	-	2,20,000				
Less: Closing stock	20,000	-	20,000				
Prime Cost	2,00,000	-	2,00,000				
To Manufacturing Overheads	96,000	-	96,000				
Total cost	2,96,000	-	2,96,000				
To Costing Profit and Loss A/c (20% on transfer Price or 25% on cost)		74,000	74,000				
	2,96,000	**74,000**	**3,70,000**		**2,96,000**	**74,000**	**3,70,000**

Process 'Y' Account

Dr. Cr.

Particulars	Cost (₹)	Profit (₹)	Total (₹)	Particulars	Cost (₹)	Profit (₹)	Total (₹)
To Opening Stock	23,000	4,000	27,000	By Process 'Z' A/c (Transfer)	5,36,379	2,26,121	7,62,500
To Process 'X' A/c	2,96,000	74,000	3,70,000				
To Material	65,000	--	65,000				
To Wages	1,08,000	--	1,08,000				
Total	4,92,000	78,000	5,70,000				
Less: Closing stock	27,621	4,379	32,000				
Prime Cost	4,64,379	73,621	5,38,000				
To Manufacturing Overheads	72,000	--	72,000				
Total cost	5,36,379	73,621	6,10,000				
To Costing Profit and Loss A/c (20% on transfer Price or 25% on cost)	--	1,52,500	1,52,500				
	5,36,379	2,26,121	7,62,500		5,36,379	2,26,121	7,62,500

Process 'Z' Account

Dr. Cr.

Particulars	Cost (₹)	Profit (₹)	Total (₹)	Particulars	Cost (₹)	Profit (₹)	Total (₹)
To Opening Stock	30,000	10,000	40,000	By Finished Stock A/c (Transfer)	7,45,629	5,50,371	12,96,000
To Process 'Y' A/c	5,36,379	2,26,121	7,62,500				
To Material	50,000	--	50,000				
To Wages	92,000	--	92,000				
Total	7,08,379	2,36,121	9,44,500				
Less: Closing stock	29,250	9,750	39,000				
Prime Cost	6,79,129	2,26,371	9,05,500				
To Manufacturing Overheads	66,500	--	66,500				
Total cost	7,45,629	2,26,371	9,72,000				
To Costing Profit and Loss A/c (25% on transfer Price or 33 1/3% on cost)	--	3,24,000	3,24,000				
	7,45,629	5,50,371	12,96,000		7,45,629	5,50,371	12,96,000

Finished Stock Account

Dr. Cr.

Particulars	Cost (₹)	Profit (₹)	Total (₹)	Particulars	Cost (₹)	Profit (₹)	Total (₹)
To Opening Stock	25,000	20,000	45,000	By Costing P&L A/c A/c (Transfer)	7,41,862	6,58,138	14,00,000
To Process 'Z' A/c	7,45,629	5,50,371	12,96,000				
Total	7,70,629	5,70,371	13,41,000				
Less: Closing stock	28,767	21,233	50,000				
To Costing Profit and Loss A/c	7,41,862	5,49,138	12,91,000				
		1,09,000	1,09,000				
	7,41,862	6,58,138	14,00,000		7,41,862	6,58,138	14,00,000

Costing Profit & Loss Account

for the year ending 31st March, 2014

Dr. Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Provision for unrealized profit on closing stock (₹ 4,379 + ₹ 9,750 + ₹ 21,233)	35,362	By Provision for unrealized profit on opening stock (₹ 4,000 + ₹ 10,000 + ₹ 20,000)	34,000
To Net Profit	6,58,138	By Process X A/c	74,000
		By Process Y A/c	1,52,500
		By Process Z A/c	3,24,000

		By Finished Stock A/c	1,09,000
	6,93,500		6,93,500

Workings:

Calculation of amount of unrealized profit on closing stock:

Process 'X' = Nil

Process 'Y' = $\frac{78,000}{5,70,000} \times 32,000$ = ₹ 4,379.

Process 'Z' = $\frac{2,36,121}{9,44,500} \times 39,000$ = ₹ 9,750.

Finished stock = $\frac{5,50,371}{12,96,000} \times 50,000$ = ₹ 21,233.

Balance Sheet as on 31st March, 2014 (Extract)

Liabilities	Amount (₹)	Assets	Amount (₹)
Net profit	6,58,138	Closing stock:	
		Process – X	20,000
		Process – Y	32,000
		Process – Z	39,000
		Finished stock	50,000
			1,41,000
		Less: Provision for unrealized profit	35,362
			1,05,638

Question 10

Pharma Limited produces product 'Gluco-G' which passes through two processes before it is completed and transferred to finished stock. The following data relates to March, 2014:

	Process-I (₹)	Process-II (₹)	Finished Stock (₹)
Opening Stock	1,50,000	1,80,000	4,50,000
Direct materials	3,00,000	3,15,000	-
Direct Wages	2,24,000	2,25,000	-
Factory Overheads	2,10,000	90,000	-
Closing Stock	74,000	90,000	2,25,000
Inter process profit included in Opening stock	NIL	30,000	1,65,000

Output of process I is transferred to process II at 25 percent profit on the transfer price, whereas output of process II is transferred to finished stock at 20 percent on transfer price. Stock in processes are valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales for the month is ₹ 28,00,000.

You are required to prepare Process-I A/c, Process-II A/c, and Finished Stock A/c showing the profit element at each stage.

Solution

Process- I A/c

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
To Opening Balance	1,50,000	1,50,000	-	By Transfer to Process II A/c	10,80,000	8,10,000	2,70,000
To Direct Material	3,00,000	3,00,000	–				
To Direct Wages	2,24,000	2,24,000	-				
	6,74,000	6,74,000	-				
Less: Closing Stock	74,000	74,000	-				
Prime Cost	6,00,000	6,00,000	-				
To Factory Overhead	2,10,000	2,10,000	-				
Total Cost:	8,10,000	8,10,000	-				
Profit 25% on transfer price i.e. $33\frac{1}{3}$ on total cost	2,70,000	-	2,70,000				
	10,80,000	8,10,000	2,70,000		10,80,000	8,10,000	2,70,000

Process- II A/c

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
To Opening Stock	1,80,000	1,50,000	30,000	By Transfer to Process II A/c	22,50,000	15,15,000	7,35,000
To Direct Material	3,15,000	3,15,000	-				
To Direct Wages	2,25,000	2,25,000	-				
To Transfer from Process I A/c	10,80,000	8,10,000	2,70,000				
Prime Cost	18,00,000	15,00,000	3,00,000				
Less: Closing Stock	90,000	75,000	15,000				
	17,10,000	14,25,000	2,85,000				
To Factory Overhead	90,000	90,000	-				
Total Cost:	18,00,000	15,15,000	2,85,000				
Profit 20% on transfer price i.e. 25% on cost	4,50,000	-	4,50,000				
	22,50,000	**15,15,000**	**7,35,000**		**22,50,000**	**15,15,000**	**7,35,000**

Profit element in closing stock = $\frac{3,00,000}{18,00,000} \times 90,000 = 15,000$

Finished Stock A/c

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
To Opening Stock	4,50,000	2,85,000	1,65,000	By Sales	28,00,000	16,50,000	11,50,000
To Transfer from Process-II	22,50,000	15,15,000	7,35,000				
	27,00,000	18,00,000	9,00,000				
Less: Closing Stock	2,25,000	1,50,000	75,000				

Total Cost	24,75,000	16,50,000	8,25,000				
Profit	3,25,000	-	3,25,000				
(Balancing Figure)							
	28,00,000	16,50,000	11,50,000		28,00,000	16,50,000	11,50,000

Profit element in closing finished Stock = $\frac{7,35,000}{22,50,000}$ X 2,25,000 = 73,500

Calculation of Profit on Sale

Process	Apparent Profit (₹)	Add: Unrealised Profit in Opening Stock (₹)	Less: Unrealised Profit in Closing Stock (₹)	Actual Profit (₹)
Process – I	2,70,000	--	--	2,70,000
Process – II	4,50,000	30,000	15,000	4,65,000
Finished Stock	3,25,000	1,65,000	75,000	4,15,000
	10,45,000	1,95,000	90,000	11,50,000

Question 11

A product passes through three processes 'X', 'Y' and 'Z'. The output of process 'X' and 'Y' is transferred to next process at cost plus 20 per cent each on transfer price and the output of process 'Z' is transferred to finished stock at a profit of 25 per cent on transfer price. The following information are available in respect of the year ending 31st March, 2014:

	Process-X (₹)	Process-Y (₹)	Process-Z (₹)	Finished Stock (₹)
Opening stock	15,000	27,000	40,000	45,000
Material	80,000	65,000	50,000	--
Wages	1,25,000	1,08,000	92,000	--
Manufacturing Overheads	96,000	72,000	66,500	--
Closing stock	20,000	32,000	39,000	50,000
Inter process profit included in Opening stock	NIL	4,000	10,000	20,000

Stock in processes is valued at prime cost. The finished stock is valued at the price at which it is received from process 'Z'. Sales of the finished stock during the period was ₹ 14,00,000.

You are required to prepare:

(iv) Process accounts and finished stock account showing profit element at each stage.

(v) Costing Profit and Loss account.

(vi) Show the relevant items in the Balance Sheet.

Solution

Process 'X' Account

Dr. Cr.

Particulars	Cost (₹)	Profit (₹)	Total (₹)	Particulars	Cost (₹)	Profit (₹)	Total (₹)
To Opening Stock	15,000	-	15,000	By Process 'Y' A/c (Transfer)	2,96,000	74,000	3,70,000
To Material	80,000	-	80,000				

To Wages	1,25,000	-	1,25,000				
Total	2,20,000	-	2,20,000				
Less: Closing stock	20,000	-	20,000				
Prime Cost	2,00,000	-	2,00,000				
To Manufacturing Overheads	96,000	-	96,000				
Total cost	2,96,000	-	2,96,000				
To Costing Profit and Loss A/c (20% on transfer Price or 25% on cost)		74,000	74,000				
	2,96,000	**74,000**	**3,70,000**		**2,96,000**	**74,000**	**3,70,000**

Process 'Y' Account

Dr. Cr.

Particulars	Cost (₹)	Profit (₹)	Total (₹)	Particulars	Cost (₹)	Profit (₹)	Total (₹)
To Opening Stock	23,000	4,000	27,000	By Process 'Z' A/c (Transfer)	5,36,379	2,26,121	7,62,500
To Process 'X' A/c	2,96,000	74,000	3,70,000				
To Material	65,000	--	65,000				
To Wages	1,08,000	--	1,08,000				
Total	4,92,000	78,000	5,70,000				
Less: Closing stock	27,621	4,379	32,000				
Prime Cost	4,64,379	73,621	5,38,000				
To Manufacturing Overheads	72,000	--	72,000				
Total cost	5,36,379	73,621	6,10,000				
To Costing Profit and Loss A/c (20% on transfer Price or 25% on cost)	--	1,52,500	1,52,500				
	5,36,379	2,26,121	7,62,500		5,36,379	2,26,121	7,62,500

Process 'Z' Account

Dr. Cr.

Particulars	Cost (₹)	Profit (₹)	Total (₹)	Particulars	Cost (₹)	Profit (₹)	Total (₹)
To Opening Stock	30,000	10,000	40,000	By Finished Stock A/c (Transfer)	7,45,629	5,50,371	12,96,000
To Process 'Y' A/c	5,36,379	2,26,121	7,62,500				
To Material	50,000	--	50,000				
To Wages	92,000	--	92,000				
Total	7,08,379	2,36,121	9,44,500				
Less: Closing stock	29,250	9,750	39,000				

Prime Cost	6,79,129	2,26,371	9,05,500				
To Manufacturing Overheads	66,500	--	66,500				
Total cost	7,45,629	2,26,371	9,72,000				
To Costing Profit and Loss A/c (25% on transfer Price or 33 1/3% on cost)	--	3,24,000	3,24,000				
	7,45,629	5,50,371	12,96,000		7,45,629	5,50,371	12,96,000

Finished Stock Account

Dr. Cr.

Particulars	Cost (₹)	Profit (₹)	Total (₹)	Particulars	Cost (₹)	Profit (₹)	Total (₹)
To Opening Stock	25,000	20,000	45,000	By Costing P&L A/c A/c (Transfer)	7,41,862	6,58,138	14,00,000
To Process 'Z' A/c	7,45,629	5,50,371	12,96,000				
Total	7,70,629	5,70,371	13,41,000				
Less: Closing stock	28,767	21,233	50,000				
To Costing Profit and Loss A/c	7,41,862	5,49,138	12,91,000				
		1,09,000	1,09,000				
	7,41,862	6,58,138	14,00,000		7,41,862	6,58,138	14,00,000

Costing Profit & Loss Account

for the year ending 31st March, 2014

Dr. Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Provision for unrealized profit on closing stock (₹ 4,379 + ₹ 9,750 + ₹ 21,233)	35,362	By Provision for unrealized profit on opening stock (₹ 4,000 + ₹ 10,000 + ₹ 20,000)	34,000
To Net Profit	6,58,138	By Process X A/c	74,000
		By Process Y A/c	1,52,500
		By Process Z A/c	3,24,000
		By Finished Stock A/c	1,09,000
	6,93,500		6,93,500

Workings:

Calculation of amount of unrealized profit on closing stock:

Process 'X' = Nil

Process 'Y' = $\frac{78,000}{5,70,000} \times 32,000$ = ₹ 4,379.

Process 'Z' = $\frac{2,36,121}{9,44,500} \times 39,000$ = ₹ 9,750.

Finished stock = $\frac{5,50,371}{12,96,000}$ X 50,000 = ₹ 21,233.

Balance Sheet as on 31st March, 2014 (Extract)

Liabilities	Amount (₹)	Assets	Amount (₹)
Net profit	6,58,138	Closing stock:	
		Process – X	20,000
		Process – Y	32,000
		Process – Z	39,000
		Finished stock	50,000
			1,41,000
		Less: Provision for unrealized profit	35,362
			1,05,638

Question 12

Pharma Limited produces product 'Gluco-G' which passes through two processes before it is completed and transferred to finished stock. The following data relates to March, 2014:

	Process-I (₹)	Process-II (₹)	Finished Stock (₹)
Opening Stock	1,50,000	1,80,000	4,50,000
Direct materials	3,00,000	3,15,000	-
Direct Wages	2,24,000	2,25,000	-
Factory Overheads	2,10,000	90,000	-
Closing Stock	74,000	90,000	2,25,000
Inter process profit included in Opening stock	NIL	30,000	1,65,000

Output of process I is transferred to process II at 25 percent profit on the transfer price, whereas output of process II is transferred to finished stock at 20 percent on transfer price. Stock in processes are valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales for the month is ₹ 28,00,000.

You are required to prepare Process-I A/c, Process-II A/c, and Finished Stock A/c showing the profit element at each stage.

Solution

Process- I A/c

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
To Opening Balance	1,50,000	1,50,000	-	By Transfer to Process II A/c	10,80,000	8,10,000	2,70,000
To Direct Material	3,00,000	3,00,000	–				
To Direct Wages	2,24,000	2,24,000	-				
	6,74,000	6,74,000	-				
Less: Closing Stock	74,000	74,000	-				
Prime Cost	6,00,000	6,00,000	-				
To Factory Overhead	2,10,000	2,10,000	-				

Total Cost:	8,10,000	8,10,000	-				
Profit 25% on transfer price i.e. $33\frac{1}{3}$ on total cost	2,70,000	-	2,70,000				
	10,80,000	8,10,000	2,70,000		10,80,000	8,10,000	2,70,000

Process- II A/c

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
To Opening Stock	1,80,000	1,50,000	30,000	By Transfer to Process II A/c	22,50,000	15,15,000	7,35,000
To Direct Material	3,15,000	3,15,000	-				
To Direct Wages	2,25,000	2,25,000	-				
To Transfer from Process I A/c	10,80,000	8,10,000	2,70,000				
Prime Cost	18,00,000	15,00,000	3,00,000				
Less: Closing Stock	90,000	75,000	15,000				
	17,10,000	14,25,000	2,85,000				
To Factory Overhead	90,000	90,000	-				
Total Cost:	18,00,000	15,15,000	2,85,000				
Profit 20% on transfer price i.e. 25% on cost	4,50,000	-	4,50,000				
	22,50,000	**15,15,000**	**7,35,000**		**22,50,000**	**15,15,000**	**7,35,000**

Profit element in closing stock = $\frac{3,00,000}{18,00,000}$ X 90,000 = 15,000

Finished Stock A/c

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
To Opening Stock	4,50,000	2,85,000	1,65,000	By Sales	28,00,000	16,50,000	11,50,000
To Transfer from Process-II	22,50,000	15,15,000	7,35,000				
	27,00,000	18,00,000	9,00,000				
Less: Closing Stock	2,25,000	1,50,000	75,000				
Total Cost	24,75,000	16,50,000	8,25,000				
Profit	3,25,000	-	3,25,000				
(Balancing Figure)							
	28,00,000	16,50,000	11,50,000		28,00,000	16,50,000	11,50,000

Profit element in closing finished Stock = $\frac{7,35,000}{22,50,000}$ X 2,25,000 = 73,500

Calculation of Profit on Sale

Process	Apparent Profit (₹)	Add: Unrealised Profit in Opening Stock (₹)	Less: Unrealised Profit in Closing Stock (₹)	Actual Profit (₹)
Process – I	2,70,000	--	--	2,70,000

Process – II	4,50,000	30,000	15,000	4,65,000
Finished Stock	3,25,000	1,65,000	75,000	4,15,000
	10,45,000	1,95,000	90,000	11,50,000

Question 13

M J Pvt. Ltd. produces a product "SKY" which passes through two processes, viz. Process-A and Process-B. The details for the year ending 31st March, 2014 are as follows:

	Process – A	Process – B
40,000 Units introduced at a cost of	₹ 3,60,000	-
Material Consumed	₹ 2,42,000	2,25,000
Direct Wages	₹ 2,58,000	1,90,000
Manufacturing Expenses	₹ 1,96,000	1,23,720
Output in Units	37,000	27,000
Normal Wastage of Input	5%	10%
Scrap Value (per unit)	₹ 15	20
Selling Price (per unit)	₹ 37	61

Additional Information:

(a) 80% of the output of Process-A, was passed on to the next process and the balance was sold. The entire output of Process- B was sold.

(b) Indirect expenses for the year was ₹ 4,48,080.

(c) It is assumed that Process-A and Process-B are not responsibility centre.

Required:

(i) Prepare Process-A and Process-B Account.

(ii) Prepare Profit & Loss Account showing the net profit I net loss for the year.

Solution :

(i) Process – A Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Input	40,000	3,60,000	By Normal wastage (2,000 units X ₹ 15)	2,000	30,000
To Material	--	2,42,000	By Abnormal Loss A/c (1,000 units X ₹ 27)	1,000	27,000
To Direct Wages	--	2,58,000	By Process – B (29,600 units X ₹ 27)	29,600	7,99,200
To Manufacturing Exp.	--	1,96,000	By Profit & Loss A/c (7,400 units X ₹ 27)	7,400	1,99,800
	40,000	10,56,000		40,000	10,56,000

Cost per Unit $= \frac{\text{Rs. } 10,56,000 - \text{Rs.}30,000}{40,000 \text{ units} - 2,000 \text{ units}}$ = ₹ 27 per unit

Normal Wastage = 40,000 units X 5% = 2,000 units

Abnormal Loss = 40,000 units – (37,000 units+2,000 units) = 1,000 units

Transfer to Process – B = 37,000 units X 80% = 29,600 units

Sale = 37,000 units X 20% = 7,400 units

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process – A A/c	29,600	7,99,200	By Normal wastage	2,960	59,200

			(2,960 units X ₹ 20)		
To Material	---	2,25,000	By Profit & Loss A/c (27,000 units X ₹ 48)	27,000	12,96,000
To Direct Wages	---	1,90,000			
To Manufacturing Exp.	---	1,23,720			
To Abnormal Gain A/c (360 units X ₹ 48)	360	17,280			
	29,960	13,55,200		29,960	13,55,200

Cost per Unit = $\frac{\text{Rs. } 13,37,920 - \text{Rs.}59,200}{29,600 \text{ units} - 2,960 \text{ units}}$ = ₹ 48 per unit

Normal Wastage = 29,600 units X 10% = 2,960 units

Abnormal Loss = (27,000 units + 2,960 Units) – 29600 units = 360 units

Particulars	Amount (₹)	Particulars	Amount (₹)
To Process – A A/c	1,99,800	By Sales :	
To Process – B A/c	12,96,000	- Process – A (7,400 units X ₹ 37)	2,73,800
To Abnormal Loss A/c	12,000	- Process – B (27,000 units X ₹ 61)	16,47,000
To Indirect Expenses	4,48,080	By Abnormal Gain	10,080
		By Net Loss	25,000
	19,55,880		19,55,880

Working Notes :

Normal wastage (Loss) Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process – A A/c	2,000	30,000	By Abnormal Gain A/c (360 units X ₹ 20)	360	7,200
To Process – A A/c	2,960	59,200	By Bank (Sales)	4,600	82,000
	4,960	89,200		4,960	89,200

Abnormal Loss Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process – A A/c	1,000	27,000	By Bank A/c (1,000 units X ₹ 15)	1,000	15,000
			By Profit & Loss A/c	--	12,000
	1,000	27,000		1,000	27,000

Abnormal Gain Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Normal Loss A/c	360	7,200	By Process – B A/c	360	17,280
To Profit & Loss A/c		10,080			
	360	17,280		360	17,280

EQUIVALENT PRODUCTION CONCEPT

12

Question 1.

Calculate the value of Closing WIP, Finished Goods from the following information by FIFO Method :

1) Opening WIP: 1000 unit

Item	Cost (Rs.)	LOC (Level of completion)
Material	3000	40%
Labour	4000	50%
Overheads	1000	60%3

2) Finished Goods produced 8000 units .

3) Closing WIP 3000 units

Item	LOC
Material	20%
Labour	30%
Overheads	40%

4) Other expenses during the year:

Material	100000
labour	30000
Overheads	25000

Answer :	**Material**	**Labour**	**Overhead**
Equivalent production (Units)	**8200**	**8400**	**8600**
Cost per Unit (Rs.)	**12.1951**	**3.5714**	**2.9070**
	Finished Goods	**Clo.WIP**	**AG or AL**
Valuation(Rs.)	**148981**	**14019**	**-**

Question 2.

Calculate the value of Closing WIP, Finished Goods from the following information by FIFO Method :

1) Opening WIP: 2000Units

Item	Cost (Rs.)	LOC (Level of completion)
Material	3000	20%
Labour	4000	30%
Overheads	1000	40%

2) Units introduced during the year 15000 units .

3) Finished Goods produced 12000 units .

4) Closing WIP 5000 units

Item	LOC
Material	30%
Labour	40%
Overheads	50%

5) Other expenses during the year:

Material	30000

Labour	40000
Overheads	10000

Answer :	**Material**	**Labour**	**Overhead**
Equivalent production (Units)	**13100**	**13400**	**13700**
Cost per Unit (Rs.)	**2.2901**	**2.9851**	**0.73**
	Finished Goods	**Clo.WIP**	**AG or AL**
Valuation(Rs.)	**76171**	**11230**	**-**

Question 3.

Calculate the value of Closing WIP, Finished Goods from the following information by FIFO Method :

1) Opening WIP: 2000 Units

Item	Cost (Rs.)	LOC (Level of completion)
Material	3000	40%
Labour	4000	30%
Overheads	5000	50%

2) Units introduced during the year 10000 units .

3) Finished Goods produced 8000 units .

4) Normal loss 10% of input estimated to realize Rs. 1 per unit.

5) Closing WIP 3000 units

Item	LOC
Material	30%
Labour	40%
Overheads	50%

5) Other expenses during the year:

Material	20000
Labour	30000
Overheads	10000

Answer :	**Material**	**Labour**	**Overhead**
Equivalent production (Units)	**8100**	**8600**	**8500**
Cost per Unit (Rs.)	**2.34571**	**3.4884**	**1.1765**
	Finished Goods	**Clo.WIP**	**AG or AL**
Valuation (Rs.)	**62940**	**8062**	**-**

Question 4.

Calculate the value of Closing WIP, Finished Goods from the following information by FIFO Method :

1) Opening WIP: 3000Units

Item	Cost (Rs.)	LOC (Level of completion)
Material	1000	20%
Labour	2000	30%
Overheads	3000	40%

2) Units introduced during the year 20000 units .

3) Finished Goods produced 15000 units .

4) Normal loss 5% of input, estimated to realize Rs. 2 per unit.

5) Closing WIP 7000 units

Item	LOC
Material	30%
Labour	40%
Overheads	50%

6) Other expenses during the year:

Material	50000
Labour	40000
Overheads	30000

Answer :	**Material**	**Labour**	**Overhead**
Equivalent production (Units)	**16500**	**16900**	**17300**
Cost per Unit (Rs.)	**2.9091**	**2.3669**	**1.7341**
	Finished Goods	**Clo.WIP**	**AG or AL**
Valuation (Rs.)	**105194**	**18805**	**-**

Question 5.

Calculate the value of Closing WIP, Finished Goods and abnormal loss from the following information by FIFO Method :

1) Opening WIP: 5000Units

Item	Cost (Rs.)	LOC (Level of completion)
Material	2000	20%
Labour	3000	30%
Overheads	4000	40%

2) Units introduced during the year 20000 units .

3) Finished Goods produced 15000 units .

4) Normal loss 5% of output, estimated to realize Rs. 1 per unit.

5) Closing WIP 10000 units

Item	LOC
Material	30%
Labour	40%
Overheads	50%

5) Other expenses during the year:

Material	60000
Labour	40000
Overheads	30000

6) The loss is estimated to be complete as follows :

Item	LOC
Material	40%
Labour	50%
Overheads	60%

Answer :	**Material**	**Labour**	**Overhead**
Equivalent production (Units)	**16860**	**17275**	**17690**
Cost per Unit (Rs.)	**3.5083**	**2.3155**	**1.6959**
	Finished Goods	**Clo.WIP**	**AG or AL**

Valuation(Rs.)	**111422**	**22614**	**4115**

Question 6.

Calculate the value of Closing WIP, Finished Goods and abnormal gain from the following information by FIFO Method :

1) Opening WIP: 6000Units

Item	Cost (Rs.)	LOC (Level of completion)
Material	2000	20%
Labour	3000	30%
Overheads	4000	40%

2) Units introduced during the year 30000 units .

3) Finished Goods produced 20000 units .

4) Normal loss 10% of output, estimated to realize Rs. 1 per unit.

5) Actual Loss 2000 Units

5) Closing WIP 14000 units

Item	LOC
Material	30%
Labour	40%
Overheads	50%

5) Other expenses during the year:

Material	30000
Labour	40000
Overheads	50000

Answer :	**Material**	**Labour**	**Overhead**
Equivalent production (Units)	**23900**	**24700**	**25500**
Cost per Unit (Rs.)	**1.2092**	**1.6194**	**1.9608**
	Finished Goods	**Clo. WIP**	**AG or AL**
Valuation(Rs.)	**95716**	**27874**	**4310**

Question 7.

Calculate the value of Closing WIP, Finished Goods and abnormal gain from the following information by FIFO Method :

1) Opening WIP: 8000Units

Item	Cost (Rs.)	LOC (Level of completion)
Material	5000	20%
Labour	4000	40%
Overheads	2000	30%

2) Units introduced during the year 40000 units .

3) Finished Goods produced 30000 units .

4) Normal loss 10% of output, estimated to realize Rs. 2 per unit.

5) Actual Loss 3000 Units

5) Closing WIP 15000 units

Item	LOC
Material	20%

Labour	10%
Overheads	40%

6) Other expenses during the year:

Material	80000
Labour	60000
Overheads	40000

Answer :	**Material**	**Labour**	**Overhead**
Equivalent production (Units)	**31100**	**28000**	**33300**
Cost per Unit (Rs.)	**2.3601**	**2.1429**	**1.2012**
	Finished Goods	**Clo.WIP**	**AG or AL**
Valuation(Rs.)	**168610**	**17501**	**1711**

Question 8.

Calculate the value of Closing WIP, Finished Goods and abnormal loss from the following information by FIFO Method :

1) Opening WIP: 4000Units

Item	Cost (Rs.)	LOC (Level of completion)
Material-1	20000	-
Material-2	24000	40%
Labour	14400	60%
Overheads	7200	60%

2) Material received from the previous process 40000 units for Rs. 171000.

3) Finished Goods produced 20000 units .

4) Normal loss 5% of input, estimated to realize Rs. 1.50 per unit.

