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COSTING WORK BOOK

BY

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Prof. Dani Khandelwal is a Chartered Accountant and practising International Cost Consultant.

He conducts Cost Accountancy and OR lectures, face to face in Mumbai.

He has been a visiting faculty at WIRC Mumbai, Goa and Gujarat. Visiting Faculty at Bombay Chartered Accountants Society (BCAS).

He has given coaching to thousands of students; he is into Coaching since last 15 years.

His teaching method is so simplified that over a period the Cost Accountancy subject is known amongst students as Dani ki Costing.

He is available to students 365 days a year on phone also.

He has written several Books on Cost Accountancy, Operations Research and Financial Management.

For Final year students he has prepared Video Lectures and Hard book (Full course), Last Minute Revision (LMR) Video Lectures and Hard book, Practice Manual (PM) Hard book.

I recommend him as a true friend of all CA students.

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COST ACCOUNTING

CA Inter New Course

Paper-3 Group-I

Author
Prof. Dani Khandelwal (CA)

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DKC INTER SABKUCH
It's A Full COURSE
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DANI KI COSTING
MOBILE No.-9820030925

COSTING

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CHAPTER 1

MATERIAL

Question 1

The following details apply to annual budget for a manufacturing company :

Quarter	1st	2nd	3rd	4th
Working days	65	60	55	60
Production (units per working day)	100	110	120	105
Raw materials purchases				
(% by weight of annual total)	30%	50%	20%	--
Budgeted purchase price (per kg.)	Rs. 1	1.05	1.125	--

Quantity of raw material per unit production : 2 kg.

Budgeted opening stock material.. 4,000 kg. (cost Rs. 4,000)

Budgeted closing stock of raw material : 2,000 kg.

Issues are priced of FIFO basis.

Calculate the following budgeted figures :

(a) Quarterly and annual purchases of raw material, by weight and value.

(b) Closing quarterly stock by weight and value.

Question 2

Oil India is a bulk distributor of high octane petrol. A periodic inventory of petrol on hand is taken when the books are closed at the end of each month. The following summary of information for the month of June 2016 was available.

	Rs.
Sales	9,45,000
General Administrative Cost	25,000

Opening stock : 1,00,000 litres @ Rs. 3 per Ltr.

Purchases

June 1. 2,00,000 litres @ Rs. 2.85 per Ltr.

June 30. 1,00,000 litres @ Rs. 3.03 per Ltr.

June 30. 130,000
Cel. Stock)

Compute the following data by the first-in-first out. Weighted average and last in first out method of inventory costing.

(a) Value of Inventory on June 30.

(b) Amount of the cost of goods sold for June.

(c) Profit or loss for June.

Question 3

The particulars relating to the import of Sealing Ring made by AB & Co., during December, 2016 are given below :

(a) Sealing Ring-1,000 pieces invoiced @ UK£2.00 C.I.F., Bombay Port.

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

(c) Clearing charges-Rs. 1,800 for the entire consignment, and

(d) Freight charges-Rs. 1,400 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 scarp 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.

Calculate :

(a) Total cost of material, and

(b) Unit cost of material issued to production.

Also state briefly how the value of 100 pieces rejected in inspection will be treated in costs.

Question 4

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

	Rs.
Chemical A : 3,000 kg. @ Rs. 4.20 per kg.	12,600
Chemical B : 5,000 kg. @ Rs. 3.80 per kg.	19,000
Chemical C : 2,000 kg. @ Rs. 4.75 per kg.	9,500
Sales Tax	2,055
Railway Freight	1,000
Total Cost	44,155

DKC

A shortage of 200 kg. in Chemical A, of 280 kg. in Chemical B and of 100 kg. in Chemical C was noticed due to breakages. At Surat, the manufacturer paid Octroi duty @Rs. 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 chemical assuming a provision of 5% towards further deterioration.**

Question 5

A Manufacturer buys certain equipment from outside suppliers at Rs. 30 per unit. Total annual needs are 800 units.

The Following further data are available :

Annual return on investment 10%

Rent, Insurance, taxes per unit per year Re. 1

Cost of placing an order Rs. 100

Determine economic order quantity.

Question 6

G Ltd. produces product which has a monthly demand of 4,000 units. The product requires a component X which is purchased at Rs. 20. For every finished product, one unit of component is required. The ordering cost is Rs. 120 per order and the holding cost is 10% p.a. :

You are required to calculate:

(i) Economic order quantity

(ii) If the minimum lot size to be supplied is 4,000 units, what is the extra cost, the company has to incur?

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

Question 7

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

	Rs.
Purchase Price Per Component	200
Cost of an Order	100
Annual Cost of Carrying one Unit 10% of Purchase in Inventory Price	
Total Cost of carrying 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 2,000 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 discount policy.]

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

Question 8

(a) EXE Limited has received an offer of quantity discounts on its order of materials as under:-

Price per tonne	Tonnes
Rs.	Nos.
1,200	Less than 500
1,180	500 and less than 1,000
1,160	1,000 and less than 2,000
1,140	2,000 and less than 3,000
1,120	3,000 and above.

The annual requirement for the material is 5,000 tonnes. The ordering cost per order is Rs. 1,200 and the stock holding is estimated to 20% of material cost per annum. **You are required to compute the most economical purchase level.**

(b) What will be your answer to the above question if there are no discounts offered and the price per tonne is Rs. 1,500?

Question 9

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

Price per tonne	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 to 25% of the material cost per annum.

Required:

i. Compute the most economical purchase level.

ii. Compute EOQ if there are no quantity discounts and the price per tonne is Rs. 10,500.

Question 10

The conco company used 12,000 switches per year supplied ordinarily at a price of Rs. 3.00 per item, carrying cost are 16% of the value of the average inventory and ordering costs are Rs. 20 per order.

Order Size	Price per item
Less than 2,000	Rs. 3
2,000 to 3,999	Rs. 2.92
4000 or more	Rs. 2.90

Which is the most economic order size?

Question 11 (Job and Batch Costing)

X Ltd. is committed to supply 24,000 bearings per annum to Y Ltd. on a steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the setup cost per run of bearing is Rs. 324.

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

(b) Assuming that the company has a policy of manufacturing 6,000 bearing per run, how much extra cost the company would be incurring as compared to the optimum run suggested in (a) above?

(c) What is the minimum inventory holding cost?

Question 12

Two components A & B are used as follows :

Normal usage	= 50 per week each
Reordering quantity	= A-300, B-500
Maximum usage	= 75 per week each
Minimum usage	= 25 per week each

Lead Time : A-4 to 6 weeks, B-2 to 4 weeks

Calculate for each component

(a) Re-ordering level (b) Minimum level

(c) Maximum level (d) Average stock level

Question 13

A company manufactures 5000 units of a product per month. The cost of placing an order is Rs. 100. The purchase price of the raw material is Rs. 10 per kg. The re-order period is 4 to 8 weeks. The consumption of raw materials varies from 100 kg to 450 kg per week, the average consumption being 275 kg. The carrying cost of inventory is 20% per annum.

You are required to calculate :

(i) Re-order quantity (ii) Re-order level (iii) Maximum level (iv) Minimum level (v) Average stock level.

Question 14

M/s. Tubes Ltd. are the manufacturers of picture tubes for T.V. The following are the details of their operation during 2016:

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 quarterly 1,500 units at a discount of 5%, is it worth accepting?

(2) Maximum Level of the stock

(3) Minimum Level of the stock

(4) Reorder Level

Question 15

PQR Tubes Ltd. are the manufacturers of picture tubes for T.V. The following are the details of their operations during 2015-2016:

Ordering cost	Rs. 100 per order
Inventory carrying cost	20% p.a.
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

Required:

(i) Economic order quantity. If the supplier is willing to supply quarterly 1,500 units at a discount of 5%, is it worth accepting?

(ii) Re-order level

(iii) Maximum level of stock

(iv) Minimum level of stock

Question 16

From the details given below, calculate:

(i) Re- ordering Level

(ii) Maximum Level

(iii) Minimum Level

(iv) Danger Level

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

Cost of placing a purchase order is Rs. 20.

Number of uits to be purchased during the year is 5,000.

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 5 days. For emergency purchases 4 days.

Rate of Consumption: Average : 15 units per day, Maximum:20 units per day.

CHAPTER 2

MATERIAL COST

LEARNING OUTCOMES

- ☐ State the meaning, need and importance of material.
- ☐ Discuss the procedures and documentations involved in procuring, storing and issuing material.
- ☐ Discuss the various inventory control techniques and determination of various stock levels.
- ☐ Compute Economic Order Quantity (EOQ) and apply it to determine the optimum order quantity.
- ☐ Discuss the various methods of inventory accounting and Prepare stock ledger/ account.
- ☐ Identify and explain normal and abnormal loss and its accounting treatment.

ILLUSTRATION 1

An invoice in respect of a consignment of chemicals A and B provides the following information :

	(₹)
Chemical A: 10,000 kgs. at ₹ 10 per kg.	1,00,000
Chemical B: 8,000 kgs. at ₹ 13 per kg.	1,04,000
Basic custom duty @ 10% (Credit is not allowed)	20,400
Railway freight	3,840
Total cost	2,28,240

A shortage of 500 kgs. in chemical A and 320 kgs. in chemical B is noticed due to normal breakages. You are required to determine the rate per kg. of each chemical, assuming a provision of 2% for further deterioration.

(ILL-1 / 2.13)

STEP NO(1) STATEMENT SHOWING NET QTY AVAILABLE FOR ISSUE

CHEMICAL	A	B
QTY - PURCHASED	10000 kg	8000 kg
SHORTAGE (NORMAL WT)	(500)	(320)
QTY AVAILABLE (NET)	9500 "	7680 "
=	(190)	(153·60)
FURTHER-LOSS 2%	(9500 X 2%)	(7680 X 2%)
	9310 "	7526.40

STEP NO(2) STATEMENT SHOWING TOTAL COST / PER KG / COST PER KG

	A	B
PURCHASE COST	100000	104000
CUSTOM DUTY 10%	10000	10400
RAILY-WAY FREIGHT 3840	2133	1707
10000 kg : 9009		
TOTAL COST	112133	116107
QTY	÷ 9310	÷ 7526.40
	@ 12.04	15.43

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Date

ILLUSTRATION 2

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	(₹)
200 units Part No. A 32 @ ₹ 5	1,000.00
Less : 20% discount	(200.00)
	800.00
Add : SGST @ 12%	96.00
	896.00
Add : Packing charges (5 non-returnable boxes)	50.00
	946.00

(i) *A 2 per cent cash discount will be given if payment is made in 30 days.*

(ii) *Documents substantiating payment of SGST is enclosed for claiming Input credit.*

(QNo-2 2.13) STATEMENT SHOWING COST PER UNIT

	Rs
NET- PURCHASE PRICE	800
(i) (INPUT-CREDIT IS AVAILABLE FOR SGST PAID HENCE IT WILL NOT BE ADDED TO PURCHASE COST)	
(ii) CASH- DISCOUNT IS TREATED AS INTEREST AND FINANCE CHARGES HENCE ITS NOT CONSIDERD FOR VALUATION OF MATERIAL)	
ADD:- PACKING CHARGES	50
	850
÷ NO OF UNITS PURCHASED	÷200
COST-PER UNIT =	4.25

ILLUSTRATION 3

Calculate the Economic Order Quantity from the following information. Also state the number of orders to be placed in a year.

Consumption of materials per annum	:	*10,000 kg.*
Order placing cost per order	:	*₹ 50*
Cost per kg. of raw materials	:	*₹ 2*
Storage costs	:	*8% on average inventory*

(ILL-3 / 2.20)

$$E.O.Q = \sqrt{\frac{2AO}{C}}$$

A = ANNUAL CONSUMPTION = 10000 kg

O = ORDERING COST = 50

C = CARRYING COST = (2 × 8%) = .16

$$E.O.Q = \sqrt{\frac{2 \times 10000 \times 50}{.16}}$$

$$= 2500 \text{ kg}$$

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(ILL-4)

ILLUSTRATION 4

(i) Compute E.O.Q. and the total variable cost for the following:

Annual Demand	=	*5,000 units*
Unit price	=	*₹ 20.00*
Order cost	=	*₹ 16.00*
Storage rate	=	*2% per annum*
Interest rate	=	*12% per annum*
Obsolescence rate	=	*6% per annum*

(ii) Determine the total cost that would result for the items if an incorrect price of ₹ 12.80 is used.

(ILL-4 / 2.2) NOTANS(i) ANSNO (i)

A = ANNUAL CONSUMPTION = 5000 UNITS
O = ORDERING COST = 16.00
C = CARRING COST = (20% X 20) = 4

STORAGE COST 2% | INT-COST 12% | OBS-COST 6%

$$E.O.Q = \sqrt{\frac{2 \times 5000 \times 16}{4}} = 200 \text{ UNITS}$$

ANSNO (ii)
CARRYING COST (12.80 X 20%) = 2.56

$$E.O.Q = \sqrt{\frac{2 \times 5000 \times 16}{2.56}} = 250$$

(ILL-5 / 2.23) — (DKC-INTER / QNo-12 / 5)

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5. (a) EXE Limited has received an offer of quantity discounts on its order of materials as under:

Price per ton (₹)	Ton (Nos.)
1,200	Less than 500
1,180	500 and less than 1,000
1,160	1,000 and less than 2,000
1,140	2,000 and less than 3,000
1,120	3,000 and above.

The annual requirement for the material is 5,000 tons. The ordering cost per order is ₹ 1,200 and the stock holding cost is estimated at 20% of material cost per annum. You are required to compute the most economical purchase level.

(b) What will be your answer to the above question if there are no discounts offered and the price per ton is ₹1,500?

(ILL-6 / 2.24) ⟶ (DKC-INTER / QNo-16)

ILLUSTRATION 6

From the details given below, calculate:

(i) Re-ordering 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 purchase order is ₹ 20

Number of units to be purchased during the year is 5,000

Purchase price per unit inclusive of transportation cost is ₹ 50

Annual cost of storage per units is ₹ 5.

Details of lead time : *Average- 10 days, Maximum- 15 days, Minimum-5 days.*
For emergency purchases- 4 days.

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

ILL-7
Material cost END

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ILLUSTRATION 7

M/s Tyrotubes trades in four wheeler tyres and tubes. It stocks sufficient quantity of tyres of almost every vehicle. In year end 20X1-X2, the report of sales manager revealed that M/s Tyrotubes experienced stock-out of tyres.

The stock-out data is as follows :

Stock-out of Tyres	No. of times
100	2
80	5
50	10
20	20
10	30
0	33

M/s Tyrotubes loses ₹ 150 per unit due to stock-out and spends ₹ 50 per unit on carrying of inventory.

Determineoptimum safest stock level.

IL-7

STOCK OUT	100	80	50	20	10	10	TOTAL
NOS	2	5	10	20	30	33	100
PROB	.02	.05	.10	.20	.30	.3	1.00

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STATEMENT SHOWING STOCK OUT INV CARRYING COST

SAFETY STOCK LEVEL	STOCK OUT UNITS	PROB	STOCK OUT COST STOCK OUT UNITS X 150	EXP-STOCK OUT COST (COST X PROB)	INV CARRYING COST	TOTAL COST
					5000	5000
100	0	-	-	-	(100 X 50)	
80	20	.02	3000 (20 X 150)	60 (3000 X .02)	4000 (80 X 50)	4060
50	50	.02	7500	(7500 X .02) = 150	50 X 50	
	30	.05	4500	(4500 X .05) = 225	= 2500	
				375	2500	2875
20	80	.02	12000	240	20 X 50	
	60	.05	9000	450	= 1000	
	30	.10	4500	450		
			25500	1140	1000	2140
10	90	.02	13500	270	(10 X 500)	
	70	.05	10500	525		
	40	.10	6000	600		
	10	.20	1500	300		
				1695	500	2195
0	100	.02	15000	300		
	80	.05	12000	600		
	50	.10	7500	750		
	20	.20	3000	600		
	10	.30	1500	450		

ILLUSTRATION 8

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

Item	Units	Unit cost (₹)
1	7,000	5.00
2	24,000	3.00
3	1,500	10.00
4	600	22.00
5	38,000	1.50
6	40,000	0.50
7	60,000	0.20
8	3,000	3.50
9	300	8.00
10	29,000	0.40
11	11,500	7.10
12	4,100	6.20

→ Cont....

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A·B·C. ANALYSIS

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STATEMENT SHOWING TOTAL COST RANK

ITEM	UNITS	% TOTAL UNITS	UNIT COST	TOTAL COST	% TOTAL COST	RANK
1	7000	3·1963%	5·00	35000	9·838%	4
2	24000	10·9589%	3·00	72000	20·23%	2
3	1500	·6849%	10·00	15000	4·2162%	7
4	600	·2740%	22·00	13200	3·7103%	8
5	38000	17·3515%	1·50	57000	16·0216%	3
6	40000	18·26%	·50	20000	5·6216%	6
7	60000	27·3973%	·20	12000	3·3730%	9
8	3000	1·3699%	3·50	10500	2·9513%	11
9	300	·1369%	8·00	2400	·6746%	12
10	29000	13·2420%	·40	11600	3·2605%	10
11	11500	5·2512%	7·10	81650	22·9502%	1
12	4100	1·8723%	6·20	25420	7·1451%	5
	219000			355720	100%	

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Basis for selective control (Assumed)

₹ 50,000 & above -- 'A' items

₹ 15,000 to 50000 -- 'B' items

Below ₹ 15,000 -- 'C' items

On this basis, a plan of A B C selective control is given below:

Ranking	Item Nos.	% of Total units	Cost (₹)	% of Total Cost	Category
1	11	5.2512	81,650	22.9502	
2	2	10.9589	72,000	20.2378	
3	5	17.3516	57,000	16.0216	
Total	**3**	**33.5617**	**2,10,650**	**59.2096**	**A**
4	1	3.1963	35,000	9.8378	
5	12	1.8721	25,420	7.1451	
6	6	18.2648	20,000	5.6216	
7	3	0.6849	15,000	4.2162	
Total	**4**	**24.0181**	**95,420**	**26.8207**	**B**
8	4	0.2740	13,200	3.7103	
9	7	27.3973	12,000	3.3730	
10	10	13.2420	11,600	3.2605	
11	8	1.3699	10,500	2.9513	
12	9	0.1370	2,400	0.6746	
Total	**5**	**42.4202**	**49,700**	**13.9697**	**C**
Grand Total	12	100	3,55,770	100	

(1) Advantages of ABC analysis : The advantages of ABC analysis are the following:

(i) *Continuity in production* : It ensures that, without there being any danger of interruption of production for want of materials or stores, minimum investment will be made in inventories of stocks of materials or stocks to be carried.

(ii) *Lower cost* : The cost of placing orders, receiving goods and main-taining stocks is minimised specially if the system is coupled with the determination of proper economic order quantities.

(iii) *Less attention required* : Management time is saved since attention need be paid only to some of the items rather than all the items as would be the case if the ABC system was not in operation.

(iv) *Systematic working* : With the introduction of the ABC system, much of the work connected with purchases can be systematized on a routine basis to be handled by subordinate staff.