5) Actual Loss 4000 Units

Item	LOC
Material	40%
Labour	80%
Overheads	80%

6) Closing WIP 20,000 units

Item	LOC
Material	60%
Labour	50%
Overheads	50%

7) Other expenses during the year:

Material	79000
Labour	138230
Overheads	69120

Answer :	**Mat. -1**	**Mat.-2**	**Lab.**	**OH**
Equivalent production (Units)	**38000**	**31200**	**29200**	**29200**
Cost per Unit (Rs.)	**4.4211**	**2.5321**	**4.7339**	**2.3671**
	Finished Goods		**Clo.WIP**	**AG or AL**
Valuation (Rs.)	**307903**		**189817**	**22230**

Question 9.

Calculate the value of Closing WIP, Finished Goods and abnormal loss from the following information by FIFO Method :

1) Opening WIP: 4000Units

Item	Cost (Rs.)	LOC (Level of completion)
Material-1	10000	-
Material-2	8000	40%
Labour	10000	60%
Overheads	6000	80%

2) Material received from the previous process 30000 units for Rs. 10 each.

3) Finished Goods produced 20000 units .

4) Normal loss 5% of output, estimated to realize Rs. 1 per unit.

5) Actual Loss 2000 Units

Item	LOC
Material	40%
Labour	60%
Overheads	50%

6) Closing WIP 12,000

Item	LOC
Material	40%
Labour	60%
Overheads	60%

7) Other expenses during the year:

Material	40000
Labour	50000
Overheads	60000

Answer :	**Mat. -1**	**Mat.-2**	**Lab.**	**OH**
Equivalent production (Units)	**28900**	**23560**	**25340**	**24450**
Cost per Unit (Rs.)	**10.3426**	**1.6978**	**1.9732**	**2.4540**
	Finished Goods		**Clo.WIP**	**AG or AL**
Valuation(Rs.)	**306677**		**164136**	**12089**

Question 10.

Calculate the value of Closing WIP, Finished Goods and abnormal gain from the following information by FIFO Method :

1) Opening WIP: 6000Units

Item	Cost (Rs.)	LOC (Level of completion)
Material-1	10000	-
Material-2	8000	40%
Labour	6000	60%
Overheads	4000	80%

2) Material received from the previous process 40000 units for Rs. 360000.

3) Finished Goods produced 30000 units .

4) Normal loss 5% of input, estimated to realize Rs. 2.00 per unit.

5) Actual Loss 1500 Units

Item	LOC

	Material	40%
	Labour	80%
	Overheads	80%

6) Closing WIP

Item	LOC
Material	30%
Labour	50%
Overheads	60%

7) Other expenses during the year:

Material	40000
Labour	30000
Overheads	20000

Answer :		**Mat. -1**	**Mat.-2**	**Lab.**	**OH**
Equivalent production (Units)		**38000**	**31450**	**33150**	**33400**
Cost per Unit	**(Rs.)**	**9.3684**	**1.2719**	**0.9050**	**0.5989**
		Finished Goods		**Clo.WIP**	**AG or AL**
Valuation (Rs.)		**326931**		**153146**	**6072**
Valuation(Rs.)	**106455**	**31398**		**1952**	

Question 11.

Calculate the value of Closing WIP, Finished Goods and abnormal gain from the following information by Weighted Average Method

1) Opening WIP: 4000Units

Item	Cost (Rs.)	LOC (Level of completion)
Material	3000	20%
Labour	2000	30%
Overheads	1000	40%

2) Units introduced during the year 30000 units .

3) Finished Goods produced 25000 units .

4) Normal loss 5% of output, estimated to realize Rs. 2 per unit.

5) Actual Loss 1000 Units

6) Closing WIP 8000 units

Item	LOC
Material	40%
Labour	60%
Overheads	80%

7) Other expenses during the year:

Material	80000
Labour	40000
Overheads	20000

Answer :	**Material**	**Labour**	**Overhead**
Equivalent production (Units)	**27900**	**29500**	**31100**
Cost per Unit (Rs.)	**2.8817**	**1.4237**	**0.6752**
	Finished Goods	**Clo.WIP**	**AG or AL**
Valuation(Rs.)	**124515**	**20377**	**1494**

Question 12.

Calculate the value of Closing WIP, Finished Goods and abnormal gain from the following information by Weighted Average Method

1) Opening WIP: 6000Units

Item	Cost (Rs.)	LOC (Level of completion)
Material	8000	40%
Labour	4000	50%
Overheads	2000	60%

2) Units introduced during the year 40000 units .

3) Finished Goods produced 35000 units .

4) Normal loss 5% of input, estimated to realize Rs. 1 per unit.

5) Actual Loss 3000 Units

Item	LOC
Material	20%
Labour	30%
Overheads	40%

6) Closing WIP 8000 units

Item	LOC
Material	80%
Labour	60%
Overheads	70%

7) Other expenses during the year:

Material	100000
Labour	80000
Overheads	60000

Answer :	**Material**	**Labour**	**Overhead**
Equivalent production (Units)	**41600**	**40100**	**41000**
Cost per Unit (Rs.)	**2.5481**	**2.0948**	**1.5122**
	Finished Goods	**Clo.WIP**	**AG or AL**
Valuation(Rs.)	**215429**	**34831**	**1743**

FOR YOUR PRACTICE

Question 1. **CA Inter Nov.1995**

Process 2 receives units from process 1 and after carrying out work on the units transfers them to Process 3. For the accounting period the relevant data were as follows :

Opening WIP 200 units (25% complete) valued at Rs. 5000

800 units received from Process 1 valued at Rs. 8600

840 units were transferred to Process 3

Closing WIP 160 units (50% complete)

The costs of the period were RS. 33160 and no units were scrapped.

Required :

Prepare the Process Account for Process 2 using the Average Cost method of valuation.

Solution

Dr. **Process I A/c** *Cr.*

Particulars	*Unit*	*Rs.*	*Particulars*	*Unit*	*Rs.*
To Opening WIP	200	5,000	By Process III	840	42,694
To Process I	800	8,600	By Closing WIP	160	4,066
To Cost	-	33,160			
	1,000	**46,760**		**1,000**	**46,760**

Working note (i)

			Material		Labour		O/H	
Input	**Particular**	**Output**	**LOC**	**Eq. unit**	**LOC**	**Eq. unit**	**LOC**	**Eq. unit**
	Input:-							
200	Opening WIP							
800	Introduction							
	Output:-							
	FG	840	100%	840	100%	840	100%	840
	Closing WIP.	160	50%	80	50%	80	50%	80
1,000		1,000		920		920		920

(ii) Normal cost p.u. = $\frac{8600 + 5000 + 33160}{920} = 50.8261$

(iii) Valuation:-

FG = 840 × 50.8261 = 42694

Closing WIP = 80 × 50.8261 = 4066

Question 2. **CA Inter May1998**

The following data relate to Process Q:

(i)	Operating work-in-process	4000 units	
	Degree of completion :		
	Materials	100 %	Rs. 24000
	Labour	60%	Rs. 14400
	Overheads	60%	Rs. 7200
(ii)	Received during the month of April, 1998 from Process P:		
		40000 units	Rs. 171000
(iii)	Expenses incurred in Process Q during the month:		
	Materials		Rs. 79000
	Labour		Rs. 138230
	Overheads		Rs. 69120
(iv)	Closing work-in-process	3000 units	
	Degree of completion :		
	Materials	100 %	
	Labour & Overheads	50 %	
(v)	Units scrapped	4000 units	
	Degree of completion :		
	Materials	100 %	
	Labour & Overheads	80%	

(vi) Normal loss : 5% of current input.

(vii) Spoiled goods realized Rs. 1.50 each on sale.

(viii) Completed units are transferred to warehouse.

Required :

Prepare : (i) Equipment units statement

(ii) Statement of cost per equivalent unit and total cost

(iii) Process Q Account

(iv) Any other account necessary.

Solution a)

Dr. **Process Q A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	4,000	4,56,000	By Normal Loss	2,000	3,000
To Material II		79,000	(40,000 × 5%)		
To Material I	40,000	1,71,000	By Abnormal Loss	2,000	21800
To Labour		1,38,230	By FG	37,000	450400
To Overhead		69,120	By Closing WIP	3,000	27750
	44,000	**5,02,950**		**44,000**	**5,02,950**

b) Statement for equivalent production units

Input	Particulars	Output	Material I		Material II		Labour		Overhead	
			LOC	E/units	LOC	E/units	LOC	E/units	LOC	E/units
	Input:									
4,000	Opening WIP									
40,000	Introduced									
	Output:									
	Normal Loss	2,000	-	-	-	-	-	-	-	-
	Abnormal loss	2,000	100%	2,000	100%	2,000	80%	1,600	80%	1,600
	FG:									
	Opening WIP	4,000	0%	-	0%	-	40%	1,600	40%	1,600
	Introduced	33,000	100%	33,000	100%	33,000	100%	33,000	100%	33,000
	Closing WIP	3,000	100%	3,000	100%	3,000	50%	1,500	50%	1,500
44,000		**44,000**		**38,000**		**38,000**		**37,700**		**37,700**

c) Calculate normal cost p.u.

Element	Workings	Rs. p.u.
Material I	171000 – 3000 / 38000	4.4211
Material II	79000 / 38000	2.0790
Labour	138230 / 37700	3.6666
Overhead	69120 / 37700	1.8334
		12.0001

d) Valuation of Output

(i) FG Produced – Opening WIP – PY 45,600

CY : Material I [0 × 4.4211] 0

Material II [0 × 2.0790]	0
Labour [1,600 × 36,666]	5866.36
Overhead [1,600 × 1.8334]	2933.44
Introduced [33,000 × 12.0001]	396003.3
	4,50,403.3

(ii) Closing WIP

CY : Material I [3,000 × 4.4211]	13263.3
Material II [3,000 × 2.0790]	6237
Labour [1,500 × 3.6666]	5499.9
Overhead [1,500 × 1.8334]	2750.1
	27750.3

(iii) Abnormal Loss

Material I [2,000 × 4.4211]	8842.2
Material II [2,000 × 2.0790]	4158
Lobour [1,600 × 3.6666]	5866.56
Overhead [1,600 × 1.8334]	2933.44
	21800.2

Question 3. **CA Inter May 1999**

Following information is available regarding process A for the month of February, 1999:

Production Record

Units in process as on 1.2.1999	4000
(All materials used, 25% complete for labour and overhead)	
New units introduced	16000
Units completed	14000
Units in process as on 28.2.1999	6000
(All materials used, 33 1/3% complete for labour and overhead)	

Cost Records

Work-in-process as on 1.2.1999	*Rs.*
Materials	6000
Labour	1000
Overhead	1000
	8000
Cost during the month:	
Materials	25600
Labour	15000
Overhead	15000
	55600

Presuming that average method of inventory is used, prepare:

i) Statement of equivalent production.

ii) Statement showing cost for each element.

iii) Statement of apportionment of cost.

iv) Process cost account for process A.

Solution a)

Dr. **Process A A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	4,000	8,000			
To Direct material	16,000	25,600	By FG Produced	14,000	50,120
To Labour	-	15,000	By Closing WIP	6,000	13,480
To Overhead	-	15,000			
	20,000	**63,600**		**20,000**	**63,600**

b) Statement for calculation of equivalent no. of units

Input	Particulars	Output	Material		Labour		Overhead	
			LOC	E/units	LOC	E/units	LOC	E/units
	Inputs:							
4,000	Opening WIP							
16,000	Introduced							
	Output:							
	FG Produced	14,000	100%	14,000	100%	14,000	100%	14,000
	Closing WIP	6,000	100%	6,000	33⅓%	2,000	33⅓%	2,000
20,000		**20,000**		**20,000**		**16,000**		**16,000**

c) Statement of weighted average cost p.u.

Elements	Workings	Cost p.u.
Material	25600 + 6000 / 20000	1.58
Labour	15000 + 1000 / 16000	1
Overhead	15000 + 1000 / 16	1
		3.58

d) Statement for valuation of Output

(i) FG Produced = 14,000 × 3.58 =		50,120
(ii) Closing WIP : Material	[6,000 × 1.50]	9,480
Labour	[2,000 × 1]	2,000
Overhead	[2,000 × 1]	2,000
		13,480

Question 4. **CA Inter May 2001**

The following information is given in respect of Process No.3 for the month of January, 2001.

Opening stock – 2000 units made-up of:

Direct Materials-I	Rs.	12350
Direct Materials-II	Rs.	13200
Direct Labour	Rs.	17500
Overheads	Rs.	11000

Transferred from Process No.2: 20000 units @ Rs.6.00 per unit.

Transferred to Process No.4:17000 units.

Expenditure incurred in Process No.3:

Direct Materials	Rs.	30000
Direct labour	Rs.	60000
Overheads	Rs.	60000

Scrap: 1000 units – Direct Materials 100%, Direct Labour 60%, Overheads 40%.

Normal Loss 10% of production.

Scrapped units realized Rs.4 per unit.

Closing Stock:4000 units – Degree of completion : Direct Materials 80%, Direct Labour 60% and Overheads 40%.

Prepare Process No.3 Account using average price method, along with necessary supporting statements.

Solution a)

Dr. **Process No. 3 A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	2,000	54,050	By Normal Loss	1,800	7,200
To Matterial I	20,000	1,20,000	[2,000 + 20,000 – 4,000] × 10%		
To Direct material	–	30,000	By FG	17,000	2,81,822
To Labour	–	60,000	By Closing WIP	4,000	48,290
To Overhead	–	60,000			
To Abnormal Gain	800	13,262			
	22,800	**3,37,312**		**22,800**	**3,37,312**

b) Statement for calculation of equivalent no. of units

Input	Particulars	Output	Material I		Material II		Labour		Overhead	
			LOC	E/units	LOC	E/units	LOC	E/units	LOC	E/units
	Input:									
2,000	Opening WIP									
20,000	Introduced									
	Output:	1,800	-	-	-	-	-	-	-	-
	Normal Loss	(800)	100%	(800)	100%	(800)	100%	(800)	100%	(800)
	Abnor. Gain	17,000	100%	17,000	100%	17,000	100%	17,000	100%	17,000
	FG Produced	4,000	100%	4,000	80%	3,200	60%	2,400	40%	1,600
22,000	Closing WIP	**22,000**		**20,200**		**19,400**		**18,600**		**17,800**

c) Statement for calculation of weighted average cost p.u.

Elements	Workings	Rs. p.u.
Material I	12350 + 120000 – 7200 / 20200	6.1955
Material II	13200 + 30000 / 19400	2.2268
Labour	17500 + 60000 / 18,600	4.1667
Overhead	11000 + 60,000 / 17,800	3.9888
		16.5778

d) Valuation of Output

(i) FG Produced = 17,000 × 16.5778 = 281822.6

(ii) Closing WIP :

Material I [4,000 × 6.1955]	24,782
Material II [3,200 × 2.2268]	7125.76
Labour [2,400 × 4.1667]	10000.08
Overhead [1,600 × 3.9888]	6382.08
	48289.92

(iii) Abnormal Gain = 800 × 16.5778 = 13262.24

Question 5. **CA Inter Nov. 2003**

From the following information for the month of October 2003, prepare Process III Cost accounts:

Opening WIP in Process III	:	1800 units at Rs. 27000
Transfer from Process II	:	47700 units at Rs. 536625
Transferred to Warehouse	:	43200 units
Closing WIP of Process III	:	4500 units
Units scrapped	:	1800 units
Direct material added in Process III	:	Rs.177840
Direct Wages	:	Rs.87840
Production overheads	:	Rs.43920

Degree of completion :

	Opening Stock	Closing Stock	Scrap
Material	80%	70%	100%
Labour	60%	50%	70%
Overheads	60%	50%	70%

The normal loss in the process was 5% of the production and scrap was sold @ Rs.6.75 per unit.

Solution a)

Dr. **Process III A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	1,800	27,000	By Normal Loss	2,250	15,188
To Process II	47,700	5,36,625	[1,800 + 47,700 – 4,500] × 5%		
To Direct material	-	1,77,840	By FG Produced	43,200	7,95,373
To Direct wages	-	87,840	By Closing WIP	4,500	70,977
To Prod. Overhead	-	43,920			
To Abnormal Gain	450	8,313			
	49,950	**8,81,538**		**49,950**	**8,81,538**

b) Statement for calculation of equivalent no. of units

Input	Particulars	Output	Material I		Material II		Labour		Overhead	
			LOC	E/units	LOC	E/units	LOC	E/units	LOC	E/units
	Input:									
1,800	Opening WIP									
47,700	Introduced									
	Output:									
	Normal Loss	2,250	-	-	-	-	-	-	-	-
	Abnormal Gain	(450)	100%	(450)	100%	(450)	100%	(450)	100%	(450)
	FG:									
	Opening WIP	1,800	0%	-	20%	360	40%	720	40%	720

	Introduced	41,400	100%	41,400	100%	41,400	100%	41,400	100%	41,400
	Closing WIP	4,500	100%	4,500	70%	3,150	50%	2,250	50%	2,250
49,500		**49,500**		**45,450**		**44,460**		**43,920**		**43,920**

c) Calculate normal cost p.u.

Elements	Workings	Rs. p.u.
Material I	536625 – 15188 / 45450	11.4728
Material II	177840 / 44460	4
Labour	87840 / 43920	2
Overhead	43920 / 43920	1
		18.4728

d) Valuation of Output

(i) FG Produced : PY : Opening WIP		27,000
CY : Material I [0 × 11.4728]		0
Material II [360 × 4]		1,440
Labour [270 × 2]		1,440
Overhead [720 × 1]		720
		30,600
Introduced [41,400 × 18.4728]		764773.92
		795373.92
(ii) Closing WIP : CY : Material I [4,500 × 11.4728]		51627.6
Material II [3,150 × 4]		12,600
Labour [2,250 × 2]		4,500
Overhead [2,250 × 1]		2,250
		70977.6

(iii) Abnormal Gain = 450 × 18.4728 = 8312.76

Question 6. **CA PE II Nov. 2005**

From the following information for the month of October 2005, prepare Process III Cost accounts. Use FIFO Method to value equivalent production.

Direct Material Added in Process III (Opening WIP)	:	2,000 units at Rs. 25,750
Transfer from Process II	:	53,000 units at Rs. 4,11,500
Transferred to Process IV	:	48000 units
Closing stock of process III	:	5000 units
Units scrapped	:	2000 units
Direct material added in Process III	:	Rs. 197600
Direct Wages	:	Rs. 97600
Production overheads	:	Rs. 48800

Degree of completion :

	Opening Stock	Closing Stock	Scrap
Material	80%	70%	100%
Labour	60%	50%	70%

Overheads 60% 50% 70%

The normal loss in the process was 5% of the production and scrap was sold @ Rs. 3. per unit.

Solution a)

Dr. **Process III A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	2,000	25,750	By Normal Loss	2,500	7,500
To Process II	53,000	4,11,500	[2,000 + 53,000 – 5,000] × 5%		
To Direct material		1,97,600	By Process IV	48,000	7,21,328
To Direct wages		97,600	By Closing WIP	5,000	59,585
To Prod. Overhead		48,800			
To Abnormal Gain	500	7,163			
	55,500	**7,88,413**		**55,500**	**7,88,413**

b) Statement for calculation of equivalent no. of units

Input	Particulars	Output	Material I		Material II		Labour		Overhead	
			LOC	E/units	LOC	E/units	LOC	E/units	LOC	E/units
	Input:									
2,000	Opening WIP									
53,000	Introduced									
	Output:									
	Normal Loss	2,500	-	-	-	-	-	-	-	-
	Abnormal Gain	(500)	100%	(500)	100%	(500)	100%	(500)	100%	(500)
	FG:									
	Opening WIP	2,000	0%	-	20%	4,000	40%	8,000	40%	8,000
	Introduced	46,000	100%	46,000	100%	46,000	100%	46,000	100%	46,000
	Closing WIP	5,000	100%	5,000	70%	3,500	50%	2,500	50%	2,500
55,000		**55,000**		**50,500**		**53,000**		**56,000**		**56,000**

c) Calculation of normal cost p.u.

Elements	Workings	Rs. p.u.
Material I	411500 – 7500	8
	50,500	
Material II	197600	3.7283
	53,000	
Labour	97,600	1.7429
	56,000	
Overhead	48,800	0.8714
	56,000	14.3426

d) Valuation of Output

(i) FG Produced : PY : Opening WIP		25,750
CY : Material I [0 × 8]		–
Material II [4,000 × 3.7283]		14913.2
Labour [8,000 × 1.7429]		13943.2
Overhead [8,000 × 0.8714]		6971.2
		61577.6
Introduced [46,000 × 14.3426]		659759.6

	721337.2
(ii) Closing WIP : CY : Material I [5,000 × 8]	40,000
Material II [3,500 × 3.7283]	13049.05
Labour [2,500 × 1.7429]	4357.25
Overhead [2,500 × 0.8714]	2178.5
	59584.8

(iii) Abnormal Gain = 500 × 14.3426 = 7163

Question 7. **CA PE II May 2006**

A Company produces a component, which passes through two processes. During the month of April, 2006 materials for 40,000 components were put into Process I of which 30,000 were completed and transferred to Process II. Those not transferred to Process II were 100% complete as to materials cost and 50% complete as to labour and overheads cost. The Process I costs incurred were as follows:

Direct Materials	Rs. 15,000
Direct Wages	Rs. 18,000
Factory Overheads	Rs. 12,000

Of those transferred to Process II, 28,000 units were completed and transferred to finished goods stores. There was a normal loss with no salvage value of 200 units in Process II. There were 1,800 units, remained unfinished in the process with 100% complete as to materials and 25% complete as regard to wages and overheads.

No further process material costs occur after introduction at the first process until the end of the second process, when protective packing is applied to the completed components. The process and packing costs incurred at the end of the Process II were:

Packing Materials	Rs. 4,000
Direct Wages	Rs. 3,500
Factory Overheads	Rs. 4,500

Required :

(i) Prepare statement of Equivalent Production, Cost per unit and Process I A/c

(ii) Prepare statement of Equivalent Production, Cost per unit and Process II A/c

Solution (i) a)

Dr. **Process I A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Direct material	40,000	15,000	By Process II	30,000	36,964
To Direct wages	-	18,000	By Closing WIP	10,000	8,036
To Factory overhead	-	12,000		(b/f)	
	40,000	**45,000**		**40,000**	**45,000**

b) Statement for calculation of equivalent no. of units

Input	Particulars	Output	D. Material		D. Labour		Overhead	
			LOC	E/units	LOC	E/units	LOC	E/units
	Input:							
-	Opening WIP							
40,000	Introduced							
	Output:							
	FG	30,000	100%	30,000	100%	30,000	100%	30,000
	Closing WIP	10,000	100%	10,000	50%	5,000	50%	5,000
40,000		**40,000**		**40,000**		**35,000**		**35,000**

c) Calculation of normal cost p.u.

Elements	Workings	Rs. p.u.
Material	15,000	0.375
	40,000	
Labour	18,000	0.5143
	35,000	
Overhead	12,000	0.3429
	35,000	1.2322

d) Valuation

FG = 30,000 × 1.2322 = 36,966

Closing WIP : Material [10,000 × 0.375] =	3,750
Labour [5,000 × 0.5143] =	2571.5
Overhead [5,000 × 0.3429] =	1714.5
	8036

(ii) a)

Dr. **Process II A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process I	30,000	36,964	By Normal Loss	200	-
To Packing material	-	4,000			
To Direct wages	-	3,500	By FG Produced	28,000	46,605
To Factory overhead	-	4,500	By Closing WIP	1,800	2,359
	30,000	**48,964**		**30,000**	**48,964**

b) Calculation of equivalent no. of units

Input	Particulars	Output	Material		Packing Mat.		Labour		Overhead	
			LOC	E/units	LOC	E/units	LOC	E/units	LOC	E/units
	Input:									
30,000	Opening WIP									
	Introduced									
	Output:									
	Normal Loss	200	-	-	-	-	-	-	-	-
	FG	28,000	100%	28,000	100%	28,000	100%	28,000	100%	28,000
	Closing WIP	1,800	100%	1,800	0%	-	25%	450	25%	450
30,000		**30,000**		**29,800**		**28,000**		**28,450**		**28,450**

c) Calculation of normal cost p.u.

Elements	Workings	Rs. p.u.
Material	36,964	1.2404
	29,800	
Packing material	4,000	0.1429
	28,000	
Labour	3,500	0.1230
	28,450	
Overhead	4,500	0.1581
	28,450	1.6644

d) Valuation

FG = 28,000 × 1.6644 = 46,603.2

Closing WIP:

Material [1,800 × 1.2404]	=	2232.72
Labour [450 × 0.1230]	=	55.35
Overhead [450 × 0.1581]	=	71.145
		2359.215

Question 8. **CA PE II Nov. 2006**

A Chemical Company carries on production operation in two processes. The material first pass through Process I, where Product 'A' is produced.

Following data are given for the month just ended:

Material input quantity	2,00,000 kgs.
Opening work-in-progress quantity (Material 100% and conversion 50% complete)	40,000 Kgs.
Work completed quantity	1,60,000 Kgs.
Closing work-in-progress quantity (Material 100% and conversion two-third complete)	30,000 Kgs.
Material input cost	Rs. 75,000
Processing cost	Rs. 1,02,000
Opening work-in-progress cost	
Material cost	Rs. 20,000
Processing cost	Rs. 12,000

Normal process loss in quantity may be assumed to be 20% of material input. It has no realizable value.

Any Quantity of Product 'A' can be sold for Rs. 1.60 per kgs.

Alternatively, it can be transferred to Process II for further processing and then sold as Product, 'AX' for Rs. 2 per kg. Further materials are added in Process II, which yield two kgs of product 'AX' for every kg of Product 'A' of process I. Of the 1,60,000 kgs per month of work completed in process I, 40,000 kgs are sold as Product 'A' and 1,20,000 kgs are passed through Process II for sale as Product 'AX'. Process II has facilities to handle upto 1,60,000 kgs of Product 'A' per month, if required.

The monthly costs incurred in Process II (other than the cost of Product 'A') are:

	1,20,000 kgs of Product 'A'	1,60,000 kgs of Product 'A'
	Input	Input
Materials Costs	Rs. 1,32,000	Rs. 1,76,000
Processing Costs	Rs. 1,20,000	Rs. 1,40,000

Determine, using the weighted average cost method, the cost per kg of product 'A' in Process I and value of both work completed and closing work-in-progress for the month just ended.

Solution a)

Dr. **Process I A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	40,000	32,000	By Normal Loss	40,000	-
To Direct material	2,00,000	75,000	By Abnormal Loss (b/f)	10,000	10,750

To Processing cost		1,02,000	By FG	1,60,000	1,72,000
			By Closing WIP	30,000	26,250
	2,40,000	**2,09,000**		**2,40,000**	**2,09,000**

b) Statement for calculation of eq. no. of units

Input	**Particulars**	**Output**	**Material**		**Cost**	
			LOC	**E/units**	**LOC**	**E/units**
	Input:					
40,000	Opening WIP					
2,00,000	Introduced					
	Output:					
	Normal Loss	40,000	-	-	-	-
	Abnormal Loss	10,000	100%	10,000	100%	10,000
	FG produced	1,60,000	100%	1,60,000	100%	1,60,000
	Closing WIP	30,000	100%	30,000	⅔	20,000
2,40,000		**2,40,000**		**2,00,000**		**1,90,000**

c) Calculation of normal cost p.u.

Elements	Workings	Rs. p.u.
Material	75,000 + 20,000 / 2,00,000	0.475
Processing cost	1,02,000 + 12,000 / 1,90,000	0.6
		1.075

d) Valuation

(i) FG = 1,60,000 × 1.075	1,72,000
(ii) Abnormal Loss = 10,000 × 1.075	10,750
(iii) Closing WIP : Material [30,000 × 0.475]	14,250
Cost [20,000 × 0.6]	12,000
	26,250

Question 9. **Nov. – 2007 CA PCC**

ABC Limited manufactures a product 'ZX' by using the process namely RT. For the month of May, 2007, the following dates are available:

Process RT	
Material introduced (units)	16,000
Transfer to next process (units)	14,400
Work in process:	
At the beginning of the month (units)	4,000
(4/5 completed)	
At the end of the month (units)	3,000
(2/3 completed)	
Cost records:	
Work in process at the beginning of the month	
Material	Rs. 30,000
Conversion cost	Rs. 29,200

Cost during the month : materials Rs. 1,20,000

Conversion cost Rs. 1,60,800

Normal spoiled units are 10% of goods finished output transferred to next process.

Defects in these units are identified in their finished state. Material for the product is put in the process at the beginning of the cycle of operation, whereas labour and other indirect cost flow evenly over the year. It has no realizable value for spoiled units.