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ILLUSTRATION 9

A factory uses 4,000 varieties of inventory. In terms of inventory holding and inventory usage, the following information is compiled:

No. of varieties of inventory	%	% value of inventory holding (average)	% of inventory usage(in end-product)
3,875	96.875	20	5
110	2.750	30	10
15	0.375	50	85
4,000	100.00	100	100

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

IU-9

SOLUTION

Classification of the items of inventory as per ABC analysis

1. 15 number of varieties of inventory items should be classi¬fied as 'A' category items because of the following reasons:
   (i) Constitute 0.375% of total number of varieties of inventory handled by stores of factory, which is minimum as per given classification in the table.
   (ii) 50% of total use value of inventory holding (average) which is maximum according to the given table.
   (iii) Highest in consumption about 85% of inventory usage (in end-product).
2. 110 number of varieties of inventory items should be classified as 'B' category items because of the following reasons:
   (i) Constitute 2.750% of total number of varieties of inventory items handled by stores of factory.
   (ii) Requires moderate investment of about 30% of total use value of inventory holding (average).
   (iii) Moderate in consumption about 10% of inventory usage (in end-product).
3. 3,875 number of varieties of inventory items should be classified as 'C' category items because of the following reasons:
   (i) Constitute 96.875% of total varieties of inventory items handled by stores of factory.
   (ii) Requires about 20% of total use value of inventory holding (average).
   (iii) Minimum inventory consumption i.e. about 5% of inventory usage (in end-product).

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ILLUSTRATION 10

The following data are available in respect of material X for the year ended 31st March, 20X1.

	(₹)
Opening stock	*90,000*
Purchases during the year	*2,70,000*
Closing stock	*1,10,000*

Calculate :

(i) Inventory turnover ratio, and

(ii) The number of days for which the average inventory is held.

(ILL-10 / 2.35)

INVENTORY TURNOVER RATIO = (COST OF RAW MATERIAL CONSUMED / AVG-STOCK-OF RAW MATERIAL)

	₹.
OPENING STOCK	90000
PURCHASE	270000
CLOSING STOCK	(110000)
	250000

AVG-STOCK = (90000 + 110000 / 2)

= 100000

(250000 / 100000) = 2.5 (TIMES)

AVG-NUMBER OF DAYS FOR (365)

(ILL-11)

ILLUSTRATION 11

From the following data for the year ended 31st December, 20X1, calculate the inventory turnover ratio of the two items and put forward your comments on them.

	Material A (₹)	Material B (₹)
Opening stock 1.1.20X1	10,000	9,000
Purchase during the year	52,000	27,000
Closing stock 31.12.20X1	6,000	11,000

	₹	₹.
MATERIAL CONS		
OPEN-STOCK	10000	9000
PURCHASE	52000	27000
CLOSING STOCK	(6000)	(11000)
CONSUMPTION	56000	25000
Avg-STOCK (INVENTORY)	$\left(\frac{10000+6000}{2}\right)$	$\left(\frac{9000+11000}{2}\right)$
	= 8000	= 10000
INVENTORY/TURNOVER RATIO $\left(\frac{\text{CONSUMPTION}}{\text{Avg-STOCK}}\right)$	$\left(\frac{56000}{8000}\right)$	$\left(\frac{25000}{10000}\right)$
	= 7.000 TIMES	= 2.5 TIMES
INV-TURNO	$\left(\frac{365}{7}\right)$	$\left(\frac{365}{2.5}\right)$
	= 52 Days	= 146

ILLUSTRATION 12

The following transactions in respect of material Y occurred during the six months ended 30th June, 20X1:

Month	Purchase (units)	Price per unit (₹)	Issued units
January	200	25	Nil
February	300	24	250
March	425	26	300
April	475	23	550
May	500	25	800
June	600	20	400

Required:

(a) The Chief Accountant argues that the value of closing stock remains the same no matter which method of pricing of material issues is used. Do you agree? Why or why not? Detailed stores ledgers are not required.

(b) When and why would you recommend the LIFO method of pricing material issues?

SOLUTION

(a) The Closing Stock at the end of six months' period i.e., on 30th June, 20X1 will be 200 units, whereas up to the end of May 20X1, total purchases coincide with the total issues i.e., 1,900 units. It means that at the end of May 20X1, there was no closing stock. In the month of June 20X1, 600 units were purchased out of which 400 units were issued. Since there was only one purchase and one issue in the month of June, 20X1 and there was no opening stock on 1st June 20X1, the Closing Stock of 200 units is to be valued at ₹ 20 per unit.

In view of this, the argument of the Chief Accountant appears to be correct. Where there is only one purchase and one issue in a month with no opening stock, the method of pricing of material issues becomes irrelevant. Therefore, in the given case one should agree with the argument of the Chief Accountant that the value of Closing Stock remains the same no matter which method of pricing the issue is used.

It may, however, be noted that the argument of Chief Accountant would not stand if one finds the value of the Closing Stock at the end of each month.

(b) LIFO method has an edge over FIFO or any other method of pricing material issues due to the following advantages:

(i) The cost of the materials issued will be either nearer or will reflect the current market price. Thus, the cost of goods produced will be related to the trend of the market price of materials. Such a trend in price of materials enables the matching of cost of production with current sales revenues.

(ii) The use of the method during the period of rising prices does not reflect undue high profit in the income statement, as it was under the first-in-first-out or average method. In fact, the profit shown here is relatively lower because the cost of production takes into account the rising trend of material prices.

(iii) In the case of falling prices, profit tends to rise due to lower material cost, yet the finished products appear to be more competitive and are at market price.

(iv) During the period of inflation, LIFO will tend to show the correct profit and thus, avoid paying undue taxes to some extent.

ILLUSTRATION 13

The following information is provided by Sunrise Industries for the fortnight of April, 20X1:

Material Exe:

Stock on 1-4-20X1 100 units at ₹ 5 per unit.

Purchases

5-4-20X1, 300 unitsat ₹ 6

8-4-20X1, 500 unitsat ₹ 7

12-4-20X1, 600unitsat ₹ 8

Issues

6-4-20X1, 250 units

10-4-20X1, 400units

14-4-20X1, 500units

Required:

(A) Calculate using FIFO and LIFO methods of pricing issues:

(a) the value of materials consumed during the period

(b) the value of stock of materials on 15-4-20X1.

(B) Explain why the figures in (a) and (b) in part A of this question are different under the two methods of pricing of mate¬rial issues used. You need not draw up the Stores Ledgers.

ANS NO - A (9) (F.I.F.O)

STATEMENT SHOWING STORES LEDGER.

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Date

	PURCHASES			ISSUED			CLOSING STOCK		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
1-4	100 (opening)	5	500	100	5	500			
5-4	300	6	1800	150	6	900	150	6	900
8-4	500	7	3500	150	6	900			
				250	7	1750	250	7	1750
12-4	600	8	4800				250	7	1750
							600	8	4800
14-4				250	7	1750			
				250	8	2000			
							350	8	2800
				1150		7800			

MATERIAL CONSUMED = 7800

CLOSING STOCK = 2800

ANS NO A (b) LIFO

STATEMENT SHOWING STORES LEDGER

	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
1-4	100 (op-5700)	5	500	—	—	—	100	5	500
5-4	300	6	1800	250	6	1500	100	5	500
6-4							50	6	300
8-4	500	7	3500				100	5	500
							50	6	300
							500	7	3500
10-4	—	—	—				100	5	500
				400	7	2800	50	6	300
							100	7	700
12-4	600	8	4800				100	5	500
							500	6	300
									~~4800~~
							100	7	700
							600	8	4800
14-4			—	800	8	4000	100	5	500
							50	6	300
							100	8,7	~~8000~~ 700
							100	8	800
							350		2300
				1150		8300			

FIFO

	Qty	Rate	Amt
6-4	100	5	500
	150	6	900
10-4	150	6	900
	250	7	1750
14-4	250	7	1750

LIFO

Qty	Rate	Amt
250	6	1500
400	7	2800

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Date

Example: During the month of April, a company has made five purchases as follows:

1st April, 200 units @ ₹10 each;

5th April, 150 units @ ₹12 each;

14th April, 210 units @ ₹12 each;

21st April, 50 units @ ₹15 each and

28th April, 140 units @ ₹11 each.

The issue price under Simple Average Price Method would be calculated as below:

$$\frac{₹10 + ₹12 + ₹12 + ₹15 + ₹11}{5 \text{ lots}} = ₹12 \text{ each}$$

$$\text{Avg Price (P-U)} = \left(\frac{10 + 12 + 12 + 15 + 11}{5}\right)$$

$$= 12.00$$

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Date

Example: During the month of April, a company has made five purchases as follows:

1st April, 200 units @ ₹10 each;

5th April, 150 units @ ₹12 each;

14th April, 210 units @ ₹12 each;

21st April, 50 units @ ₹15 each and

28th April, 140 units @ ₹11 each.

The issue price under Weightage Average Price Method would be calculated as below:

$$\frac{\{(₹\,10\times 200\text{units})+(₹\,12\times 150\text{units})+(₹\,12\times 210\text{units})+(₹\,15\times 50\text{units})+(₹\,11\times 140\text{units})\}}{(200+150+210+50+140)\text{units}}$$

$$\frac{₹\,8,610}{750\text{units}} = ₹11.48 \text{ each}$$

W Avg :-

$$\frac{(10\times 200)+(12\times 150)+(12\times 210)+(15\times 50)+(11\times 140)}{(200+150+210+50+140)}$$

$$= 11.48$$

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(PRACTICAL QNO-1)
2.60

Practical Problems

1. Anil & Company buys its annual requirement of 36,000 units in 6 instalments. Each unit costs ₹ 1 and the ordering cost is ₹ 25. The inventory carrying cost is estimated at 20% of unit value. Find the total annual cost of the existing inventory policy. How much money can be saved by Economic Order Quantity.

$$E.O.Q. = \sqrt{\frac{2AO}{C}}$$

A = ANNUAL CONSUMPTION = 36000

O = ORDERING COST = 25

C = CARRYING COST = (20% X 1) = .20

P = PURCHASE PRICE = 1.00

$$= \sqrt{\frac{2 \times 36000 \times 25}{.20}}$$

= 3000 UNITS

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Date

2. A Company manufactures a special product which requires a component 'Alpha'. The following particulars are collected for the year 20X1:

(i)	Annual demand of Alpha	8,000 units
(ii)	Cost of placing an order	₹ 200 per order
(iii)	Cost per unit of Alpha	₹ 400
(iv)	Carrying cost p.a.	20%

The company has been offered a quantity discount of 4 % on the purchase of 'Alpha' provided the order size is 4,000 components at a time.

Required:

(i) Compute the economic order quantity

(ii) Advise whether the quantity discount offer can be accepted.

A: ANNUAL CONSUMPTION = 8000 UNITS

O: ORDERING COST = 200

C: CARRYING COST = (20/400) = 80
400

P: PRICE P.U =

$$E.O.Q = \sqrt{\frac{2AO}{C}}$$

$$\sqrt{\frac{2 \times 8000 \times 200}{80}}$$

$$= 200$$

STATEMENT SHOWING MATERIAL COST

ORDER SIZE	PURCHASE COST	ORDERING COST	CARRYING COST	
200	3200000 (8000 X 400)	$\frac{8000}{200} \times 200$ = 8000	$\frac{1}{2} \times 200 \times 80$ = 8000	= 3216000
4000	(8000 X 400) X $\frac{96}{100}$ =	$\frac{8000}{4000} \times 200$ = 400	$\frac{1}{2} \times 4000 \times 80 \times 96$ = 153600	322600 / 10000

3. The complete Gardener is deciding on the economic order quantity for two brands of lawn fertilizer. Super Grow and Nature's Own. The following information is collected:

	FERTILIZER	
	Super Grow	**Nature's Own**
Annual demand	2,000 bags	1,280 bags
Relevant ordering cost per purchase order	₹ 1,200	₹ 1,400
Annual relevant carrying cost per bag	₹ 480	₹ 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.

	SUPER GROW	NATURE OWN
A = ANNUAL demand	2000	1280
O = ORDERING COST	1200	1400
A = ANN-RE-COST	480	560
E.O.Q	$\sqrt{\frac{2 \times 2000 \times 1200}{480}}$	$\sqrt{\frac{2 \times 1280 \times 1400}{560}}$
	= 100 NOS	= 80 NOS

ORDER SIZE	ORDERING COST	CARRYIN COST	T.COST
100	$\frac{2000}{100} \times 1200$	$\frac{1}{2} \times 100 \times 480$	48000
	= 24000	= 24000	
80	$\frac{1280}{80} \times 1400$	$\frac{1}{2} \times 80 \times 560$	44800
	= 22400	= 22400	

(iii) NO OF DELIVERY

$\left(\frac{2000}{100}\right) = 20$ $\left(\frac{1280}{80}\right) = 16$

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4. A Company uses three raw materials A, B and C for a particular product for which the following data apply:

Raw Material	Usage per unit of Product (Kgs.)	Re-order quantity (Kgs.)	Price per Kg.	Delivery period (In weeks)			Re-order level (Kgs)	Minimum level
				Mini-mum	Aver-age	Maxi-mum		
A	10	10,000	10	1	2	3	8,000	?
B	4	5,000	30	3	4	5	4,750	?
C	6	10,000	15	2	3	4	?	2,000

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

(i) Minimum stock of A,

(ii) Maximum stock of B,

(iii) Re-order level of C,

(iv) Average stock level of A.

ANS NO(i) MINIMUM STOCK LEVEL-A

= R.O.L − (Avg CONSUMPTION X Avg Lead TIME)

= 8000 (GIVEN) − (2000 (200 x 10) X 2 (GIVEN))

= 4000

(II) MAX STOCK LEVEL B = ~~4750~~ R.O.L + EOQ (MIN QTY) − (MIN CON X MIN LEAD)

= 4750 + 5000 − (175 (4X175) X 3) = 7600

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ANSNO (iii) REORDER Level-C

R.O.L = (Max CON X Max Lead.)

5400 = (1350 / 225X6 X 4)

=

ANSNO(IV)

Avg stoac Level = (Max stock level + MIN stock level) / 2

10125 = (16250 + 4000 (Ans 2)) / 2

Max-stock-Level

R.O.L + R.O.L − (MIN CON X MIN Lead.)

= 5000 + 10000 − (1750 / 175X10 X 1)

=

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PRACTICAL - 5
2.61
DICC - QNO - 8/4

5. (a) EXE Limited has received an offer of quantity discounts on its order of materials as under:

Price per ton (₹)	Ton (Nos.)
1,200	Less than 500
1,180	500 and less than 1,000
1,160	1,000 and less than 2,000
1,140	2,000 and less than 3,000
1,120	3,000 and above.

The annual requirement for the material is 5,000 tons. The ordering cost per order is ₹ 1,200 and the stock holding cost is estimated at 20% of material cost per annum. You are required to compute the most economical purchase level.

(b) What will be your answer to the above question if there are no discounts offered and the price per ton is ₹1,500?

PRACTICAL QNO-6/2.62
(DCC NO- 16/7)

6. From the details given below, calculate:
   (i) Re-ordering 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 purchase order is ₹ 20
Number of units to be purchased during the year is 5,000
Purchase price per unit inclusive of transportation cost is ₹ 50
Annual cost of storage per units is ₹ 5.
Details of lead time : Average- 10 days, Maximum-15 days Minimum- 5 days.
For emergency purchases- 4 days.
Rate of consumption : Average: 15 units per day,
Maximum: 20 units per day.

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7. G. Ltd. produces a product which has a monthly demand of 4,000 units. The product requires a component X which is purchased at ₹ 20. For every finished product, one unit of component is required. The ordering cost is ₹ 120 per order and the holding cost is 10% p.a.

You are required to calculate:

(i) Economic order quantity.

(ii) If the minimum lot size to be supplied is 4,000 units, what is the extra cost, the company has to incur?

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

A = ANNUAL DEMAND = (4000 X 1 X 12) = 48000

O = ORDERING COST = 120.00

C = CARRYING COST = (₹20 X 10%) = ₹2.2

ANS (i) $\sqrt{\frac{2 \times 48000 \times 120}{2}}$

= 2400 UNITS

ANS (ii)

STATEMENT SHOWING MATERIAL COST

ORDER SIZE	PURCHASE COST = (QTY X RATE)	ORD COST	CARRYING COST	T COST
2400	48000 X 20 = 960000	$\frac{48000}{2400} \times 120$ = 2400	$\frac{1}{2} \times 2400 \times 2$ = 2400	964800
4000	48000 X 20 = 960000	$\frac{48000}{4000} \times 120$ = 1440	$\frac{1}{2} \times 4000 \times 2$ = 4000	965440
				640

ANS (iii)

MINIMUM CARRY COST = ₹400

8. From the following data for the year ended 31st December, 20X1, calculate the inventory turnover ratio of the two items and put forward your comments on them.

	Material A(₹)	Material B (₹)
Opening stock 1.1.20X1	10,000	9,000
Purchase during the year	52,000	27,000
Closing stock 31.12.20X1	6,000	11,000

9. 'AT' Ltd. furnishes the following store transactions for Septem¬ber, 20X1:

1-9-X1	Opening balance	25 units value ₹ 162.50
4-9-X1	Issues Req. No. 85	8 units
6-9-X1	Receipts from B & Co. GRN No. 26	50 units @ ₹ 5.75 per unit
7-9-X1	Issues Req. No. 97	12 units
10-9-X1	Return to B & Co.	10 units
12-9-X1	Issues Req. No. 108	15 units
13-9-X1	Issues Req. No. 110	20 units
15-9-X1	Receipts from M & Co. GRN. No. 33	25 units @ ₹ 6.10 per unit
17-9-X1	Issues Req. No. 121	10 units
19-9-X1	Received replacement from B & Co. GRN No. 38	10 units
20-9-X1	Returned from department, material of M & Co. MRR No. 4	5 units
22-9-X1	Transfer from Job 182 to Job 187 in the dept. MTR 6	5 units
26-9-X1	Issues Req. No. 146	10 units
29-9-X1	Transfer from Dept. "A" to Dept. "B" MTR 10	5 units
30-9-X1	Shortage in stock taking	2 units

Write up the priced stores ledger on FIFO method and discuss how would you treat the shortage in stock taking.

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STATEMENT SHOWING STORES LEDGER (FIFO)

	PURCHASES			ISSUED			CLOSING STOCK		
	QTY	Rate	Amt	QTY	Rate	Amt	QTY	R	Amt
1-9	25 (OPENING STOCK)	6.5	162.50	—	—	—	25	6.5	162.50
4-9		—	—	8	6.5	52	17	6.5	110.5
6-9	50	5.75	287.50	—	—	—	17	6.5	= 110.5
							50	5.75	= 287.50
7-9	—	—	—	12	6.50	78	5	6.5	32.50
							50	5.75	287.50
10-9	—	—	—	10	5.75	57.50	5	6.5	32.50
							40	5.75	230
12-9 (RNO-108)	—	—	—	5	6.50	32.50			
				10	5.75	57.50	30	5.75	172.50
13-9 RNO-110	—	—	—	20	5.75	115	10	5.75	57.50
									57.50
15-9 GRN-33	25	6.10	152.50	—	—	—	10	5.75	
							25	6.10	152.50
17-9 121	—	—	—	10	5.75	57.5	—		
							25	6.10	152.50
19-9 38	10	5.75	57.50	—	—	—			
							25	6.10	152.50
							10	5.75	57.50

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STATEMENT SHOWING STORES LEDGER (FIFO)

	PURCHASES			ISSUED			CLOSING STOCK		
	QTY	Rate	Amt	Qty	Rate	Amt	Qty	R	Amt
1-9	25 (OPENING + STOCK)	6.5	162.50	—	—	—	25	6.5	162.50
4-9	〃	—	—	8	6.5	52	17	6.5	110.5
6-9	50	5.75	287.50	—	—	—	17	6.5	= 110.5
							50	5.75	= 287.50
7-9	—	—	—	12	6.50	78	5	6.5	32.50
							50	5.25	287.50
10-9	—	—	—	10	5.75	57.50	5	6.5	32.50
							40	5.75	230
12-9 (RNO-108)	—	—	—	5	6.50	32.50			
				10	5.75	57.50	30	5.75	= 172.50
13-9 RNO-110	—	—	—	20	5.75	115	10	5.75	57.50
15-9 GRN-33	25	6.10	152.50	—	—	—	10	5.75	57.50
							25	6.10	152.50
17-9 121	—	—	—	10	5.75	57.5	25	6.10	152.50
19-9 38	10	5.75	57.50	—	—	—	25	6.10	152.50
			—				10	5.75	57.50
20-9	5	5.75	28.75	—	—	—	25	6.10	152.50
							10	5.75	57.50
							*5	5.75	28.75
26-9	—	—	—	5	5.75	28.75	20	6.10	122
				5	6.10	30.5	10	5.75	57.50
30-9	—	—	—	2	6.10	12.2	18	6.10	
							10	5.75	57.5

10. The following information is extracted from the Stores Ledger:

Material X	
Opening Stock	Nil
Purchases:	
Jan. 1	100 @ ₹1 per unit
Jan. 20	100 @ ₹ 2 per unit
Issues:	
Jan. 22	60 for Job W 16
Jan. 23	60 for Job W 17

Complete the receipts and issues valuation by adopting the First-In-First-Out, Last-In-First-Out and the Weighted Average Method. Tabulate the values allocated to Job W 16, Job W 17 and the closing stock under the methods aforesaid and discuss from different points of view which method you would prefer.

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STATEMENT SHOWING STORES

	RECEIPTS			ISSUE			CLOSING STOCK		
(FIFO)	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
1JAN	100	1	100	–	–	–	100	1	100
2011	100	2	200	–	–	–	100	1	100
							100	2	200
JAN22 (W-16)	–	–	–	60	1	60	40	1	400
							100	2	200
JAN-23 (W-17)	–	–	–	40	1	40			
				20	2	40	80	2	160
L-I-FO				120		140			
1-1	100	1	100	–	–	–	100	1	100
20-1	100	2	200	–	–	–	100	1	100
							100	2	200
JAN-22 (W-16)	–	–	–	60	2	120	100	1	100
							40	2	80
JAN-23 (W-17)	–	–	–	40	2	80			
				20	1	20	80	1	80
WAvg				120		220			
JAN-1	100	₹	₹100	–	–	–	100	₹	₹00
JAN20	100	2	200	–	–	–	200	1.5	300
JAN-22 (W-16)	–	–	–	60	1.5	90	140	1.5	210
JAN-23 (W-17)	–	–	–	60	1.5	90	80	1.5	(120)
				120		180			

X

CHAPTER - 2
LABOUR

Question 1

A worker takes 6 hours to complete a job under a scheme of payment by results. The standard time allowed for the job is 9 hours. His wage is Rs. 1.50 per hour. Material cost of the job is Rs. 16/- and the overheads are recovered at 150% of the total direct wages.

Calculate the factory cost of job under

(a) Rowan System

(b) Halsey System

Question 2

In an engineering concern, the employees are paid incentive bonus in addition to their normal wages at hourly rates. Incentive bonus is calculated in proportion of time taken to time allowed, of the time saved. The following details are made available in respect of employees X. Y and Z for a particular week :-

	X	Y	Z
Normal Wages (Re. per hour)	4.00	5.00	6.00
Completed Units of production	6000	3000	4800
Time Allowed (Per 100 units)	0.8 hr.	1.5 hr.	1 hr.
Actual time taken (hours)	42	40	48

You are required to work out for each employee :

(i) the amount of bonus earned ;

(ii) the total amount of wages received ;

(iii) the total wage cost per 100 units of output.

Question 3

In a factory two workmen A and B produce the same product using the same material. Their normal wage rate is also the same. They are paid bonus according to the Rowan System. The time allotted to the product is 40 hours. A takes 25 hours and B takes 30 hours to finish the product. The factory cost of the product for A is Rs. 193.75 and B, Rs. 205. The factory overhead rate is one rupee per man-hour.

Find the normal rate of wages and the cost of materials used for the product.

Question 4

A job can be executed either through workman A or B. A takes 32 hours to complete the job while B finishes it in 30 hours. The standard time to finish the job is 40 hours. The hourly wage rate is same for both the workers. In addition workman A is entitled to receive bonus according to Halsey plan (50% sharing) while B is paid bonus as per Rowan plan. The works overheads are absorbed on the job at Rs. 7.50

per labour hour worked. The factory cost of the job comes to Rs. 2,600 irrespective of the workman engaged.

Find out the hourly wage rate and cost of raw – materials input. Also show cost against each element of cost included in factory cost.

Question 5

During the first week of April 2016 the workman Mr. Kalyan manufactured 300 articles. He receives wages for a guaranteed 48 hours week at the rate of Rs. 4 per hour. The estimated time to produce one article is 10 minutes and under incentive scheme the time allowed is increased by 20%. This incentive takes care of the normal idle time.

Calculate his gross wages according to-

(a) Piece work with a guaranteed weekly wage.
(b) Rowan premium bonus and
(c) Halsey premium bonus with 50% to the workman.

Question 6

(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 and Rowan system for each hour saved progressively.

Question 7

Mr. A is working by employing 10 skilled workers. He is considering the introduction of some scheme incentive -either Halsey 5cheme (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 this assurance, the increase in productivity has been observed as revealed by the following figures for the current month.

Hourly rage 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

1) Calculate the effective Rate of earning per hr under halsey and Rowan
2) Calculate the Saving to Mr A in Direct labour Cost per Scheme above.
3) Advice Mr. A to the Scheme for his Assurance

Question 8 Scheme

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

Because of assurance, the increase in productivity has been observed as revealed by the figures for the month of April, 2016.

Hourly rate of wages (guaranteed)	Rate 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 ZED Limited in terms of direct labour cost per piece.

(iii) Advise ZED Limited about the selection of the scheme to fulfil his assurance.

Question 9

What will be the earning of a worker at Rs. 2.25 per hour when he takes 130 hours to do a work for which the standard time allowed is 200 hours? He is entitled to bonus for the time saved of scale as follows :-

(a) Within the first	10% of saving in standard time, bonus is	30% of time saved
(b) Within the second	10% of saving in standard time, bonus is	40% of time saved
(c) Within the third	10% of saving in standard time, bonus is	50% of time saved

(d) Within the fourth	10% of saving in standard time, bonus is	60% of time saved
(e) and for the rest		70% of saved time.

Question 10

From the following particulars calculate the Group Bonus payable in each case and the amount that will be paid to each member of the group.

Standard production in a.week 120 units.

It is agreed that for every 10% increase in production, bonus of S% of the total wages, payable of the week, will be paid and the same will be shared by the group consisting of 4 members in proportion to their total wages of the week.

Total production for the week 145 units.

Wages earned by the four members of the group (A,B,C & D) are respectively Rs.80/-, Rs. 78/-, Rs. 72/- and Rs. 69/-.

Question 11

Calculate the normal and overtime wages payable to a workman from the following data.

DAYS	HOURS WORKED
Monday	9 hours
Tuesday	10 hours
Wednesday	9 hours
Thursday	11 hours
Friday	9 hours
Saturday	5 hours
TOTAL	53 hours
Normal Working hours	8 hours per day
Normal rate	Rs. 0.50 per hour

Overtime rate: Up to 9 hours in a day, at single rate & over hours in a day, at double rate or upto 48 hours in a week at single rate and over 48 hours at double rate, whichever is more beneficial to the workman.

Question 12

The standard time for 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 rate of pay is Re. 1 per hour. The bonus system applicable to 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.

Calculate the total earnings of each worker and also the rate of earnings per hour.

Question 13

Following are the particulars for April, 2016 relating to four employees working in Department "M" of a factory, exclusively for job no. 120 :-

Name	Designation	Wage Rs.	Per
A	Foreman	800	Month
B	Mechanic	15	day
C	Machine Operator	12	day
D	Workman	10	day

The normal working hours per week of six days are 48, at 8 hours per day: Sundays are paid holidays. (There were no other holidays during the month).

Provident fund Contribution was 8% of monthly wages by employer & Employees. Employee State Insurance contribution was 3% of monthly wages by employee & 5% of monthly wages by employer.

(a) Net Wages payable by the employer for the month;
(b) The total amount of Provident Fund Contribution to be deposited by employer.
(c) Employee State Insurance Contribution to be deposited by employer;
(d) Total labour cost to the employer for the month of April, chargeable to the job;
(e) The total cost of the job requiring materials valued at Rs. 6,000 and overheads at 50% of prime cost.

Question 14

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

	A	B
i) Basic Wages	Rs. 100	Rs.160
ii) Dearness Allowance	50%	50%
iii) Contribution to Provident Fund (on basic wages)	8%	8%
iv) Contribution to Employees' State Insurance (one basic wages)	2%	2%
v) Overtime done on job Y	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 with employees' contribution. 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%

Question 15

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	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 are 8.

Question 16

Calculate the earnings under MERRICK differential system and under Gantt Task Bonus system from the following particulars :-

(i) Standard production 80 units in a day of 8 hours

(ii) Time Rate Rs. 2/- per hour
A produces 75 units
B produces 80 units

C produces	100 units
D produces	64 units

Question 17

Calculate the earnings of workers A, B and C under Taylor's differential piece rate system as per the particulars mentioned below :-

(i)	Standard production	80 units in a day of 8 hours
(ii)	Time rate	Rs. 2/- per hour
	A produces	75 units
	B produces	80 units
	C produces	100 units

Question 18

An article passes through five hand operations as follow :

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.

Question 19

(a) The management of Sunshine Ltd. wants to have an idea of the profit lost/foregone as a result of labour turnover last year.

Last year sales accounted to Rs. 66,00,000 and P/V Ratio was 20%. The total number of actual hours worked by the direct labour force was 3.45 lakhs. As a result of the delays by the Personnel Department in filling vacancies due to labour turnover, 75,000 potentially productive hours were lost. The actual direct labour 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:

	Rs.
Settlement cost due to leaving	27,420
Recruitment costs	18,725
Selection costs	12,750
Training costs	16,105

Assuming that the potential production lost due to labour turnover could have been sold at prevailing prices, ascertain the profit foregone/lost last year on account of labour turnover.

Question 20

(ii) From the following data, given by the Personnel Department, calculate the labour turnover rate applying:

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

No. of workers on the payroll;

At the beginning of the month	900
At the end of the month	1100

During the month 10 workers left and 40 persons were discharged while 250 workers were recruited. Of these, 25 workers are recruited the vacancies of those leaving , while the rest were engaged for an expansion scheme.

******

HOME-WORK!

CHAPTER 3

LEARNING OUTCOMES

- ☐ State the meaning and importance of employee (labour) cost in an organisation.
- ☐ Discuss the attendance and payroll procedures.
- ☐ State the meaning and treatment of idle time and overtime cost.
- ☐ Compute employee (labour) turnover, discuss its meaning, reasons, methods of measurement and cost impacts.
- ☒ Discuss and apply the various methods of remuneration and incentive system in calculation of wages, bonus etc.
- ☐ Discuss the efficiency rating procedures.

(2)

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ILLUSTRATION 1

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

(a) Basic pay	*₹10,000 p.m.*
(b) Dearness allowance	*₹2,000 p.m.*
(c) Bonus	*20% of salary and D.A.*
(d) Other allowances	*₹2,500 p.m.*
(e) Employer'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 compute the effective hourly cost of employee 'X'.

(Ill-1) (3.12)

STATEMENT SHOWING EFFECTIVE HRLY COST OF EMPLOYEE - X

TOTAL HRS = 2400 hrs

NORMAL IDLE TIME 400 hrs — EFFECTIVE HRS 2000 hrs

		₹
BASIC-PAY	(10000 X 12)	120000
D.A	(2000 X 12)	24000
BONUS	20% (120000 + 24000)	28800
EMPLOYER'S CONTRIBUTION	(10% (120000 + 24000))	14400
OTHER ALLOW.	(2500 X 12)	30000
	TOTAL	217200

EFF-HRLY-RATE = $\left(\frac{217200}{2000}\right)$ = 108.60

ILLUSTRATION 2

In a factory working six days in a week and eight hours each day, a worker is paid at the rate of ₹100 per day basic plus D.A. @ 120% of basic. He is allowed to take 30 minutes off during his 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?

(ILL-2 3.13) STATEMENT SHOWING EFFECTIVE HRS PER WEEK

TOTAL-HRS = (8 X 60 MIN) = 480 MINT
OFF (30 ")
RECESS- REST (10 ")

440 MIN

EFF-HRS (440 MINTS X 6 Days / 60 MINTS) = 44 hrs

Rs
WAGES paid = 100
D.A. (120% X 100) = 120
220

Rs
(Wages + DA) = (220 X 6) = 1320
÷ HRS ÷ 44
HRS PER = 30

HRS - ACTUALLY = 44 hrs.

ACTUALLY WORKED (15 + 12 + 13) = 40 hrs

ABN- IDLETIME 4

STATEMENT SHOWING ALLOCATION OF WAGES

X	Y	Z	ABN	TOTAL
15 X 30 = 450	12 X 30 = 360	13 X 30 = 390	4 X 30 = 120	1320

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ILLUSTRATION 3

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

		A	B
(i)	Basic Wages (₹)	10,000	16,000
(ii)	Dearness Allowance	50%	50%
(iii)	Contribution to provident Fund (on basic wages)	8%	8%
(iv)	Contribution to Employee's State Insurance (on basic wages)	2%	2%
(v)	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 with employees' 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.

(ILL-3 / 3.15)

STATEMENT SHOWING NET WAGES

	A	B
BASIC-WAGES	10000	16000
D.A	5000 (50% X 10000)	8000 (50% X 16000)
GROSS WAGES	15000	24000
P.F CONTRIBUTION	= (800) (8% X 10000)	(1280) (8% X 16000)
E.S.I.C. CONTRI.	(200) (2% X 10000)	(320) (2% X 16000)
	14000	22400
O.T (NORMAL)	1500	
NET-WAGES	15500	22400

(10000+5000) X 10 X 2

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SOLNO(2)

STATEMENT SHOWING COST TO EMPLOYER

	A	B
NET-WAGES	14000	22400
P.F-CONT (EMP + EMPYR)	1600	2560
E.S.I.C.	400	640
NORMAL TOTAL COST	16000	25600
NORMAL HRS	÷ 200 hr	÷ 200 hr
COST PER HR	= 80	= 128

STATEMENT SHOWING ALLOCATION OF WAGES

	X	Y	Z	TOTAL
WOR-A	= 6400 (40% X 16000)	= 4800 (30% X 16000)	= 4800 (30% X 16000)	16000 (100% X 16000)
	12800 (50% X 25600)	5120 (20% X 25600)	7680 (30% X 25600)	25600 (100% X 25600)
O.T	—	—	1500	1500
	19200	9920	13980	43100

DKC

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ILLUSTRATION 4

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 ₹ 200 per day of 8 hours	Worker 'B' paid at ₹ 100 per day of 8 hours	Worker 'C' paid at ₹ 300 per day of 8 hours
Monday (hours)	10.5	8.0	10.5
Tuesday (hours)	8.0	8.0	8.0
Wednesday (hours)	10.5	8.0	10.5
Thursday (hours)	9.5	8.0	9.5
Friday (hours)	10.5	8.0	10.5
Saturday (hours)	--	8.0	8.0
Total (hours)	49.0	48.0	57.0

In terms of an award in anemployee 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 @ ₹968 for the relevant month. The dearness allowance is payable to all workers irrespective of wages 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, 1948. Excluding holidays,the total numberof hours worksout to 176 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.

STATEMENT SHOWING HRS TO BE PAID FOR-A

	NORMAL HRS	EXTRA HRS	O.T HRS	O.T HRS @2	TOTAL HRS
MONDAY	8	1	1.50	1.5X2=3	12
TUESDAY	8	—	—	—	8
WEDDAY	8	1	1.50	1.50X2=3	12
THURDAY	8	1	.50	.50X2=1	10
FRIDAY	8	1	1.50	1.5X2=3	12
SATDAY	—	—	—		
	40	4	5	10	54

STATEMENT SHOWING HRS TO BE PAID TO B

DAYS	NORMAL HRS	EXTRA HRS	OT HRS	O.T HRS X 2	TOTAL HRS
MONDAY	8	—	—		8
TUESDAY	8	—	—		8
WEDDAY	8	—	—		8
THURDAY	8	—	—		8
FRIDAY	8	—	—		8
FRIDAY	4	4	—		8
	44	4			48

STATEMENT SHOWING HRS TO BE PAID C

MONDAY	8	1	1.5	1.5X2=3		12
TUED	8		—	—		8
WED	8	1	1.5	1.5X2=3		12
THUR	8	1	1.5	1.5X2=1		10
FRIDAY	8	1	1.5	1.5X2=3		12
SAT.	4	—	4	4X2=8		12
	44	4	9	18		66

STATEMENT SHOWING WAGES PAYABLE

	A	B	C
BASIC WAGES	25	12.5	37.50
D.A	5.50	5.50	5.50
TOTAL	3050	18	43
	X54	X 48	X 66
TOTAL WAGES	= 1647	= 864	= 2838

ILLUSTRATION 5

In a factory, the basic wage rate is ₹100 per hour and overtime rates are as follows:

Before and after normal working hours	*175% of basic wage rate*
Sundays and holidays	*225% of basic wage rate*
During the previous year, the following hours were worked	
- Normal time	*1,00,000 hours*
- Overtime before and after working hours	*20,000 hours*
Overtime on Sundays and holidays	*5,000 hours*
Total	*1,25,000 hours*

The following hours have been worked on job 'Z'

Normal	*1,000 hours*
Overtime before and after working hrs.	*100 hours.*
Sundays and holidays	*25 hours.*
Total	*1,125 hours*

You are required to calculate the labour cost chargeable to job 'Z' and overhead in

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

BASIC- WAGES 100 PER-HR

O·T (BEFORE & AFTER W·hrs) 175 "
(100X175/)

O·T SUNDAYS/ HOLIDAYS 225 P·H
(100X225/)

STATEMENT SHOWING WAGES + O·T

ANNUAL WAGES FOR PREVIOUS year = 1,00,00,000
(100000 hrsX100)

O·T (OVER TIME) BEFORE & AFTER 3500000
WORKING HRS
(20000 X175)

WAGES FOR OVERTIME ON SUNDAY & HOLIDAYS 1125000
(5000 X 225)

14625000

AVG INFLATED RATE P·H = $\frac{14625000}{1250000}$ = 117

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ANSNO (a)
STATEMENT SHOWING LABOUR COST CHARGEABLE TO JOB '2'.

ANSNO(a)
WHERE OVERTIME IS WORKED REGULARY THROUHOUT THE YEAR AS A POLICY DUE TO WORKERS SHORTAGE

NOTNO(1) THE OVERTIME PREMIUM IS TREATED AS A PART OF EMPLOYEE COST AND JOB IS CHARGED AT AN INFLATED WAGE RATE :-

(1125 HRS X 117) = 131625

ANSNO(b)
WHERE OVERTIME IS WORKED IRREGULARLY TO MEET THE REQUIREMENT OF PRODUCTION

1125 HRS

CHARGED TO JOB I
NORMAL WAGES →
(1125 X 100)
= 112500

CHARGED TO —
FACTORY O·H
(175 − 100) X 100 hrs = 7500
(225 − 100) X 25% = 3125
10625

ANSNO-(c)

		Rs.
JOB	1125 X 100 =	112500
O·T	100 hrs (175-100)	= 7500
	25% (225-100)	= 3125
		123125

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ILL 6
3.23

STANDARD PRODUCTION AMT. 40 UNITS

(8 hrs X 60 min / 12 min)

ACTUAL UNITS - ACTUAL 37.11

Eff Ratio = (37 x 100 / 40) = 92.50%.