Required :

i. statement of equivalent production (Average cost method);

ii. Statement of cost and distribution of cost;

iii. Process accounts.

Solution a)

Dr. **Process RT A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	4,000	59,200	By Normal Loss	1,440	-
To Direct material	16,000	1,20,000	[14,400 × 10%]		
To Conversion cost		1,60,800	By FG Produced	14,400	2,72,189
			By Closing WIP	3,000	45,885
			By Abnormal Loss	1,160	21,926
				(b/f)	
	20,000	**3,40,000**		**20,000**	**3,40,000**

b) Statement for Calculation of eq. no. of units

Input	Particulars	Output	Material		Conversion cost	
			LOC	E/units	LOC	E/units
	Input:					
4,000	Opening WIP					
16,000	Introduced					
	Output:					
	Normal Loss	1,440	-	-	-	-
	Abnormal Loss	1,160	100%	1,160	100%	1,160
	FG	14,400	100%	14,400	100%	14,400
	Closing WIP	3,000	100%	3,000	⅔	2,000
20,000		**20,000**		**18,560**		**17,560**

c) Calculation of normal cost p.u.

Elements	Workings	Rs. p.u.
Material	30,000 + 1,20,000 – 0 / 18,560	8.0819
Conversion cost	29,200 + 1,60,800 / 19,000	10.8200
		18.9019

d) Valuation :

FG = [14,400 × 18.9019] = 272187.38

Closing WIP = 3,000 × 8.0819 = 24245.7

Abnormal Loss = 1,160 × 18.9019 = 21926.204

Material cost = 2,000 × 10.8200 = 21640

Question 10. **2010, November**

Following information is available regarding Process A for the month of October 2010 :

Production Record :

(i) Opening work-in-progress 40,000 Units
(Material : 100% complete, 25% complete for labour & overheads)

(ii) Units Introduced 1,80,000 Units

(iii) Units Completed 1,50,000 Units

(iv) Units in-process on 31.10.2010 70,000 Units
(Material : 100% complete, 50% complete for labour & overheads)

Cost Record :

Opening Work-in-Progress :

Material Rs 1,00,000
Labour Rs 25,000
Overheads Rs 45,000

Cost incurred during the month :

Material Rs 6,60,000
Labour Rs 5,55,000
Overheads Rs 9,25,000

Assume that FIFO method is used for W.I.P. inventory valuation.

Required :

(i) Statement of Equivalent Production
(ii) Statement showing Cost for each element
(iii) Statement of apportionment of Cost
(iv) Process A Account.

Solution a)

Dr. **Process A A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	40,000	1,70,000	By F/G	1,50,000	18,04,000
To D/M	1,80,000	6,60,000	By Closing WIP	70,000	5,06,000
To Labour	-	5,55,000			
To Overhead	-	9,25,000			
	2,20,000	**23,10,000**		**2,20,000**	**23,10,000**

b) Statement for calculation of equivalent no. of units

Input	Particulars	Output	Material		Labour		Overhead	
			LOC	E/units	LOC	E/units	LOC	E/units
	Inputs:							
40,000	Opening WIP							
1,80,000	Units Introduced							
	Outputs:							
	FG Produred:							
	Opening WIP	40,000	100%	40,000	75%	30,000	75%	30,000
	Introduced	1,10,000	100%	1,10,000	100%	1,10,000	100%	1,10,000

	Closing WIP	70,000	100%	70,000	50%	35,000	50%	35,000
2,20,000		**2,20,000**		**2,20,000**		**1,75,000**		**1,75,000**

c) Calculation of normal cost p.u.

Element	Workings	Cost p.u.
Material	6,60,000	3
	2,20,000	
Labour	5,55,000	3.1714
	1,75,000	
Overhead	9,25,000	5.2857
	1,75,000	11.4571

d) Statement for Valuation of Output

(i) FG Produced : Opening WIP : PY		1,70,000
CY : Material [40,000 × 3]		1,20,000
Labour [30,000 × 3.1714]		95,142
Overhead [30,000 × 5.2857]		1,58,571
Introduced [1,10,000 × 11.4571]		12,60,281
		18,03,994
(ii) Closing WIP : CY : Material [70,000 × 3]		2,10,000
Labour [35,000 × 3.1714]		110999
Overhead [35,000 × 5.2857]		1,85,000
		5,05,999

Question 11. **2011, November**

The following details are available of Process X for August 2011 :

1. Opening work-in-process 8,000 units
   Degree of completion and cost :
   - Material (100%) Rs 63,900
   - Labour (60%) Rs 10,800
   - Overheads (60%) Rs 5,400
2. Input 1,82,000 units at Rs 7,56,900
3. Labour paid Rs 3,28,000
4. Overheads incurred Rs 1,64,000
5. Units scrapped 14,000
   Degree of completion :
   - Material 100%
   - Labour and overhead 80%
6. Closing work-in-process 18,000 units
   Degree of completion :
   - Material 100%
   - Labour and overhead 70%
7. 1,58,000 units were completed and transferred to next process.
8. Normal loss is 8% of total input including opening work-in-process.
9. Scrap value is Rs 8 per unit to be adjusted in direct material cost.

You are required to compute, assuming that average method of inventory is used :

(i) Equivalent production, and

(ii) Cost per unit

Solution a)

Dr. **Process X A/c** *Cr.*

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	8,000	80,100	By Normal Loss	15,200	1,21,600
To Direct material	1,82,000	7,56,900	[8,000 + 1,82,000] × 8%		
To Labour		3,28,000	By FG	1,58,000	11,06,000
To Overhead		1,64,000	By Closing WIP	18,000	1,09,800
To Abnormal gain	1,200	8,400			
	1,91,200	**13,37,400**		**1,91,200**	**13,37,400**

b) Statement for calculation of equivalent production units

Input	Particulars	Output	Material		Labour		Overhead	
			LOC	E/units	LOC	E/units	LOC	E/units
	Input:							
8,000	Opening WIP							
1,82,000	Introduced							
	Output:							
	Normal Loss	15,200	-	-	-	-	-	-
	Abnormal Gain	(1,200)	100%	(1,200)	100%	(1,200)	100%	(1,200)
	FG Produced	1,58,000	100%	1,58,000	100%	1,58,000	100%	1,58,000
	Closing WIP	18,000	100%	18,000	70%	12,600	70%	12,600
1,90,000		**1,90,000**		**1,74,800**		**1,69,400**		**1,69,400**

c) Statement of normal cost p.u.

Elements	Workings	Cost p.u.
Material	63900 + 756900 – 121600 / 174800	4
Labour	10800 + 328000 / 1,69,400	2
Overhead	5400 + 1,64,000 / 1,69,400	1
		7

d) Statement for valuation of output

(i) FG Produced:

Material [1,58,000 × 7] = 11,06,000

(ii) Closing WIP :

Material [18,000 × 4]	72,000
Labour [12,600 × 2]	25,200
Overhead [12,600 × 1]	12,600
	1,09,800

(iii) Abnormal gain : 1,200 × 7 = 8,400

JOINT PRODUCTION BY PRODUCTION

13

Question 1.

A coke manufacturing company produces the following products by using 5000 tones of coal @ Rs. 15 per tone into a common process.

Coke	3500 tones
Tar	1200 tones
Sulphate of ammonia	52 tones
Benzol	48 tones

Apportion the joint cost amongst the products on the basis of the physical unit method.

Answer: Joint Cost Allocated Rs. 54688; 18750 ;813 ; 750

Question 2.

Find out the cost of joint products A and B using contribution margin method from the following data:

Sales	A: 100 kg @ Rs. 60 per kg
	B: 120 kg @ Rs. 30 per kg
Joint costs	Marginal cost Rs. 4400
	Fixed cost Rs. 3900

Answer: Joint Cost Allocated Rs. 5000; 3300

Question 3.

A company's plant processes 150000 kgs. of raw material in a month to produce two products, viz, 'P' and 'Q'. The cost of raw materials is Rs. 12 per kg. The process costs per month are:

	Rs.
Direct Materials	90000
Direct Wages	120000
Variable Overheads	100000
Fixed Overheads	100000

The loss in process is 5% of input and the output ratio of P and Q which emerge simultaneously is 1:2. The selling prices of the two products at the point of split off are: P Rs. 12 per kg. and Q Rs. 20 per kg. A proposal is available to process P further by mixing it with other purchased materials. The entire current output of the plant can be so processed further to obtain a new product 'S'. The price per kg. of S is Rs. 15 and each kg. of output of S will require one kilogram of input P. The cost of processing of P into S (including other materials) is Rs. 185000 per month.

You are required to prepare a statement showing the monthly profitability based both on the existing manufacturing operations and on further processing.

Will you recommend further processing ?

Answer: Joint Cost Allocated Rs. 510000; 1700000
No further processing is suggested.

Question 4.

A company operates a chemical process which produces four products: K, L, M and N from a basic raw material. The company's budget for a month is as under:

	Rs.
Raw materials consumption	17520

Initial processing wages	16240
Initial processing overheads	16240

Product	Production Kgs.	P.u. cost	Sales Rs.	Additional Processing Costs after split-off Rs.
K	16000	6.85	109600	28800
L	200	28	5600	--
M	2000	15	30000	16000
N	360	60	21600	6600

The company presently intends to sell product L at the point of split-off without further processing. The remaining products, K, M and N are to be further processed and sold. However, the management has been advised that it would be possible to sell all the four products at the split-off point without further processing and if this course was adopted, the selling prices would be as under:

Product	K	L	M	N
Selling Price Rs. per kg.	4.00	28.00	8.00	40.00

The joint costs are to be apportioned on the basis of the sales value realization at the point of split-off.

Required:

i) Prepare the statement showing the apportionment of joint costs.

ii) Present a statement showing the product wise and total budgeted profit or loss based on the proposal to sell product L at the split-off point and products K, M and N after further processing.

iii) Prepare a statement to show the product wise and total profit or loss if the alternative strategy to sell all the products at split-off stage was adopted.

iv) Recommend any other alternative which in your opinion can increase the total profit further. Calculate the total profit as also the product wise profit or loss, based on your recommendation.

Answer:	**Joint Cost Allocated**	**Rs. 32000; 2800; 8000;7200.**			
	Budgeted profit	**Rs. 48800; 2800; 6000; 7800**			
	If sold at split off Point	**Rs. 32000**	**2800**	**8000**	**7200**
	Alternative strategy	**Rs. 48800**	**2800**	**8000**	**7800**

Question 5.

Three joint products are produced by passing chemicals through two consecutive processes. Output from process I is transferred to process 2 from which the three joint products are produced and immediately sold. The data regarding the processes for April, 1990 is given below:

	Process 1	Process 2
Direct material 2500 kilos at Rs. 4 per kilo	Rs. 10000	--
Direct labour	Rs. 6250	Rs. 6900
Overheads	Rs. 4500	Rs. 6900
Normal Loss	10% of input	Nil
Scrap value of loss	Rs. 2 per kilo	–
Output	2300 kilos	Joint Products
		A-900 kilos
		B-800 kilos
		C-600 kilos

There were no opening or closing stocks in either process and the selling prices of the output from process 2 were:

Joint product A	Rs. 24 per kilo
Joint product B	Rs. 18 per kilo
Joint product C	Rs. 12 per kilo

Required:

a) Prepare an account for process I together with any Loss or Gain Accounts you consider necessary to record the month's activities.

b) Calculate the profit attributable to each of the joint products y apportioning the total costs from process 2:

(i) According to weight of output

(ii) By the market value of production

Answer: Profitability:

Physical Weight Method	**Rs. 8100**	**2400**	**1800**
Sale Value at split off point	**Rs. 4350**	**2900**	**1450**

Question 6.

Inorganic Chemicals purchases salt and processes it into more refined products such as Caustic Soda, Chlorine and PVC. In the month of July, Inorganic Chemicals purchased Salt for Rs. 40000. Conversion of Rs. 60000 were incurred upto the split off point, at which time two sealable products were predicted. Chlorine can be further processed into PVC.

The July production and sales information is as follows :

	Production (tonnes)	Sales Quantity (tonnes)	Selling price (per tonnes)
Caustic Soda	1200	1200	Rs. 50
Chlorine	800	---	---
PVC	500	500	Rs. 200

All 800 tonnes of Chlorine were further processed, at an incremental cost of Rs. 20000 to yield 500 tonned of PVC. There were no beginning or ending inventories of Caustic Soda, Chlorine or PVC in July.

There is active market for Chlorine, Inorganic Chemicals could have sold all its July production of Chlorine at Rs. 75 per tonne.

Required :

(1) To calculate how joint cost of Rs. 100000 would be apportioned between Caustic Soda and Chlorine under each of following methods:

a) Sales value at split off,

b) Physical measure (method), and

c) Estimated net realizable value

(2) Lifetime Swimming Pool Products offers to purchase 800 tones of Chlorine in August at Rs. 75 per tone. This sale of Chlorine would mean that no PVC would be produced in August. How the acceptance of this offer for the month of August would affect operating income

Answer: Joint Cost Allocated :

Sale Value at Split Off Point Method	**Rs. 50000**	**50000**
Physical measure Method	**Rs. 60000**	**40000**
Estimated Net Realisable Value Method	**Rs. 42857**	**57143**

Incremental Net Profit : Rs. 20000 therefore it is recommended that the product must be further processed.

Question 7.

SUNMOON Ltd. produces 200000;30000;25000;20000 and 75000 units of its five products A, B, C, D and E respectively in a manufacturing process and sells them at Rs. 17, Rs.13, Rs. 8, Rs. 10 and Rs. 14 per unit. Except product D remaining products can be further processed and then can be sold at Rs. 25, Rs. 17, Rs. 12 and Rs. 20 per unit in case of A,B,C and E respectively.

Raw material costs Rs. 3590000 and other manufacturing expenses cost Rs.547000 in the manufacturing process, which are absorbed on the products on the basis of their 'Net realizable value'. The further processing costs of A,B,C and E are Rs. 1250000; Rs. 150000; Rs. 50000 and Rs. 150000 respectively. Fixed finance costs are Rs. 473000.

You are required to prepare the following in respect of the coming year:

a) Statement showing income forecast of the company assuming that none of its products are to be further processed.

b) Statement showing income forecast of the company assuming that products A, B, C and E are to be processed further.

Can you suggest any other production plan whereby the company can maximize its profits? If yes, then submit a statement showing income forecast arising out of adoption of that plan.

Answer: Joint Cost Allocated : Rs. 2625000; 252000; 175000;140000; 945000
Split off Point Sale : Rs. 630000
Sale after further processing Rs. 1300000
Only A,C,E must be further processed.

Question 8.

A company processes as raw material in its Department 1 to produce three products, viz., A , B and X at the same split-off stage. During a period 180000 kgs. of raw material were processed in Department 1 at a total cost of Rs. 1288000 and the resultant output of A,B and X were 18000 kgs., 10000 kgs., and 54000 kgs respectively. A and B were further processed in Department 2 at a cost of Rs. 180000 and Rs. 150000 respectively.

X was further processed in Department 3 at a cost of Rs. 108000. There is no waste in further processing. The details of sales effected during the period were as under :

		A	B	X
Quantity Sold	(Kgs.)	17000	5000	44000
Sales Value	(Rs.)	1224000	250000	792000

There were no opening stocks. If these products were sold at split-off stage, the selling price of A, B and X would have been Rs. 50, Ts. 40 and Rs. 10 per kg. respectively Required :

a) Prepare a statement showing the apportionment of joint cost to A, B and X.

b) Present a statement showing the cost per kg. of each product indicating joint cost, further processing cost and total cost separately.

c) Prepare a statement showing the productwise and total profit for the period.

d) State with supporting calculation as to whether any or all the products should be further processed or not.

Answer: Joint Cost Allocated Rs. 630000 280000 378000
Joint Cost per Kg. Rs. 35 Rs. 28 Rs.7
Total Cost per Kg. Rs. 45 Rs. 43 Rs. 9
Profitability Rs. 459000 Rs. 35000 Rs. 396000
Only Product A and X be further Processed .

Question 9.

Two products P and Q are obtained in a crude form and require further processing at a cost of Rs. 5 and Rs. 4 for Q per unit before sale. Assuming a net margin of 25 per cent on cost, their sale prices are fixed at Rs. 13.75 and Rs. 8.75 per unit respectively. During the period, the joint cost was Rs. 88000 and the outputs were :

P	8000 units
Q	6000 units

Ascertain the joint cost per unit.

Answer: Joint Cost Per Unit Rs. 8 Rs. 3

Question 10.

The Sunshine Oil Company purchases crude vegetable oil. It does refining or the same. The refining process results in four products at the split off point : M, N, O and P.

Product O is fully processed at the split off point. Product M, N and P can be individually further refined into 'Super M', 'Super N' and Super P'. In the most recent month (October, 1999), the output at split off point was :

Product M	300000	gallons
Product N	100000	gallons
Product O	50000	gallons
Product P	50000	gallons

The joint cost of beginning or ending inventories. Sales of Product O in October were Rs. 2000000. Total output of products M, N and P was further refined and then sold. Data related of October, 1999 are as follows :

	Further Processing Costs to Make Super Products	Sales
'Super M'	Rs. 8000000	Rs. 12000000
'Super N'	Rs. 3200000	Rs. 4000000
'Super P'	Rs. 3600000	Rs. 4800000

Sunshine had the option of selling products M, N and P at the split off point. This alternative would have yielded the following sales for the October, 1999 production :

Product M	Rs. 2000000
Product N	Rs. 1200000
Product P	Rs. 2800000

You are required to answer :

i) How the joint cost of Rs. 4000000 would be allocated between each product under each of the following methods (a) sales value at split off ; (b) physical output (gallons); and (c) estimated net realizable value ?

ii) Could Sunshine have increased its October, 1999 operating profits by making different decision about the further refining of product M, N or P ? Show the effect of nay change you recommend on operating profits.

Answer: Joint Cost Allocated Rs. 1000000; 600000; 1000000; 1400000;
Rs. 2400000; 800000; 400000; 400000
Rs. 2000000; 400000; 100000; 600000

The company must further process only product M and this will increase the overall profit by Rs. 2000000.

Question 11.

In a chemical manufacturing company, three products A, and B and C emerge at a single split off stage in department P. Product A is further processed in department Q, product B in department R and product C in department S. There is no loss in further Processing of any of the three product. The cost data for a month are as under :

Cost of raw materials introduced in department P	Rs. 1268800
Direct Wages Department	Rs.
P	384000
Q	96000
R	64000
S	36000

Factory overheads of Rs. 464000 are to be apportioned to the department on direct wages basis.

During the month under reference, the company sold all three products after processing them further as under :

Product	A	B	C
Output sold Kg.	44000	40000	20000
Selling Price per kg Rs.	32	24	16

There are no Opening or Closing Stocks. If these products were sold at the split off stage, that is, without further processing, the selling prices would have been Rs. 20, Rs. 22 and Rs. 10 each per kg. respectively for A, B and C.

Required :

a) Prepare a statement showing the apportionment of joint costs to joint products.

b) Present a statement showing product-wise and total profit for the month under reference as per the company's current processing policy.

c) What processing decision should have been taken to improve the profitability of the company.

d) Calculate the product-wise and total profit arising from your recommendation in (c) above.

Answer: Joint Cost Allocated	**Rs. 880000; 880000; 200000**
Profit as per companies policy	**Rs. 355200 ; Rs.(35200) ; Rs. 55200**
Profit as per our recommendation	**Rs. 355200 ; Rs. Nil ; Rs. 55200**

Question 12.

ABC Ltd., operates a simple chemical process to convert a single material into three separate items, referred to here as X, Y and Z. All three end products are separated simultaneously at a single split-off point.

Product X and Y are ready for sale immediately upon split-off without futher processing or any other additional costs. Product Z, however is processed further before being sold. There is no available market price for Z at the split-off point.

The selling prices quoted here are expected to remain the same in the coming year. During 2002-03, the selling prices of the items and the total amounts sold were :

X - 186 tons sold for Rs. 1500 per ton

Y – 527 sold for Rs. 1125 per ton

Z – 736 tons sold for Rs. 750 per ton.

The total joint manufacturing costs for the year were Rs. 625000. An additional Rs. 310000 was spent to finish product Z.

There were no opening inventories of X, Y or Z. At the end of the year, the following inventories of complete units were on hand :

X	180 tons
Y	60 tons
Z	25 tons

There was no operating or closing work-in-progress.

Required :

Computer the cost of inventories of X, Y and Z for Balance Sheet purpose and cost of goods sold for income statement purpose as of March 31, 2003, using :

i. Net realizable value (NRV) method of joint cost allocation.

ii. Constant gross-margin percentage NRV method of joint-cost allocation.

iii. Compare the gross-margin percentaes for X, Y and Z using two methods given in requirement (i).

Answer: Joint Cost Allocated :			
NRV Method :	**Rs. 233400**	**Rs. 280750**	**Rs. 110850**
Constant GM NRV Method	**Rs. 288371**	**Rs. 346872**	**Rs. (10243)**
Comparision of GP Rate			
NRV Method (%)	**57.48**	**57.49**	**26.26**
C.GM. NRV (%)	**47.48**	**47.48**	**47.48**

Question 13.

Bright Chemicals Ltd. electrolyses common salt to obtain 3 Joint Products Caustic Soda, Chlorine and Hydrogen. During a costing period, the expenditure relating to the inputs for the common process amounted to Rs. 350000. After separation expenses amounting to Rs. 160000 Rs. 77500 and Rs. 10000 were incurred for caustic Soda, chlorine and hydrogen respectively. The entire production was sold and Rs. 375000, Rs. 250000 and Rs. 60000 were realized for caustic soda, chlorine and hydrogen respectively. The selling expenses were estimated at 5% of realizations from sale. The management expected profits at 15%, 10% and 5% of realizations from the sale of caustic soda, chlorine and hydrogen respectively.

Draw a columnar statement showing the apportionment of Joint Costs and the profitability of each product.

Answer :	**Joint Cost Allocated**	**Rs. 153605**	**148119**	**48276**
	Profitability of the products	**Rs. 61395**	**24381**	**1724**

Question 14.

Chem. & Co. Ltd. products two joint Products 'J' and 'K' in Department 'A' from a basic raw material. The input-output ration of Department a is 100 : 90. Product 'J' which becomes the input of Department 'B' can be further processed in Department 'B' to make one of the most popular industrial product 'N'. The input-output ratio of Department 'B' is 100 : 95. Alternatively Product 'J' can also be sold at the split off stage.

The selling price are

Product	Rs. Per Kg.
J	29.40
K	26.00
N	31.50

The department expenses, production data and selling expenses envisaged in the budget for 1986 are as under :

Department expenses :	**A**	**B**
	Lacs Rs.	**Lacs Rs.**
Raw material	Rs. 16 per Kg.	
Direct Materials	10.00	3.00
Direct Wages	15.00	5.00
Variable Overheads	20.00	7.00
Fixed overheads	25.00	10.00

Production data

Product	Kg.
N	475000
K	850000

Selling expenses :

Prodcut	Rs.
J	100000
K	200000
N	200000

You are required to :

i) Prepare a statement showing the apportionment of joint costs between products 'J' and 'K'.

ii) Advise whether the company should process 'J' further into product 'N' or not. Show workings.

iii) Present a statement of profitability based on your decision.

Answer

Question 15.

A factory is engaged in the production of a chemical BOMEX and in the course of its manufacture, a by-product BRUCIL is produced, which after further processing has a commercial value. For the month of April 1990, the following are the summarized cost data:

	Joint Expenses	Separate Expenses	
		BOMEX	BRUCIL
	Rs.	Rs.	Rs.
Materials	100000	6000	4000
Labour	50000	20000	18000
Overheads	30000	10000	6000
Selling price per unit		98	34
Estimated profit per unit on Sale of BRUCIL			4
		Units	Units
No. of units Produced		2000	2000

The factory uses reverse cost method of accounting for by-products whereby the sales value of by-products after deduction for the estimated profit, post separation costs and selling and distribution expenses relating to the by-products is credited to the joint process cost account.

You are required to prepare statements showing:

(i) The joint cost allocable to BOMEX

(ii) The product-wise and over all profitability of the factory for April 1990.

Answer: Joint Cost Allocated Bomex Rs. 148000
Profitability of the products Bomex Rs. 12000 and Brucil Rs. 8000 .

Question 16.

During the month of May, 1986, 10000 liters of product A and 12000 liters of Product B were manufactured Jointly by incurring following costs:

	Rupees
Direct material	26000
Direct labour	10000
Variable overheads	8000
Fixed overheads	22000

Sales value: A 10000 liters at Rs. 5.20 per liter
B 12000 liters at Rs. 3.00 per liter

(i) Allocate the joint cost to products A and B under following three alternative methods:

a) On the basis of quantity produced and sold.

b) On the basis of sales value.

c) Variable cost on the basis of quantity produced and sold and fixed cost on the basis of contribution.

(ii) Also determine the profit margin for product A and product B under the above three methods.

Question 17.

A manufacturing unit imports Raw material and processes it to produce 3 different products viz. Bright, Light and White. The raw material has F.O.B. value of Rs. 5 per kg. freight and insurance are charged at 10% F.O.B. price. Customs duty at 120% of C.I.F. is levied at the time of import. Auxiliary duty at 20% is also charged on C.I.F. price. Countervailing duty is charged on C.I.F. plus duty at 10%. The landed cost includes 5% for clearing charges.

Bright and Light are joint products while white emerges as a by-product. The value of by-product after deducting 30% (10% being notional profit and 20% for selling expenses) from sale value is credited to process account. The unit consumed 4000 kgs. raw materials during a year. The relevant data is as under.

	Bright	Light	White
Production and sale kg.	1400	1600	1000
Selling price Rs. per kg.	30	26	12
Further processing cost Rs.	1500	1000	–

Assuming additional processing cost other than material at Rs. 15800 for all products (includes Rs. 800 for white) prepare a statement showing:

Credit to process A/c for by-product sale,

Allocation of joint costs on relative sale value basis and

Profit on each product

Answer : Joint Cost Allocated Bright Rs. 34356 and Light Rs. 34028
Profitability of the products Rs. 6144; 6572; 1200

Question 18. **CA PE II May 2004**

A Company Produces two joint products P and Q in 70 : 30 ratio form basic raw materials in department A. The input output ratio of department A is 100 : 85. Product P can be sold at the split of stage or can be processed further at department B and sold as product AR. The input output ratio is 100 : 90 of department B. The department B is created to process product A only and to make it product AR.

The selling prices per Kg. are as under :

Product P Rs. 290

Product Q Rs. 290

Product AR Rs. 115

The production will be taken up in the next month.

Raw materials 8,00,000 Kgs.

Purchase price Rs. 80 per Kg.

Fixed costs	Rs. 264000	per week
Variable cost	Rs. 16.50	per kg processed

The following actual data relate to the first week of the month:

Process I

Opening Work-in-progress	Nil
Material input 40000 kg costing	Rs. 660000
Direct Labour	Rs. 440000
Variable Overheads	Rs. 176000
Fixed Overheads	Rs. 264000

Outputs:

Product J	19200 kg
Product K	14400 kg
Product L	4000 kg
Toxic waste	2400 kg
Closing Work-in-progress	Nil

Process II

Opening Work-in-progress	Nil

Input of product K	14400 kg
Output of product K2	13200 kg
Closing Work-in-progress (50% converted and conversion costs were incurred in accordance with the planned cost structure)	1200 kg

Required:

Prepare Process I account for the first week of the month using the final sales value method of attribute the pre-separation costs to join products.

Prepare the toxic waste account and Process II account for the first week of the month.

Comment on the method used by the JKL Limited to attribute the pre-separation costs to joint products.

Advise the management of JKL Limited whether or not, on purely financial grounds, it should continue to process product K into product K2:

If product K could be sold at the point of separation for Rs. 47.30 per kg; and

If the 60% of the weekly fixed costs of Process II were avoided by not processing product K further.

Question 19. **CA PCC May 2007**

A Company Produces two joint products P and Q in 70 : 30 ratio from basic raw materials in department A. The input output ratio of department A is 100 : 85. Product P can be sold at the split of stage or can be processed further at department B and sold as product AR. The input output ratio is 100 : 90 of department B. The department B is created to process product A only and to make it product AR.

The selling prices per Kg. are as under :

Product P Rs. 85

Product Q Rs. 290

Product AR Rs. 115

The production will be taken up in the next month.

Raw materials 8,00,000 Kgs.

Purchase price Rs. 80 per Kg.

		Deptt. A	Deptt. B
		Rs. Lacs	Rs. Lacs
Direct Materials		35.00	5.00
Direct Labour		30.00	9.00
Variable overheads		45.00	18.00
Fixed overheads		40.00	32.00
Total		150.00	64.00
Selling Expenses :			
Product P	24.60		
Product Q	21.60		
Product AR	16.80		

Required :

(i) Prepare a statement showing the apportionment of joint costs.

(ii) State whether it is advisable to produce product AR or not.

Answer : (1) Joint Cost of P = Rs. 316 Lac., Q = Rs. 474 Lac. (2) Advise = Yes, it is beneficial because the profit increases by Rs. 31.86 Lac.

Question 20. **CA PE II Nov. 2004**

Pokemon Chocolates manufactures and distributes chocolate products. It purchases Cocoa beans and processes them into two intermediate products:

- Chocolate powder liquor base.
- Milk –chocolate liquor base.

These two intermediate products become separately identifiable at a single split – off point. Every 500 pounds of cocoa beans yields 20 gallons of chocolate-power liquor base and 30 gallons of milk-chocolate liquor base.

The chocolate powder liquor base is further processed into chocolate power. Every 20 gallons of chocolate-powder liquor base yields 200 pounds of chocolate powder. The milk-chocolate liquor base is further processed of milk-chocolate. Every 30 gallons of milk chocolate liquor base produces 340 pounds of milk chocolate.

Production and sales date for October, 2004 are:

- Cocoa beans processed = 7,500 Pounds
- Costs of processing Cocoa beans to split- off point
  (including purchase of beans) = 7,12,500

	Production	**Sales**	**Selling Price**
Chocolate Powder	3,000	3,000	Rs. 190
	Pounds	Pounds	Per Pounds
Milk Chocolate	5,100	5,100	Rs. 237.50
	Pounds	Pounds	Per pounds

The October, 2004 separable cost of processing chocolate-powder liquor into chocolate powder is Rs. 3,02,812.50. The October, 2004 separable cost of processing milk-chocolate liquor base into milk-chocolate is Rs. 6,23,437.50.

Pokemon fully processes both of its intermediate products into chocolate powder or milk-chocolate. There is an active market for these intermediate products. In October, 2004, Pokemon could have sold the chocolate powder liquor base for Rs. 997.50 a gallon, and the milk-chocolate liquor base for Rs. 1,235 a gallon.

(i) Calculate how the joint cost of Rs. 7,12,500 would be allocated between the chocolate powder milk-chocolate liquor bases under the following methods:
  - Sales value at split off-point
  - Physical measure (gallons)
  - Estimated net realizable value (NRV) and
  - Constant gross-margin percentage NRV.

(ii) What is the gross-margin percentage of the chocolate powder and milk-chocolate under each of the methods in requirement (i)?

(iii) Could Pokemon have increased its operating income by a change in its decision to fully process both of its intermediate products? Show your computations.

Answer : (iii) Incremental Revenue = 32062.50

Question 21. **May 2005 CA PE II**

A Company produces two joint products X and Y, from the same basic materials.

Materials are mixed in department I. At the end of this process, X and Y get separated. After separation X is completed in the department II and Y is finished in department III. During a period 2,00,000 Kgs of raw material were processed in

department I, at a total cost of Rs. 8,75,000, and the resultant 60% becomes X and 30% becomes Y and 10% normally lost in processing.

In department II, 1/6 of the quantity received from department I is lost in processing. X is further processed in department II at a cost of Rs. 1,80,000. In department III, further new material is added to the material received from department I and weight mixture is doubled, there is no quantity loss in the department and further processing cost (with material cost) is Rs. 1,50,000. The details of sales during the year:

	Product X	Product Y
Quantity sold (Kgs.)	90,000	1,15,000
Sales Price per Kg (Rs.)	10	4

There were no opening stocks. If these products were sold at split-off-point, the selling price of X and Y would B Rs. 8 and Rs. 4 per kg respectively.

Required :

- Prepare a statement showing the apportionment of joint cost to X and Y in proportion of sales value at split off point.
- Prepare a statement showing the cost per kg of each product indicating joint cost, processing cost and total cost separately.
- Prepare a statement showing the product wise profit for the year.
- On the basis of profits before and after further processing of product X and Y, give your comment that products should be further processed or not.

Answer : (i) Joint Cost = X = 7,00,000, Y = 1,75,000 (ii) Cost per kg. = Product X = 8.80, Product Y = 2.708 (iii) Profit = X = 1,08,000, Y = 1,48,540 (iv) Profit X = 2,60,000 Y = b 65,000 Profit before processing.

STANDARD COSTING

14

Question 1.

Rs. Ltd. has established the following standard mix for producing 9 tonnes of product Z.

		Rs.
5 tonnes of material A at Rs. 7 per tonnes	=	35
3 tonnes of material B at Rs. 5 per tonnes	=	15
2 tonnes of material C at Rs. 2 per tonnes	=	4
		Rs. 54

A standard loss of 10% of input is expected to occur. Actual input was as under:

53000 tonne of material A at Rs. 7 per tonnes.

28000 tonne of material B at Rs. 5.30 per tonnes.

19000 tonne of material A at Rs. 2.20 per tonnes.

Actual output for a period was 92700 tones of product Z.

Compute:

(i) Material Mix Variance;

(ii) Material Yield Variance;

Question 2.

S.V. Ltd. manufactures BXE by mixing three raw materials. For every batch of 100 kgs. of BXE, 125 kgs. of raw materials are used. In April 2007 60 batches were prepared to produce an output of 5600 kgs. of BXE. The standard and actual particulars for April 2006 are as under:-

Raw material	Standard		Actual		Quantity Purchased
	Mix	Price per kg.	Mix	Price per kg.	
	%	Rs.	%	Rs.	Kg.
A	50	20	60	21	5000
B	30	10	20	8	2000
C	20	5	20	6	1200

Calculate all Material variances.

Question 3.

One kilogram of product 'K' requires two chemicals A and B. The following were the details of product 'K' for the month of June 2007:

(a) Standard mix Chemical 'A' 50% and chemical 'B' 50%.

(b) Standard price per kilogram of Chemical 'A Rs. 12 and chemical 'B' Rs. 15.

(c) Actual input of chemical 'B' 70 kilograms.

(d) Actual price per kilogram of Chemical 'A' Rs. 15.

(e) Standard normal loss 10% of total input.

(f) Materials cost variance total Rs. 650 adverse.

(g) Materials yield variance total Rs. 135 adverse.

(h) Actual output is 90 kg.

You are required to calculate:

(1) Material mix variance

(2) Material usage variance
(3) Material price variance
(4) Actual loss of actual input
(5) Actual input of Chemical 'A'
(6) Actual price per kilogram of Chemical 'B'.

Question 4.

Compute the missing data indicated by the Question Marks from the following:

Particulars	A	B
Standard Price/Unit	Rs. 12	Rs. 15
Actual Price/Unit	Rs. 15	Rs. 20
Standard Input (kgs.)	50	?
Actual Input (kgs.)	?	70
Material Price Variance	?	?
Material Usage Variance	?	Rs. 300 Adverse
Material Cost Variance	?	?

Material mix variance for both products together was Rs. 45 Adverse.

Question 5.

Eskay Ltd. produces an article by blending two basic raw materials. The following standard have been set up for raw materials:

Material	Standard Mix	Standard Price per kg.
A	**40%**	**Rs. 4.00**
B	**60%**	**Rs. 3.00**

The standard loss in processing is 15%. During September, 1990, the company produced 1700 kg. of finished output.

The position of stock and purchases for the month of September, 1990 is as under:

Material	Stock on 1.09.90	Stock on 30.9.90	Purchased during September, 90	
	Kg.	Kg.	Kg.	Cost Rs.
A	35	5	800	3400
B	40	50	1200	3000

Calculate the following variances:

(a) Material price variance
(b) Material usage variance
(c) Material yield variance
(d) Material mix variance
(e) Total material cost variance.

Assume first in first out method for the issue of material. The opening stock is to be valued at standard price.

Question 6. **(I.C.W.A. Inter, June, 1996-Stage I)**

The standard material inputs required for 1000 kgs. of a finished product are given below

Material	*Quantity (in kg.)*	*Standard rate per kg. (in Rs..)*
P	450	20

Q	400	40
R	250	60
	1100	
Standard loss	100	
Standard output	1000	

Actual production in a period was 20000 kgs. of the finished product for which the actual quantities of material used and the prices paid thereof, are as under:

Material	*Quantity (in kg.)*	*Actual rate per kg. (in Rs..)*
P	10000	19
Q	8500	42
R	4500	65

Calculate the :

(i) Material Cost Variance; (ii) Material Price Variance;

(iii) Material Usage Variance; (iv) Material Mix Variance;

(v) Material Yield Variance;

Present a reconciliation among the variances.

Answer: (i) 39,500 (ii) 29,500 (iii) 10,000 (iv) 26,363 (v) 36,363

Question 7. **(I.C.W.A. Inter, June, 1990)**

XYZ Company manufactures a product ABC by mixing three raw materials. For every 100 kgs. of ABC, 125 kgs. of materials are used. In April, 1990, there was an output of 5600 kg of ABC. The standard and actual particulars of April, 1990 are as follows:

Raw Material	**Standard**		**Actual**	
	Mix	**Price per kg.**	**Mix**	**Price per kg.**
	%	Rs.	%	Rs.
Raw Material I	50	40	60	42
Raw Material II	30	20	20	16
Raw Material III	20	10	20	12

Calculate all variances.

Answer: Material Price Variances : 5,600 Material Mix Variances : 14,000
Material Yield Variances : Nil Material Usage Variances : 14,000
Material Cost Variances : 19,600

Question 8. **(C.S. Inter, December, 1992)**

Modern Tiles Ltd. makes plastic tiles of standard size of 6" x 6" x 1/8". From the following information **you are required** to calculate for direct materials:

(i) Cost variance in total;

(ii) Cost variance sub-divided into (a) price and (b) usage;

(iii) The usage variance analysed to show: (a) mix and (b) yield.

Standard consumption of raw material for 20,000 sq. ft. tiles are:

Direct Material	*Quantity (kg.)*	*Standard rate per kg.*
A	600	Re. 0.90

B	400	0.65
C	500	0.40

During December, 1993, eight mixes were processed and actual materials consumed were:

Direct Material	*Quantity (kg.)*	*Standard rate per kg.*
A	5000	Re. 0.85
B	2900	0.60
C	4400	0.45

Actual production for December was 620000 tiles.

Answer: (i) Cost Variance in Total = 220 A. (ii) (a) 175 F. (b) 395 A. (iii) (a) 55 F. (b) 450 A.

Question 9. **(B. Com Hons. Delhi, 1993)**

A gang of workers normally consists of 30 men, 15 women and 10 boys. They are paid at standard rates as under :

Men	Re. 0.80
Women	Re. 0.60
Boys	Re. 0.40

In a normal working week of 40 hours, the gang is expected to produce 2000 units of output.

During the week ended 31st March, 1993, the gang consisted of 40 men, 10 women and 5 boys. The actual wages paid were at the rate of Re. 0.70, Re. 0.65 and Re, 0.30 respectively. 4 hours were lost due to abnormal idle time and 1600 units were produced. Calculate : (i) Labour cost variance, (ii) Labour rate variance, (iii) Labour efficiency variance, (iv) Labour mix variance, (v) Labour idle time variance.

Answer: (i) LRV = 160 F (ii) LMV = 120 A (iii) LITV = 148 A (iv) LYV = 148 A (v) LEV = 416 A (vi) LCV = 256 A

Question 10. **(I.C.W.A. Inter, June, 1995-Stage I, December, 1985)**

The standard labour complement and the actual labour complement engaged during the month are given below:

	Skilled	**Semi-skilled**	**Unskilled**
(a) Standard number of workers in a group	30	10	10
(b) Standard wage rate (Rupees per hour)	5	3	2
(c) Actual number of workers employed during the month in the group	24	15	12
(d) Actual wage rate per hour (Rs.)	6	2.5	2

During the month of 200 working hours, the group produced 9600 standard hours of work.

Required:

Calculations showing Wage rate variance, Labour efficiency variance, Labour mix variance and Total labour cost variance.

Answer: (i) WRV = 3300 A (ii) WGV = 3000 F (iii) LEV = 2400 A (iv) WCV = 2700 A

Question 11. **(I.C.W.A. Inter, December, 1996-Stage I)**

The following was the composition of a gang of workers in a factory during a particular month, in one of the production departments. The standard composition of workers and wager rate per hour were as below:

Skilled	:	Two workers at a standard rate of Rs. 20 per hour each.
Semi-skilled	:	Four workers at a standard rate of Rs. 12 per hour each
Unskilled	:	Four workers at a standard rate of Rs. 8 per hour each.

The standard output of the gag was four units per hour, of the product.

During the month in question, however, the actual composition of the gang and hourly rates paid were as under:

Nature of worker	*No. of Worker*	*Wage rate paid per worker per hour engaged*
Skilled	2	Rs. 20

Semi-skilled	3	14
Unskilled	5	10

The gang was engaged for 200 hours during the month, which included 12 hours when no production was possible, due to machine break-down, 810 units of the product were recorded as output of the gang during the month.

You are required:

(a) to compute the standard unit labour cost of the product;

(b) to compute the total variance in labour cost during the month; and

(c) analyse the variances in (b) above into sub-variances and reconcile.

Answer: (i) LRV = 3200 A (ii) LGV = 800 F (iii) LITV = 1440 A (iv) LYV = 1740 F (v) LEV = 1100 F (vi) LCV = 2100 A

Question 12. **(B.Com, Andhra, 1990)**

From the following information relating to the month of January, Calculate production volume ratio, capacity ratio and efficiency ratio :

	Budget	**Actual**
Units produced	12000	12600
Hours worked	24000	26400

Answer: Production Volume Ratio = 105%; Capacity Ratio = 110%; Efficiency Ratio = 95.45%.

Question 13. **(B. Com. (Hons.), Delhi, 1987)**

(a) Efficiency ratio (b) Activity ratio (c) Capacity ratio

from the following figures :

Budgeted production	88	units
Standard hours per unit	10	
Actual production	72	units
Actual working hours	600	

Answer: (i) 125% (ii) 85.23% (iii) 68.18%

Question 14. **(C.A. Inter, May 1997)**

If the 'activity ratio' and 'capacity ratio' of a company is 104% and 96% respectively, find out its 'efficiency ratio'.

Question 15. **(I.C.W.A. Inter, June, 1999)**

From the following figures :

(i) Efficiency ratio,

(ii) Activity ratio and

(iii) Capacity ratio

Budgeted Production	880 units
Standard hours per unit	10
Actual Production	750 units
Actual working hours	6000

Answer: (i) 125% (ii) 85.23% (iii) 68.18%

Question 16. **(I.C.W.A. Inter, June, 1994; December, 1991)**

AB Company Limited is having Standard Costing system in operation for quite some time. The following data relating to the month of April, 1994, is available form the cost records:

	Budgeted	Actual
Output (in units)	30,000	32,500
Operating hours	30,000	33,000

Fixed Overheads (Rs.)	45,000	50,000
Variable Overheads (Rs.)	60,000	68,000
Working Days	25	26

You are required to work out the relevant variances (on the basis of output).

Answer: (i) Variable Overhead Expenditure Variance = 2,000 A (ii) Variable Overhead Efficiency Variance = 1,000 A (iii) Fixed Overhead Expenditure Variance = 5,000 A (iv) Fixed Overhead Calendar Variance = 1,800 F (v) Fixed Over head Capacity Variance = 2,700 F (vi) Fixed Overhead Efficiency Variance = 750 A (vii) Fixed Overhead Volume Variance = 3,750 F (viii) Fixed Overhead Variance = 1,250 A

Question 17. (CIMA, London, November, 1992)

A labour-intensive production unit operation as standard absorption cost accounting system provides the following information for period 10:

Normal capacity, in direct labour hours	9,600
Budgeted variable production overhead	Rs. 3 per direct labour hour
Budgeted fixed production overhead per four-week financial period	Rs. 1,20,000
To produce one unit of output in takes two hours of working.	
Actual figures produced for the four-week period 10 were:	
Production, in units	5,000
Variable production overhead incurred	Rs. 28,900
Fixed production overhead incurred	1,18,000
Actual direct labour hours worked	9,300

You are required:

(a) to calculate, in accordance with the 1991 edition of the Institute's Terminology, the variances for
   (i) variable production overhead expenditure variance,
   (ii) variable production overhead efficiency variance,
   (iii) fixed production overhead expenditure variance,
   (iv) fixed production overhead volume variance.

(b) to sub-divide your volume variance produce for (a) (iv) above into two sub-variance and explain the meaning of these in the brief from to management.

Answer: (i) Variable Overhead Expenditure Variance = 100 A (ii) Variable Overhead Efficiency Variance = 2,100 F (iii) Fixed Overhead Expenditure Variance = 2,000 F (iv) Fixed Over head Capacity Variance = 3,750 A (v) Fixed Overhead Efficiency Variance = 8,750 F (vi) Fixed Overhead Volume Variance = 5,000 F

Question 18. [2002 – May]

ABC Limited provides the following information for April, 2002.

	Budget	Actual
Number of working days	20	21
Man hours	40,000	43,000
Output per manhour (units)	3.2	3.0
Overhead – Fixed (Rs.)	32,000	31,500
Variable (Rs.)	1,02,400	1,14,400

Required:

Compute variable overhead variance, fixed overhead variances and total overhead variance.

Answer: Total Variable overhead variance Rs. 11,200 A; Variable overhead Expenditure variance Rs. 4,320 A; Variable overhead efficiency variance Rs. 6,880 A; Total fixed overhead cost variance Rs. 750 F; Fixed overhead expenditure variance Rs. 500 F; Fixed overhead volume variance Rs. 250 F; Fixed overhead efficiency variance Rs. 2,150 A; Fixed overhead capacity variance Rs. 800 F; Calendar Variance Rs. 1,600 F; Total overhead variance Rs. 10,450 A.

Question 19. **(C.A. Inter May, 1985)**

The following information was obtained from the record of a manufacturing unit using standard costing system.

	Standard	Actual
Production	4,000 units	3,800 units
Workings days	20	21
Fixed Overhead	Rs. 40,000	Rs. 39,000
Variable Overhead	12,000	12,000

You are required to calculate the following overhead variance:

(a) Variable overhead variance

(b) Fixed overhead variances:

(i) Expenditure variance (ii) Volume variance

(iii) Efficiency variance (iv) Calendar variance

(c) Also prepare a reconciliation statement for the standard fixed expenses worked out at Standard Fixed Overhead Rate and the Actual Fixed Overhead.

Answer: (i) Fixed Overhead Expenditure Variance = 1,000 F (ii) Fixed Overhead Calendar Variance = 2,000 F (iii) Fixed Overhead Capacity Variance = Nil (iv) Fixed Overhead Efficiency Variance = 4,000 A (v) Fixed Overhead Volume Variance = 2,000 A (vi) Fixed Overhead Variance = 1,000 A

Question 20. **(C.A. Inter, May, 1998)**

A company has a normal capacity of 120 machines, working 8 hours per day of 25 days in a month. The fixed overheads are budgeted at Rs. 1,44,000 per month. The standard time required to manufacture on unit of product is 4 hours.

In April, 1998, the company worked 24 days of 840 machine hours per day and produced 5,305 units of output, The actual fixed overheads were Rs. 1,42,000.

Compute :

(i) Efficiency variance (ii) Capacity variance

(iii) Calendar variance (iv) Expense variance

(v) Volume variance (vi) Total fixed overheads variance

Answer: (i) 6,360 F (ii) 17,280 A (iii) 5,760 A (iv) 2,000 F (v) 16,680 A (vi) 14,680 A

Question 21. **(C.A. Inter, November, 1981; I.C.W.A. Inter, December, 1991; C.S. Inter, June, 1999)**

S.V. Ltd. has furnished the following data :

	Budget	Actual, July (1999)
No. of working days	25	27
Production in units	20,000	22,000
Fixed overheads	Rs. 30,000	Rs. 31,000

Budgeted fixed overhead rate is Re. 1.00 per hour. In July, 1999, the actual hours worked were 31,500.

Calculate the following variances:

(i) Efficiency variance. (ii) Capacity variance.

(iii) Calendar variance. (iv) Volume variance.

(v) Expenditure variance. (vi) Total overhead variance.

Answer: (i) 1,500 F (ii) 900 A (iii) 2,400 F (iv) 3,000 F (v) 1,000 A (vi) 2,000 F

Question 22. **(I.C.W.A. Inter, December, 1995-Stage I; C.A. Inter, November, 1981; C.A. Final, May, 1983-Similar)**

The following data has been collected from the cost records of a unit for computing the various fixed overhead variances for a period:

Number of budgeted working days	25
Budgeted man-hours per day	6,000
Output (budgeted) per man-hour (in units)	1
Fixed overhead cost as budgeted	Rs. 1,50,000
Actual number of working days	27
Actual man-hours per day	6,300
Actual output per man-hour (in units)	0.9
Actual fixed overhead incurred	Rs. 1,56,000

Calculate fixed overhead variances:

(a) Expenditure Variance, (b) Calendar Variance,

(c) Capacity Variance, (d) Efficiency Variance,

(e) Volume Variance, (f) Fixed Cost Variance,

Answer: (a) 6,000 A (b) 12,000 F (c) 8,100 F (d) 17,010 (e) 3,090 F (f) 2,910 A

Question 23. **(CA, Inter, November 1989)**

Following information is available from the records of a factory:

	Budget	**Actual**
Fixed overhead for June	Rs. 10,000	Rs. 12,000
Production in June (units)	2,000	2,100
Standard time per unit (hours)	10	22,000
Actual hours worked in June		

Compute :

(i) Fixed overhead cost variance ; (ii) Expenditure variance ;

(iii) Volume variance ; (iv) Capacity variance ;

(v) Efficiency variance ;

Answer: (i) 1,500 A (ii) 2,000 A (iii) 500 F (iv) 1,000 F (v) 500 A

Question 24.

AB Ltd. furnishes the following information relating to budgeted sales and actual sales for April 2007.

	Product	**Sales quantity units**	**Selling price per Unit Rs.**
Budgeted Sales			

	A	1,200	15
	B	800	20
	C	2,000	40
Actual sales			
	A	880	18
	B	880	20
	C	2,640	38

Calculate the following variances:

1. Sales value variance
2. Sales volume variance
3. Sales price variance
4. Sales mix variance
5. Sales Qty. variance

Question 25.

1191 - Nov [1] {C} (a) Trident Toys Ltd. had drawn up the following Sales Budget for August, 1991:-

'Bravo' Toys 5,000 units at Rs. 100 each

'Champion' Toys 4,000 units at Rs. 200 each

'Super' Toys 6,000 unis at Rs. 180 each

The actual sales for August, 1991 were:

'Bravo' Toys 5,750 units at Rs. 120 each

'Champion Toys 4,850 units at Rs. 180 each

'Super' Toys 5,000 units at Rs. 165 each

The costs per unit of Bravo. Champion and Super Toys were Rs. 90, Rs. 170 and Rs. 130 respectively.

Analyse the variances to show:

(a) the effect on turnover:

(i) Sales price variance (ii) Sales mix variance

(iii) Sales quantity variance (iv) Total sales value variance

(b) the effects on profit:

(i) Sales margin : Price variance (ii) Sales margin : Mix variance

(iii) Sales margin : Quantity variance (iv) Total sales margin variance.

Question 26.

X Ltd. has budgeted the following sales for the month of August, 1998:

Product A : 800 units @ Rs. 100 per unit.

Product B : 700 units @ Rs. 200 per unit.

The actual sales for the month were as follows:

Product A : 900 units @ Rs. 110 per unit.

Product B : 800 units @ Rs. 180 per unit.

The costs per unit of products A and B were Rs. 80 and Rs. 170 respectively.

You are required to compute the different variances to explain the difference between the budgeted and actual profits.

Answer: (i) Sales Value Price Variance = 100, (ii) Sales Value Mix Variance = 222 (iii) Sales Value Quantity Variance = 2,222 (iv) Sales Value Variance = 1,900 (v) Sales Value Volume Variance = 2,000

Question 27.

SQC Ltd. provides the following data for the month of October, 1999:

Budget			
Product	**Budgeted Sales Quantity**	**Budgeted Selling Price per unit (Rs.)**	**Standard Cost Per Units (Rs.)**
A	2,160	12	9
B	1,440	5	3

Actual			
Product	**Budgeted Sales Quantity**	**Budgeted Selling Price per unit (Rs.)**	**Standard Cost Per Units (Rs.)**
A	2,240	11	8
B	960	6	5

You are required to compute:

(i) Sales margin quantity variance
(ii) Sales margin mix variance
(iii) Sales margin volume variance
(iv) Sales margin price variance
(v) Sales margin total variance

Answer: Sales Margin Price Variance = 1,280 A, Sales Margin Mix Variance = 320 F, Sales Margin Quantity Variance = 1,040 A, Sales Margin Variance = 2,000 A, Sales Margin Volume Variance = 720 A

Question 28. **2011, November**

Gama Ltd. has furnished the following standard cost data per unit of production :

- Material 10 kg @ Rs 10 per kg.
- Labour 6 hours @ Rs 5.50 per hour.
- Variable overhead 6 hours @ Rs 10 per hour.
- Fixed overhead Rs 4,50,000 per month (Based on a normal volume of 30,000 labour hours).

The actual cost data for the month of August 2011 are as follows :

- Material used 50,000 kg at a cost of Rs 2,25,000.
- Labour paid Rs 1,55,000 for 31,000 hours worked.
- Variable overheads Rs 2,93,000.
- Fixed overheads Rs 4,70,000.
- Actual production 4,800 units.

Calculate :

(i) Material cost variance.
(ii) Labour cost variance.
(iii) Fixed overhead cost variance.
(iv) Variable overhead cost variance.

Question 29

KPR Limited 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 kg. @ ₹ 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 June, 2013 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 June, 2013, 2,25,000 kg. 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 kg.
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 June, 2013 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.

FOR YOUR PRACTICE

Question 1. **(I.C.W.A. Inter, June, 1992)**

100 skilled workmen, 40 semi-skilled workmen and 60 unskilled workmen were to work for 30 weeks to get a contract job completed. The standard weekly wages were Rs. 60, Rs. 36 and Rs. 24 respectively. the job was actually completed in 32 weeks by 80 skilled, 50 semi-skilled and 70 unskilled workmen who were paid Rs. 64, Rs. 40 and Rs. 20 respectively as weekly wages.

Find out the labour cost variance, labour rate variance, labour mix variance and labour efficiency variance.

Solution

	Standard (30 weeks)			Actual (32 weeks)		
	SH	SR	TSC	AHW/AHP	AR	TAC
Skilled	3,000	60	1,80,000	2560	64	1,63,840
Semi skilled	1,200	36	43,200	1600	40	64,000
Unskilled	1,800	24	43,200	2240	20	44,800
	6,000		2,66,400	6400		2,72,640
	[100 : 40 : 60]			[80 : 50 : 70]		

Direct labour cost variance = 2,66,400 – 2,72,640 = 6,240 A

ii Labour Rate variance: (SR – AR) × AHP

Skilled:	(60 – 64) × 2,560 =	10,240 A	
Semi Skilled:	(36 – 40) × 1,600 =	6, 400 A	
Unskilled:	(24 – 20) × 2,240 =	8,960 F	7,680 A

iii Labour Efficiency variance: (SH – AHW) × SR

Skilled:	(3,000 – 2,500) × 60	26,400 F	
Semi Skilled:	(1,200 – 1,600) × 36	14,400 A	
Unskilled:	(1,800 – 2,240) × 24	10,560 A	1,440 F

Question 2. **(C.S. Inter, June, 1993)**

A gang of workers usually consists of 10 men, 5 women and 5 boys in a factory. they are paid at standard hourly rates of Rs. 1.25, Re. 0.80 and Re. 0.70 respectively. In a normal working week of 40 hours, the gang is expected to produce 1000 units of output.

In a certain week, the gang consisted of 13 men, 4 women and 3 boys. Actual wages were paid at the rates of Rs. 1.20, Re. 0.85 and Re. 0.65 respectively. Two hours were lost due to abnormal idle time and 960 units of output were produced.

Calculate various labour variances.