RULE

If Eff less than 100%. NORMAL 83%.

If 100% or more 125%.

Rate Perhr = 20.

(8 hrs x 20) + 40 = 4.00 P.U

Wages
(4.00 X 37) = X 83% = 122.84

ILLUSTRATION 6

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

Standard time per piece	*12 minutes*
Normal rate per hour (in an 8 hour- day)	*₹20*
A produced	*37 units*

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ILLUSTRATION 7

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

Standard time per piece	20 minutes
Normal rate per hour (in an 8 hour- day)	₹90.00
Amar produced	23 units
Akbar produced	24 units
Ali produced	30 units

(ILL-7 / 3.24)

	AMAR	AKBAR	ALI
STANDARD UNIT.	24 UNIT	24 UNIT	24 UNIT
(RS/HR × 60 MIN / 20 MIN)			
ACTUAL UNITS	23 "	24 "	30 "
EFF RATIO →	(23/24 × 100)	(24/24 × 100)	(30/24 × 100)
	= 95.83%	= 100%	= 125%
RATE PER PC	83%	125%	125%

* (90 × 8 / 24) = 30.00

STATEMENT SHOWING EARNING OF WORKER AS PER TAYLOR UNIT

AMAR 23 × 30 × 83% = 527.70

AKBAR 24 × 30 × 125% = 900.00

ALI 30 × 30 × 125% = 1125

(Ill-8 3.28)

AS PER - MERRICK PIECE RATE

UPTO 83%.	NORMAL PIECE RATE
ABOVE 83% TO 100%.	110% PIECE RATE
ABOVE 100%.	120% OR 130%.

STATEMENT SHOWING EARNING OF WORKER

AMAR 23 UNIT. × 30 × 100% = 690

AKBAR 24 × 30 × 110% = 792

ANTHONY 30 UNIT × 30 × 130% = 1170

ILLUSTRATION 8

Refer the Illustration-7 and compute the earnings of workers under Merrick's Differential Piece Rate System

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ILLUSTRATION 9

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

Normal Rate per Hour	₹54
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.

ACTUAL OUTPUT IN ACTUAL NO	390	450	600
EFF RATIO	$\left(\frac{390}{480} \times 100\right)$ = 81.25%	$\left(\frac{450}{480} \times 100\right)$ = 93.75%	$\left(\frac{600}{480} \times 100\right)$ = 125%
EFFICIENCY	100%	110%	130%

RATE FOR NORMAL PC = $\left(\frac{8 \text{ hr} \times 54}{8 \times 60 \text{ MI}}\right)$ = .90

STATEMENT SHOWING EARNINGS.

(i) STRAIGHT PIECE WORKERS

A	390	× .90 =	351
B	450	× .90 =	405
C	600	× .90 =	540

(ii) MERRICK

A	390 ×	.90 ×	351 × 100% = 351
B	450 ×	.90 ×	405 × 110% = 445.50
C	600 ×	.90 ×	540 × 130% = 702

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ILLUSTRATION 10

In a factory the standard time allowed for completing a given task (50 units), is 8 hours. The guaranteed time wages are ₹20 per hour. If a task is completed in less than the standard time, the high rate of ₹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.

WHEN THE OUTPUT BELOW STANDARD — RATE P.H

WHEN THE OUTPUT AT - PAR — RATE P.H +20%

ABOVE STANDARD — HIGH PC RATE / PC RATE 20%

ILL-10 / 3.27	(i)	(ii)	(iii)
STANDARD HRS	8	8	8
ACTUAL HRS	10	8	6
STANDARD RATE	BELOW GUARANTEED	AT Rate +20%	ABOVE PC Rate +20%
WAGES	(10 X 20) = 200	(8 X 20) X 120% = 192	(50 X 4 X 120/200) = 6
RATE PER HR	÷ 10 = 20.00	+ 8 = 24.00	3333

ILLUSTRATION 11

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 hour in units	:	*5*
Daily wage rate	:	*₹500*
Actual output in units		
Worker A		*25 units*
Worker B		*40 units*
Worker C		*45 units*

STATEMENT SHOWING BONUS & TOTAL EARNING UNDER EMERSONS EFF SYSTEM

WORKERS	A	B	C
STANDARD UNITS	40	40	40
AGUAL OUTPUT	25	40	45
EFF RATIO =	$\left(\frac{25}{40} \times 100\right)$	$\left(\frac{40}{40} \times 100\right)$	$\left(\frac{45}{40} \times 100\right)$
	= 62.5%	= 100%	= 112.5%
BONUS	–		
	(BELOW – 66.67%)	(66.67% TO 100%)	20% BASIC
		.01% AND 20%	1% FOR 1%
			32.5%
Wages	500	500	500
BONUS	–	100	162.50
		(20% X 500)	(325% X 500)
	500	600	662.50

The levels are as mentioned below:

(i) For a performance below 66.67% only time rate wages without any bonus are paid.

(ii) 662/3%to 100% efficiency, bonus varies between 0.01% and 20%.

(iii) Above 100% efficiency bonus of 20% of basic wages plus 1% for each 1% increase

ILLUSTRATION 12

Calculatethe earnings of worker from the following information under Bedauxsystem:
Standard time for a product A-30 seconds plus relaxation allowance of 50%.
Standard time for a product B-20 second plus relaxation allowance of 50%.
During 8 hour- day for
Actual output of product A- 500 units.
Actual output of product B- 300 units
Wage rate- ₹100 per hour

NO & NO(i) BEDAUX POINT PER UNIT OF PRODUCT-A

$$\frac{30 \text{ SECONDS} + 50\% \text{ of } 30 \text{ SECONDS}}{60 \text{ SECONDS}} = \frac{45}{60} = .75$$

BEDAUX POINT PER UNIT OF PRODUCT-B

$$\frac{20 \text{ SECONDS} + 50\% \text{ of } 20 \text{ SEC}}{60 \text{ SEC.}} = \frac{30}{60} = .50$$

TOTAL PRODUCTION IN TERMS 'B'

500 × .75 = 375
300 × .50 = 150
525

STANDARD B'S (8 × 60 MIN) = 480

(525 − 480) = 45 B'S

8 HRS × 100 = 800

$\left(\frac{75}{100} \times \frac{45}{60} \times 100\right) = \frac{56.30}{85(.30}$

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ILLUSTRATION 13

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

Time Rate (per hour)	₹60
Time allowed	*8 hours*
Time taken	*6 hours*
Time saved	*2 hours*

(ILL-13 / 3.30) HALSEY

STANDARD TIME = 8 hrs.
ACTUAL TIME = 6 "
TIME SAVED = 2 "

BONUS (50% X 2) = 1 hr

(ACTUAL HRS) + (BONUS HRS) X RATE = WAGES
(6 + 1) X 60 = 420

ILL-14) DHIMAN

ILLUSTRATION 14

Calculate the earnings of a worker under Rowan System. The relevant data is given as below:

Time rate (per Hour)	₹60
Time allowed	*8 hours.*
Time taken	*6 hours.*
Time saved	*2 hours.*

BONUS = (TIME TAKEN X TIME SAVED) / TIME ALL.

= (6/8 X 2) = 1.5 hrs.

(ACT + BONUS) X RATE = WAGES
(6 + 1.5) X 60 = 450

ILLUSTRATION 15

Two workmen, 'A' and 'B', produce the same product using the same material. Their normal wage rate is also the same. 'A' is paid bonus according to the Rowan system, while 'B' is paid bonus according to the Halsey system. The time allowed to make the product is 50 hours. 'A' takes 30 hours while 'B' takes 40 hours to complete the product. The factory overhead rate is ₹5 per man-hour actually worked. The factory cost for the product for 'A' is ₹3,490 and for 'B' it is ₹3,600.

Required:

(a) Compute the normal rate of wages;

(b) Compute the cost of materials cost;

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

(ILL-15)

	A	B
GIVEN STANDARD HRS.	50 hrs	50 hrs
ACTUAL HRS.	(30 ")	(40 ")
HRS SAVED	20 "	10 "
BONUS HR	$\left(\frac{20}{50} \times 20\right)$ = 12	(50/X10) = 5

Wages. A = (30+12) = 42 hrs.

B = (40+5) = 45 hrs.

Assuming Mat cost = x wage rate = y (P.h)

$x + 42y + (30 \times 5) = 3490$

$x + 45y + (40 \times 5) = 3600$

$x + 42y = 3340$

$x + 45y = 3400$

$3y = 60$ $y = 20$ ANS NO (a)

ANS (b) $x + (42 \times 20) = 3340$ $x = 2500$

ANS NO (c) STATEMENT SHOWING FACTORY COST

	A	B
Mat	2500	2500
Wages	840	900
F.O	(42 X 20) 150 (30 X 5)	(45 X 20) 200 (40 X 5)

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(IU-16 / 3·33) / DKC

ILLUSTRATION 16

(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 ₹8. Prepare a statement showing:*

i. *The bonus earned*

ii. *The total earnings of employee and*

iii. *Hourly earnings.*

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

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ILLUSTRATION 17

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

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

Standard time = 4

HRS - WORKED = T

Actual time = $\frac{T}{4-T}$

$37.50\,T = T30 + \left(\frac{4-T}{4}\right) \times T \times 30$

Effective = T37.5

$32.5T = T30 + (4-T) \times T \times 7.50$

[illegible] = [illegible]

$37.5 = 30 + (4-T) \times 7.50$

Wages Per hr = $T30 + \left(\frac{T}{4}\right) \times (4-T) \times 30$

$7.50 = (4-T) \times 7.50$

$7.50 = 30 - 7.50T$

$T\,37.50 = T30 + \left(\frac{T}{4}\right) \times (4-T) \times 30$

$-22.50 = -7.50T$

$7.50T = T \times (4-T) \times 7.5$

$T = 3$

$7.5 = 30 - 7.5T$

$7.5T = 22.5$

$T = 3$

HRS ALLOWED = 4

HRS TAKEN = (3)

TIME SAVED = 1

BONUS (50% X 1) = .50 hrs

Actual Hrs + (Bonus hrs) X Rate = Wages ÷ Hrs = Rate

(3 + .50 hrs) X 30 = 105 ÷ 3 = 35

ILLUSTRATION 18

A factory having the latest sophisticated machines wants to introduce an incentive scheme for its workers, keeping in view the following:

(i) The entire gains of improved production should not go to the workers.

(ii) In the name of speed, quality should not suffer.

(iii) The rate setting department being newly established are liable to commit mistakes.

You are required to devise a suitable incentive scheme and demonstrate by an illustrative numerical example how your scheme answers to all the requirements of the management.

Rowan Scheme of premium bonus (variable sharing plan) is a suitable incentive scheme for the workers of the factory. If this scheme is adopted, the entire gains due to time saved by a worker will not pass to him.

Another feature of this scheme is that a worker cannot increase his earnings or bonus by merely increasing its work speed. The reason for this is that the 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.

Lastly, Rowan System provides a safeguard in the case of any loose fixation of the standards by the rate-setting department. It may be observed from the following illustration that in the Rowan Scheme the bonus paid will be low due to any loose fixation of standards. Workers cannot take undue advantage of such a situation. The above three features of Rowan Plan can be discussed with the help of the following illustration:

(i) Time allowed = 4 hours

Time taken = 3 hours

Time saved = 1 hour

Rate = ₹5 per hour

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate}$$

$$= \frac{3 \text{ hours}}{4 \text{ hours}} \times 1 \text{ hour} \times ₹5 = ₹3.75$$

In the above illustration time saved is 1 hour and, therefore, total gain is ₹5. Out of ₹5 according to Rowan Plan only ₹3.75 is given to the worker in the form of bonus and the remaining ₹1.25 remains with the management. In other words, a worker is entitled for 75 percent of the time saved in the form of bonus.

(ii) The figures of bonus in the above illustration when the time taken is 2 hours and 1 hour respectively are as below:

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate}$$

$$= \frac{2 \text{ hours}}{4 \text{ hours}} \times 2 \text{ hours} \times ₹5 = ₹5$$

$$= \frac{1 \text{ hour}}{10 \text{ hours}} \times 3 \text{ hours} \times ₹5 = ₹3.75$$

The above figures of bonus clearly show that when time taken is half of the time allowed, the bonus is maximum. When the time taken is reduced from 2 to 1 hour, the bonus figure fell by ₹1.25. Hence, it is quite apparent to workers that it is of no use to increase speed of work. This feature of Rowan Plan thus protects the quality of output.

(iii) If the rate-setting department erroneously sets the time allowed as 10 hours instead of 4 hours, in the above illustration; then the bonus paid will be as follows:

$$\text{Bonus} = \frac{3 \text{ hours}}{10 \text{ hours}} \times 7 \text{ hours} \times ₹5 = ₹10.50$$

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ILLUSTRATION 19

A, B and C were engaged on a group task for which a payment of ₹72,500 was to be made. A's time basis wages are ₹800 per day, B's ₹600 per day and C's ₹500 per day. A worked for 25 days; B worked for 30 days; and C for 40 days. Calculatethe share of bonus to be distributed among the workers and total earnings thereof.

(ILL-19) (3.39) STATEMENT SHOWING CALCULATION OF GROUP BONUS.

		₹
A	(25 × 800) =	20000
B	(30 × 600) =	18000
C	(40 × 500) =	20,000
		58000
BONUS.		(14500)
PAYMENT		72500

BONUS (%) = $\left(\frac{14500}{58000}\right) \times 100 = 25\%$.

	A	B	C	TOTAL
Wage	20000	18000	20000	58000
BONUS 25%	5000	4500	5000	14500
	25000	22000	25000	72500

ILLUSTRATION 20

Both direct and indirect employees 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 tons per month (of 28 days) a general incentive of ₹1,500 per ton 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 employee, @ 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 employees also get a special bonus @ ₹500 per ton for all production in excess of 120% of standard.

(c) Inspection staff are penalized @ ₹2,000 per ton for rejection by customer in excess of 2% of production.

(d) Maintenance staff are also penalized @ ₹2,000 per hour for breakdown.

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

(a)	*Actual working days*	*: 25*
(b)	*Production*	*: 21,000 tons*
(c)	*Rejection by customer*	*: 500 tons*
(d)	*Machine breakdown*	*: 40 hours*

STANDARD OUTPUT PER DAY = (STANDARD OUTPUT PER MONTH / BUD NO OF DAYS IN A MONTH)

(16800 TONNES / 28 DAYS) = 600 TONNES

STANDARD OUTPUT = (600 TONNES X 25) = 15000

ACTUAL OUTPUT = 21000 TONNES

EXCESS OUTPUT = (21000 − 15000) = 6000 TONNES

(%) = (6000 X100 / 15000) = 40%

AGGREGATE GEN INCENTIVE

(6000 TONNES X 1500) = 9000000

DIRECT EMPLOYEE	INSP STAFF	MAINT STAFF	SUP STAFF
65%	15%	12%	8%
X9000000	X9000000	X9000000	X9000000
5850000	1350000	1080000	720000

(b) SPECIAL BONUS TO DIRECT WORKERS

20% IS EXCESS OUTPUT OVER 120% OF STANDARD OUTPUT

OR

(5000 TONNES X 20%) = 3000 TONNES

(3000 X 500) = 1500000

(c) PENALTY IMPOSED ON INSPECTION STAFF

NORMAL REJECTION = 2% PRODUCTION

(2% X 21000) = 420 TONNES

ACTUAL REJECTION (500 − 420) = 80

PENALTY (80 X 2000) = 160000

(d) PENALTY IMPOSED ON MAINT STAFF

Break down 40

(40mx 2000) = 80000

STATEMENT SHOWING PRODUCTION BONUS EARNED

	DIREM EMP	INP STAFF	MAINT STAFF	SUP STAFF	TOTAL
GEN-ENS	5850000	1350000	1080000	720000	9000000
SPECIAL BONUS	1500000	—	—	—	1500000
PENALTY	—	(160000)	(80000)	—	(240000)
	7350000	1190000	1000000	720000	10260000

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ILLUSTRATION 21

A worker is paid ₹10,000 per month and a dearness allowance of ₹2,000 p.m. Worker contribution to provident fund is @ 10% and employer also contributes the same amount as the employee. The Employees State Insurance Corporation premium is 6.5% of wages of which 1.75% is paid by the employees. It is the firm's practice to pay 2 months' 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.

(ILL-21 / 3.43)

STATEMENT SHOWING EFFECTIVE HRS PER YEAR

300 Days

LEAVE
15 DAYS

EFFECTIVE DAYS
285
X 8 hrs
= 2280 hrs

STATEMENT SHOWING EFF/HRLY RATE

Wages PAID	BASIC (10000X12)	120000
	D.A (2000X12)	24000
EMP-CONT	P.F (10% X 144000)	14400
	ESIC (4.75% X 144000)	6840
	Bonus. $\left(\frac{120000 + 24000}{12}\right) \times 2$ mnths	24000
		189240

(189240 ÷ 2280 hrs) = ₹ 83.00

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(ILL-22)
2.44

ILLUSTRATION 22

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

Basic pay	*₹10,000 p.m.*
D.A.	*₹3,000 p.m.*
Fringe benefits	*₹1,000 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.

STATEMENT SHOWING EFFECTIVE HRS

EFFECTIVE DAYS=	300
LEAVE DAYS =	(20)
	280
HRS PER DAY	X8
TOTAL EFFECTIVE HRS=	2240

STATEMENT SHOWING EFFECTIVE HRS/RATE

		R
BASIC-WAGES	(10000X12)	120000
D.A.	(3000X12)	36000
F.B	(1000X12)	12000
		168000

$\left(\frac{168000}{2240}\right)$ = 75.00

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(ILQ8B 3.4.9)

ILLUSTRATION 23

The Accountant of Y Ltd. has computed employee turnover rates for the quarter ended 31st March, 20X1 as 10%, 5% and 3% respectively under 'Flux method', 'Replacement method' and 'Separation method' respectively. If the number of workers replaced during that quarter is 30, find outthe number of workers for the quarter

(i) recruited and joined and (ii) left and discharged and (iii) Equivalent employee turnover rates for the year.

Avg- NUMBER OF WORKERS ON ROLL (FOR THE QTR)

EMPLOYEES TURNOVER RATE USIING REPLACEMENT METHOD =

$$\text{REPLACEMENT METHOD} = \left(\frac{\text{NO OF REPLACEMENT}}{\text{Avg NO OF WORKERS ON ROLL}}\right) \times 100$$

$$\frac{5}{100} = \frac{30}{x}$$

$$5x = 3000$$

$$x = 600$$

ANS NO(i) NO OF WORKERS RECRUITED AND JOINED

$$\left(\frac{\text{NO OF SEP} + \text{NO OF ACCESSIONS}}{\text{AVG NO OF WORKERS}}\right)$$

$$\left(\frac{18 + x}{600}\right) = \frac{10}{100}$$

$$6000 = 1800 + 100x$$

$$4200 = 100x \qquad x = 42$$

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(II) NO OF WORKERS LEFT AND DISCHARGED

EMPLOYEE TURN OVER RATE SEP- METHOD = (NO OF SEP / Avg NO OF WORKERS ON ROLL) X100

$$\frac{3}{100} = \frac{x}{100}$$

$100x = 1800$

$x = 18$

(iii) CALCULATION OF EMPLOYEES TURNOVER RATES

= EMPLOYEE TURNOVER FOR THE QTR / NO OF QTRS X 4 QTRS

USING FLUX METHOD = $\left(\frac{10}{1} \times 4\right) = 40\%$

USING REPLACEMENT METHOD = $\left(\frac{5}{1} \times 4\right) = 20\%$

USING SEP METHOD = $\left(\frac{3}{1} \times 4\right) = 12\%$

B1

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Employ. cost & DT expense

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ILLUSTRATION 24

The management of B.R Ltd. is worried about their increasing employee turnover in the factory and before analyzing the causes and taking remedial steps, it wants to have an idea of the profit foregone as a result of employee turnover in the last year.