Solution

	Standard (960 units)					Actual (960 units)		
	SH	SR	TSC	RSH	AHW	AHP	AR	TAC
Men	384	1.25	480	380	494	520	1.20	624
Women	192	0.80	153.6	190	152	160	0.85	136
Boys	192	0.70	134.4	190	114	120	0.65	78
800 × 960	768		768	760	760	800		838
1000	[10 : 5 : 5]			[10 : 5 : 5]			[13 : 4 : 3]	

SC = $\frac{768}{960}$ = Rs. 0.80

Standard O/P = $\frac{1000}{800}$ × 760 = 950

(i) Direct labour cost variance = TSC – TAC = 768 – 838 = 70 A

(ii) Labour Rate Variance: (SR – AR) × AHP

Men	(1.25 – 1.20) × 520	26 F	
Women	(0.80 – 0.85) × 160	8 A	
Boys	(0.70 – 0.65) × 120	6 F	24 F

(iii) Labour Efficiency Variance: (SH – AHW) × SR

Men	(384 – 494) × 1.25	137.5 A
Women	(192 – 152) × 0.80	32 F
Boys	(192 – 114) × 0.70	54.6 F
		50.9 A

(iv) Labour Idle time Variance: (AHW – AHP) × SR

Men	(494 – 520) × 1.25	32.5 A
Women	(152 – 160) × 0.80	6.4 A
Boys	(114 – 120) × 0.70	4.2 A
		43.1 A

(v) Labour Sub-efficiency Variance: (SH – RSH) × SR

Men	(384 – 380) × 1.25	5 F	
Women	(192 – 190) × 0.80	1.6 F	
Boys	(192 – 190) × 0.70	1.4 F	8 F

(vi) Labour mix Variance: (RSH – AHW) × SR

Men	(380 – 494) × 1.25	142.5 A
Women	(190 – 152) × 0.80	30.4 F
Boys	190 – 114) × 0.70	53.2 F
		58.9 A

(vii) Labour yield Variance = (960 – 950) × 0.80 = 8

Question 3. **(I.C.W.A. Inter, December, 1987)**

The following details are available from the records of ABC Ltd. engaged in manufacturing Article 'A' for the week ended 28th September.

The standard labour hours and rates of payment per article 'A' were as follows:

	Hours	Rate per hour	Total
Skilled labour	10	Rs. 3.00	Rs. 30
Semi-skilled labour	8	1.50	12
Unskilled labour	16	1.00	16
			58

The actual production was 1000 units of articles 'A' for which the actual hours worked and rates are given below:

	Hours	Rate per hour	Total
Skilled labour	9000	Rs. 4.00	Rs. 36000
Semi-skilled labour	8400	1.50	12600
Unskilled labour	20000	0.90	18000
			66600

From the above set of data you are asked to calculate :

(a) Labour cost variance (b) Labour rate variance

(c) Labour efficiency variance (b) Labour mix variance

Solution

	Standard (1000 unit)				Actual (1000 unit)			
	SH	SR	TSC	RSH	AHW	AHP	AR	TAC
Skilled	10,000	3.00	30,000	11,000	9,000	9,000	4	36,000
Semi Skilled	8,000	1.50	12,000	8,800	8,400	8,400	1.50	12,600
Unskilled	16,000	1.00	16,000	17,600	20,000	20,000	0.90	18,000
34 × 1000	34,000		58,000	37,400	37,400	37,400		66,600
1	[10 : 8 : 16]			[10 : 8 : 16]	[45 : 42 : 100]			

SC p.u. = Rs. 58 $\frac{58,000}{1000}$ Standard Output = $\frac{1}{34}$ × 37,400 = 1100 units

(i) Direct Labour Cost Variance = 58,000 – 66,600 = 8600 A

Labour Rate Variance: (SR – AR) × AHP

Skilled	(3 – 4) × 9,000	9,000 A	
Semi Skilled	(1.50 – 1.50) × 8,400	-	
Unskilled	(1 – 0.90) × 20,000	2,000 F	7,000 A

(ii) Labour Efficiency Variance: (SH – AHW) × SR

Skilled	(10,000 – 9,000) × 3	3,000 F	
Semi Skilled	(8,000 – 8,400) × 1.50	600 A	
Unskilled	(16,000 – 20,000) × 1	4,000 A	1,600 A

(iii) Labour Idle time Variance: (AHW – AHP) × SR

Skilled	(9,000 – 9,000) × 3	-	
Semi Skilled	(8,400 – 8,400) × 1.5	-	
Unskilled	(20,000 – 20,000) × 1.0	-	-

(iv) Labour Sub-efficiency Variance: (SH – RSH) × SR

Skilled	(10,000 – 11,000) × 3	3,000 A

	Semi Skilled	(8,000 – 8,800) × 1.5	1,200 A	
	Unskilled	(16,000 – 17,600) × 1	1,600 A	5,800 A
(v)	Labour Mix Variance:			
	Skilled	(11,000 – 9,000) × 3	6,000 F	
	Semi Skilled	(8,800 – 8,400) × 1.5	600 F	
	Unskilled	(17,600 – 20,000) × 1	2,400 A	4,200 F
(vi)	Labour yield Variance = (1,000 – 1100) × 58 =			5,800 A

Question 4. **(I.C.W.A. Inter, December, 1982 ; June, 1986)**

The direct labour strength of a section of an engineering factory is 100 workers paid at the rte of Rs. 6.00 per day of 8 hours each. The normal production is 1000 pieces per week of 48 hours. During a particular week an order for 1500 pieces was completed expending in all 7650 hours made up of 6300 hours at normal wages and 1350 hours at overtime wage at double rate. The total wages come to Rs. 6300. Calculate the average labour cost per piece during the week and analyse the labour cost variance for the week.

Solution

Standard (1,500)				Actual (1,500)		
SH	SR	TSC		AHW / AHP	AR	Total Actual Cost
7,200	0.75	5,400	Normal	6,300	x (0.7)	4,410
			O/T	1,350	2x (1.4)	1,890
				7,650		6,300

$\frac{4800}{1000} \times 1500$ SC = $\frac{5400}{1500}$ = Rs. 3.60 Standard Output = $\frac{1000}{4800} \times 7650 = 1593.75$

(i) Direct Labour Cost Variance = 5400 – 6300 = 900 A

Labour Rate Variance: (SR – AR) × AHP

(0.75 – 0.7) × 6300 = 315 F

(0.75 – 1.4) × 1350 = 877.5 A 562.5 A

(ii) Labour Efficiency Variance: (SH – AHW) × SR

(7200 – 7650) × 0.75 = 337.5 A

(iv) Labour yield Variance = (1500 – 1593.75) × 3.60 = 337.5 A

Working Note:-

Calculation of actual wage rate per hour-

	Hours	**Rate**	**Rs.**
Normal	6.300	x	6,300x
Over-time	1,350	2x	2,700x
			9,000x = 6,300
			x = 0.70

Normal wage rate = Rs. 0.70 per hour

Over time wage rate = Rs. 1.40 per hour

Question 5.

The standard cost p.u. is as under:

Direct Materials	Rs.
2 units of A at Rs. 4 per unit	8.00
3 units of B at Rs. 3 per unit	9.00
15 units of C at Re. 1 per unit	15.00

	32.00
Direct Labour 3 hrs. @ Rs. 8 per hour	24.00
Total Standard Prime Cost	56.00

The company manufactured and sold 6000 units of the product during the year, Direct Material Costs were as follows:-

12500 units of A at Rs. 4.40 per unit.

18000 units of B at Rs. 2.80 per unit.

88500 units of C at Rs. 1.20 per unit.

The company worked 17500 direct labour hours during the year. For 2500 of these hours the company paid at Rs. 2 per hour while for the remaining the wages were paid at the standard rate. Calculate Materials Cost, Price and usage variances and Labour cost, Rate and Efficiency Variances.

Solution

	Standard			Actual		
	SQ	SP	TSC	AQ	AP	TAC
A	12,500	4	50,000	12,500	4.40	55,000
B	18,000	3	54,000	18,000	2.80	50,400
C	88,500	1	88,500	88,500	1.20	1,06,200
	1,19,000		1,92,500	1,19,000		2,11,600

(i) Material Cost Variance = TSC – TAC = 1,92,500 – 2,11,600 = 19,100 A

(ii) Material Price Variance: (SP – AP) × AQ

A	(4 – 4.40) × 12,500	5,000 A
B	(3 – 2.80) × 18,000	3,600 F
C	(1 – 1.20) × 88,500	17,700 A
		19,100 A

(iii) Material Usage Variance: (SQ – AQ) × SP

A	(12,500 – 12,500) × 4	-
B	(18,000 – 18,000) × 3	-
C	(88,500 – 88, 500) × 1	-

Labour:-

	Standard			Actual		
SH	S/R	TSC	AHW	AHP	AR	TAC
18,000	8	1,44,000	15,000	15,000	8	1,20,000
			2,500	2,500	2	5,000
		1,44,000	17,500	17,500		1,25,000

Labour cost Variance = (1,44,000 – 1,25,000) = 19,000 F

Labour Efficiency Variance = (18,000 – 17,500) × 8 = 4,000 F

Question 6.

From the particulars given below, compute: Material Price Variance, Material Usage Variance, Labour Rate Variance, Idle Time Variance and Labour Efficiency with full working details:

1 tonne of material input yield a standard output of 100000 units. The standard price of material is Rs. 20 per kg. Number of employees engaged is 200. The standard wage rate per employee per day is Rs. 6. The standard daily output per employee is 100 units. The actual quantity of material used is 10 tonnes and the actual price paid is Rs. 21 per kg. Actual output obtained is 900000 units. Actual number of days worked is 50 and actual rate of wages paid is Rs. 6.50 per day. Idle time paid for and included in above time is 1/2 day.

Answer : (i) MPV = 10,000 A (ii) MUV = 20,000 A (iii) LRV = 5,000 A (iv) LITV = 600 A (v) LIV = 5400 A (vi) LEV = 6,000 A.

Question 7. **(I.C.W.A. Inter, June 1998-Stage I)**

From the following data prepare a unit cost statement showing the prime cost of products A and B together with analysis of variance:

		Product 'A'	Product 'B'
Material	Standard	600 kg. @ Rs. 5.00	90 kg. @ Rs. 3.00
	Actual	580 kg. @ Rs. 5.50	100 kg. @ Rs. 2.80
Labour	Standard	80 kg. @ Rs. 2.00	16 kg. @ Rs. 2.80
	Actual	92 kg. @ Rs. 1.75	14 kg. @ Rs. 2.60

Solution

Material:-

	Standard			Actual		
	SQ	SR	TSC	AQ	AR	TAC
A	600	5	3,000	580	5.5	3,190
B	90	3	270	100	2.8	280
	690		3,270	680		3,470

Labour:-

	SH	SR	TSC	AHW/AHP	AR	TAC
A	80	2	160	92	1.75	161
B	16	2.8	44.8	14	2.60	36.4
	96		204.8	106		197.4

(i) Material Cost Variance: (TSC – TAC)
= (3270 – 3470) = 200 A

(ii) Material Price Variance: (SP – AP) × AQ

A	(5 – 5.5) × 580	290 A
B	(3 – 2.8) × 100	20 F

(iii) Material Usage Variance: (SQ – AQ) × SP

A	(600 – 580) × 5	100 F
B	(90 – 100) × 3	30 A

(iv) Labour Cost Variance: (TSC – TAC)
= (204.8 – 197.4) = 7.4 F

(v) Labour Rate Variance = (SR – AR) × AHP

A	(2 – 1.75) × 92 =	23 F
B	(2.8 – 2.60) × 14	2.80 F

(vi) Labour Efficiency Variance = (SH – AHW) × SR

A	(80 – 92) × 2	24 A
B	(16 – 14) × 2.8	5.6 F

Question 8. **(C.A. Inter, May 1986; I.C.W.A. Inter, December, 1998)**

The following standards have been set to manufacture a product :

Direct Material :	**Rs.**
2 units of A @ Rs. 4 per unit	8.00
3 units of B @ Rs. 3 per unit	9.00
15 units of C @ Rs. 1 per unit	15.00

Direct Labour : 3 hrs @ Rs. 8 per hour	32.00
Total standard prime cost	24.00
	56.00

The company manufactured and sold 6000 units of the product during the year. Direct material costs were as follows:

12500 units of A at Rs. 4.40 per unit

18000 units of B at Rs. 2.80 per unit

88500 units of C at Rs. 1.20 per unit

The company worked 17500 direct labour hours during the year. For 2500 of these hours, the company paid at Rs. 12 per hour while for the remaining, the wages were paid at standard rate. Calculate materials price variance and usage variance and labour rate and efficiency variance.

Answer : (i) MPV = 19100 A (ii) MUV = 500 A (iii) LRV = 10,000 A (iv) LEV = 4,000 F

Question 9. (C.A. Inter, May, 1996)

From the particulars given below, compute: Material Price Variance, Material Usage Variance, Labur Rate Variance, Idel Time Variance and Labour Efficiency Variance with full working details:

1 tonne of material input yields a standard output of 100000 units. The standard price of material is Rs. 20 per kg. Number of employees engaged is 200. The standare wage rate per employee per day is Rs. 6. The standard daily output per employee is 100 units. The actual quantity of material used is 10 tonnes and the actual price paid is Rs. 21 per kg.Actual output obtained is 900000 units. Actual number of days worked is 50 and actual rate of wages paid is Rs. 6.50 per day. Idle time paid for and included in above time is ½ day.

Answer : (i) MPV = 10,000 A (ii) MUV = 20,000 A (iii) LRV = 5,000 A (iv) LITV = 600 A (v) LYV = 5,400 A (vi) LEV = 6,000 A

Question 10

SJ Ltd. has furnished the following information:

Standard overhead absorption rate per unit	₹ 20
Standard rate per hour	₹ 4
Budgeted production	12,000 units
Actual production	15,560 units

Actual overheads were ₹ 2,95,000 out of which ₹ 62,500 fixed .

Actual hours 74,000

Overheads are based on the following flexible budget

Production (units)	8,000	10,000	14,000
Total Overheads (₹)	1,80,000	2,10,000	2,70,000

You are required to calculate the following overhead variances (on hour's basis) with appropriate workings:

(i) Variable overhead efficiency and expenditure variance

(ii) Fixed overhead efficiency and capacity variance.

Solution :

Workings :

(a) Variable overhead rate per unit

$$= \frac{\text{Difference of Overhead at two level}}{\text{Difference in Production units}}$$

$$= \frac{\text{Rs.2,10,000 – Rs. 1,80,000}}{\text{10,000 Units – 8,000 Units}} = ₹\ 15$$

(b) Fixed Overhead = ₹ 1,80,000 – (8,000 units X ₹ 15) = ₹ 60,000

(c) Standard hours per unit of production $= \frac{\text{Std.Overhead Absorption Rate}}{\text{Std.Rate per hour}}$

$= \frac{\text{Rs. 20}}{\text{Rs. 4}} = 5$ hours

(d) Standard Variable Overhead Rate per Hour $= \frac{\text{Variable Overhead per unit}}{\text{Std.hour per unit}}$

$= \frac{\text{Rs. 15}}{\text{5 Hours}} = ₹\ 3$

(e) Standard Fixed Overhead Rate per hour = ₹ 4 - ₹ 3 = ₹ 1

(f) Actual Variable Overhead = ₹ 2,95,000 - ₹ 62,500 = ₹ 2,32,500

(g) Actual variable Overhead Rate per hour $= \frac{\text{Rs. 2,32,500}}{\text{74,000 hours}} = ₹\ 3.1419$

(h) Budgeted hours = 12,000 units X 5 hours = 60,000 hours

(i) Standard Hours for Actual Production = 15,560 units X 5 hours = 77,800 hours

(i) Variable Overhead Efficiency and Expenditure Variance :

Variable Overhead Efficiency Variance = Std. Rate per hour (Std. hours – Actual hours)
= ₹ 3 (77,800 hours – 74,000 hours)
= ₹ 11,400 (F)

Variable Overhead Expenditure Variance = Actual hours (Std. Rate – Actual hours)
= ₹ 74,000 (₹ 3 - ₹ 3.1419)
= ₹ 10,500 (A)

(ii) Fixed Overhead Efficiency and Capacity Variance :

Fixed Overhead Efficiency Variance = Std. Rate per hour (Std. hours – Actual Hours)
= ₹ 1 (77,800 hours – 74,000 hours) = ₹ 3,800 (F)

Fixed Overhead Capacity Variance = Std. Rate per hour (Std. hours – Budgeted Hours)
= ₹ 1 (74,000 hours – 60,000 hours)
= ₹ 74,000 - ₹ 60,000 = ₹ 14,000 (F)

Question 11

Following are the details of the product Phomex for the month of April 2013:

Standard quantity of material required per unit	5 kg
Actual output	1000 units
Actual cost of materials used	₹ 7,14,000
Material price variance	₹ 51,000 (Fav)

Actual price per kg of material is found to be less than standard price per kg of material by ₹ 10.

You are required to calculate:

(i) Actual quantity and Actual price of materials used.

(ii) Material Usage Variance

(iii) Material Cost Variance.

Solution :

(i) Actual Quantity and Actual Price of material used :

Material Price Variance = Actual Quantity (Std. Price – Actual Price) = ₹ 51,000

Or, AQ (SP - AP) = ₹ 51,000

Or, 10 AQ = ₹ 51,000

Or, AQ = 5,100 kgs.

Actual cost of material used is given i.e.

AQ X AP = ₹ 7,14,000

Or, 5,100 AP = ₹ 7,14,000

AP = ₹ 140

∴ Actual price is less by ₹ 10

So, Standard Price = ₹ 140 + ₹ 10 = ₹ 150 per kg.

Actual Quantity = 5,100 kgs.

Actual Price = ₹ 140/kg

(ii) Material Usage Variance

Std. Price (Std. Quantity – Actual Quantity)

Or, SP (SQ - AQ) = ₹ 150 (1,000 units X 5 kg. – 5,100 kg.)

= ₹ 15,000 (A)

(iii) Material Cost Variance

= Std. Cost – Actual Cost

= (SP X SQ) – (AP X AQ)

= ₹ 150 X 5,000 - ₹ 140 X 5,100

= ₹ 7,50,000 - ₹ 7,14,000

= ₹ 36,000 (F)

OR

Material Price Variance + Material Usage Variance

₹ 51,000 (F) + ₹ 15,000 (A) = ₹ 36,000 (F)

Question 12

SP Limited produces a product 'Tempex' which is sold in a 10 Kg. packet. The standard cost card per packet of 'Tempex' are as follows:

	(₹)
Direct materials 10 kg @ ₹ 45 per kg	450
Direct labour 8 hours @ ₹ 50 per hour	400
Variable Overhead 8 hours @ ₹ 10 per hour	80
Fixed Overhead	200
	1,130

Budgeted output for the third quarter of a year was 10,000 Kg. Actual output is 9,000 Kg. Actual cost for this quarter are as follows :

	(₹)
Direct Materials 8,900 Kg @ ₹ 46 per Kg.	4,09,400
Direct Labour 7,000 hours @ ₹ 52 per hour	3,64,000
Variable Overhead incurred	72,500
Fixed Overhead incurred	1,92,000

You are required to calculate :

(i) Material Usage Variance

(ii) Material Price Variance

(iii) Material Cost Variance

(iv) Labour Efficiency Variance

(v) Labour Rate Variance

(vi) Labour Cost Variance

(vii) Variable Overhead Cost Variance

(viii) Fixed Overhead Cost Variance.

Solution :

(i) Material Usage Variance = Std. Price (Std. Quantity – Actual Quantity)
= ₹ 45 (9,000 kg. – 8,900 kg.)
= ₹ 4,500 (Favourable)

(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)
= 8,900 g. (₹ 45 - ₹ 46) = ₹ 8,900 (Adverse)

(iii) Material Cost Variance = Std. Material Cost – Actual Material Cost
= (SQ - SP) – (AQ X AP)
= (9,000 kg. X ₹ 45) – (8,900 kg. X ₹ 46)
= ₹ 4,05,000 - ₹ 4,09,400
= ₹ 4,400 (Adverse)

(iv) Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)
$= ₹\ 50 \left(\frac{9,000}{10}\ \text{X 8 hours} - 7,000\ \text{hrs.} \right)$
= ₹ 50 (7,200 hrs. – 7,000 hrs.)
= ₹ 10,000 (Favourable)

(v) Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)
= 7,000 hrs. (₹ 50 - ₹ 52)
= ₹ 14,000 (Adverse)

(vi) Labour Cost Variance = Std. Labour Cost – Actual Labour Cost
= (SH X SR) – (AH X AR)
= (7,200 hrs. X ₹ 50) - (7,000 hrs. X ₹ 52)
= ₹ 3,60,000 - ₹ 3,64,000
= ₹ 4,000 (Adverse)

(vii) Variable Cost Variance = Std. Variable Cost – Actual Variable Cost
= (7,200 hrs. X ₹ 10) - ₹ 72,500
= ₹ 500 (Adverse)

(viii) Fixed Overhead Cost Variance = Absorbed Fixed Overhead – Actual Fixed Overhead
$= \frac{\text{Rs. 200}}{\text{10 kgs.}}$ X 9,000 kgs. - ₹ 1,92,000
= ₹ 1,80,000 - ₹ 1,92,000 = ₹ 12,000 (Adverse)

Question 13

Jigyasa Pharmaceuticals Ltd. is engaged in producing dietary supplement 'Funkids' for growing children. It produces 'Funkids' in a batch of 10 kgs. Standard material inputs required for 10 kgs. of 'Funkids' are as below:

Material	Quantity (in kgs.)	Rate per kg. (in ₹)
Vita-X	5	110
Proto-D	3	320
Mine-L	3	460

During the month of March, 2014, actual production was 5,000 kgs. of 'Funkids' for which the actual quantities of material used for a batch and the prices paid thereof are as under:

Material	Quantity (in kgs.)	Rate per kg. (in ₹)
Vita-X	6	115
Proto-D	2.5	330
Mine-L	2	405

You are required to calculate the following variances based on the above given information for the month of March, 2014 for Jigyasa Pharmaceuticals Ltd.:

(i) Material Cost Variance;

(ii) Material Price Variance;

(iii) Material Usage Variance;

(iv) Material Mix Variance;

(v) Material Yield Variance.

Solution :

Material	SQ* X SP	AQ** X SP	AQ** X AP	RSQ*** X SP
Vita-X	₹ 2,75,000 (2,500 kg. X ₹ 110)	₹ 3,30,000 (3,000 kg. X ₹ 110)	₹ 3,45,000 (3,000 kg. X ₹ 115)	₹ 2,62,460 (2,386 kg. X ₹ 110)
Proto – D	₹ 4,80,000 (1,500 kg. X ₹ 320)	₹ 4,00,000 (1,250 kg. X ₹ 320)	₹ 4,12,500 (1,250 kg. ₹ 330)	₹ 4,58,240 (1,432 kg. X ₹ 320)
Mine – L	₹ 6,90,000 (1,500 kg. X ₹ 460)	₹ 4,60,000 (1,000 kg. X ₹ 460)	₹ 4,05,000 (1,000 kg. ₹ 405)	₹ 6,58,720 (1,432 kg. X ₹ 460)
Total	**₹ 14,45,000**	**₹ 11,90,000**	**₹ 11,62,500**	**₹ 13,79,420**

* Standard Quantity of materials for actual output :

Vita-X	$= \frac{5 \text{ kgs.}}{10 \text{ kgs.}}$ X 5,000 kgs. = 2,500 kgs.
Proto – D	$= \frac{3 \text{ kgs.}}{10 \text{ kgs.}}$ X 5,000 kgs. = 1,500 kgs.
Mine – L	$= \frac{3 \text{ kgs.}}{10 \text{ kgs.}}$ X 5,000 kgs. = 1,500 kgs.

** Actual Quantity of Material used for actual output :

Vita-X	$= \frac{6 \text{ kgs.}}{10 \text{ kgs.}}$ X 5,000 kgs. = 3,000 kgs.
Proto – D	$= \frac{2.5 \text{ kgs.}}{10 \text{ kgs.}}$ X 5,000 kgs. = 1,250 kgs.
Mine – L	$= \frac{2 \text{ kgs.}}{10 \text{ kgs.}}$ X 5,000 kgs. = 1,000 kgs.

*** Revised Standard Quantity (RSQ) :

Vita-X	$= \frac{5 \text{ kgs.}}{11 \text{ kgs.}}$ X 5,250 kgs. = 2,386 kgs.
Proto – D	$= \frac{3 \text{ kgs.}}{11 \text{ kgs.}}$ X 5,250 kgs. = 1,432 kgs.
Mine – L	$= \frac{3 \text{ kgs.}}{11 \text{ kgs.}}$ X 5,250 kgs. = 1,432 kgs.

(i)	Material Cost Variance	= (Std. Qty. X Std. Price) – (Actual Qty. X Actual Price)	
	Or	= (SQ X SP) – (AQ X AP)	
	Vita-X	= ₹ 2,75,000 - ₹ 3,45,000 =	₹ 70,000 (A)
	Proto-D	= ₹ 4,80,000 - ₹ 4,12,500 =	₹ 67,500 (F)
	Mine-L	= ₹ 6,90,000 - ₹ 4,05,000 =	₹ 2,85,000 (F)
			₹ 2,82,500 (F)
(ii)	Material Price Variance	= Actual Quantity (Std. Price – Actual Price)	
		= (AQ X SP) – (AQ X AP)	
	Vita-X	= ₹ 3,30,000 - ₹ 3,45,000 =	₹ 15,000 (A)
	Proto-D	= ₹ 4,00,000 - ₹ 4,12,500 =	₹ 12,500 (A)
	Mine-L	= ₹ 4,60,000 - ₹ 4,05,000 =	₹ 55,000 (F)
			₹ 27,500 (F)
(iii)	Material Usage Variance	= Std. Price (Std. Qty. – Actual Qty.)	
	Or	= (SQ X SP) – (AQ X SP)	
	Vita-X	= ₹ 2,75,000 - ₹ 3,30,000 =	₹ 55,000 (A)
	Proto-D	= ₹ 4,80,000 - ₹ 4,00,000 =	₹ 80,000 (F)
	Mine-L	= ₹ 6,90,000 - ₹ 4,60,000 =	₹ 2,30,000 (F)
			₹ 2,55,000 (F)
(iv)	Material Mix Variance	= Std. Price (Revised Std. Qty. – Actual Qty.)	
	Or	= (RSQ X SP) – (AQ X SP)	
	Vita-X	= ₹ 2,62,460 - ₹ 3,30,000 =	₹ 67,540 (A)
	Proto-D	= ₹ 4,58,240 - ₹ 4,00,000 =	₹ 58,240 (F)
	Mine-L	= ₹ 6,58,720 - ₹ 4,60,000 =	₹ 1,98,720 (F)
			₹ 1,89,420 (F)
(v)	Material Yield Variance	= Std. Price (Std. Qty. – Revised Std. Qty.)	
	Or	= (SQ X SP) – (RSQ X SP)	
	Vita-X	= ₹ 2,75,000 - ₹ 2,62,460 =	₹ 12,540 (F)
	Proto-D	= ₹ 4,80,000 - ₹ 4,58,240 =	₹ 21,760 (F)
	Mine-L	= ₹ 6,90,000 - ₹ 6,58,720 =	₹ 31,280 (F)
			₹ 65,580 (F)

Question 14

The following information has been provided by a company :

Number of units produced and sold	6,000
Standard labour rate per hour	₹8

Standard hours required for 6,000 units	-
Actual hours required	17,094 hours
Labour efficiency	105.3%
Labour rate variance	₹ 68,376(A)

You are required to calculated :

(i) Actual labour rate per hour

(ii) Standard hours required for 6,000 units

(iii) Labour efficiency variance

(iv) Standard labour cost per unit

(v) Actual labour cost per unit

Solution :

SR – Standard labour Rate per Hour

AR – Acutal labour rate per hour

SH – Standard Hours

AH – Actual hours

(i) Labour Rate Variance = AH (SR – AR)

= 17,094 (8 - AR) = 68,376 (A) = - 68,476

= 8 – AR = -4

= AR = ₹ 12

(ii) Labour Efficiency $= \frac{SH}{AH} \times 100 = 105.3$

$= SH = \frac{AH \times 105.3}{100} = \frac{17,094 \times 105.3}{100}$

= 17,999.982

= SH = 18,000 hours

(iii) Labour Efficiency Variance = SR (SH – AH)

= 8 (18,000 – 17,094)

= 8 X 906

= ₹ 7,248 (F)

(iv) Standard Labour Cost per Unit $= \frac{18,000 \times 8}{6,000} =$ ₹ 24

(v) Actual Labour Cost Per Unit $= \frac{17,094 \times 12}{6,000} =$ ₹ 34.19

MARGINAL COSTING

15

Question 1. **Nov. 2008 PCC**

ABC Ltd. can produce 4,00,000 units of a product per annum at 100% capacity. The variable production costs are Rs. 40 per units and the variable selling expenses are Rs. 12 per sold unit. The budgeted fixed production expenses were Rs. 24,00,000 per annum and the fixed selling expenses were Rs. 16,00,000. During the year ended 31st March, 2008, the company worked at 80% of its capacity. The operating data for the year are as follows:

Production	3,20,000 units
Sales @ Rs. 80 per unit	3,10,000 units
Opening stock of finished goods	40,000 units

Fixed production expenses are absorbed on the basis of capacity and fixed selling expenses are recovered on the basis of period.

You are required to prepare statements of Cost and profit for the year ending 31st March, 2008:

(i) On the basis of marginal costing

(ii) On the basis of the absorption costing.

Question 2. **(C.S., Inter, December 1990)**

The following is the standard cost data per unit of product "Flex" manufactured by Gama Limited:

Selling price	Rs. 40
Costs:	
Direct Material	Rs. 8
Direct Labour	5
Variable Production Overheads	2
Fixed Production Overheads	5

(Based on a budgeted normal output of 36000 units per annum)

Variable Selling Overheads	6

Further the fixed selling expenses were Rs. 120000 per annum

During a particular month, the company produced 2000 units of the product and sold 1500 units of the same. There was no opening stock.

You are required to:

(a) Prepare profit statements under:

(i) Marginal costing method and (ii) Absorption costing method.

(b) Explain the difference in the profit.

Question 3. **(C.I.M.A. London November 1994-Stage 2)**

(a) PQ Limited makes and sells a single product X, and has budgeted the following figures for a one-year period:

Sales in units	160000
Sales	Rs. 6400000
Production costs:	
-Variable	Rs. 2560000
-Fixed	800000
Selling, distribution and administration costs:	
-Variable	1280000
-Fixed	1200000

Total costs	5840000
Net profit	560000

Fixed costs are assumed to be incurred evenly throughout the year.

At the beginning of the year, here were no stocks of finished goods. In the first quarter of the year, 55000 units were produced and 40000 units were sold.

You are required to prepare profit statements for the first quarter using:

(i) Marginal costing, and (ii) Absorption costing.

(b) There is a difference in the profit reported when marginal costing is used compare with when absorption costing is used.

You are required to discuss the above statement and to indicate how each of the following conditions would affect the net profit reported:

(i) When sales and production are in balance at standard (or expected) volume.

(ii) When sales exceed production,

(iii) When production exceeds sales.

Question 4. **(B. Com, Madurai-Kamaraj April 1992)**

From the following particulars, calculate break-even point:

Sales	.....	Rs. 200000
Variable cost	.....	Rs. 120000
Fixed overhead	.....	Rs. 30000

Also calculate :

(a) New B.E.P. if selling price is reduced by 10%.

(b) New B.E.P. if variable cost increases by 10%.

(c) New B.E.P. if fixed cost increases by 10%.

Answer: (a) Rs. 90000 (b) Rs. 88235 (c) Rs. 82500

Question 5. **(M. Com, Bharathidasan, April 1988)**

An analysis of S. Ltd.'s cost records gives the following information :

	Variable Cost (% of sales)	Fixed Cost
Direct Material	Rs. 32.8	
Direct Labour	28.4	
Factory overhead	12.6	189000
Distribution overhead	4.1	58400
General administration overhead	1.1	66700
General administration overhead		

Budgeted sales for the next year Rs. 1850000.

You are required to determine :

(a) Break-even sales value. (b) Profit at the budgeted sales volume.

(c) Profit it the actual sales

(i) drop by 10%

(ii) increase by 5% from the sales.

Answer: (a) Rs. 1495714 (b) Rs. 74400 (c) (i) Rs. 35550 (ii) Rs. 93825

Question 6. **(C.A. Inter, May, 1998)**

A single product company sells its product at Rs. 60 per unit. In 1996, the company operated at a margin f safety of 40%. The fixed costs amounted to Rs. 360000 and the variable cost ratio to sales was 80%.

In 1997, it is estimated that the variable cost will go up by 10% and the fixed cost will increase by 3%.

Find the selling price required to be fixed in 1997 to earn the same P/V ratio as in 1996.

Assuming the same selling price of Rs. 60 per unit in 1997, find the number of units required to be produced and sold to earn the same profit as in 1996.

Answer: Selling price per unit = Rs. 66

no. of units to be produced in 1997 = 85834 units

Question 7. (C.A. Inter, November 1996-Part Question)

An automobile manufacturing company produces different models of Cars. The budget in respect of model 118 for the month of September, 1996 is as under :

	Budgeted Output	**40000 Units**
	Rs. in lakhs	**Rs. in lakhs**
Net Realisation		700.00
Variable Costs :		
Materials	264.00	
Labour	52.00	
Direct Expenses	124.00	440.00
Specific Fixed Cost	90.00	
Allocated Fixed Costs	112.50	202.50
Total Costs		642.50
Profit		57.50
Sales		700.00

Calculate :

(i) Profit with 10 percent increase in selling price with a 10 percent reduction in sales volume.

(ii) Volume to be achieved to maintain the original profit after a 10 percent rise in material costs, at the originally budgeted selling price per unit.

Answer: (i) 94.5 lakhs (ii) volume to be achieved to maintain original profit = 44521

Question 8. (I.C.W.A. Inter, June 1997 ; C.A. Inter May 1985)

The variable cost structure of a product manufactured by a company during the current year is as under:

	Rs. per unit
Material	120
Labour	30
Overheads	12

The selling price per unit is Rs. 270 and the fixed cost and sales during the current year are Rs. 14 lakhs and Rs. 40.5 lakhs respectively.

During the forthcoming year the direct worker will be entitled to a wage increase of 10% from the beginning of the year and the material cost, variable overhead and fixed overhead are expected to increase by 7.5%, 5% and 3% respectively.

The following are required to be computed:

(a) New sale price in the forthcoming year if the current P/V ratio is to be maintained.

(b) Number of units that would required to be sold during the forthcoming year so ass to yield the same amount of profit in the current year, assuming that selling price per unit will not be increased.

Answer: (a) Selling Price = Rs. 291 (b) 17422 Units

Question 9. (C.A. Inter November 1999-Part Question)

PQR Ltd. has furnished the following data for the two years:

	1997-98	1998-99
Sales	Rs. 800000	?

Profit/Volume Ratio (P/V ratio)	50%	37.5%
Margin of Safety (Sales as a % of Total Sales)	40%	21.875%

There has been substantial saving in the fixed cost in the year 1998-99 due to the restructuring process.

The company could maintain its sales quantity level of 1997-98 in 1998-99 by reducing selling price.

You are required to calculate the following:

(i) Sales for 1998-99 in Rupees; (ii) Fixed cost for 1998-99;

(iii) Break-even sales for 1998-99 in Rupees.

Answer: (i) 6,40,000 (ii) Rs. 1,87,500 (iii) Rs. 5,00,000

Question 10. (B. Com. Hons. Delhi 1982)

The Young Hotel has annual fixed costs applicable to rooms of Rs. 1500000 for a 300 rooms-hotel with average daily room rates of Rs. 40 and average variable costs of Rs. 6 for each room rented.

The hotel operates 365 days per year. It is subject to an income tax rate of 30 percent.

It is required to:

(i) calculate the number of rooms the Hotel must rent to earn a net income after taxes of Rs. 1000000 and

(ii) compute the break-even point in terms of number of rooms rented.

Answer: (i) No. of Rooms = 86135 Appx. (ii) 44118 Rooms.

Question 11. (C.A. Inter May 1996-Part Question)

A company had incurred fixed expenses of Rs. 450000 with sales of Rs. 1500000 and earned a profit of Rs. 30000 during the first half year. In the second half, it suffered a loss of Rs. 150000. Calculate:

(i) The profit-volume ratio, break-even point and margin of safety for the first half-year.

(ii) Expected sales-volume for the second half-year assuming that selling price and fixed expenses remained unchanged during the second half year.

(iii) The break-even point and margin of safety for the whole year.

Answer: (i) (a) P/v Ratio = 50% (b) B.E. Point = 9,00,000 (c) MOS = Rs. 6,00,000

(ii) Rs. 6,00,000

(iii) (a) B.E. Point = 18,00,000 (b) MOS = Rs. 3,00,000.

Question 12. (C.A. Inter, November 1996)

A company has three factories situation North, East and South with its head Office in Mumbai. The Management has received the following summary report on the operations of each factory for a period.

(Rs. '000)

	Sales		***Profit***	
	Actual	***Over/(Under) Budget***	***Actual***	***Over/(Under) Budget***
North	1100	(400)	135	(180)
East	1450	150	210	90
South	1200	(200)	330	(110)

Calculate for each factory and for the company as a whole for the period:

(i) The Fixed Costs

(ii) Break-even Sales

Answer: (i) 1350 (ii) 2500 (in Rs. '000)

Question 13. **(I.C.W.A. Inter June 1993)**

A factory engaged in manufacturing plastic buckets is working at 40% capacity and produced 10000 buckets per month. The present cost breakup for one bucket is as under:

Materials	Rs. 20
Labour	Rs. 6
Overheads	Rs. 10 (60% fixed)

The selling price is Rs. 40 per bucket. If it is decided to operate the factory at 50% capacity, the selling price falls by 3%. AT 90% capacity, the selling price falls by 5% accompanied by a similar fall in the price of materials.

You are required to prepare a statement showing the profits at 50% and 90% capacities and also determine the break-even points at each of these production levels.

Answer:

Capacity	50%	90%
Profit	50,000	1,42,500
BEP	6818	6667

Question 14. **(C.A. Inter May 1987; I.C.W.A. Final December 1996)**

A Bank conducts competitive examination every year for selection of candidates for the post of Probationary Officers. Each candidate is charged an entrance fee of Rs. 75 for admission to the examination. Data gathered from the last two years are as under:

	19X1	19X2
Fees collected	Rs. 300000	375000
Costs:		
Valuation of answer books	120000	150000
Question papers	80000	100000
Hire of hall	12000	12000
Honorarium to Examination Superintendent	10000	10000
Invigilators at the rate of one invigilator for every 50 students at Rs. 100 per day for two days	16000	20000
General expenses	12000	12000
Total	250000	304000
Net income	50000	71000

In 1993, it is expected that 6000 candidates will appear for the entrance examination. The hall rent and general expenses are expected to increase by Rs. 3000 and Rs. 8000 respectively. You are required to calculate the following for 19X3:

(i) Budgeted income;

(ii) Break-even number of candidates;

(iii) Number of students required to sit for examination to earn a net revenue of Rs. 100000.

Answer: (i) Budgeted income = 81,000 (ii) BEP = 2142.86 Candidates (iii) No. of Students = 6912 Candidates.

Question 15. **(CIMA London, May 1992)**

PE Limited produces and sells two products, P and E. Budgets prepare for the next six months give the following information:

	Product P per unit	Product E per unit
Selling price	Rs. 10.00	Rs. 12.00
Variable costs : production and selling	5.00	10.00
Common fixed costs ; production and selling (for six		

months) 561600

You are required, in respect of the forthcoming six months:

(i) to state what the break-even point in rupees will be and the number of each product this figure represents if the two products are sold in the ratio 4P to 3E;

(ii) to state the break-even point in rupees and the number of products this figure represents if the sales mix changes to 4P to 4E (ignore fractions of products);

(iii) to advise the sales manager which product mix should be better, that in (i) above or that in (ii) above, and why;

(iv) to advise the sales manager which of the two products should be concentrated on and the reason (s) for your recommendation - assume that whatever can be made can be sold, that both products go though a machining process and that there are only 32000 machine hours available, with product P requiring 0.40 hour per unit and product E requiring 0.10 hour per unit.

Answer: (i) BEP units, Product P = 86,400 Product E = 64,800 (ii) BEP units, Product P,E = 80228 units.

Question 16. (C.A. Final, November 1991; C.S. Final June 1986)

Titan Engineering is operating at 70 percent capacity and presents the following information:

Break-even point	Rs. 200 crores
P/V Ratio	40 percent
Margin of safety	Rs. 50 crores

Titan's management has decided to increase production to 95 percent capacity level with the following modifications:

(i) The selling price will be reduced by 8 percent.

(ii) The variable cost will be reduced by 5 percent on sales.

(iii) The fixed cost will increase by Rs. 20 crores, including depreciation on additions, but excluding interest on additional capital.

(iv) Additional capital of Rs. 50 crores will be needed for capital expenditure and working capital.

Required:

(a) Indicate the sales figures, with the working, that will be needed to earn Rs. 10 crores over and above the present profit and also met 20 percent interest on the additional capital.

(b) What will be the revised:

(i) Break-even point (ii) P/V ratio (iii) Margin of safety ?

Answer: (a) Rs. 311.11 Crores (b) (i) 244.44 Crores (ii) 45% (iii) 66.67 Crores

Question 17. (C.A. Final November 1987)

A Company has an opening stock of 6000 units of output. The production planned of the current period is 24000 units and expected sales for the current period amount to 28000 units. The selling price per unit of output is Rs. 10. Variable cost per unit is expected to be Rs. 6 per unit while it was only Rs. 5 per unit during the previous period. What is the break-even volume for the current period if the total fixed cost for the current period is Rs. 86000?

Assume that the first in first out system is followed

Answer: 20,000 units.

Question 18. (I.C.W.A. Final June 1981; I.C.W.A. Inter, December 1987; C.A. Inter, November 1986; May, 1983; I.C.W.A. Final December 1992;

Two manufacturing companies which have the following operating details decide to merge:

	Company 1	**Company 2**
Capacity utilization %	90	60
Sales (Rs. lakhs)	540	360
Variable Costs (Rs. lakhs)	396	225
Fixed Costs (Rs. lakhs)	80	50

Assuming that the proposal is implemented, calculate:

(i) Break-even sales of the merged plant and the capacity utilization at that stage.

(ii) Profitability of the merged plant at 80% capacity utilization.

(iii) Sales turnover of the merged plant to earn a profit of Rs. 75 lakhs.

(iv) When the merged plant is working at a capacity to earn a profit of Rs. 75 lakhs, what percentage increase in selling price is required to sustain as increase of 5% in fixed overheads.

Answer: (i) BEP of the merged plant = Rs. 501.74 (ii) 98 (iii) 791.20 lakh (iv) .8214

Question 19. **2011, November**

The P/V Ratio of Delta Ltd. is 50% and margin of safety is 40%. The company sold 500 units for Rs 5,00,000. You are required to calculate :

(i) Break even point, and

(ii) Sales in units to earn a profit of 10% on sales.

FOR YOUR PRACTICE

Question 1.

The data below relates to a company which makes and sells computers:

	March	**April**
Sales	units 5000	units 10000
Production	10000	5000
Selling price/unit	Rs. 100	Rs. 100
Variable production cost/unit	50	50
Fixed production overhead incurred	100000	100000
Fixed production overhead cost per unit, being the predetermined overhead absorption rat	10	10
Selling, distribution and administration cost (all fixed)	50000	50000

You are required to present comparative profit statement for each month using:

(i) absorption costing, (ii) marginal costing

Solution

Working Note 1

Calculation of variable cost of good sold under marginal costing :-

March :

	Quantity	**Rate**	**Amount**
Production	10,000	50	5,00,000
(-) Closing Stock	5,000	50	2,50,000
Cost of good sold	5,000		2,50,000

April :

	Quantity	**Rate**	**Amount**
Opening Stock	5,000	50	2,50,000
(+) Production	5,000	50	2,50,000
Cost of good sold	10,000		5,00,000

Working Note 2

Calculation of production cost of goods sold under absorption costing :-

March :

	Quantity	**Rate**	**Amount**
Production	10,000	60 (50 + 10)	6,00,000

(-) Closing Stock	5,000	60	3,00,000
Production cost of G. sold	5,000		3,00,000

April :

	Quantity	Rate	Amount
Opening Stock	5,000	60	3,00,000
(+) Production	5,000	60	3,00,000
		(50 + 10)	
Production cost of good sold	10,000		6,00,000

Working Note 3

Calculate of under recovery and over recovery of fixed production cost:-

March :

Budget			Actual			
BQ	**Recovery rate p.u.**	**BFO**	**AQ**	**Recovery rate p.u.**	**RFPO**	**AFPO**
10,000	10	1,00,000 (AFPO)	10,000	10	1,00,00	1,00,000

April :

Budget			Actual			
BQ	**Recovery rate p.u.**	**BFO**	**AQ**	**Recovery rate p.u.**	**RFPO**	**AFPO**
10,000	10	1,00,000 (AFPO)	5,000	10	50,000	1,00,000

Under-recovery
50,000

Soln.

A. Marginal Costing :-

Particulars	**March**	**April**
Sales @ Rs 100	5,00,000	10,00,000
	(5,000 × 100)	(10,000 × 100)
(-) Variable Production cost of good sold	2,50,000	5,00,000
Contribution	2,50,000	5,00,000
(-) Fixed production cost	1,00,000	1,00,000
(-) Fixed Administration & Selling overhead	50,000	50,000
Profit	1,00,000	3,50,000

B. Absorbtion costing approach :-

Particulars	**March**	**April**
Sales @ Rs 100	5,00,000	10,00,000
(-) Production cost of good sold	3,00,000	6,00,000
Gross Profit	2,00,000	4,00,000
(-) Administration and selling Expenses	50,000	50,000
Profit before adjustment	1,50,000	3,50,000
(-) Under recovery of Fixed Production overhead	–	50,000
Profit after adjustment	1,50,000	3,00,000

Question 2. **(I.C.W.A. Inter, December, 1989)**

Cookwell Ltd. manufactures pressure cookers the selling price of which is Rs. 300 per unit. Currently the capacity utilisation is 60% with a sales turnover of Rs. 18 lakhs. The company proposes to reduce the selling price by 20% but desires to maintain the same profit position by increasing the output. Assuming that the increased output cold be made and sold, determine the level at which the Company should operate to achieve the desired objective.

The following further data are available:

(i) Variable cost per unit Rs. 60

(ii) Semi-variable cost (including a variable element of Rs. 10 pr unit) Rs. 180000.

(iii) Fixed cost Rs. 300000 will remain constant up to 80% level. Beyond this an additional amount of Rs. 60000 will be incurred.

Solution

Given:-	Selling price p.u.	Rs. 300		
	Sales [60%]	Rs. 18,00,000	[6,000 unit]	
	Full capacity	10,000 unit		
	Variable cost p.u.	(60 + 10)		70 Rs.
Fixed cost	1 – 8000	[3,00,000 + 1,20,000]		4,20,000
	8001 – 10,000	[3,60,000 + 1,20,000		4,80,000
Profit	[(300 – 70) × 6,000] – 4,20,000			9,60,000

Block	FC	SFC	TFC	D. Profit	Cont p.u.	D. Sales Qty.	Remarks
1 – 8,000	3,00,000	1,20,000	4,20,000	9,60,000	170 (240 – 70)	8,118 units	Invalid
8001 – 10,000	3,60,000	1,20,000	4,80,000	9,60,000	170	8,471 units approx	Valid

Question 3. **(I.C.W.A. Inter, June 1986)**

The XYZ Co. has the following budget for the year 1986-87:

Sales (100000 units @ Rs. 20)	Rs. 2000000
Variable cost	1000000
Contribution	1000000
Fixed cost	400000
Net profit	600000

From the above set of information find out:

(a) The adjusted profits for 1986-87 if the following two sets of changes are introduced and also suggest which plan should be implemented:

Plan A		**Plan B**	
Increase in price	20%	Decrease in price	20%
Decrease in volume	25%	Increase in volume	25%
Increase in variable cost	10%	Decrease in variable cost	10%
Increase in fixed cost	5%	Decrease in fixed cost	5%

(b) The P/V ratio and break-even points under the two plans referred to above.

Solution

Given :

	Basic	**A**	**B**
Sales Quantity	1,00,000 units	75,000	1,25,000

Selling price p.u.	Rs 20	Rs 24	Rs 16
Variable cost	Rs 10	Rs 11	Rs 9
Fixed cost	Rs 4,00,000	Rs 4,20,000	Rs 3,80,000
Contribution p.u.	Rs 10	Rs 13	Rs 7
Plan A	Sales	18,00,000	
	(-) Variable cost	8,25,000	
	Contribution	9,75,000	
	(-) Fixed cost	4,20,000	
	Profit	5,55,000	
Plan B	Sales	20,00,000	
	(-) Variable cost	11,25,000	
	Contribution	8,75,000	
	(-) Fixed cost	3,80,000	
	Profit	4,95,000	
	BEP = A = 4,20,000 / 13 = 32,308	B = 3,80,000 / 7 = 54,286	
	PV Ratio = 9,75,000 / 18,00,000 × 100 = 54.17%	8,75,000 / 20,00,000 × 100 = 43.75%	

Question 4. **(C.A. Inter, November, 1998-Part Question)**

The profit-volume ratio of X Ltd. is 50% and the margin of safety is 40%. Your are required to calculate the net profit if the sales volume is Rs. 100000.

Solution

P/V Ratio = 50% Sales = 1,00,000

MOS = 40% BES = 60,000

BEP = 60% BES = Fixed Cost / PV Ratio

□ Fixed cost = 30,000

Desired sales = Fixed Cost + Profit / PV Ratio

1,00,000 □ 30,000 + Profit / 50%

Profit = 20,000

Question 5. **(I.C.W.A. Inter December, 1999-Stage I)**

(i) When volume is 3000 units, average cost is Rs. 4 per unit. When volume is 4000 units, average cost is Rs. 3.50. The break-even point is 5000 units. Find the profit-volume ratio.

(ii) ABC Ltd. has fixed costs of Rs. 200000. It has two products that it can sell, A and B. The company sells these products at a rate of 2 units of A to 1 unit B. The unit contribution is Re. 1 per unit for A and Rs. 2 per unit for B. How many units of A and B would be sold at the break-even point?

(iii) If margin of safety is 40% of sales, find fixed costs when profit is Rs. 20000.

Solution

i)	3,000 unit @ 4	4,000 unit @ 3.5
Total Cost	12,000	14,000
(-) Variable cost	6,000	8,000

2,000	(2 × 3,000)	(2 × 4,000)
1,000	____	____
Fixed cost	6,000	6,000

ii) BEP (unit) = $\frac{\text{Fixed Cost}}{\text{Cont. p.u.}}$

$5{,}000 = \frac{6{,}000}{\text{Cont. p.u.}}$

Cont. p.u. = 1.20 Variable cost = 2

SP = 3.20

PV Ratio = $\frac{1.20}{3.20} \times 100 = 37.5\%$

Question 6. **(C.A. Inter, May, 1999-Part Question)**

(i) Ascertain profit, when sales	=	Rs. 200000
Fixed Cost	=	Rs. 40000
BEP	=	Rs. 160000
(ii) Ascertain sales, when fixed cost	=	Rs. 20000
Profit	=	Rs. 10000
BEP	=	Rs. 40000

Solution

i)

Sales	2,00,000
Fixed cost	40,000
BEP	1,60,000

BEP = $\frac{\text{Fixed Cost}}{\text{PV Ratio}}$

PV Ratio = $\frac{40{,}000}{1{,}60{,}000} = 0.25$

Profit = MOS × PV Ratio

= 40,000 × 0.25

= 10,000

ii) Fixed cost = 20,000

Profit = 10,000

BEP = 40,000

BEP = $\frac{\text{Fixed Cost}}{\text{PV Ratio}}$

PV Ratio = $\frac{20{,}000}{40{,}000} = 0.5$

Sales = $\frac{\text{Contribution}}{\text{PV Ratio}} = \frac{\text{Fixed Cost + Profit}}{\text{PV Ratio}}$

= $\frac{30{,}000}{0.5} = 60{,}000$

Question 7. **(I.C.W.A. Inter June 1995 - Stage I)**

A company producing a single product sells it at Rs. 50 per unit. Unit variable cost is Rs. 35 and fixed cost amounts to Rs. 12 lakhs per annum. With this data you are required to calculate the following, treating each independent of the other:

(a) P/V ratio and Break-even sales.

(b) New Break-even sales if variable cost increases by Rs. 3 per unit, without increase in selling price.

(c) Increase in sales required if profits are to be increased by Rs. 2.4 lakhs.

(d) Percentage increase/decrease in sales volume units to off-set:

(i) an increase of Rs. 3 in the variable cost per unit.

(ii) a 10% increase in selling price without affecting existing profits quantum.

(e) Quantum of advertisement expenditure permissible to increase sales by Rs. 1.2 lakhs, without affecting existing profits.

Solution

a) Selling price = 50 Variable cost = 35 Fixed cost = 12,00,000

Contribution = 15

PV Ratio = $\frac{15}{50} \times 100 = 30\%$

BES = $\frac{\text{Fixed Cost}}{\text{PV Ratio}}$

BES = $\frac{12,00,000}{0.30} = 40,00,000$

b) If Variable cost = 38 Selling price = 50 Fixed cost = 12,00,000

Contribution = 12

PV Ratio = 24 %

BES = $\frac{12,00,000}{0.24} = 50,00,000$

c) PV Ratio = $\frac{\square \text{ Profit}}{\square \text{ Sale}} = \frac{\square \text{ Sale} = 2,40,000}{0.30} = 8,00,000$

d) i)

	Present	Revised	Revised
Selling price	50	50	55
(-) Variable cost	35	38	35
Contribution p.u.	15	12	20
	1.25		0.15
	More 25%		Less 25%

Question 8. **(C.A. Inter, May 1989)**

The following figures are available from the records of VENUS ENTERPRISES as on 31st March :

	1988	**1989**
	Rs. lakhs	**Rs. lakhs**
Sales	150	200
Profit	30	50

Calculate : (a) the P/V ratio and total fixed expenses, (b) the break-even level of sales, (c) sales required to earn a profit of Rs. 90 lakhs, (d) profit or loss that would arise if the sales were Rs. 280 lakhs.

Solution

(In Lakhs)

	1988	**1989**
Sales	150	200
Profit	30	50

a) PV Ratio = Change in Profit

Chage in sales

$= \frac{20}{50} = 40\%$

Contribution = Sales × PV Ratio

Contribution = 150 × 40% = 60,00,000

Contribution = Fixed cost + Profit or Fixed cost = Contribution – Profit

Fixed cost = 60,00,000 – 30,00,000 = 30 lakh

b) $BES = \frac{\text{Fixed Cost}}{\text{PV Ratio}}$

$= \frac{30,00,000}{0.4} = 75,00,000$

c) If Profit is 90 lakh then Sales = ?

$\text{PV Ratio} = \frac{\square \text{ in Profit}}{\square \text{ in Sales}}$

$\square \text{ in Sales} = \frac{40,00,000}{40\%}$

= 1,00,00,000

Sales = 2,00,00,000 + 1,00,00,000 = 3,00,00,000

d) $\text{PV Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}}$

40% × 80,00,000 = Change in Profit

32,00,000 = Change in Profit

Profit = 50,00,000 + 32,00,000 = 82,00,000

Question 9. **(C.A. Inter, November 1989)**

The Laila Shoe Company sells five different styles of ladies chappals with identical purchase costs and selling prices. The company is trying to find out the profitability of opening another store, which will have the following expenses and revenues :

	Rs. Per Pair
Selling Price	30.00
Variable Cost	19.50
Salesmen's Commission	1.50
Total Variable Cost	21.00
Annual fixed expenses are :	
Rent	Rs. 60000
Salaries	200000
Advertising	80000
Other Fixed Expenses	20000
	360000

Required :

(a) Calculate the annual break-even point in units and in value. Also determine the profit or loss of 35000 pairs of chappals are sold.

(b) The sales commissions are proposed to be discontinued, but instead a fixed amount of Rs. 90000 is to be incurred in fixed salaries. A reduction in selling price of 5% is also proposed. What will be the break-even point in units:

(c) It is proposed to pay the Store Manager 50 paise per pair as further commission. The selling price is also proposed to be increased by 5%. What would be the break-even point in units?

(d) Refer to the original data. If the Store Manager were to be paid 30 paise commission on each pair of chappal sold in excess of the break-even point, what would be the store's net profit if 50000 pairs were sold ?

Note : Consider each part of question separately.

Solution

a) Contribution = 30 – 21 = Rs. 9

Fixed cost = 3,60,000

BEP (units) = $\frac{3,60,000}{9}$ = 40,000

PV Ratio = $\frac{9}{30} \times 100$ = 30%

BEP (Rs.) = $\frac{3,60,000}{0.30}$ = 12,00,000

Profit = Sales – Variable cost – Fixed cost

Sales = 35,000 × 30 =	10,50,000
Variable cost = 21 × 35,000	7,35,000
Fixed cost =	3,60,000

Loss/Profit = 10,50,000 – (7,35,000 + 3,60,000)

Loss = 45,000

b) Selling price = 28.5

Fixed cost = 3,60,000 + 90,000 = 4,50,000

Variable cost = 19.5

Contribution = 28.5 – 19.5 = 9.