Last year sales amounted to ₹83,03,300 and P/V ratio was 20 per cent. The total number of actual hours worked by the direct employee force was 4.45 lakhs. As a result of the delays by the Personnel Department in filling vacancies due to employee turnover, 1,00,000 potentially productive hours were lost. The actual direct employee hours included 30,000 hours attributable to train¬ing new recruits, out of which half of the hours were unproductive.

The costs incurred consequent on employee turnover revealed, on analysis, the following:

Settlement cost due to leaving	*₹43,820*
Recruitment costs	*₹26,740*
Selection costs	*₹12,750*
Training costs	*₹30,490*

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

Practical Questions

1. 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 Employee 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)	₹40
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 :

   (i) Calculate effective rate of earnings per hour under Halsey Scheme and Rowan Scheme.

   (ii) Calculate the savings to Mr. A in terms of direct labour cost per piece under the schemes.

PRACTICAL(2) STANDARD HRS FOR ACTUAL PRODUCTION = 2500
3.59 (1250 UNITS X 2 HRS)

ACTUAL HRS FOR ACTUAL PRODUCTION = 2000
(25 days X 8 hrs X 10 WORKERS)
time saved. 500

HALSEY = (50% X 500) = 250 hrs
ROWAN = $\left(\frac{2000}{2500} \times 500\right)$ = 400 "

(i) STATEMENT SHOWING EFFECTIVE Rate Per hr.

(A HRS + BONUS HRS) X Rate Wages ÷ hrs = Effective

HASEY (2000 + 250) X 40 = 90000 ÷ 2000 = 45
ROWAN (2000 + 400) X 40 = 96000 ÷ 2000 = 48

(ii) STATEMENT SHOWING SAVING PER PC

	COST PER PC (NOTIONAL)		COST PER PC (ACTUAL)	=	SAVING
HASEY	72.00	—	80	=	8.00 ₹
ROWAN	76.80	—	80	=	3.20 ₹

HALSEY (90000 ÷ 1250) = 72.00 | PIECE RATE 2 X 40 = 80

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PRACTICAL QN 6-2
3:59

2. Wage negotiations are going on with the recognised employees' union, and the management wants you as the as an executive of the company to formulate an incentive scheme with a view to increase productivity.

The case of three typical workers A, B and C 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 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 employee cost per 100 pieces under (i) Day wages, (ii) 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.

NOGIVEN GIVEN

STATEMENT SHOWING WAGES

	A	B	C
STANDARD HRS	= 18	= 12	= 10
	(180 UNITS X 8 / 100 UNITS)	(120 UNITS X 8 / 100 UNITS)	(100 UNITS X 8 / 100)
ACTUAL TIME	(8)	(8)	(8)
TIME SAVED	10	4	2
BONUS HALSEY	(50% · 10) = 5	(50% X 4) 2	(50% X 4) 1
ROWAN.	(8/18 X 10) = 4·44	(8/12 X 4) = 2·67	(8/10 X 2) = 1·60
PC-Rate	(8HRS/8OUTPUT) X 75 = 7·50	(8HRS/8OUTPUT X 75) = 7·50	(8HRS/8OUTPUT X 75) = 7·50
PER DAY WAGES	8 X 75 = 600	8 X 75 = 600	8 X 75 = 600

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STATEMENT SHOWING GROSS WAGES.

ANSNO(i)

WORKER	Daywages (NOGTNOI)	÷ OUTPUT =	COST PER 100/ UNIT
A	600	÷ 180 =	333.33
B	600	÷ 120 =	500
C	600	÷ 100 =	600

ANSNO(ii)

PC Rate

WORKER	ACHIEVED		COST PER UNIT		WAGES/100 UNIT
	Wages				
A	180	X	7.50	= (1350 ÷ 180) 100 = 750	
B	120	X	7.50	= (900 ÷ 120) x 100 = 750	
C	100	X	7.50	= (750 ÷ 100) x 100 = 750	

ANSNO(iii)

HASEY

(ACHIEVED + BONUS) x Rate ÷ [illegible]) x 100 = Wages For 100

A	(8	+5)	x 75 ÷	925) x 1000	= 925 x 100 / 180 = 541.6
B	(8	+2)	x 75 ÷	750) x 1000	= 750 x 100 / 120 = 625
C	(8	+1)	x 75 ÷	675) x 1000	= 675 x 100 / 100 = 675

ROWAN

A	(8	+ 4.44)	x 75 = 933	933/180 x 100 =	518.33
B	(8	+ 2.67)	x 75 = 800.25	800/120 x 100 =	666.67
C	(8	+ 1.60)	x 75 = 720	720/100 x 100 =	720

3. During audit of account of the G Ltd., 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 wage 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 per piece.

(iii) Percentage Bonus Plan – Standard quantities of production per hour are established by the engineering department. The workers' average hourly production, determined from his total hours worked and his 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 66⅔ %	Nil
66⅔ % 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:

Worker	Wages incentive plan	Total hours	Down-time hours	Units produced	Standard units	Base rate	Gross wages as per book
Rajesh	Straight piece work	40	5	400	-	180	8,500
Mohan*	Straight piece work	46	-	455	-	180	9,500
John	Straight piece work	44	-	425	-	180	8,500
Harish	Percentage bonus plan	40	4	250	200	220	12,000
Mahesh	Emerson's	40	-	240	300	210	9,300
Anil	Emerson's	40	-	600	500	200	12,600

* *Total hours of Mohan include 6 overtime hours.*

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

STATEMENT SHOWING THE CORRECT FIGURE OF MINIMUM WAGES/G

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WORKER	Wage PLAN INCENTIVE	WORANU NOTE	MINIMUM WAGES	GROSS WAGES As PER PLAN	GROSS WAGES AS BOOK	WAGES TO BE PAID
RAJESH	STRAIGHT PC	NOGNO1	7200	8000	8500	8000
MOHAN	STRAIGHT PC	NOGNO2	8820	9100	9500	9100
JOHN	STRAIGHT PC	NOGNO3	8280	8500	8500	8500
HARISH	% BONUS PLAN	NOGNO4	8800	12200	12000	12200
MAHESH	EMERSONS	NOGNO5	8400	10080	9300	10080
ANIL	EMERSONS	NOGNO6	8000	11600	12600	11600

NOGNO(1) RAJESH

MINIMUM WAGES (40hrs X 180) = 7200.

NO OF UNITS X Rate per unit
400 X 20 = 8000

NOGNO(2) MOHAN

Actual hrs X Rate = wages
40 X 180 = 7200

O.T
6 hrs X 270 = 1620

8820

(After calling 20) = 9100

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NOTE NO-(3)

JOHN

NORMAL (40HRS X180) = 7200
O.T (4HR X 270) = 1080
8280

(425 UNITS X 20) = 8500

NOTE NO(4) (1.) BONUS PLAN

(40HR X 220) = 8800

EFF RATIO = $\frac{(250 \text{ UNITS} \div 36\text{HR})}{200'' \div 40''} \times 100$

$\left(\frac{6.94}{5} \times 100\right) = 138.80\%$

HRLY WAGES (138% X220) = ~~8836~~ 305

(40HR X 305) = 12200

NOTE NO(5) MAHESH

EMERSONS

MINIMUM WAGES = (~~40 X 305~~) = ~~12200~~

(40HR X 210) = 8400

EFF RATIO = $\frac{(240 \div 40}{300 \div 40)} \times 100 = 80\%$

WAGES = 8400
BONUS 20% 1680
10080

Page No.
Date

NOGNO(6)

MINIMUM wage = (40m × 200) = 8000

Eff Ratio = $\left(\frac{600}{500} \times 100\right)$ = 120%.

wage	8000
Bonus (45% 8000)	3600
	11600

CHAPTER - 3
OVERHEAD

Question 1

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 lakhs man-days respectively. Out of the 40,000 units produced during a period, 30,000 were sold.

On analysing 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 ?

Question 2

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 200 equivalent units in work-in-progress ?

On investigation, it was found that 50% of the unabsorbed overhead was on account of increase in the cost of indirect materials and indirect labour and the remaining 50% was due to factory inefficiency. Also give the profit implication of the method suggested.

Question 3

The following information is obtained from the costing records of a factory :

Actual Overhead incurred	Rs. 3,75,000
Actual Hours worked	2,50,000

Budgeted Rate of a recovery of overheads is Rs. 100 per hour.

Units produced	9,800
Units sold	9,000
Units in work in progress	400 (50% complete)

(Q3)

On verification, it was found that 25% of the unabsorbed overhead due to the increase in cost of indirect material and indirect labour and 75% was due to inefficiency in the factory. Show the effects on costs of units produced, and on stocks values.

Question 4

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. 80,000 and 10,000 hours respectively. Of the amount of Rs. 80,000, Rs. 15,000 became payable due to an award of the Labour Court and Rs. 5,000 was in respect of expenses of the previous year booked in the current month (August). Actual production was 40,000 units, of which 30,000 units were sold. On analysing 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 ?

Question 5

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 2016-17, it has been found that actual production overheads incurred were Rs. 6,00,000. It included Rs. 45,000 on account of 'written off' obsolete stores and Rs. 30,000 being the wages paid for the strike period under an award.

The production and sales data for the year 2016-17 is as under :

Production :

Finished goods	20,000 units
Work-in-progress (50% complete in all respects)	8,000 units

Sales :

Finished goods	18,000 units

The actual machine hours worked during the period were 48,000. 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.

You are required to :

(i) Calculate the amount of under-absorption of production overheads during the year 2016-17; and

(ii) Show the accounting treatment of under-absorption of production overheads.

CHAPTER - 3
OVERHEAD

Question 1

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 lakhs man-days respectively. Out of the 40,000 units produced during a period, 30,000 were sold.

On analysing 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.

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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 200 equivalent units in work-in-progress ?

On investigation, it was found that 50% of the unabsorbed overhead was on account of increase in the cost of indirect materials and indirect labour and the remaining 50% was due to factory inefficiency. Also give the profit implication of the method suggested.

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Units sold	9,000
Units in work in progress	400 (50% complete)

(Q3)

On verification, it was found that 25% of the unabsorbed overhead due to the increase in cost of indirect material and indirect labour and 75% was due to inefficiency in the factory. Show the effects on costs of units produced, and on stocks values.

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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. 80,000 and 10,000 hours respectively. Of the amount of Rs. 80,000, Rs. 15,000 became payable due to an award of the Labour Court and Rs. 5,000 was in respect of expenses of the previous year booked in the current month (August). Actual production was 40,000 units, of which 30,000 units were sold. On analysing 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 ?

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Finished goods	18,000 units

The actual machine hours worked during the period were 48,000. 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.

You are required to :

(i) Calculate the amount of under-absorption of production overheads during the year 2016-17; and

(ii) Show the accounting treatment of under-absorption of production overheads.

Question 6

Separate departmental overhead application rates based on direct labour, are being used to buy a manufacturing company. At the end of the year, the following is supplied to you.

	Dept I	Dept. I	Dept. III
Overhead absorption rate	Rs. 4.00	3.00	7.00
Actual overhead incurred	81,900	1,20,960	1,79,360
Overhead absorbed	72,800	1,00,800	86,800
Direct labour hours recorded against.			
Work-in-progress	2,800	4,930	820
Finished goods	S,400	3,700	1,210

(a) **Calculate the revised overhead application rates per direct labour hour (to the nearest paise) in the light of actual figures for the year supplied to you.**

(b) **Calculate also the total amounts by which the work-in-progress and finished goods stock in each department will have to be increased or decreased in the light of the revised overhead application rates.**

Question 7

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, 2016.

	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
Work-in-progress	48,000

Using two methods of disposal of under-absorbed overheads show the implication on the profits of the company under each method.

DKC

Question 8 **OVERHEAD**

A company manufacturing one product uses a rate of overhead per unit.

The following amounts of factory overhead have been budgeted to be incurred for various levels of production.

Production Level (units)	Factory overhead (Rs.)
10,000	14,500
20,000	18,000
30,000	21,000
40,000	23,600
50,000	25,500

The present method of absorption is to compute a rate of overhead for each quarter based on the level of production estimated for the quarter.

It is proposed, however, that this method should be changed for one whereby a rate of overhead is established for the year as a whole, based on a normal production level of 30,000 units per quarter.

For quarters 1 and 2 following data applied :

	Production level (Units)		Factory Overhead		
Quarter	Estimated	Actual	Incurred (Rs.)	Sales (units)	
1.	20,000	19,000	17,500	15,000	
2.	40,000	42,000	25,000	40,000	

There is no work-in-progress at the end of any quarter and no finished stock at the beginning of the first quarter. Finished stock is valued on a first-in-first-out basis.

Calculate for each quarter :

1. Under present method of overhead absorption :
   a) Over or Under absorbed overhead for each quarter.
   b) The amount of factory overhead.
      i) included in overhead cost on the profit and loss account for the quarter and
      ii) appearing in Balance Sheet at the end of each quarter.

Assuming that over-or under absorption is transferred to the profit and loss account at the end of each quarter.

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Direct labour hours recorded against.			
Work-in-progress	2,800	4,930	820
Finished goods	5,400	3,700	1,210

(a) **Calculate the revised overhead application rates per direct labour hour (to the nearest paise) in the light of actual figures for the year supplied to you.**

(b) **Calculate also the total amounts by which the work-in-progress and finished goods stock in each department will have to be increased or decreased in the light of the revised overhead application rates.**

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1. Under present method of overhead absorption :
   a) Over or Under absorbed overhead for each quarter.
   b) The amount of factory overhead.
      i) included in overhead cost on the profit and loss account for the quarter and
      ii) appearing in Balance Sheet at the end of each quarter.

Assuming that over-or under absorption is transferred to the profit and loss account at the end of each quarter.

Question 9

A certain cost centre consists of ten workers using similar machines. The normal week consists of 5 days, totalling 42 hr. each worker has two week's annual holidays, together with other holiday of 5 days per annum. Each week, two hours per operator should be spent in cleaning etc., and it is estimated that illness and absenteeism will cause the loss of 1,000 hours per annum.

It is not anticipated that any overtime will be worked, or that any time other than stated will be lost.

Overheads allocated and apportioned to the cost centre, which are to be absorbed at a rate per direct labour hour, total Rs. 13,875 and your are required to calculate the absorption rate.

During the year, actual overheads amounted to Rs. 14,500 : time occupied in cleaning etc., totalled 1,000 hours., time lost by illness and absenteeism totalled 1,300 hours; time lost by machine breakdown totalled 200 hours. Overtime worked on production during the period amounted to 800 hours.

Present the overhead absorption account at the year-end assuming that standard costing is not in operation.

Question 10

X Ltd. having fifteen different types of automatic machines furnishes information as under for 2016-17.

(i) Overhead expenses : Factory rent Rs. 96,000 (Floor area 80,000 sq. ft.) Heat and 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.

DKC

OVERHEAD

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

Question 11

A Ltd. an Engineering Company having 25 different automatic machines, furnished you the following data for 2016-17 in respect of machine 'B'.

1. Cost of the machine Rs. 50,000
   Life 10 years
   Scarp Value NIL
2. Overhead expenses are for the factory :

Factory Rent	50,000
Heating and Lighting	40,000
Supervision	1,50,000
Reserve equipment for Machine 'B'	5,000 p.a.
Area of the factory	80,000 sq. ft.
Area occupied by the machine	3,000 sq. ft.

   Power cost 50 paise when in operation

3. Wages of operator is Rs. 24 per day of 8 hours including all benefits. He attends to one machine when it is being set up and two machine while under operations.

4. Estimated production hours 3,600 p.a
   Estimate set-up time 400 p.a. (hours)
   Prepare schedule of machine-hour rate and find the cost of the following jobs :

	Job 1102	Job 1308
Set-up time (hrs.)	80	40
Operation time (hrs.)	130	160

Question 12

Gemini Enterprises undertakes three different jobs A, B and C. All of them require, 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 :

Rent for the quarter	Rs. 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 Computer	600	900	--
(b)	With the use of the Computer	400	600	1,000

Your are required to compute machine hour rate :

(a) For the firm as a whole month when the computer was used when the computer was not used.

(b) For the individual jobs A, B and C.

Question 13

In a machine shop, the machine hour rate is worked out at the beginning of a year on the basis of 13 week period, which is equal to 3 calendar months. The following estimates for operating a machine are relevant :

Total working hours available per week	49 hours
Maintenance time included in the above	2 hours
Setting-up time included in the above	2 hours

Cost Details :

Operator's wages (per month)	Rs. 650
Supervisory salary (per month) (Common supervisor for 3 machines)	1,500
W.D.V. of machine (Depreciation at 10% plus 20% on an average for extra shift allowance)	1,80,000
Repairs and maintenance (per annum)	16,000
Consumable stores (per annum)	30,000
Rent, rates and taxes (for the quarter (apportioned)	5,000

Power consumed @ 15 units per hour @ 40 paise per unit.

Power is required for productive hours only. Setting-up time is part of productive time but no power is required for setting-up jobs.

The operator and supervisor are permanent. Repairs and maintenance and consumables stores are variable.

Your are required to :

(a) work out the machine hour rate.

(b) work out the rate for quoting to the outside party for utilizing the idle capacity in the machine shop assuming a profit of 20% above variable cost.

100

DKC

OVERHEAD

Question 14

The following is a schedule of expenses allocated to three machines A, B and C Viz.

	A	B	C
Rent and Rates	75	59	120
Insurance	2	1	4
Power	128	146	273
supervision	40	30	60
Organisation (wages of clerks time-keeper, foreman etc.)	10	7	15
Store service	20	29	46
Tool setters	93	78	12
Tool makers	194	145	214
Oil and sundries	8	12	7
Depreciation and repairs	69	100	83
	639	607	951

In addition to this expenses, there was the expenses of operating an overhead crane, which was necessary to bring heavy materials to the machine. These expenses were as follows :

	Rs.
Power consumed by the Crane	227
Wages of Crane driver	216
Repairs	28
Depreciation	49
Oil and sundries	5
Sundry charges allocated to the crane	45
	570

The number of hours the machine were in use during the period represented by the above expenditure was as follows :

	A	B	C
With use of crane	160	130	480
Without use of crane	428	577	---
	588	707	480

Calculate the machine-hour rate applicable to each machine, distinguishing between the hours when the crane was used and the hours in which it was not.

Question 15

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

Total cost of production Rs.	Volume of production (units)
14,600	800
19,400	1,200

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

Question 16

A company is making a study of the relative profitability of the two products – A and B. In addition to direct costs, indirect selling and distribution cost to be allocated between the two products are as under :

	Rs.
Insurance charges for inventory (finished)	78,000
storage costs	1,40,000
Packing and forwarding charges	7,20,000
Salesman salaries	4,50,000

Other details are :

	Product A	Product B
Selling price per unit (Rs.)	500	1,000
Cost per unit (exclusive of indirect selling and distribution costs) (Rs.)	300	600
Annual sales in units	10,000	8,000
Average inventory(units)	1,000	800
Number of Invoices	2,500	2,000

One unit of product A requires a storage space twice as much as product B. The cost to pack and forward one unit is the same for both the products. Salesmen are paid salary plus commission @ 5% on sales and equal amount of efforts are put forth on the sales of each of the products.

Required :

(i) Set up a schedule showing the apportionment of the indirect selling and distribution costs between the two products.

(ii) Prepare a statement showing the relative profitability of the two products.

DKC

OVERHEAD

Question 17

A Ltd., manufactures two products A and B. The manufacturing division consists of two production departments P_1 and P_2 and two service departments S_1 and S_2.

Budgeted overhead rates are used in the production departments to absorb factory overheads to the products. The rate of Department P_1 is based on direct machine hours while the rate of Department P_2 is based on direct labour hours. In applying overheads the pre-determined rates are multiplied by actual hours.

For allocating the service department cost to production departments, the basis adopted is as follows :

(i) Cost of Department S_1 to Department P_1 and P_2 equally, and

(ii) Cost of Department S_2 to Department P_1 and P_2 in the ratio of 2 : 1 respectively.

The following budgeted and actual data are available :

Annual profit plan data :

Factory overheads budgeted for the year :

		Rs.		Rs.
Departments	P_1	25,50,000	S_1	6,00,000
	P_2	21,75,000	S_2	4,50,000

Budgeted output in units :

Product A—50,000; B—30,000.

Budgeted raw-material cost per unit :

Product A—Rs. 120; Product B—Rs. 150.

Budgeted time required for production per unit :

Department P_1 : Product A: 1.5 machine hours

Product B: 1.0 machine hour

Department P_2: Product A: 2 Direct labour hours

Product B: 2.5 Direct labour hours

Average wage rates budgeted in Department P_2 are : Product A - Rs. 72 per hour and

: Product B - Rs. 75 per hour.

All material are used in Department P_1 only.

Actual data : (for the month of July, 2016)

Units actually produced ;Product A : 4,000 units

Actual direct machine hours worked in Department P_1 :

On product A – 6,100 hours, Product B – 4,150 hours.

Actual direct labour hours worked in Department P_2 :

On product A – 8,200 hours, Product B – 7,400 hours.

Cost actually incurred :

	Product A	Product B
Raw Materials :	Rs. 4,89,000	Rs. 4,56,000
Wages :	Rs. 5,91,900	Rs. 5,52,000

		Rs.		Rs.
Overheads :				
Department	P_1	2,31,000	S_1	60,000
	P_2	2,04,000	S_2	48,000

You are required to :

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

(ii) Prepare a performance report for July, 2016 that will reflect the budgeted costs and actual costs.

Question 18

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

Department	Factory Overhead Rs.	Direct Labour Hours	No. of Employees	Area in sq. m.
Production :				
X	1,93,000	4,000	100	3,000
Y	64,000	3,000	125	1,500
Z	83,000	4,000	85	1,500
Service :				
P	45,000	1,000	10	500
Q	75,000	5,000	50	1,500
R	1,05,000	6,000	40	1,000
S	30,000	3,000	50	1,000

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	Number of Employees
Q	Direct Labour Hours
R	Area in square metres
S	Direct Labour Hours

DKC

OVERHEAD

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.

Question 19

A factory comprises two production Departments and three service Departments. For the month of July, the direct department expenses were as follows :

Production Department		**Service Department**	
A - Rs. 85,000		Power House	Rs. 47,350
B - Rs. 70,000		Store	Rs. 15,000
		Repair	Rs. 60,500

The expenses of service departments are distributed on a percentage basis as under:

Power House: 25% to Repair Shop. 25% to Dept., A and 50% to Dept. B.

Store : 10% to Power , 20% to Repair Shop , 30% to Dept. A and 40% to Dept. B.

Repair shop : 20% to Power House, 30% to Dept. A and 50% to Dept. B

Prepare a statement showing the distribution of service department expenses to production departments using simultaneous equation method.

******

HOME- WORK

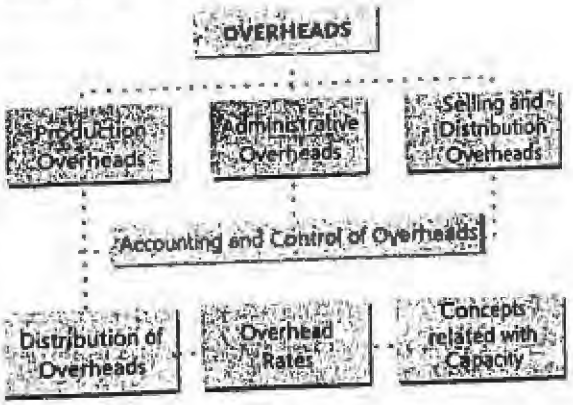
CHAPTER 4

OVERHEADS-ABSORPTION COSTING METHOD

LEARNING OUTCOMES

- Discuss the meaning of Overheads- Production, Administrative and Selling & Distribution.
- Discuss the meaning and methods of allocation, apportionment and absorption of overheads.
- Discuss the meaning and treatment of under-absorption and over-absorption of overheads and apply the same in cost computation.
- State the accounting and control of administrative, selling and distribution overheads.
- Discuss and apply the various methods to calculate overhead rate.

CHAPTER OVERVIEW



3

Cost & Mgmt Accounting.

Page No. 1
Date

ILLUSTRATION 1

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:	*(₹)*	*(₹)*
A	*30,00,000*	
B	*26,00,000*	
C	*24,00,000*	*80,00,000*
Service Departments:	*(₹)*	*(₹)*
Stores	*4,00,000*	
Time-keeping and Accounts	*3,00,000*	
Power	*1,60,000*	
Canteen	*1,00,000*	*9,60,000*

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 (₹)	*2,50,000*	*1,50,000*	*1,00,000*

Apportion the costs of service departments over the production departments.

(ILL-1)

Page No. Date

DIRECT- RE DISTRIBUTION :-

STATEMENT SHOWING APPORTION / DISTRIBUTION SERVICE DEPT OVER THE PRODUCTION DEPT

PART.	BASIS OF APP	TOTAL	PRODUCTION DEPT A	B	C
COST —	PROD DEPT (GIVEN)	8000000	3000000	2600000	2400000
STORES	VALUE OF STORES REQ 250 : 150 : 100	400000	200000	120000	80000
TIME KEEPING	NO OF WORK. (20 : 15 : 15)	300000	120000	90000	90000
POWER	H.P. MACHINE (300 : 300 : 200)	160000	60000	60000	40000
CANTEEN	NO OF WORKERS. (20 : 15 : 5)	100000	40000	30000	30000
	TOTAL	8960000	3420000	2900000	2640000

Page No.

ILLUSTRATION 2

Suppose the expenses of two production departments A and B and two service departments X and Y are as under:

	Amount	Apportionment Basis		
	(₹)	Y	A	B
X	2,00,000	25%	40%	35%
Y	1,50,000	—	40%	60%
A	3,00,000			
B	3,20,000			

STATEMENT SHOWING OVERHEADS DISTRIBUTION

		SERVICE DEPT		PRODUCTION DEPT	
DEPT		X	Y	A	B
	GIVEN	200000	150000	300000	320000
					70000
X-	Y : A : B 25 : 40 : 35	(200000)	50000	80000	~~50000~~
Y-	A : B	~~150000~~)	200000	80000	120000
				460000	510000

ILL-3

ILLUSTRATION 3

Service departments' expenses

	(₹)
Boiler House	3,00,000
Pump Room	60,000
	3,60,000

The allocation is :

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

STATEMENT SHOWING ALLOCATION OF O.H

	PRODUCTION DEPT		SERVICE DEPT	
	A	B	BOILER	PUMP
NOTATION	76923	38462		
	203077	118462		
TOTAL	210770	157231		

NOTATION: B = TOTAL EXP BOILER HOUSE
P = TOTAL EXP PUMP HOUSE

$$B = 300000 + \frac{1}{2}P$$

$$P = 60000 + \frac{1}{20}B$$

$$P = 60000 + \frac{1}{20}\left(300000 + \frac{1}{2}P\right)$$

$$P = 60000 + 15000 + \frac{1}{40}P$$

$$P - \frac{1}{40}P = 75000$$

$$\frac{39}{40}P = 75000$$

$$P = \underline{76923}$$

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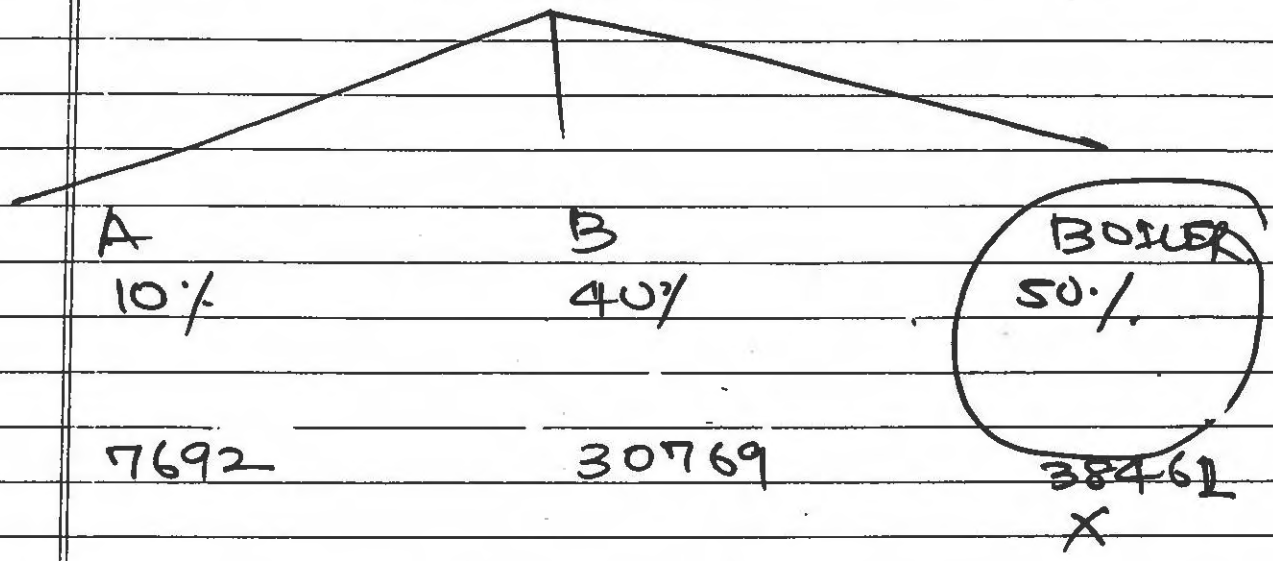
$B = 300000 + \frac{1}{2}\,76923$

$B = 338462$

$P = 76923$



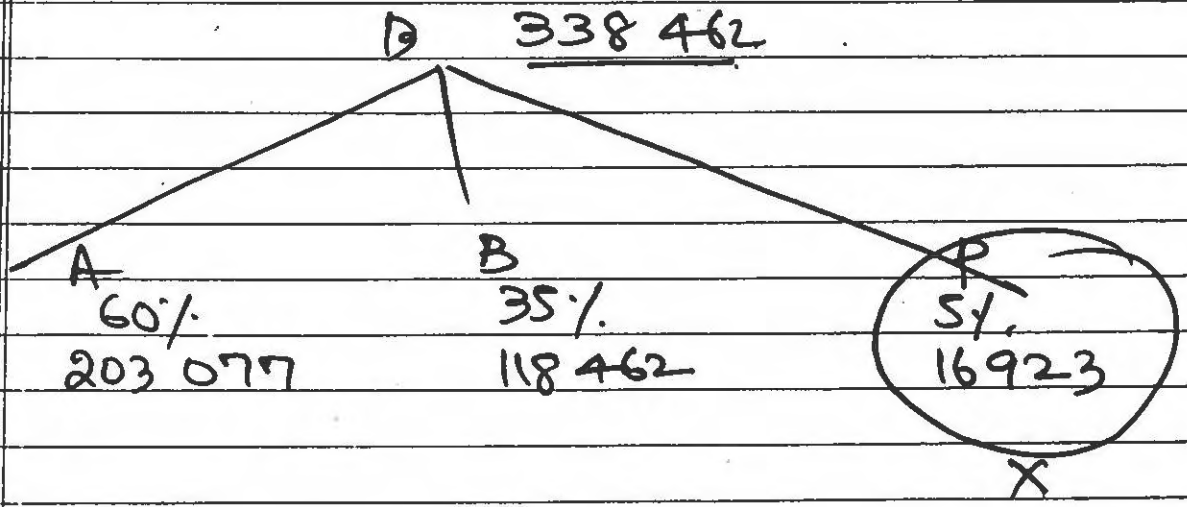


ILLUSTRATION 4

Sanz 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 20X3 :

	Total(₹)	A(₹)	B(₹)	C(₹)	X(₹)	Y(₹)
Direct material		1,00,000	2,00,000	4,00,000	2,00,000	1,00,000
Direct wages		5,00,000	2,00,000	8,00,000	1,00,000	2,00,000
Factory rent	4,00,000					
Power	2,50,000					
Depreciation	1,00,000					
Other overheads	9,00,000					
Additional information :						
Area (Sq. ft.)		500	250	500	250	500
Capital value of assets (₹ lakhs)		20	40	20	10	10
Machine hours		1,000	2,000	4,000	1,000	1,000
Horse power of machines		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 using Trial and error method.

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ANS NO(i) STATEMENT SHOWING DISTRIBUTION OF O/H

	BASIS OF DISTR	TOTAL ₹	A	B	C	X	Y	
DIRECT MAIE	DIRECT	—	—	—	—	200000	100000	Rs
DCR	DIRECT	—	—	—	—	100000	200000	Rs
Lab			(500)	(250)	(500)	(250)	(500)	
F.R	AREA (HP/MA)	400000	100000 (1000×50)	50000 (2000×40)	100000 (4000×20)	50000 (1000×15)	100000 (1000×25)	Rs
		250000	50000	80000	80000	150000	250000	Rs
DEP	CAPITAL VALUE	100000	(20) 20000	(40) 40000	(20) 20000	(10) 10000	(10) 10000	Rs
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]	[illegible]	[illegible]				
OTHE	M'NTS. →		(1000)	(2000)	(4000)	(1000)	(1000)	
	Rs	900000	100000	200000	400000	100000	100000	
		1650000	270000	370000	600000	475000	535000	

ANS NO(ii) STATEMENT OF SERVICE SHOWING REDISTRIBUTION

			SERVICE DEPT.	
			(X)	(Y)
			[illegible]	[illegible]
			475000	535000
			[illegible]	47500
				582500
X — TOY	10%		29125	2912
Y — TOX	5%			

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STATEMENT SHOWING DISTRIBUTION

	SERVICE		PRODUCTION		
	X	Y	A	B	C
	~~504271~~	~~585443~~	270000	320000	600000
	504300	585400			
(90% of 504271)					
(90% . 504300)					
			~~252490~~		
A : B : C			226935	75645	151290
45 : 15 : 30					
585400 X 95%			351240	204890	
A B C					
60 35					
			848175	650535	751290

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ILLUSTRATION 5

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 20X1:

	Total(₹)	A(₹)	B(₹)	C(₹)	X(₹)	Y(₹)
Direct material		1,00,000	2,00,000	4,00,000	2,00,000	1,00,000
Direct wages		5,00,000	2,00,000	8,00,000	1,00,000	2,00,000
Factory rent	4,00,000					
Power	2,50,000					
Depreciation	1,00,000					
Other overheads	9,00,000					
Additional information :						
Area (Sq. ft.)		500	250	500	250	500
Capital value of assets (₹ lakhs)		20	40	20	10	10
Machine hours		1,000	2,000	4,000	1,000	1,000
Horse power of machines		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'.

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STATEMENT SHOWING DISTRIBUTION OF OVERHEADS

PARTICULARS	BASIS	TOTAL	A	B	C	X	Y
NON-MFG	(GIVEN)		—	—	—	200000	100000
MFG	(11)					100000	200000
E-R	AREA.	400000	100000	50000	100000	50000	100000
(500 : 250 : 500 : 250 : 500)							
POWER		250000	50000	80000	80000	15000	25000
(HP x m hrs)							
(50000 : 80000 : 80000 : 15000 : 25000)							
DEP.		100000	20000	40000	20000	10000	10000
VALUE							
(20 : 40 : 20 : 10 : 10)							
OTHER OH		900000	100000	200000	400000	100000	100000
(1000 : 2000 : 4000 : 1000 : 1000)							
		1650000	270000	370000	600000	475000	535000

STATEMENT SHOWING REDISTRIBUTION

			A	B (Y)	(A)	(B)	(C)
O.H	(GIVEN)		475000	535000	270,000	370,000	600000
REDIS	'X'						
(45 : 15 : 30 : 10)			(475000)	47500	213750	71250	142500
				(582500)			
RE-DIS	'X'			(582500)			
60 : 35 : 5			29125	—	349500	203875	—
'X'			(29125)	2912	13106	4369	8738
45 : 15 : 30 : 10			—	[illegible]	[illegible]	[illegible]	[illegible]
'Y'							[illegible]
60 : 35 : 5			145	(2912)	1747	1019	
'X'			(145)	15	65	22	[illegible]
(45 : 15 : 30 : 10)				(15)	9	6	—
'Y'							
60 : 35 : 5			X	X	848177	650541	751282

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STATEMENT SHOWING MACHINE HR. RATE

$\left(\frac{O \cdot H}{M\,hrs}\right)$ = MACHINE hr RATE

(A) $\left(\frac{848177}{1000\ hrs}\right)$ = 848.18 P.hr.

(B) $\left(\frac{650541}{2000\ hrs.}\right)$ = 325.27 Phr

(C) $\left(\frac{751282}{4000\ hr}\right)$ = 187.82 hr.

A Ltd., manufactures two products A and B. The manufacturing division consists of two production departments P_1 and P_2 and two service departments S_1 and S_2.

Budgeted overhead rates are used in the production departments to absorb factory overheads to the products. The rate of Department P_1 is based on direct machine hours, while the rate of Department P_2 is based on direct labour hours. In applying overheads, the pre-determined rates are multiplied by actual hours.

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

(i) Cost of Department S_1 to Department P_1 and P_2 equally, and

(ii) Cost of Department S_2 to Department P_1 and P_2 in the ratio of 2 : 1 respectively.

The following budgeted and actual data are available:

Annual profit plan data:

Factory overheads budgeted for the year:

Departments	P_1	25,50,000	S_1	6,00,000
	P_2	21,75,000	S_2	4,50,000

Budgeted output in units:

Product A 50,000; B 30,000.

Budgeted raw-material cost per unit :

Product A ₹ 120; Product B ₹ 150.

Budgeted time required for production per unit:

Department P_1 : Product A : 1.5 machine hours
Product B : 1.0 machine hour

Department P_2 : Product A : 2 Direct labour hours
Product B : 2.5 Direct labour hours

Average wage rates budgeted in Department P_2 are:

Product A - ₹ 72 per hour and Product B – ₹ 75 per hour.

All materials are used in Department P1 only.

Actual data: (for the month of July, 20X1)

Units actually produced : Product A : 4,000 units
Product B : 3,000 units

Actual direct machine hours worked in Department P_1:

On product A 6,100 hours, Product B 4,150 hours.

Actual direct labour hours worked in Department P_2:

on product A 8,200 hours, Product B 7,400 hours.