BEP (units) = $\frac{4,50,000}{9}$ = 50,000 Pairs

c) Selling price = 31.5 Variable cost = 21.5 Fixed cost = 3,60,000

Contribution p.u. = 10

BEP (units) = $\frac{3,60,000}{10}$ = 36,000 units

Sales	50,000 × 30	= 15,00,000
(-) Variable cost	(10,000 × 0.3) + (50,000 × 21)	= 10,53,000
(-) Fixed cost		= 3,60,000
Profit		87,000

* 10,000 = 50,000 – $\frac{3,60,000}{9}$

Question 10. **(I.C.W.A. Inter, December 1987; C.A. Inter November 1987; C.S. Inter, June 1986)**

Mr. X has Rs. 200000 investments in his business firm. He wants a 15 percent return on his money. From an analysis of recent cost figures, he finds that his variable cost of operating is 60 percent o of sales, his fixed costs are Rs. 80000 per year. **Show** computations to answer the following questions:

(i) What sales volume musts be obtained to break even ?

(ii) What sales volume must be obtained to get 15 percent return on investment?

(iii) Mr. X estimates that even if he closed the doors of his business, he would incur Rs. 25000 as expenses per year. At what sales would he be better off by locking his business up?

Solution

Given:

Average workers = $\frac{500 + 600}{2} = \frac{1100}{2} = 550$

Separations = 25 (5 + 20)

Replacement = 10

New recruits = 65

(a) Separation method = $\frac{25}{550} \times 100 = 4.54\%$

(b) Replacement method = $\frac{10}{550} \times 100 = 1.81\%$

(c) Flux method :

I = $\frac{25 + 10}{550} \times 100 = \frac{35}{550} \times 100 = 6.36\%$

II = $\frac{25 + 10 + 65}{550} \times 100 = \frac{100}{550} \times 100 = 18.18\%$

Question 11. **(I.C.W.A. Inter, December 1992; C.A. Inter, May 1999)**

M Ltd. manufactures three products P, Q and R. The unit selling prices of these products are Rs. 100, Rs. 80 and Rs. 50 respectively. The corresponding unit variable costs are Rs. 50, Rs. 40 and Rs. 20. The proportions (quantity-wise) in which these products are manufactured and sold are 20%, 30% and 50% respectively. The total fixed costs are Rs. 1480000.

Given the above information, you are required to work out the overall break-even quantity and the product-wise break-up of such quantity.

Solution

A. Calculation of average Contribution p.u.

	(x)	(f)	(fx)
Product	Contribution p.u.	Sales Quantity Weight	Multiple
P	50	0.20	10
Q	40	0.30	12
R	30	0.50	15
		1.00	37

Average contribution p.u. (x) = Rs. 37

B. Overall BEP = $\frac{\text{Overall Fixed Cost}}{\text{Average contribution p.u.}} = \frac{14,80,000}{37}$ = 40,000 unit

C. Product wise Break-up:

Product	Proportion of Quantity	Quantity
A	0.20	8,000
B	0.30	12,000
C	0.50	20,000
		40,000 unit

Question 12. **(C.A. Final, November 1986)**

(a) Calcutta Company Ltd. manufactures and sells four types of products under the brand names Ace, Utility, Luxury and Supreme. The sales mix in value comprises the following:

Brand	Percentage
Ace	33-1/3%
Utility	41-2/3%
Luxury	16/2/3%
Supreme	8-1/3%
	100%

The total budgeted sales (100%) are Rs. 600000 per month. The operating costs are:

Ace	60% of selling price
Utility	68% of selling price
Luxury	80% of selling price
Supreme	40% of selling price

The fixed costs are Rs. 159000 per month. Calculate the break-even point for the products on an overall basis.

(b) It has been proposed to change the sales mix as follows, the total sales per month remaining Rs. 600000.

Brand	Percentage
Ace	25%
Utility	40%
Luxury	30%
Supreme	5%
	100%

Assuming that this proposal is implemented, calculate the new break-even point.

Solution

(a)

Product	S/Value	PV Ratio	Cont.	BEP (Rs.)
Ace	2,00,000	40%	80,000	1,51,429
Utility	2,50,000	32%	80,000	1,89,286
Luxury	1,00,000	20%	20,000	75,714
Supreme	50,000	60%	30,000	37,857
	6,00,000		2,10,000	4,54,286
				(4 : 5 : 2 : 1)

Average PV Ratio = $\frac{2,10,000}{6,00,000} = 0.35$

O/A BEP (Rs.) = $\frac{1,59,000}{0.35}$ = 4,54,286 Rs.

(b)

Product	S/Value	PV Ratio	Cont.	BEP (Rs.)
Ace	1,50,000	40%	60,000	1,25,000
Utility	2,40,000	32%	76,800	2,00,000
Luxury	1,80,000	20%	36,000	1,50,000
Supreme	30,000	60%	18,000	25,000
	6,00,000		1,90,800	5,00,000
				(5 : 8 : 6 : 1)

Average PV Ratio = $\frac{1,90,800}{6,00,000} = 0.318$

O/A BEP (Rs.) = $\frac{1,59,000}{0.318}$ = 5,00,000 Rs.

Question 13. **Nov. 2007 PCC**

A company produces single product which sells for Rs. 20 per unit. Variable cost is Rs. 15. Per unit and Fixed overhead for the year is Rs. 6,30,000.

(i) Calculate sales value needed to earn a profit of 10% on sales.

(ii) Calculate sales price per unit to bring BEP down to 1,20,000 units.

(iii) Calculate margin of safety sales if profit is Rs. 60,000.

Answer : (i) 4,20,000 (ii) 20.25 (iii) 2,40,000.

Question 14. **May – 2008**

A Company has fixed cost of Rs. 90,000, Sales Rs. 3,00,000 and Profit of Rs. 60,000.

Required:

(i) Sales Volume if in the next period, the company suffered a loss of Rs. 30,000.

(ii) What is the margin of safety for a profit of Rs. 90,000?

Answer : (i) 1,20,000 (ii) 1,80,000.

Question 15. **Nov. 2008**

PQ Ltd. reports the following cost structure at two capacity level :

	(100% capacity)	
	2000 units	1,500 units
Production overhead I	Rs. 3 per unit	Rs. 4 per unit
Production overhead II	Rs. 2 per unit	Rs. 2 per unit

If the selling price, reduced by direct material and labour is Rs. 8 per unit, what would be its break-even point?

Solution

Production overhead I is fixed overhead.

In case of 2,000 units - 2,000 × 3 = 6,000

In case of 1,500 units - 1,500 × 4 = 6,000

Hence, Fixed Production Overhead = Rs 6,000

Variable Production Overhead = Rs 2 per unit

Working Note

Selling price p.u.	××
(-) Direct material	××
(-) Direct labour	××
	8
(-) Variable overhead p.u.	2
Contribution	6

$$\text{BEP (units)} = \frac{\text{Fixed Cost}}{\text{Contribution}} = \frac{6{,}000}{6} = 1{,}000 \text{ unit}$$

Question 16

A company produces single product which sells for ₹ 20 per unit. Variable cost is ₹ 15 per unit and Fixed overhead for the year is ₹ 6,30,000.

Required:

(a) Calculate sales value needed to earn a profit of 10% on sales.

(b) Calculate sales price per unit to bring BEP down to 1,20,000 units.

(c) Calculate margin of safety sales if profit is ₹ 60,000.

Solution :

(a) Suppose Sales units are *x* then

S = V + F + P

(S = Sales; V = Variable Cost; F = Fixed Cost; P = Profit)

₹ 20*x* = ₹ 15*x* + ₹ 6,30,000 + ₹ 2*x*

₹ 20*x* - ₹ 17*x* = ₹ 6,30,000

$\therefore x = \frac{6,30,000}{3}$ = 2,10,000 units

Sales Value = 2,10,000 units X ₹ 20 = ₹ 42,00,000 to earn a profit of 10% on sales.

(b) Sales price to bring down BEP to 1,20,000 units

$$\text{B.E.P. (Units)} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

$$\text{Or, Contribution per unit} = \frac{\text{Rs. 6,30,000}}{\text{1,20,000 units}} = ₹\ 5.25$$

So, Sales Price = ₹ 15 + ₹ 5.25 = ₹ 20.25

(c) $\text{Margin of Safety Sales} = \frac{\text{Profit}}{\text{P/V Ratio}}$ Or, $\frac{\text{Rs. 60,000}}{\text{P/V Ratio}}$

$$\text{Where, P/V Ratio} = \frac{\text{Contribution per unit}}{\text{Sales Price}} \text{ X } 100 \text{ Or, } \frac{\text{Rs. 5}}{\text{Rs. 20}} \text{ X } 100 = 25\%$$

$$\text{Margin of Safety Sales} = \frac{\text{Rs.60,000}}{\text{25\%}} = ₹\ 2,40,000$$

So if profit is ₹ 60,000, margin of safety sale will be ₹ 2,40,000.

Question 17

A Company sells two products, J and K. The sales mix is 4 units of J and 3 units of K. The contribution margins per unit are ₹ 40 for J and ₹ 20 for K. Fixed costs are ₹ 6,16,000 per month. Compute the break-even point.

Solution :

Let $4x$ = No. of units of J

Then $3x$ = No. of units of K

$$\text{BEP in x units} = \frac{\text{Fixed Cost}}{\text{Contribution}} = \frac{\text{Rs. 6,16,000}}{(4x \text{ X Rs. } 40) + (3x \text{ X Rs. } 20)}$$

$$\text{Or, } x = \frac{\text{Rs. 6,16,000}}{\text{Rs. 220}} = 2,800 \text{ Units}$$

Break – even point of Product J = 4 X 2,800 = 11,200 units

Break – even point of Product K = 3 X 2,800 = 8,400 units

Question 18

MNP Ltd sold 2,75,000 units of its product at ₹ 37.50 per unit. Variable costs are ₹ 17.50 per unit (manufacturing costs of ₹ 14 and selling cost ₹ 3.50 per unit). Fixed costs are incurred uniformly throughout the year and amount to ₹ 35,00,000 (including depreciation of ₹ 15,00,000). there are no beginning or ending inventories.

Required:

(i) Estimate breakeven sales level quantity and cash breakeven sales level quantity.

(ii) Estimate the P/V ratio.

(iii) Estimate the number of units that must be sold to earn an income (EBIT) of ₹ 2,50,000.

(iv) Estimate the sales level achieve an after-tax income (PAT) of ₹ 2,50,000. Assume 40% corporate Income Tax rate.

Solution :

(i) Contribution = ₹ 37.50 - ₹ 17.50 = ₹ 20 per unit.

Break even Sales Quantity $= \frac{\text{Cash Fixed Cost}}{\text{contribution margin per unit}} = \frac{\text{Rs. 35,00,000}}{\text{Rs. 20}}$ = 1,75,000 units

Cash Break even Sales Qty. $= \frac{\text{Cash Fixed Cost}}{\text{contribution margin per unit}} = \frac{\text{Rs. 20,00,000}}{\text{Rs. 20}}$ = 1,00,000 units

(ii) P/V ratio $= \frac{\text{Contribution/ unit}}{\text{Selling Prife/unit}} \text{ X } 100 = \frac{\text{Rs. 20}}{\text{Rs. 37.50}} \text{ X } 100 = 53.33\%$

(iii) No. of units that must be sold to earn an Income (EBIT) of ₹ 2,50,000

$\frac{\text{Fixed cost+Desired EBIT level}}{\text{Contribution margin per unit}} = \frac{35,00,000+2,50,000}{20}$ = 1,87,500 units

(iv) After Tax Income (PAT) = ₹ 2,50,000

Tax rate = 40%

Desired level of Profit before tax $= \frac{\text{Rs. 2,50,000}}{60} \text{ X } 100$ = ₹ 4,16,667

Estimate Sales Level $= \frac{\text{Fixed Cost+Desired Profit}}{\text{P/V ratio}}$

Or, $\left(\frac{\text{Fixed Cost+Desired Profit}}{\text{Contribution per unit}} \text{ X Selling Price per unit}\right)$

$= \frac{\text{Rs. 35,00,000+Rs. 4,16,667}}{53.33\%} \text{ X }$ ₹ 73,43,750

Question 19

The following figures are related to LM Limited for the year ending 31st March, 2014:

Sales - 24,000 units @ ₹ 200 per unit;

P/V Ratio 25% and Break-even Point 50% of sales.

You are required to calculate:

(i) Fixed cost for the year

(ii) Profit earned for the year

(iii) Units to be sold to earn a target net profit of ₹ 11,00,000 for a year.

(iv) Number of units to be sold to earn a net income of 25% on cost.

(v) Selling price per unit if Break-even Point is to be brought down by 4,000 units.

Solution :

Break – even point (in units) is 50% of sales i.e. 12,000 units.

Hence, Break-even point (in sales value) is 12,000 units X ₹ 200 = ₹ 24,00,000

(i) We know that Break even sales $= \frac{\text{Fixed Cost}}{\text{P/V ratio}}$

Or, ₹ 24,00,000 = $\frac{\text{Fixed Cost}}{25\%}$

Or, Fixed Cost = ₹ 24,00,000 X 25%

= ₹ 6,00,000

So Fixed Cost for the year is = ₹ 6,00,000

(ii) Contribution for the year = (24,000 units X ₹ 200) X 25%

= ₹ 12,00,000

Profit for the year = Contribution – Fixed Cost

= ₹ 12,00,000 – ₹ 6,00,000

= ₹ 6,00,000

(iii) Target net profit is ₹ 11,00,000

Hence, Target contribution = Target Profit + Fixed Cost

= ₹ 11,00,000 + ₹ 6,00,000

= ₹ 17,00,000

Contribution per unit = 25% of ₹ 200 = ₹ 50 per unit

No. of units = $\frac{\text{Rs. 17,00,000}}{\text{Rs. 50 per unit}}$ = 34,000 unit

So, 34,000 units to be sold to earn a target net profit of ₹ 11,00,000 for a year.

(iv) Net desired total Sales (Number of unit X Selling Price) be *x* then desired profit is 25% on Cost or 20% on Sales i.e. 0.2 *x*.

Desired Sales = $\frac{\text{Fixed Cost + Disired Profit}}{\text{P/V ratio}}$

x = $\frac{6,00,000+0.2x}{25\%}$

or, 0.25 *x* = 6,00,000 + 0.2 *x*

or, 0.05 *x* = 6,00,000

or, *x* = ₹ 1,20,00,000

No. of units to be sold = $\frac{\text{Rs. 1,20,00,000}}{\text{Rs. 200}}$ = 60,000 units

(v) If Break – even point is to be brought down by 4,000 units then Break-even point will be 12,000 units – 4,000 units = 8,000 units

Let Selling price be ₹ *x* and fixed cost and variable cost per unit remain unchanged i.e. ₹ 6,00,000 and ₹ 150 respectively.

Break even point : Sales Revenue = Total cost

8,000 *x* = 8,000 X ₹ 150 + ₹ 6,00,000

Or, 8,000 *x* = ₹ 12,00,000 + ₹ 6,00,000

Or, *x* = $\frac{\text{Rs.18,00,000}}{8,00,000}$ = ₹ 225

∴ Selling Price Should be ₹ 225

Hence, selling price per unit shall be ₹ 225 if Break-even point is to be brought down by 4,000 units.

Question 20

MFN Limited started its operation in 2012 with the total production capacity of 2,00,000 units. The following data for two years is made available to you:

	2012	2013
Sales units	80,000	1,20,000
Total cost (₹)	34,40,000	45,60,000

There has been no change in the cost structure and selling price and it is expected to continue in 2014 as well. Selling price is ₹ 40 per unit.

You are required to calculate:

(i) Break-Even Point (in units)

(ii) Profit at 75% of the total capacity in 2014

Solution :

	2012	2013	Difference
Sales Units	80,000	1,20,000	40,000
Sale Value @ ₹ 40	32,00,000	48,00,000	16,00,000
Total Cost (₹)	34,40,000	45,60,000	11,20,000

Variable Cost per unit $= \frac{\text{Change in Total Cost}}{\text{Change in sales valume}}$

$= \frac{\text{Rs. 11,20,000}}{\text{40,000 Units}}$ = ₹ 28 per unit

Total Fixed Cost (₹) = ₹ 45,60,000 – (1,20,000 units X ₹ 28) = ₹ 12,00,000

(i) Break-even point (in units) $= \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$

$= \frac{\text{Rs. 12,00,000}}{\text{(Rs. 40−Rs. 28)}}$ = ₹ 1,00,000 Units

(ii) Profit at 75% Capacity in 2014.

= (2,00,000 units X 75%) X Contribution per unit – Fixed Cost

= 1,50,000 units X ₹ 12 - ₹ 12,00,000 = ₹ 6,00,000.

Question 21

Arnav Ltd. manufacture and sales its product R-9. The following figures have been collected from cost records of last year for the product R-9:

Elements of Cost	Variable Cost portion	Fixed Cost
Direct Material	30% of Cost of Goods Sold	--
Direct Labour	15% of Cost of Goods Sold	--
Factory Overhead	10% of Cost of Goods Sold	₹ 2,30,000
General & Administration Overhead	2% of Cost of Goods Sold	₹ 71,000
Selling & Distribution Overhead	4% of Cost of Sales	₹ 68,000

Last Year 5,000 units were sold at ₹185 per unit. From the given data find the followings:

(a) Break-even Sales (in rupees)

(b) Profit earned during last year

(c) Margin of safety (in %)

(d) Profit if the sales were 10% less than the actual sales.

Solution :

(i) Calculation of Cost of Goods Sold (COGS) :

COGS = {(DM – 03 COGS) + (DL-0.15 COGS) + (FOH – 0.10 COGS + ₹ 2,30,000) + (G&AOH – 0.02 COGS + ₹ 71,000)}

Or COGS = 0.57 COGS + ₹ 3,01,000

OR COGS = $\frac{\text{Rs. } 13,01,000}{0.43}$ = ₹ 7,00,000

(ii) Calculation of Cost of Sales (COS) :

COS = COGS + (S&DOH – 0.04 COS + ₹ 68,000)

Or COS = ₹ 7,00,000 + (0.04 COS + ₹ 68,000)

Or COS = $\frac{\text{Rs. } 7,68,000}{0.96}$ = ₹ 8,00,000

(iii) Calculation of Variable Costs :

Direct Material	(0.3 X ₹ 7,00,000)	₹ 2,10,000
Direct Labour	(0.15 X ₹ 7,00,000)	₹ 1,05,000
Factory Overhead	(0.10 X ₹ 7,00,000)	₹ 70,000
General & Administration OH-	(0.02 X ₹ 7,00,000)	₹ 14,000
Selling & Distribution OH	(0.04 X ₹ 8,00,000)	₹ 32,000
		₹ 4,31,000

(iv) Calculation of total Fixed Costs :

Factory Overhead	₹ 2,30,000
General & Administration OH-	₹ 71,000
Selling & Distribution OH	₹ 68,000
	₹ 3,69,000

(v) Calculation of P/V Ratio :

P/V Ratio = $\frac{\text{Contribution}}{\text{Sales}}$ X 100 = $\frac{\text{Sales} - \text{Variable Costs}}{\text{Sales}}$ X 100

= $\frac{(\text{Rs. } 185 \text{ X } 5,000 \text{ units}) - \text{Rs.}4,31,000}{\text{Rs. } 185 \text{ X } 5,000 \text{ units}}$ X 100 = 53.41%

(a) Break-Even Sales = $\frac{\text{Fixed Costs}}{\text{P/V Ratio}}$ = $\frac{\text{Rs. } 3.69.000}{53.41\%}$ = ₹ 6,90,882

(b) Profit earned during the last year

= (Sales – Total Variable Cost) – Total Fixed Costs

= (₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000

= ₹ 1,25,000

(c) Margin of Safety (%) = $\frac{\text{Sales} - \text{Breakeven Sales}}{\text{Sales}}$ X 100

= $\frac{\text{Rs.}9,25,000 - \text{Rs.}6,90,882}{\text{Rs. } 9,25,000}$ X 100 = 25.31%

(d) Profit if the sales were 10% less than the actual sales :

Profit = 90% 9=(₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000

= ₹ 4,44,600 - ₹ 3,69,000 = ₹ 75,600

Question 22

Maxim Ltd. manufactures a product "N-joy". In the month of August 2014, 14,000 units of the product "N-joy" were sold, the details are as under:

	(₹)
Sale Revenue	2,52,000
Direct Material	1,12,000
Direct Labour	49,000
Variable Overheads	35,000
Fixed Overheads	28,000

A forecast for the month of September 2014 has been carried out by the General manger of Maxim Ltd. As per the forecast, price of direct material and variable overhead will be increased by 10% and 5% respectively.

Required to calculate:

(i) Number of units to be sold to maintain the same quantum of profit that made in August 2014.

(ii) Margin of safety in the month of August 2014 and September 2014.

Solution :

Calculation of Profit made in the month of August 2014 by selling 14,000 units.

	Amount per unit (₹)	Amount (₹)
Sales Revenue	18.00	2,52,000
Less : Variable Costs :		
- Direct Material	8.00	1,12,000
- Direct Labour	3.50	49,000
- Variable Overhead	2.50	35,000
Contribution	4.00	56,000
Less : Fixed Overhead	2.00	28,000
Profit	2.00	28,000

(i) To maintain the same amount of profit i.e. ₹ 28,000 in September 2014 also, the company needs to maintain a contribution of ₹ 56,000.

Let, number of units to be sold in September 2014 is '*x*', then the contribution will be

₹ 18 *x* – [(₹ 8 X 1.10) + ₹ 3.5 + (₹ 2.5 X 1.05)] x = ₹ 56,000

₹ 18 x – (₹ 8.8 + ₹ 3.5 + ₹ 2,625) x = ₹ 56,000

Or, $x = \frac{\text{Rs. } 56{,}000}{\text{Rs. } 3.075}$ = 18,211.38 units or 18,212 units.

(ii) Margin of Safety

	August 2014	September 2014
Profit	₹ 28,000	₹ 28,000
P/V Ratio	$\frac{\text{Rs. } 4}{\text{Rs. } 18}$ X 100	$\frac{\text{Rs. } 3.075}{\text{Rs. } 18}$ X 100
	₹ 1,26,000	₹ 1,63,902.44
Margin of Safety $\left(\frac{\text{Profit}}{\text{P/V Ratio}} \text{ X } 100\right)$	$\left(\frac{\text{Profit}}{\text{P/V Ratio}} \text{ X } 100\right)$	$\left(\frac{\text{Profit}}{\text{P/V Ratio}} \text{ X } 100\right)$

Question 23

SHA Limited provides the following trading results:

Year	Sale	Profit
2012-13	₹ 25,00,000	10% of Sale
2013-14	₹ 20,00,000	8% of Sale

You are required to calculate:

(i) Fixed Cost

(ii) Break Even Point

(iii) Amount of profit, if sale is ₹ 30,00,000

(iv) Sale, when desired profit is ₹ 4,75,000

(v) Margin of Safety at a profit of ₹ 2,70,000

Solution :

Working :

Profit in year 2012-13 = ₹ 25,00,000 X 10% = ₹ 2,50,000

Profit in year 2013-14 = ₹ 20,00,000 X 8% = ₹ 1,60,000

So, P/V Ratio $= \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$

$= \frac{\text{Rs.2,50,000} - \text{Rs.1,60,000}}{\text{Rs.25,00,000} - \text{Rs.20,00,000}} \times 100 = \frac{\text{Rs.90,000}}{\text{Rs.5,00,000}} \times 100 = 18\%$

(i) Fixed Cost = Contribution (in year 2012-13) – Profit (in year 2012-13)

= (Sales X P/V Ratio) - ₹ 2,50,000

= (₹ 25,00,000 X 18%) - ₹ 2,50,000

= ₹ 4,50,000 - ₹ 2,50,000

= ₹ 2,00,000

(ii) Break-even Point (in Sales) $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

$= \frac{\text{Rs. 2,00,000}}{18\%} =$ ₹ 11,11,111 (Approx)

(iii) Calculation of profit, if sale is ₹ 30,00,000

Profit = Contribution – Fixed Cost

= (Sales X P/V Ratio) – Fixed Cost

= (₹ 30,00,000 X 18%) - ₹ 2,00,000

= ₹ 3,40,000

So Profit is ₹ 3,40,000, if Sale is ₹ 30,00,000

(iv) Calculation of Sale, when desired Profit is ₹ 4,75,000

Contribution Required = Desired Profit + Fixed Cost

= ₹ 4,75,000 + ₹ 2,00,000

= ₹ 6,75,000

Sales $= \frac{\text{Contribution}}{\text{P/V Ratio}} = \frac{\text{Rs. 6,75,000}}{18\%} =$ ₹ 37,50,000

Sales is ₹ 37,50,000 when desired profit is ₹ 4,75,000.

(v) Margin of Safety $= \frac{\text{Profit}}{\text{P/V Ratio}}$

$$= \frac{\text{Rs. } 2,70,000}{18\%} = ₹\ 15,00,000$$

So Margin of Safety is ₹ 15,00,000 at a profit of ₹ 2,70,000

Question 24

Zed Limited sells its product at ₹ 30 per unit. During the quarter ending on 31st March, 2014, it produced and sold 16000 units and' suffered a loss of ₹ 10 per unit. If the volume of sales is raised to 40000 units; it can earn a profit of ₹ 8 per unit.

You are required to calculate:

(i) Break Even Point in Rupees.

(ii) Profit if the sale volume is 50000 units.

(iii) Minimum level of production where the company needs not to close the production if unavoidable fixed cost is ₹ 1,50,000.

Solution :

Units Sold	Sales Value (₹)	Profit / (Loss) (₹)
16,000 units	4,80,000 (₹ 30 X 16,000 units)	(1,60,000) (₹ 10 X 16,000 units)
40,000 units	12,00,000 (₹ 30 X 40,000 units)	3,20,000 (₹ 8 X 40,000 units)

$$\text{P/V Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales Value}} \text{ X } 100 = \frac{\text{Rs.3,20,000} - (-\text{Rs.1,60,000})}{\text{Rs.12,00,000} - \text{Rs.4,80,000}} \text{ X } 100$$

$$= \frac{\text{Rs.4,80,000}}{\text{Rs.7,20,000}} \text{ X } 100 = 66.67\%$$

Total Contribution in case of 40,000 units = Sales Value X P/V Ratio

= ₹ 12,00,000 X 66.67%

= ₹ 8,00,000

So, Fixed Cost = Contribution – Profit

= ₹ 8,00,000 – ₹ 3,20,000

= ₹ 4,80,000

(i) Break-even Point in Rupees $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

$$= \frac{\text{Rs.4,80,000}}{66.67\%} = ₹\ 7,20,000$$

(ii) If sales volume is 50,000 units, then profit = Sales Value X P/V Ratio–Fixed Cost

= (50,000 units X ₹30 X 66.67% - ₹4,80,000)

= ₹ 5,20,000

(iii) Minimum level of production where the company needs not to close the production, if unavoidable fixed cost is ₹ 1,50,000 :

$$= \frac{\text{Avoidable Fixed Cost}}{\text{Contribution per unit}}$$

$$= \frac{\text{total fixed cost} - \text{unavoidable fixed cost}}{\text{Contribution per unit}}$$

$$= \frac{Rs.4,80,000 - Rs.1,50,000}{Rs.30 \times 66.67\%}$$

$$= \frac{Rs.3,30,000}{Rs.20} = 16,500 \text{ units.}$$

At production level of ≥ 16,500 units, company needs not to close the production.

Question 25

Maximum Production capacity of KM (P) Ltd. is 28000 units per month. Output at different levels along with cost data is furnished below:

Particulars of Costs	Activity Level		
	16,000 units	18,000 units	20,000 units
Direct Material	₹ 12,80,000	₹ 14,40,000	₹ 16,00,000
Direct Labour	₹ 17,60,000	₹ 19,80,000	₹ 22,00,000
Total factory overheads	₹ 22,00,000	₹ 23,70,000	₹ 25,40,000

You are required to work out the selling price per unit a an activity level of 24,000 units by considering profit at the rate of 25% on sales.

Solution :

Computation of Overheads :

Variable Overhead per unit $= \frac{\text{Change in Factory Overheads}}{\text{Change in activity legel}}$

$$= \frac{23,70,000 - 22,00,000}{18,000 - 16,000} \text{ or } \frac{25,40,000 - 23,70,000}{20,000 - 18,000}$$

$$= \frac{1,70,000}{2000} = ₹ 85 \text{ per unit}$$

Fixed Overhead

Activity Level = 16,000 units

Particulars	Amount (₹)
Total factory overheads	22,00,000
Less : Variable overheads 16,000 units @ ₹ 85 per unit	13,60,000
Fixed Overhead	8,40,000

Computation of Costs at Activity Level 24,000 units

	Per Unit (₹)	Amount (₹)
Direct Material (12,80,000/16,000)	80.00	19,20,000
Direct Labour (17,60,000/16,000)	110.00	26,40,000
Variable Overhead (As calculated above)	85.00	20,40,000
Fixed Overhead		8,40,000
Total Cost		**74,40,000**

Computation of Selling Price at activity level 24,000 units

Profit required is 25% on selling price, hence cost will be 75%.

Therefore desired profit $= \frac{25 \times 74,40,000}{75} = ₹ 24,80,000$

Cost of 24,000 units	74,40,000

Desired Profit	24,80,000
Total Sales	99,20,000

Selling Price Per Unit = $\frac{\text{Total Sales}}{\text{No of Units}} = \frac{99,20,000}{24,000}$ = ₹ 413.33 or ₹ 413

Question 26

SK Lit. is engaged in the manufacture of tyres. Analysis of income statement indicated a profit of ₹ 150 lakhs on a sales volume of 50,000 units. The fixed costs are ₹ 850 lakhs which appears to be high. Existing selling price is ₹ 3,400 per unit. The company is considering to revise the profit target to ₹ 350 lakhs. You are required to compute :

(i) Break-even point at existing levels in units and in rupees.

(ii) The number of units required to be sold to earn the target profit.

(iii) Profit with 15% increase in selling price and drop in sales volume by 10%.

(iv) Volume to be achieved to earn target profit at the revised selling price as calculated in (ii) above, if a reduction of 8% in the variable costs and ₹ 85 lakhs in the fixed cost is envisaged.

Solution :

Sales Volume 50,000 Units

Computation of existing contribution

Particulars	Per Unit (₹)	Total (₹ in Lakhs)
Sales	3,400	1,700
Fixed Cost	1,700	850
Profit	300	150
Contribution	2,000	1,000
Variable Cost	1,000	700

(i) Break even sales in units = $\frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{8,50,00,000}{2,000}$ = 42,500 units

Break even sales in rupees = 42,500 units X ₹ 3,400 = ₹ 1,445 lakhs

Or

P/V Ratio = $\frac{2,000}{3,400}$ X 100 = 58.82%

B.EP (Rupees) = $\frac{\text{FC}}{\text{P/V Ratio}} = \frac{8,50,00,000}{58,82\%}$ = ₹ 1,445 lakhs (approx.)

(ii) Number of units sold to achieve a target profit of ₹ 350 lakhs :

Desired contribution = Fixed Cost + Target Profit

= 850 L + 350 L = 1,200L

Number of units to be sold = $\frac{\text{Desired Contribution}}{\text{Contribution per unit}} = \frac{12,00,00,000}{2,000}$ = 60,000 units

(iii) Profit if selling price is increased by 15% and sales volume drops by 10% :

Existing Selling Price per unit = ₹ 3,400

Revised Selling price per unit = ₹ 3,400 X 115% = ₹ 3,910

Existing Sales Volume = 50,000 units

Revised sales Volume = 50,000 units – 10% of 50,000 = 45,000 units.

Statement of profit at sales volume of 45,000 units @ ₹ 3910 per unit

Particulars	Per Unit (₹)	Total (₹ in Lakhs)
Sales	3,910.00	1,759.50
Less : Variable Costs	1,400.00	630.00
Contribution	2,510.00	1,129.50
Less : Fixed Cost		850.00
Profit		279.50

(iv) Volume to be achieved to earn target profit of ₹ 350 lakhs with revised selling price and reduction of 8% in variable costs and ₹ 85 lakhs in fixed cost :

Revised selling price per unit = ₹ 3,910

Variable costs per unit existing = ₹ 1,400

Revised Variable Costs

Reduction of 8% in variable costs = ₹ 1,400 – 8% of 1,400

= ₹ 1,400 - ₹ 112

= ₹ 1,288

Total Fixed Cost (existing) = ₹ 850 lakhs

Reduction in fixed cost = ₹ 85 lakhs

Revised fixed cost = ₹ 850 lakhs - ₹ 85 lakhs = ₹ 765 lakhs

Revised Contribution (unit) = Revised selling price per unit – Revised Variable Costs per units

Revised Contribution per unit = ₹ 3,910 - ₹ 1,288 = ₹ 2,622

Desired Contribution = Revised Fixed Cost + Target Profit

= ₹ 765 lakhs + ₹ 350 lakhs = ₹ 1,115 lakhs

No. of units to be sold $= \frac{\text{Desired Contribution}}{\text{Contribution per unit}} = \frac{\text{Rs.1,115 lakh}}{\text{Rs.2,622}}$

= 42,525 units

Question 27

Mega Company has just completed its first year of operations. The unit costs on a normal costing basis are as under :

	(₹)
Direct materials 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) Computer 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.

Solution :

(i) Computation of Unit Cost & Total Income

Unit	Absorption costing (₹)	Marginal Costing (₹)
Direct Material	16.00	16.00
Direct Labour	54.00	54.00
Variable Overhead (₹ 2 + ₹ 20,000/24,000)	12.83	12.83
Fixed Overhead	18.00	--
Unit Cost	100.83	82.83

(iv) Income Statements

Absorption Costing	(₹)
Sales (21,500 units X ₹ 168)	36,12,000
Less : Cost of Goods sold (Refer the working note)	(21,19,917)
	14,92,083
Less : Selling & Distribution Expenses	(11,90,000)
Profit	3,02,083

Marginal Costing	(₹)
Sales (as above)	36,12,000
Less : Cost of goods sold (refer the working note)	(17,80,917)
	18,31,083
Less : Selling & Distribution Expenses	(4,30,000)
Contribution	14,01,083
Less : Fixed Factory and Selling & Distribution Overhead (₹ 3,84,000 + ₹ 7,60,000)	(11,44,000)
Profit	2,57,083

(ii) Under or over absorption of overhead :

	(₹)
Fixed Overhead :	
Budgeted (₹ 4 X 72,000 hours)	4,32,000
Actual (₹ 4,32,000 - ₹ 48,000)	3,84,000
Over-absorption	48,000

Variable Overhead :	
Budgeted (₹ 4 X 72,000 hours)	2,88,000
Actual (₹ 2,88,000 - ₹ 20,000)	3,08,000
Under-absorption	20,000

(iii) Reconciliation of Profit :

Difference in Profit : ₹ 3,02,083 - ₹ 2,57,083 = ₹ 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

Working Note :

Calculation of Cost of Goods Sold

	Absorption Costing	**Marginal Costing**
Direct Materials (₹ 16 X 24,000)	3,84,000	3,84,000
Direct labour (₹ 54 X 24,000)	12,96,000	12,96,000
Variable OH (₹ 12 X 24,000 + ₹ 20,000)	3,08,000	3,08,000
Fixed Overhead (₹ 18 X 24,000)	4,32,000	--
	24,20,000	19,88,000
Add : Opening Stock	--	--
Less : Closing Stock (24,000 – 21,500)	(2,52,083) $\left(\frac{24,20,000}{24,000 \text{ units}} \text{ X } 2,500 \text{ units}\right)$	(2,07,083) $\left(\frac{19,88,000}{24,000 \text{ units}} \text{ X } 2,500 \text{ units}\right)$
Cost of Goods Produced	21,67,917	17,80,917
Add : Adjustment for over/ under absorption	(48,000)	--
Cost of Goods Sold	21,19,917	17,80,917

BUDGETARY CONTROL

16

Question 1.

A company is drawing is production plan for the year 1997-98 i respect of two of its products 'Gamma' and 'Delta'. The company's policy is not t o carry any closing WIP at the end of any month. However, its policy is to hold a closing stock of finished goods at 50% of the anticipated quantity of sales f the succeeding month. For the year 1997-98, the company's budgeted production is 20000 units of "Gamma" and 25000 units of "Delta". The following is the estimated cost data:

	Gamma	Delta
Direct material per unit	Rs. 50	Rs. 80
Direct labour per unit	20	30
Other manufacturing expenses apportion able to each type of product based on production	200000	375000

The estimated units to be sold in the first 7 months of the year 1997-98 are as under:

	April	May	June	July	Aug.	Sept.	Oct.
Gamma	900	1100	1400	1800	2200	2200	1800
Delta	2900	2900	2500	2100	1700	1700	1900

You are required to:

(a) prepare a production budget showing month-wise number of units to be manufactured.

(b) present a summarised production cost budget for the half-year ending 30.9.97.

Question 2.

P. Ltd. manufactures two products using one type of material and one grade of labour. Shown below is an extract fro the company's working papers for the next period's budget:

	Product A	Product B
Budgeted sales (units)	3600	4800
Budgeted material consumption, per product (kg.)	5	3
Budgeted material cost Rs. 12 per kg.		
Standard hours allowed per product	5	4
Budgeted wage rate Rs. 8 per hour		

Overtime premium is 50% and is payable, if a worker works for more than 40 hours a week. There are 90 direct workers.

The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct workers in actually manufacturing the products, is 80% in addition, the non-productive down time is budgeted at 20% of the productive hours worked.

There are twelve 5-day weeks in the budget period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipate that stock at the beginning of the period will be:

Product A 1020 units; Product B 2400 units; Raw material 4300 kgs.

The target closing stock, expressed in terms of anticipated activity during the budget period, it Product A 15 days sales; Product B 20 days sales; Raw materials 10 days consumption.

Required: Calculate the material purchases budget and the wages budget for the direct worker showing the quantities and values, for the next period.

Question 3.

A single product company estimated its sales for the next year quarter wise as under:

Quarter	Sales Units
I	30000
II	37500
III	41250
IV	45000

The opening stock of finished goods is 10000 units and the company expects to maintain the closing stock of finished goods at 16250 units at the end of the year. The production pattern in each quarter is based on 80% of the sales of the current quarter and 20% of the sales of the next quarter.

The opening stock of raw materials in the beginning of the year is 10000 kg. and the closing stock at the end of the year is required to be maintain at 5000 kg. Each unit of finished output requires 2 kg. of raw materials.

The company proposes to purchase the entire annual requirement of raw material in the first three quarters in the proportion and at the prices given below:

Quarter	Purchase of raw materials % to total annual requirement in quantity	Price per kg. Rs.
I	30%	2
II	50%	3
III	20%	4

The value of the opening stock of raw materials in the beginning of the year is Rs. 20000.

You are required to present the following for the next year, quarter wise:

(i) Production budget in units;

(ii) Raw material consumption budget in quantity;

(iii) Raw material purchase budget in quantity and value;

(iv) Priced stores ledger card of the raw material using First-in-First-out method.

Question 4.

The following are the estimated sales of a company for eight months ending 30.11.1998:

Months	Estimated Sales (units)
April '98	12000
May '98	13000
June '98	9000
July '98	8000
August '98	10000
September '98	12000
October '98	14000
November '98	12000

As a matter of policy, the company maintains the closing balance of finished goods and raw materials as follows:

Stock item	Closing balance of a month
Finished goods	50% of the estimated sales for the next month
Raw materials	Estimated consumption for the next month.

Every unit of production requires 2 kg. of raw material costing Rs. 5 per kg.

Prepare Production Budget (in units) and Raw Material Purchase Budget (in units and cost) of the company for the half year ending 30 September, 1998.

Question 5.

Based on the following information, **prepare** a Cash Budget for *ABC Ltd.:*

	1st Quarter (Rs.)	2nd Quarter (Rs.)	3rd Quarter (Rs.)	4th Quarter (Rs.)
Opening cash balance	10000			
Collection from customers	125000	150000	160000	221000
Payments				
Purchase of materials	20000	35000	35000	54200
Other expenses	25000	20000	20000	17000
Salary and wages	90000	95000	95000	109200
Income tax	5000	-	-	-
Purchase of machinery	-	-	-	20000

The company desires to maintain a cash balance of Rs. 15000 at the end of each quarter. Cash can be borrowed or repaid in multiples of Rs. 500 at an interest of 10% per annum. Management does not want to borrow cash more than what is necessary and wants to repay as early as possible. In any event, loans cannot be extended beyond four quarters. Interest is computed and paid when the principal is repaid. Assume that borrowings take place at the beginning and payments are made at the end of the quarters.

Question 6.

Prepare a Cash Budget for the three months ending 30th June, 1986 from the information given below:

(a) Month	Sales (Rs.)	Materials (Rs.)	Wages (Rs.)	Overheads (Rs.)
February	14000	9600	3000	1700
March	15000	9000	3000	1900
April	16000	9200	3200	2000
May	17000	10000	3600	2200
June	18000	10400	4000	2300

(b) Credit items are :

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

Creditor	- Materials	2 months
	- Wages	¼ months
	- Overheads	½ month

(c) Cash and Bank balance on 1st April, 1986 is expected to be Rs. 6000.

(d) Other relevant information is :

(i) Plant and Machinery will be installed in February at a cost of Rs. 96000. The monthly installments of Rs. 2000 is payable from April onwards.

(ii) Dividend @ 5% on Preference Share Capital of Rs. 200000 will be paid on 1st June.

(iii) Advance to be received for sale of vehicles Rs. 9000 in June.

(iv) Dividends from investments amounting to Rs. 1000 are expected to be received in June.

(v) Income tax (advance) to be paid in June, is Rs. 2000.

Question 7. **(I.C.W.A. Inter, June, 1990)**

A factory is currently running at 50% capacity and produces 5000 units at a cost of Rs. 90/- per unit as per details below:

Material	Rs.50	
Labour	15	
Factory Overheads	15	(Rs. 6/- fixed)
Administrative Overheads	10	(Rs. 5/- fixed)

The current selling price is Rs. 100/- per unit.

At 60% working, material cost per unit increases by 2% and selling price per unit falls by 2%.

At 80% working, materials cost per unit increases by 5% and selling price per unit falls by 5%.

Estimate profits of the factory at 60% and 80% working and offer your comments.

Question 8. **(C.S. Inter, December, 1990)**

The monthly budgets for manufacturing overhead of a concern for two levels of activity were as follows:

Capacity	*60%*	*100%*
Budgeted production (units)	600	1000
Wages	Rs. 1200	Rs. 2000
Consumable stores	900	1500
Maintenance	1100	1500
Power and fuel	1600	2000
Depreciation	4000	4000
Insurance	1000	1000
	9800	12000

You are required to:

(i) indicate which of the items are fixed, variable and semi-variable;

(ii) prepare a budget for 80% capacity; and

(iii) find the total cost, both fixed and variable, per unit for output at 60%, 80% and 100% capacity.

Question 9. **May - 2009 CA PCC**

Following is the sales budget for the first six months of the year 2009 in respect to PQR Ltd.:

Months	Jan.	Feb.	March	April	May	June
Sales (units)	10,000	12,000	14,000	15,000	15,000	16,000

Finished goods inventory at the end of each month is expected to be 20% of budgeted sales quantity for the following month. Finished goods inventory was 2,700 units on January 1.2009. There would be no work-in-progress at the of any month.

Each unit of finished product requires two types of materials as detailed below:

Material X : 4 Kgs @ Rs. 10/Kg.

Material Y : 6 Kgs @ Rs. 15/Kg.

Material on hand on January 1, 2009 was 19,000 kgs of material X and 29,000 kgs of material Y. Monthly closing stock of material is budgeted to be equal to half of the requirments of next month's production.

Budgeted direct labour hour per unit of finished product is ¾ hour.

Budgeted direct labour cost for the first quarter of the year 2009 is Rs. 10,89,000.

Actual data for the quarter one, ended on March 31, 2009 is as under :

Actual production quantity : 40,000 units

Direct material cost

(purchase cost based on materials actually issued to production)

Material X : 1,65,000 kgs @ Rs. 10.20/kg

Material Y : 2,38,000 kgs @ Rs. 15.10/kg

Actual direct labour hours worked : 32,000 hours

Actual direct labour cost : Rs. 13,12,000

Required :

(a) Prepare the following budgets ;

- Monthly production quantity budget for the quarter one.
- Monthly raw material consumption quantity budget from January, 2009 to April, 2009.
- Materials purchase quantity budget for the quarter one.

(b) Compute the following variances :

- Material cost variance
- Material price variance
- Material usage variance
- Direct labour cost variance
- Direct labour rate variance

Direct labour efficiency variance.

Question 10. **CA Inter May 1996**

An article passes through five hand operations as follows:

Operation no.	Time per article	Grade of worker	Wage rate per hour
1	15 minutes	A	Re.0.65
2	25 minutes	B	Re.0.50
3	10 minutes	C	Re.0.40
4	30 minutes	D	Re.0.35
5	20 minutes	E	Re.0.30

The factory works 40 hours a week and the production target is 600 dozens per week. Prepare a statement showing for each operation and in total the number of operators required, the labour cost per dozen and the total labour cost per week to produce the total targeted output.

Answer: Cost per dozen - Rs. 8.55, Lab. Cost – Rs. 5130

Question 11

A factory which expects to operate 7,000 hours, i.e., at 70% level of activity, furnishes details of expenses as under:

Variable expenses	₹ 1,260
Semi-variable expenses	₹ 1,200
Fixed expenses	₹ 1,800

The semi-variable expenses go up by 10% between 85% and 95% activity and by 20% above 95% activity. Construct a flexible budget for 80, 90 and 100 per cent activities.

Question 12

A department of Company X attains sale of ₹ 6,00,000 at 80 per cent of its normal capacity and its expenses are given below :

Administration costs: (₹)

Office salaries	90,000
General expenses	2 per cent of sales
Depreciation	7,500
Rates and taxes	8,750
Selling costs :	
Salaries	8 per cent of sales
Travelling expenses	2 per cent of sales
Sales office expenses	1 per cent of sales
General expenses	1 per cent of sales
Distribution costs :	
Wages	15,000
Rent	1 per cent of sales
Other expenses	4 per cent of sales

Draw up flexible administration, selling and distribution costs budget, operating at 90 per cent, 100 per cent and 110 per cent of normal capacity.

Question 13

Action Plan Manufacturers normally produce 8,000 units of their product in a month, in their Machine Shop. For the month of January, they had planned for a production of 10,000 units. Owing to a sudden cancellation of a contract in the middle of January, they could only produce 6,000 units in January.

Indirect manufacturing costs are carefully planned and monitored in the Machine Shop and the Foreman of the shop is paid a 10% of the savings as bonus when in any month the indirect manufacturing cost incurred is less than the budgeted provision.

The Foreman has put in a claim that he should be paid a bonus of ₹ 88.50 for the month of January. The Works Manager wonders how anyone can claim a bonus when the Company has lost a sizeable contract. The relevant figures are as under:

Indirect manufacturing	**Expenses for a normal month**	**Planned for January**	**Actual in costs January**
	(₹)	**(₹)**	**(₹)**
Salary of foreman	1,000	1,000	1,000
Indirect labour	720	900	600
Indirect material	800	1,000	700
Repairs and maintenance	600	650	600
Power	800	875	740
Tools consumed	320	400	300
Rates and taxes	150	150	150
Depreciation	800	800	800
Insurance	100	100	100
	5,290	5,875	4,990

Do you agree with the Works Manager? Is the Foreman entitled to any bonus for the performance in January? Substantiate your answer with facts and figures.

Question 14

ABC Ltd. is currently operating at 75% of its capacity. In the past two years, the levels of operations were 55% and 65% respectively. Presently, the production is 75,000 units. The company is planning for 85% capacity level during 20X3-20X4. The cost details are as follows:

	55% (₹)	65% (₹)	75% (₹)
Direct Materials	11,00,000	13,00,000	15,00,000
Direct Labour	5,50,000	6,50,000	7,50,000
Factory Overheads	3,10,000	3,30,000	3,50,000
Selling Overheads	3,20,000	3,60,000	4,00,000
Administrative Overheads	1,60,000	1,60,000	1,60,000
	24,40,000	28,00,000	31,60,000

Profit is estimated @ 20% on sales.

The following increases in costs are expected during the year :

	In percentage
Direct Materials	8
Direct Labour	5
Variable Factory Overheads	5
Variable Selling Overheads	8
Fixed Factory Overheads	10
Fixed Selling Overheads	15
Administrative Overheads	10

Prepare flexible budget for the period 20X3-20X4 at 85% level of capacity. Also ascertain profit and contribution.

Question 15

A company is engaged in the manufacture of specialised sub-assemblies required for certain electronic equipments. The company envisages that in the forthcoming month, December, 20X2, the sales will take a pattern in the ratio of 3 : 4 : 2 respectively of subassemblies, ACB, MCB and DP.

The following is the schedule of components required for manufacture:

			Component requirements		
Sub-assembly	**Selling price**	**Base board**	**IC08**	**IC12**	**IC26**
ACB	520	1	8	4	2
MCB	500	1	2	10	6
DP	350	1	2	4	8
Purchase price (₹)		60	20	12	8

The direct labour time and variable overheads required for each of the sub-assemblies are:

	Labour hours per sub-assembly		
	Grade A	**Grade B**	**Variable overheads per sub-assembly (₹)**
ACB	8	16	36
MCB	6	12	24
DP	4	8	24

Direct wage rate per hour (₹)	5	4	—

The labourers work 8 hours a day for 25 days a month.

The opening stocks of sub-assemblies and components for December, 20X2 are as under:

Sub-assemblies		Components	
ACB	800	Base Board	1,600
MCB	1,200	IC08	1,200
DP	2,800	IC12	6,000
		IC26	4,000

Fixed overheads amount to ₹ 7,57,200 for the month and a monthly profit target of ₹ 12 lacs has been set.

The company is eager for a reduction of closing inventories for December, 20X2 of subassemblies and components by 10% of quantity as compared to the opening stock. Prepare the following budgets for December 20X2 :

(i) Sales budget in quantity and value.

(ii) Production budget in quantity

(iii) Component usage budget in quantity.

(iv) Component purchase budget in quantity and value.

(v) Manpower budget showing the number of workers and the amount of wages payable.

Question 16

Float glass Manufacturing Company requires you to present the Master budget for the next year from the following information:

Sales :

Toughened Glass	₹ 6,00,000
Bent Glass	₹ 2,00,000
Direct material cost	60% of sales
Direct wages	20 workers @ ₹ 150 per month
Factory overheads :	
Indirect labour –	
Works manager	₹ 500 per month
Foreman	₹ 400 per month
Stores and spares	2.5% on sales
Depreciation on machinery	₹ 12,600
Light and power	₹ 3,000
Repairs and maintenance	₹ 8,000
Others sundries	10% on direct wages
Administration, selling and distribution expenses	₹ 36,000 per year

Question 17

S Ltd. has prepared budget for the coming year for its two products A and B.

	Product A (₹)	Product B (₹)
Production & Sales unit	6,000 units	9,000 units
Raw material cost per unit	60.00	42.00
Direct labour cost per unit	30.00	18.00
Variable overhead per unit	12.00	6.00

Fixed overhead per unit	8.00	4.00
Selling price per unit	120.00	78.00

After some marketing efforts, the sales quantity of the Product A & B can be increased by 1,500 units and 500 units respectively but for this purpose the variable overhead and fixed overhead will be increased by 10% and 5% respectively for the both products.

You are required to prepare flexible budget for both the products:

(a) Before marketing efforts

(b) After marketing efforts.

Question 18

XY Co. Ltd. manufactures two products viz., X and Y and sells them through two divisions, East and West. For the purpose of Sales Budget to the Budget Committee, following information has been made available for the year 2014-15 :

Product	Budgeted Sales		Actual Sales	
	East Division	West Division	East Division	West Division
X	400 units at ₹ 9	600 units at ₹ 9	500 units at ₹ 9	700 units at ₹ 9
Y	300 units at ₹ 21	500 units at ₹ 21	200 units at ₹ 21	400 units at ₹ 21

Adequate market studies reveal that product X is popular but under priced. It is expected that if the price of X is increased by ₹ 1, it will, find a ready market. On the other hand, Y is overpriced and if the price of Y is reduced by ₹ 1 it will have more demand in the market. The company management has agreed for the aforesaid price changes. On the basis of these price changes and the reports of salesmen, following estimates have been prepared by the Divisional Managers :

Percentage increase in sales over budgeted sales

Product	East Division	West Division
X	+10%	+5%
Y	+20%	+10%

With the help of intensive advertisement campaign, following additional sales (over and above the above mentioned estimated sales by Divisional Manages) are possible :

Product	East Division	West Division
X	60 units	70 units
Y	40 units	50 units

You are required to prepare Sales Budget for 2015-16 after incorporating above estimates and also show the Budgeted Sales and Actual Sales of 2014-15.

Question 19

G Ltd. manufactures two products called 'M' and 'N'. Both products use a common raw material Z. The raw material Z is purchased @ ₹ 36 per kg from the market. The company has decided to review inventory management policies for the forthcoming year.

The following forecast information has been extracted from departmental estimates for the year ended 31st March 2016 (the budget period) :

	Product M	Product N
Sales (Units)	28,000	13,000
Finished goods stock increase by year-end	320	160
Post-production rejection rate (%)	4	6
Material Z usage (per completed unit, net of wastage)	5 kg	6 kg
Material Z wastage (%)	10	5

Additional information :

- Usage of raw material Z is expected to be at a constant rate over the period.
- Annual cost of holding one unit of raw material in stock is 11% of the material cost.
- The cost of placing an orders is ₹ 320 per order.
- The management of G Ltd. has decided that there should not be more than 40 orders in a year of the raw material Z.

Required :

(a) Prepare functional budgets for the year ended 31st march 2016 under the following headings :

(i) Production budget for Products M and N (in units)

(ii) Production budget for Material Z (in kgs and value)

(b) Calculate the Economic Order Quantity for Material Z (in kgs)

(c) If there is a sole supplier for the raw material Z in the market and the supplier do not sale more than 4,000 kg. of material Z at a time. Keeping the management purchase policy and production quantity mix into consideration, calculate the maximum number of units of Product M and N that could be produced.

Question 20

A Light Motor Vehicle manufacturer has prepared sales budget for the next few months, and the following draft figures are available:

Month	No. of vehicles
October	4,000
November	3,500
December	4,500
January	6,000
February	6,500

To manufacture a vehicle a standard cost of ₹ 2,85,700 is incurred and sold through dealers at an uniform selling price of ₹ 3,95,600 to customers. Dealers are paid 12.5% commission on selling price on sale of a vehicle.

Apart from other materials four units of Part-X are required to manufacture a vehicle. It is a policy of the company to hold stocks of Part-X at the end of the each month to cover 40% of next month's production. 4,800 units of Part-X are in stock as on 1st October.

There are 950 nos. of completed vehicles are in stock as on 1st October and it is policy to have stocks at the end of each month to cover 20% of the next month's sales.

You are required to :

(d) Prepare Production budget (in nos.) for the month of October, November, December and January.

(e) Prepare a Purchase budget for Part-X (in units) for the months of October, November and December.

(f) Calculate the budgeted gross profit for the quarter October to December.

Solution :

(a) Preparation of Production Budget (in nos.)

	October	November	December	January
Demand for the month (Nos.)	4,000	3,500	4,500	6,000
Add : 20% of next month's demand	700	900	1,200	1,300
Less : Opening Stock	(950)	(700)	(900)	(1,200)
Vehicles to be produced	3,750	3,700	4,800	6,100

(b) Preparation of Production Budget for Part-X

	October	November	December
Production for the month (Nos.)	3,750	3,700	4,800
Add : 40% of next month's Production	1,480 (40% of 3,700)	1,920 (40% of 4,800)	2,440 (40% of 6,100)
	5,230	5,620	7,240
No. of units required for production	20,920 (5,230 X 4 units)	22,480 (5,620 X 4 units)	28,960 (7,240 X 4 units)
Less : Opening Stock	(4,800) d	(5,920) (1,480 X 4 units)	(7,680) (1,920 X 4 units)
No. of units to be purchased	16,120	16,560	21,280

(c) Budgeted Gross Profit for the Quarter October to December

	October	November	December	Total
Sales in Nos.	4,000	3,500	4,500	12,000
Net Selling Price per unit*	₹ 3,46,150	₹ 3,46,150	₹ 3,46,150	
Sales Revenue (₹ in lakh)	13,846	12,115.25	15,576.75	41,538
Less : Cost of Sales (₹ in lakh) (Sales Unit X Cost per unit)	11,428	9,999.50	12,856,50	34,284
Gross Profit (₹ in lakh)	2,418	2,115.75	2,720.25	7,254

* Net Selling price unit = ₹ 3,95,600 – 12.5% commission on ₹ 3,95,600 = ₹ 3,46,150.