Costs actually incurred :

		Product A		Product B
		₹		₹
Raw materials		4,89,000		4,56,000
Wages		5,91,900		5,52,000
		₹		₹
Overheads : Department	P_1	2,31,000	S_1	60,000
	P_2	2,04,000	S_2	48,000

You are required to :

(i) Compute the pre-determined overhead rate for each production department.

(ii) Prepare a performance report for July 20X1 that will reflect the budgeted costs and

Cost & Mgmt Acctg

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ILLUSTRATION 8

A light engineering factory fabricates machine parts to customers. The factory commenced fabrication of 12 Nos. machine parts to customers' specifications and the expenditure incurred on the job for the week ending 21st August, 20X1 is given below:

	(₹)	(₹)
Direct materials (all items)		780.00
Direct labour (manual) 20 hours @₹ 15 per hour		300.00
Machine facilities :		
Machine No. I : 4 hours @ ₹ 45	180.00	
Machine No. II : 6 hours @ ₹ 65	390.00	570.00
Total		1,650.00
Overheads @ ₹8 per hour on 20 manual hours		160.00
Total cost		1,810.00

The overhead rate of ₹8 per hour is based on 3,000 man hours per week; similarly, the machine hour rates are based on the normal working of Machine Nos. I and II for 40 hours out of 45 hours per week.

After the close of each week, the factory levies a supplementary rate for the recovery of full overhead expenses on the basis of actual hours worked during the week. During the week ending 21st August, 20X1, the total labour hours worked was 2,400 and Machine Nos. I and II had worked for 30 hours and 32.5 hours respectively.

Prepare a Cost Sheet for the job for the fabrication of 12 Nos. machine parts duly levying the supplementary rates.

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(STATEMENT SHOWING JOB COST- SHEET)

JOB NO .....
21 AUGUST ... 20X1

DIRECT COST		
DIRECT MATERIAL		780
DIRECT LABOUR (20X15)		300
PRIME COST		1080
INDIRECT COST		
F.O		
MACHINE (I) (4hrs X 45) =	180	
MACHINE (II) (6hrs X 65) =	390	570
		1650
OVERHEADS		
(8X20 MANUAL HRS)		160
T. COST		1810
SUPP. RATE		
TOTAL O.H =	24000	
(3000X8		
RECD O.H		
(2400X8)	19200	
UNDER RECD	4800	
÷ ACTUAL HRS	÷2400	
RATE	2.00	
SUPP O.H (20X2)		40
MACHINE		
M1 → (4hrsX15)		= 60
M2 → (6X15)		= 90
		2000

SUPP. R. RATE	M1	M2	
BUD O.H =	(40X45) = 1800	(48X45) = 2160	
RE O.H =	(30X45) 1350	(32.5X65) 2112.5	
UNDR AB -	÷ 450 / 30 = 15	= 487.5 ÷ 325 = 15	

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(ON04 / 36)

ILLUSTRATION 9 : (Reverse calculation of Factory overhead and Administrative overheads)

In an engineering company, the factory overheads are recovered on a fixed percentage basis on direct wages and the administrative overheads are absorbed on a 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 materials	54,000	37,500
Direct wages	42,000	30,000
Selling price	1,66,650	1,28,250
Profit percentage on Total Cost	10%	20%

ILLUSTRATION 10

A company which sells four products, some of them unprofitable, proposes discontinuing the sale of one of them. The following information is available regarding income, costs and activity for the year ended 31st March, 20X2.

	Products			
	A	**B**	**C**	**D**
Sales (₹)	30,00,000	50,00,000	25,00,000	45,00,000
Cost of sales (₹)	20,00,000	45,00,000	21,00,000	22,50,000
Area of storage (Sq.ft.)	50,000	40,000	80,000	30,000
Number of parcels sent	1,00,000	1,50,000	75,000	1,75,000
Number of invoices sent	80,000	1,40,000	60,000	1,20,000

Selling and Distribution overheads and the basis of allocation are :

	(₹)	**Basis of allocation to products**
Fixed Costs		
Rent & Insurance	3,00,000	Square feet
Depreciation	1,00,000	Parcel
Salesmen's salaries & expenses	6,00,000	Sales Volume
Administrative wages and salaries	5,00,000	No. of invoices
Variable Costs :		
Packing wages & materials	₹ 2 per parcel	
Commission	4% of sales	
Stationery	₹ 1 per invoice	

You are required to prepare Costing Profit & Loss Statement, showing the percentage of profit or lass to sales for each product.

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ILL-10

STATEMENT SHOWING ANALYSIS OF PRICE

	TOTAL	A	B	C	D
(A) SALES	15000000	3000000	5000000	2500000	4500000
VARIABLE COST					
(a) COST OF SALES	(10850000)	(2000000)	(4500000)	(2100000)	(2250000)
(ii) COMMISSION (4% OF SALES)	(600000)	(120000)	(200000)	(100000)	(180000)
PACKING & WRAPPING MATERIAL (2 PER-PARCEL)	(1000000)	(200000)	(300000)	(150000)	(350000)
STATIONERY COST (1- PER INVOICE)	(400000)	(80000)	(140000)	(60000)	(120000)
TOTAL (B)	12850000	2400000	5140000	2410000	2900000
A-B=C=CONT	2150000	600000	(140000)	90000	1600000
FIXED COST					
(i) RENT 50:40:80:30 (AREA)	300000	75000	60000	120000	45000
(ii) DEP NO OF PARCEL (100:150:75:175)	100000	20000	30000	15000	35000
(iii) SALESMAN'S SALARY (30:50:25:45)	600000	120000	200000	100000	180000
(iv) ADMIN WAGES (80:140:60:120) NO OF INVOICE	500000	100000	175000	75000	150000
(C) TOTAL FIXED	1500000	315000	465000	310000	410000
C-D= PROFIT (%)	650000 4.33%	285000 9.5%	(605000) (12.1%)	220000 (8.8%)	1190000 (26.4%)

1. The ABC Company has the following account balances and distribution of direct charges on 31st March, 20X1.

	Total	Production Depts.		Service Depts.	
		Machine Shop	Packing	Gen. Plant	Store & Maintenance
	(₹)	(₹)	(₹)	(₹)	(₹)
Allocated Overheads :					
Indirect labour	14,650	4,000	3,000	2,000	5,650
Maintenance material	5,020	1,800	700	1,020	1,500
Misc. supplies	1,750	400	1,000	150	200
Superintendent's salary	4,000	–	–	4,000	–
Cost & payroll salary	10,000	–	–	10,000	–
Overheads to be apportioned :					
Power	8,000				
Rent	12,000				
Fuel and heat	6,000				
Insurance	1,000				
Taxes	2,000				
Depreciation	1,00,000				
	1,64,420	6,200	4,700	17,170	7,350

The following data were compiled by means of the factory survey made in the previous year:

	Floor Space		Radiator Sections	No. of Employees	Investment	[illegible]
Machine Shop	2,000	Sq. ft.	45	20	640,000	3,500
Packing	800	" "	90	10	200,000	500
General Plant	400	" "	30	3	10,000	
Store & Maint.	1,600		60	5	150,000	1,000
	4,800	" "	225	38	1,000,000	5,000

Expenses charged to the stores and maintenance departments are to be distributed [redacted] following percentages:

[redacted] General Plant 20%; General Plant overheads [redacted] of employees:

(a) [redacted] producing [redacted]

(b) [redacted] distribution [redacted] cycles. Show all [redacted] rupees.

	20	300	480	400
INVEST 10000: 150000: (640000: 200000) 10000		15000	64000	20400
(b) DEP 10000 : INVE 150000: (640000: 200000)				

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STATEMENT SHOWING DISTRIBUTION SERVICE DEPT

	SERVICE DEPT		PRODUCTION DEPT	
	GEN-PLANT	STORES & MAINT	MACHINE	PACKING
TOTAL EXP	20000	30000	83920	30500
STORES & MAINT		(30000)		
30: 50: 20	9000	–	15000	6000
	29000			
	(29000)			
GEN-PLANT		4143	16571	8286
5: 20: 10				
		(4143)		
		–		
STORES & MAINT				
30: 50: 20	1242		2072	829
	(1242)			
	~~{1242~~			
	–			
GEN-PLANT				
5: 20: 10		177	710	355
		(177)		
		–		
STORES				
30: 50: 20				
	53		88	36
	(53)		35	18
	–			
GEN-MAINT	X	X	118396	46024
5: 20: 10				

2. Modern Manufactures Ltd. has three Production Departments P_1, P_2, P_3 and Service Departments S_1 and S_2 details pertaining to which are as under :

	P_1	P_2	P_3	S_1	S_2
Direct wages (₹)	3,000	2,000	3,000	1,500	195
Working hours	3,070	4,475	2,419	-	-
Value of machines (₹)	60,000	80,000	1,00,000	5,000	5,000
H.P. of machines	60	30	50	10	-
Light points	10	15	20	10	5
Floor space (sq. ft.)	2,000	2,500	3,000	2,000	500

The following figures extracted from the Accounting records are relevant :

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

The expenses of the Service Departments are allocated as under :

	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 P_1, P_2 and P_3 for 4, 5 and 3 hours respectively, given that its Direct Material Cost is ₹ 50 and Direct Labour Cost is ₹ 30.

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STATEMENT SHOWING OF OVERHEADS

PART.	BASIS		S1	S2	P1	P2	P3
DIRECT WAGES	(GIVEN)	1695	1500	195	-	-	-
RENT	AREA	5000	1000	250	1000	1250	1500
2000:500:2000:2500:3000							
GEN LIGHTING							
LIGHT-POINTS							
10:5:	10:15:20	600	100	50	100	150	200
IND-WAGES							
Dwage Rate		1939					
(1500:195	3000:2000:3000)		300	39	600	400	600
POWER		1500	100	-	600	300	500
H.P.							
10:-:60:30:50							
DEP ON MACHINE		10000	200	200	2400	3200	4000
VALUE OF MACHINE							
5000:5000:60000:80000:100000							
SUNDRIES		9695	1500	195	3000	2000	3000
Dwage.							
(1500:195:3000:2000:3000)							
		30429	4700	929	7700	7300	9800

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STATEMENT SHOWING RE DISTRIBUTION

PART	[illegible]	SERVICE DEPT			PRODUCTION DEPT		
		[illegible]	S1	S2	P1	P2	P3
ILLEN	[illegible]	[illegible]	4700	929	7700	7300	9800
S1 →							
10% 20% 30% 40%		[illegible]	4700	470	940	1410	1880
			×	1399			
				(1399)			
S2							
S1 P1 P2 P3							
10 : 40 : 20 : 30			139.90		559.6	279.8	419.7
			(139.90)				
S1							
S2 P1 P2 P3							
10 : 20 30 40		[illegible]		13.99	27.98	41.97	55.96
				(13.99)			
S2							
S1 P1 : P2 : P3							
10 : 40 : 20 : 30			1.39		5.60	2.80	4.20
S1							
S2 P1 P2 P3							
10 : 20 : 30 : 40			(1.39)	.13	.28	.42	.56
S2							
S1 P1 P2 P3							
10 : 40 : 20 : 30				(.13)	.06	.03	.04
					9233.52	9035.20	12160.46

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

Department	Factory overhead (₹)	Direct labour hours	No. of employees	Area in sq.m.
Production :				
X	93,000	4,000	100	2,000
Y	54,000	3,000	125	500
Z	83,000	4,000	85	1,500
Service :				
P	45,000	1,000	10	500
Q	75,000	5,000	50	1,500
R	1,05,000	6,000	40	1,000
S	30,000	3,000	50	1,000

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	Number of 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.

4. Gemini Enterprises undertakes three different jobs A, B and C. All of them require the use of a special machine and also the use of a computer. The computer is hired and the hire charges work out to ₹ 4,20,000 per annum. The expenses regarding the machine are estimated as follows:

	(₹)
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	Job B	Job C
Number of hours machine used :			
(a) Without the use of computer	600	900	
(b) With the use of the computer	400		

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

5. 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 ₹ 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.	₹ 20
Production bonus estimated	15% on wages
Value of power consumed	₹ 8,050
Supervision and indirect labour	₹ 3,300
Lighting and electricity	₹ 1,200

These particulars are for a year

Repairs and maintenance including consumables 3% of value of machines.

Insurance ₹40,000

Depreciation 10% of original cost.

Other sundry works expenses ₹12,000

General management expenses allocated ₹54,530.

You are required to work out a comprehensive machine hour rate for the machine shop.

NOTE NO (i)

STATEMENT SHOWING NORMAL HRS AVAILABLE PER MONTH.

NORMAL HRS AVAILABLE = 208

ABSENTEEISM HRS = (18)

LEAVE HRS. = (20)

IDLE TIME (10)

HRS PER MONTH/ PER OP = 160

(160 HRS X 6 WORKERS X 6 months)

= 5760

NOTE NO (ii)

OPERATORS WAGES [208 - 18) = 190

(20/8) = 2.50

2.50 P.H X 190 HRS X 6 X 6 = 17100

Page No.
Date

SCHEDULE STATEMENT SHOWING MACHINE COST

		Rs
(1) DEP	$\left(800000 \times \frac{10}{10} \times \frac{6}{12}\right)$	= 40000
(2) OPERATORS WAGES	(NOTE NO 2)	= 17100
(3) BONUS	(17100 × 15%)	2565
(4) POWER CONSUMED		8050
(5) SUPERVISOR		3300
(6) LIGHT & FL		1200
(7) REPAIRES	$\left(800000 \times \frac{3}{100} \times \frac{6}{12}\right)$	12000
(8) INSURANCE	$\left(40000 \times \frac{6}{12}\right)$	20000
(9) OTHER S. EMP	$\left(12000 \times \frac{6}{12}\right)$	6000
(10) GEN MAN EMP	(54530 ÷ 2)	27265
		137480

MACHINE HR RATE = $\left(\frac{137480}{5760}\right)$

= 23.87 P.M.

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Date

6. Job No. 198 was commenced on October 10, 20X1 and completed on November 1, 20X1. Materials used were ₹ 600 and labour charged directly to the job was ₹ 400. Other information is as follows:

Machine No. 215 used for 40 hours, the machine hour rate being ₹ 3.50.

Machine No. 160 used for 30 hours, the machine hour rate being ₹ 4.00. 6 welders worked on the job for five days of 8 hours each : the Direct labour hour per welder is ₹ 0.20

Expenses not included for calculating the machine hour or direct labour hour rate total led ₹ 2,000,total direct wages for the period being ₹ 20,000. Ascertain the works costs of job No. 198.

STATEMENT SHOWING JOB COST SHEET

	₹
DIRECT COST	
(1) DIRECT MATERIAL	600
(2) DIRECT LABOUR	400
PRIME COST	1000
INDIRECT :- FACTORY O.H	
MACHINE 215 → (40 X 3·50) = 140	
MACHINE 160 → (30 X 4) = 120	
WELDER (5 X (6 X 8 HRS X ·20) = 48	
308	308
GEN O.H ($\frac{2000}{20000}$ X 100) + (10% 400)	40
	1348

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Date

7. In a factory, overheads of a particular department are recovered on the basis of ₹ 5 per machine hour. The total expenses incurred and the actual machine hours for the department for the month of August were ₹ 80,000 and 10,000 hours respectively. Of the amount of ₹ 80,000, ₹ 15,000 became payable due to an award of the Labour Court and ₹ 5,000 was in respect of expenses of the previous year booked in the current month (August). Actual production was 40,000 units, of which 30,000 units were sold. On analysing 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?

8. In a manufacturing unit, factory overhead was recovered at a pre-determined rate of ₹ 25 per man-day. The total factory overhead expenses incurred and the man-days actually worked were ₹ 41.50 lakhs and 1.5 lakh man-days respectively. Out of the 40,000 units produced during a period, 30,000 were sold.

On analysing 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 ?

9. 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 Over-heads	Direct Labour hours	Machine hours
			(₹)	(₹)	(₹)
Budget :					
Machining	6,50,000	80,000	3,60,000	20,000	80,000
Assembly	1,70,000	3,50,000	1,40,000	1,00,000	10,000
Packing	1,00,000	70,000	1,25,000	50,000	–
Actual :					
Machining	7,80,000	96,000	3,90,000	24,000	96,000
Assembly	1,36,000	2,70,000	84,000	90,000	11,000
Packing	1,20,000	90,000	1,35,000	60,000	–

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 hours (₹)	Machine hours
Machining	1,200	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.

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Date

10. The total overhead expenses of a factory are ₹ 4,46,380. Taking into account the normal working of the factory, overhead was recovered in production at ₹ 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 200 equivalent units in work-in-progress?

On investigation, it was found that 50% of the unabsorbed overhead was on account of increase in the cost of indirect materials and indirect labour and the remaining 50% was due to factory inefficiency. Also give the profit implication of the method suggested.

11. ABC Ltd. manufactures a single product and absorbs the production overheads at a pre-determined rate of ₹ 10 per machine hour.

At the end of financial year 20X1-X2, it has been found that actual production overheads incurred were ₹ 6,00,000. It included ₹ 45,000 on account of 'written off' obsolete stores and ₹ 30,000 being the wages paid for the strike period under an award.

The production and sales data for the year 20X1-X2 is as under :

Production :	
Finished goods	20,000 units
Work-in-progress (50% complete in all respects)	8,000 units
Sales :	
Finished goods	18,000 units

The actual machine hours worked during the period were 48,000. 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 20X1-X2; and

(ii) Show the accounting treatment of under-absorption of production overheads.

CHAPTER - 4

COST SHEET (UNIT COSTING)

Question 1

A factory manufactures a uniform type of article and has a capacity of 4,000 units per week. The following information shows the different element of cost for three consecutive weeks when the output has changes every week.

Units Produced	Direct material (Rs.)	Direct labour (Rs.)	Factory overheads (Partly variable & partly fixed)
2,000	12,000	6,000	12,500
2,800	16,800	8,400	16,500
3,700	22,200	11,100	21,000

The factory has received an order for 5000 units and it desires a profit of 16 – 2/3% on selling price. **Find out the price at which each unit should be sold.**

Question 2

A factory can produce 60,000 units per annum at its optimum (100%) capacity. The estimated costs of production are as under :

Direct materials – Rs. 3 per units; Direct labour – Rs. 2 per unit.

Indirect expenses : Fixed – Rs. 1,50,000 p.a. Variable – Rs. 5 per unit, Semi variable Rs. 50,000 per annum up to 50% capacity and an extra expenses of Rs. 10,000 for every 25% increase in capacity or part thereof.

The factory produces only against orders (and not for own stock).

If the production programme of the factory is as indicated below and the management desires to ensure a profit of Rs. 1,00,000 for the year, work out the average selling price of which each unit should be quoted :

First 3 months of the year : 50% of the capacity.

Remaining 9 months : 80% of the capacity.

Ignore selling, distribution and administration overhead.

DKC

COST SHEET

Question 3

The comparative profit statement of two quarters of a firm is as under:

	Quarter I	Quarter II
Units sold	2,500	3,750
	Rs.	Rs.
Direct materials	87,500	?
Direct Wages	62,500	?
Fixed and variable Factory overheads	75,000	95,000
Sales	2,75,000	?
Profit	50,000	66,250

In the second quarter, the direct material price has increased by 20%. There was a saving of Rs. 5,000 in fixed overheads in the second quarter. The other costs and selling price remained the same.

Determine the quantity that should have been sold in the second quarter to maintain the same amount of profit per unit as in the first quarter.

Question 4

The accounts of a company are expected to reveal a profit of Rs. 14,00,000 after charging fixed costs of Rs. 10,00,000 for the year ended 31st March, 2016. The selling price of the product is Rs. 50 per unit and variable cost per unit is Rs. 20.

Market investigations Alternatives	Suggest the following Selling Price reduced by	Responses to the price changes : Quantity Sold increased by
I	5%	10%
II	7%	20%
III	10%	25%

Evaluate these alternatives and state which of the alternatives, on profitability consideration should be adjusted for the forthcoming year.

Question 5

The following is a summary of the trading result of a Company selling on electrical application for the year ended 31st December, 2016 during which 80,000 units were sold:-

	Rs. (lakhs)	
Sales:	--	96
Costs:		
Material	36	--
Labour :		
Direct	15	--
Indirect	6	--
Other costs	18	75
		21

Taking into consideration the following matters, prepare a summary of the expected results for the following year :-

(i) The selling price is to be reduced by Rs. 7.50

(ii) Sales volume is expected to increase by 40%

(iii) Suppliers have agreed to give a discount of S per cent on all purchases of materials.

(iv) Direct workmen are to be paid an incentive bonus of 2 ½ per cent in order to stimulate production. Indirect labour is not expected to increase during the following year.

(v) Other cost vary directly with production except to the extent of Rs. 3 lakhs which is considered 'fixed' and an additional expenses of Rs. 1 lakh will arise due to rent in respective extension to the factory.

(vi) You are to assume that there are no stock or work-in-progress as at 31st December.

Question 6

Prepare an estimated cost sheet based on the following data and consider the price that you would quote for an export order of 25,000 PCS.

Raw material : 10,000 kgs. @ 6.95 per kg. Direct labour 15,000 hours normal at Rs. 2.00 per hour 25% overtime at double the normal rate.

Factory overheads : Normally recovered at 80% of direct wages.

Selling and Distribution cost : Normally recovered at 60% of direct wages.

Additional fixed capital investment to be made Rs. 50,000.

Normal net Return on Capital Employed Expected 25%.

Increase in working capital :- 20% of the sales value.

DKC

COST SHEET

Question 7

PH Ltd., manufactures and sells two products, namely BXE and DXE. The co. investment in fixed capital is Rs. 2 lakhs. The working capital investment is equivalent to three months cost of sales of both the products. The fixed capital has been financed by term loan lending institutions at an increase of 11% p.a. Half of the working capital is financed through bank borrowings carrying interest at the rate of 19.4% the other half of the working capital being generated through internal resources.

The operating data anticipated for 2016-17 are as under :

	Product BXE	**Product DXE**
Production per annum	5000	10,000
Direct materials/Unit		
Material A (price Rs. 4 per kg.)	1 kg.	0.75 kg.
Material B (price Rs. 2 per kg.)	1 kg.	1 kg.
Direct labour hours	5	3

Direct wages rate Rs. 2 per hour
Factory overheads are recovered at 50% of direct wages.
Admn. overheads are recovered at 40% of factory cost.
Selling & Distribution exps. are Rs. 2 and Rs. 3 per unit respectively for BXE and DXE. The company expects to earn an after tax net return of 12% on capital employed.

The Income tax Rate is 50%.

Required :

(i) Prepare a cost sheet showing the element wise cost, total cost profit and selling price per unit of both the producers.
(ii) Prepare a statement showing the net profit of the Co. after taxes for the year 2016-17.

Question 8

The Cost structure of an article, the selling price of which is Rs. 45,000 is as follows :

Direct Material	50%
Direct Labour	20%
Overheads	30%

An increase of 15% in the cost of material and 25% in the cost of labour is anticipated. These increased cost in relation to the present selling price would cause a 25% decrease in the amount of present profit per article;

You are required:

(1) To prepare a statement of profit per article at present, and

(2) The revised selling price to produce the same percentage of Profit to Sales as before.

Question 9

The following figures are extracted from the Trial Balance of Gogetter Co. on 30th September, 2016.

	Rs.	Rs.
Inventories :		
Finished Stock	80,000	---
Raw Materials	1,40,000	---
Work-in-Process	2,00,000	---
Office Appliances	17,400	---
Plant & Machinery	4,60,500	---
Buildings	2,00,000	---
Sales	---	7,68,000
Sales Return and Rebates	14,000	---
Materials Purchased	3,20,000	---
Freight incurred on Materials	16,000	---
Purchase Returns	---	4,800
Direct Labour	1,60,000	---
Indirect Labour	18,000	---
Factory Supervision	10,000	---
Repairs and Upkeep-Factory	14,000	---
Heat, Light & Power	65,000	---
Rates and Taxes	6,300	---
Miscellaneous Factory Expenses	18,700	---
Sales Commission	33,600	---
Sales Travelling	11,000	---
Sales Promotion	22,500	---
Distribution Deptt.	18,000	---
Salaries & Expenses		
Offices Salaries and Expenses	8,600	---
Interest on Borrowed Funds	2,000	---

DKC

COST SHEET

Further details are available as follows :

(i)	**Closing Inventories :**		
	Finished Goods	1,15,000	---
	Raw Materials	1,80,000	---
	Work-in-process	1,92,000	---
(ii)	**Accrued expenses on :**		
	Direct Labour	8,000	---
	Indirect Labour	1,200	---
	Interest on Borrowed Funds	2,000	---
(iii)	**Depreciation to be provided on :**		
	Office Appliances	5%	
	Plant and Machinery	10%	
	Buildings	4%	

(iv) **Distribution of the following costs :**
Heat, Light and Power to 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 condensed Profit and Loss Statement of Gogetter co. for the year ended 30th September, 2016 along with supporting schedules of :

(i) Cost of Sales.
(ii) Selling and Distribution Expenses.
(iii) Administration Expenses.

****

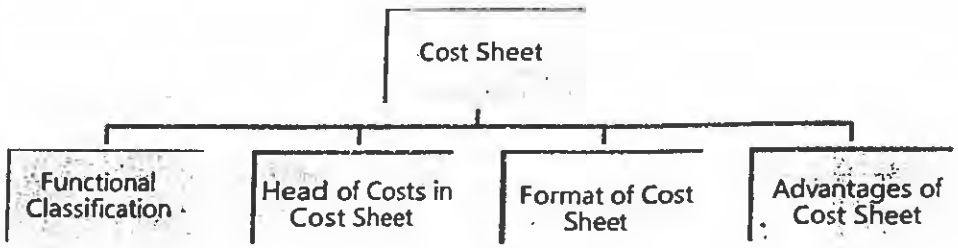
CHAPTER 6

COST SHEET

LEARNING OUTCOMES

- ☐ Classify and ascertain cost on the basis of function.
- ☐ Prepare cost sheet/ statement for production of goods and providing services.

CHAPTEROVERVIEW



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ONO-10

ILLUSTRATION 1

The following data relates to the manufacture of a standard product during the month of April, 20X8:

Raw materials	*₹ 1,80,000*
Direct wages	*₹ 90,000*
Machine hours worked (hours)	*10,000*
Machine hour rate (per hour)	*₹ 8*
Administration overheads	*₹ 35,000*
Selling overheads (per unit)	*₹ 5*
Units produced	*4,000*
Units sold	*3,600*
Selling price per unit	*₹ 125*

You are required to prepare a cost sheet in respect of the above showing:

(i) Cost per unit

(ii) Profit for the month

IIL-1 ON0-10
6.7

STATEMENT SHOWING COST SHEET APRIL - 20X8

	PRODUCTION = 4000 UNITS	
	TOTAL	P.U.
DIRECT COST		
(I) DIRECT MATERIAL	180 000	45.00
(II) DIRECT LABOUR	90 000	22.50
(III) DIRECT EXP	—	
PRIME COST	270,000	67.50
INDIRECT COST		
(1) FACTORY O.H (10000 MHR X 8)	80000	20.00
FACTORY COST	350,000	87.50
(2) ADMIN O.H	—	
COST OF PRODUCTION	350000	87.50
OPENING FINISHED GOODS	—	
CLOSING FINISHED GOODS (350000/4000 X 400 UNITS)	(35000)	—
COST OF GOOD SOLD	315000	
(I) ADMIN EXP	35000	
(II) SELLING EXP	18000	
COST OF SALES	368000	
PROFIT	82000	
SALES	450000	

ON10-11

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Date

ILLUSTRATION 2

The following information has been obtained from the records of ABC Corporation for the period from June 1 to June 30, 20X8.

	On June 1 (₹)	On June 30, 20X8 (₹)
Cost of raw materials	60,000	50,000
Cost of work-in-process	12,000	15,000
Cost of stock of finished goods	90,000	1,10,000
Purchase of raw materials during June' 20X8		4,80,000
Wages paid		2,40,000
Factory overheads		1,00,000
Administration overheads (related to production)		50,000
Selling & distribution overheads		25,000
Sales		10,00,000

Prepare a statement giving the following information:

(a) *Raw materials consumed;*

(b) *Prime cost;*

(c) *Factory cost;*

(d) *Cost of goods sold; and*

(e) *Net profit.*

ILL-2

ON 0-11

STATEMENT SHOWING COST SHEET 1-6-20X

	Rs
DIRECT COST	
(1) DIRECT MATERIAL (NOTE NO i)	490000
(2) DIRECT LABOUR	240000
(3) DIRECT EXP	
PRIME COST	730000
INDIRECT EXP/COST	
(1) FACTORY OVERHEADS	100000
GROSS - FACTORY COST	830000
OPENING W.I.P	12000
CLOSING W.I.P	(15000)
FACTORY COST	827000
(ii) ADMIN OVERHEADS	50000
COST OF PRODUCTION	877000
OPENING FINISHED GOODS	90000
CLOSING FINISHED GOODS	(110000)
COST OF GOODS SOLD	857000
(iii) SELLING OVERHEADS	25000
COST OF SALES	882000
NET PROFIT	118000
SALES	1000000
NOTE NO(i) DIRECT - MATERIAL	
OPENING STOCK	60000
PURCHASES	480000
CLOSING STOCK	(50000)
	490000

Q No-12

Practical Questions

1. The books of Adarsh Manufacturing Company present the following data for the month of April, 20X9:

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

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

Inventory accounts showed the following opening and closing balances:

	April 1 (₹)	April 30 (₹)
Raw materials	8,000	10,600
Work-in-progress	10,500	14,500
Finished goods	17,600	19,000

Other data are:

	(₹)
Selling expenses	3,500
General and administration expenses	2,500
Sales for the month	75,000

You are required to:

(i) Compute the value of materials purchased.

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

(PRACT / 6.11) QNo-12

STATEMENT SHOWING VALUE OF MATERIAL PURCHASED / PF

		Rs.
DIRECT COST		
(i) DIRECT MATERIAL	(Bal-Fig)	33900
(ii) DIRECT LABOUR		17500
(iii) DIRECT EXP		
	PRIME COST	51400
INDIRECT COST		
(i) FACTORY O.H (175% = 17500; 100% = 10000)		10000
	GROSS FACTORY COST	~~59500~~ 61400
OPENING W.I.P.		10500
CLOSING W.I.P		(14500)
	FACTORY COST	57400
ADMIN O.H		—
	COST OF PRODUCTION	57400
OPENING FINISHED GOODS		17600
CLOSING FINISHED GOODS		(19000)
	COST OF GOODS SOLD	56000
ADMIN EXP		2500
SELLING O.H		3500
	COST OF SALES	62000
	PF	13000
	SALES	75000

NOTE NO (i) MATERIAL PURCHASES

OPENING STOCK	8000
PURCHASES	36500
CLOSING STOCK	(10600)
RAW-MATERIAL CONS	33900

DKC

Q No-13

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2. A Ltd. Co. has capacity to produce 1,00,000 units of a product every month. Its works cost at varying levels of production is as under:

Level	Works cost per unit (₹)
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 ₹ 1,50,000 and fixed marketing expenses amount to ₹ 2,50,000 per month respectively. The variable distribution cost amounts to ₹ 30 per unit.

It can sell 100% of its output at ₹ 500 per unit provided it incurs the following further expenditure:

(a) it gives gift items costing ₹ 30 per unit of sale;

(b) it has lucky draws every month giving the first prize of ₹ 50,000; 2nd prize of ₹ 25,000, 3rd prize of ₹ 10,000 and three consolation prizes of ₹ 5,000 each to customers buying the product.

(c) it spends ₹ 1,00,000 on refreshments served every month to its customers;

(d) it sponsors a television programme every week at a cost of ₹ 20,00,000 per month.

It can market 30% of its output at ₹ 550 per unit without incurring any of the expenses referred to in (a) to (d) above.

Prepare a cost sheet for the month showing total cost and profit at 30% and 100% capacity level.

STATEMENT - COST- SHEET FOR THE MONTH

	30%. 30000 UNITS		100%. 100000 UNITS	
	TOTAL	P.U	TOTAL	P.U
WORKS COST	1,14,00,000	380	3,10,00,000	310
FIXED ADMIN EXP	150000	5.00	150000	1.50
COST OF PRODUTION	11550000	385	31150000	311.50
SELLING & DIST EXP	1150000	38.33	8450000	84.5
	12700000	423.33	39600000	396
COST OF SALES				
PROFIT	3800000	12.67	10400000	104
SALES	16500000	550	5,00,00,000	500

SELLING & DIST - COST

FIXED MARKEXP	250000	8.33	250000	2.50
VARIABLE DISCOM	900000	30.00	3000000	30.00
GIFT ITEM			3000000	30.00
CUSTOMER - PRIZE			100000	1.00
REF COST			100000	1.00
T.V. PROG - COST			2000000	20.00
	1150000		8450000	

CHAPTER - 5

JOB COSTING & BATCH COSTING

Question 1

A factory, which utilises job costing system, makes available the following data for the year ending 31st March, 2016.

Direct Materials	Rs.90,000
Direct Wages	Rs.75,000
Profit	Rs.60,900
Selling & Dist. Overheads	Rs.52,500
Administration Overheads	Rs.42,000
Factory Overheads	Rs.45,000

(a) **Prepare a job cost sheet indicating the prime cost, works cost, production cost, cost of sales and sales value.**

(b) In 2016-17, the factory has received an order for a number of jobs. It is estimated that direct material required will be Rs. 1,20,000 and direct labour will cost Rs. 75,000. What should be the price for these jobs if the factory intends to earn the same rate of profit on sales, assuming that selling and distribution overheads will go up by 15%? The factory recovers factory overheads as percentage of direct wages and Administration and selling overheads as a percentage of works cost, based on cost rates prevailing in the previous year.

Question 2

Mayur Engineering engaged in job work, has completed all jobs in hand on 30th December. 2016 except job No. 447. The cost sheet on 30th December, showed direct materials and direct labour costs of Rs. 40,000 and Rs. 30,000 respectively, as having been incurred a job No. 447.

The costs incurred by the business on 31st Dec, 2016, the last day of the accounting year were :

Direct Materials (Job 447)	Rs. 2,000
Direct Labour (job 447)	8,000
Indirect Labour	2,000
Miscellaneous Factory Overheads	Rs.3,000

It is the practice of the business to make the jobs absorb factory overheads on the basis of 120 % of direct labour cost. Calculate the value of work-in-progress of job 447 on 31st Dec. 2016.

Question 3

In a factory following the Job Costing Method, an abstract from the work in process as at 30th September was prepared as under :-

Job No.	Materials	Direct Labour Hrs.	Direct Labour Cost	Factory Overhead Appld.
115	Rs. 1,325	400 hours	Rs. 800	Rs. 640
118	Rs. 810	250 hours	Rs. 500	Rs. 400
120	Rs. 765	300 hours	Rs. 475	Rs. 380
	2,900		1,775	1,420

Materials used in October were as follows :

Material Requisition No.	Job No.	Cost Rs.
54	118	300
55	118	425
56	118	515
57	120	665
58	121	910
59	124	720
		3,535

A summary of Labour Hours deployed during October is as under :

Job No.	Shop A	Shop B
115	25	25
118	90	30
120	75	10
121	65	--
124	20	10
	275	75

Indirect Labour :

Waiting for Material	20	10
Machine Breakdown	10	5
Idle Time	5	6
Overtime Premium	6	5
	316	101

A shop credit slip was issued in October, that material under requisition No. 54 was returned back to stores as being not suitable. A material Transfer Note issued in October indicated that material issued under requisition No. 55 for Job 118 was directed to Job 124.

The hourly rate in Shop A per labour hour is Rs. 3 per hour while at Shop B it is Rs. 2 per hour. The factory overhead is applied at the same rate as in September. Jobs 115, 118 and 120 were completed in October.

Your are asked to compute the factory cost of the completed jobs. It is the practice of the management to put 10% on the factory cost to cover administration and selling overheads and invoice the job to the customer on a total cost-plus 20% basis. What would be the invoice price of these three jobs.

Question 4

In an engineering company, the factory overheads are recovered on a fixed percentage basis on direct wages and the administrative overheads are absorbed on a 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**
	Rs.	Rs.
Direct Materials	54,000	37,500
Direct Wages	42,000	30,000
Selling Price	1,66,650	1,28,250
Profit Percentage on Total Cost	10%	20%

Required :

(i) Computation of percentage recovery rates of factory overheads and administrative overheads.

(ii) Calculation of the amount of factory overheads, administrative 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 Materials Rs. 24,000

Direct Wages Rs. 20,000

Profit Percentage on Selling Price 12 ½ % .

Question 5

In factory, the expenses of factory are charged on a fixed percentage basis of wages and office overhead expenses are calculated on the basis of percentage of works cost.

The following information is supplied.

	Order I	Order II
Material	12,500	18,000
Wages	10,000	14,000
Selling Price	42,900	61,880
% of profit on cost	10%	12%

Find out % for factory overhead and office overhead.

Question 6

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 Rs.	Direct Wages Rs.	Factory Overheads Rs.	Direct Labour Hours	Machine Hours
Budget					
Machining	6,50,000	80,000	3,60,000	20,000	80,000
Assembly	1,70,000	3,50,000	1,40,000	1,00,000	10,000
Packing	1,00,000	70,000	1,25,000	50,000	--
Actuals					
Machining	7,80,000	96,000	3,90,000	24,000	96,000
Assembly	1,36,000	2,70,000	84,000	90,000	11,000
Packing	1,20,000	90,000	1,35,000	60,000	--

The details of one of the representative jobs produced during the month are as under :

Job No. CW 7803 :

Department	Direct Materials Rs.	Direct Wages Rs.	Direct Labour Hours	Machine Hours
Machining	1,200	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.

Question 7

From the following figures of Mysore Soap Factory (a) Fine normal overhead application rates using (i) Direct Labour hour rate Method, (ii) Direct labour cost Method. (iii) Machine-hours rate Method, given that the budgeted figures for the year are :

Estimated Factory Overhead	Rs. 58,000
Estimated Direct labour hrs.	1,34,600
Estimated labour cost	Rs. 97,800
Estimated machine-hours	50,000

Prepare of comparative statement of cost showing the result the application of each of the above rates to Batch No. 243 from the date given below :

Direct material consumed	Rs. 42
Direct Labour	45
Direct labour hours	30
Machine Hours	20

Question 8

Following information relates to the manufacturing of components X 103 in a cost centre:

Cost of materials	6 paise per component
Operator's wages	72 paise an hour
Machine-hour-rate	Rs. 1.50
Setting up time of the machine	2 hours and 20 minutes
Manufacturing time	10 minutes per unit

Prepare cost sheets, showing total and per unit cost, when a batch consists of :

i) 10 units ii) 100 units iii) 1,000 units

Question 9

Leo Limited undertakes to supply 1,000 units of a component per month for the months of January, February and March 2016. Every month a batch order is opened against which materials and labour cost are booked at actual. Overheads are levied at a rate per labour hour. The selling price is contracted at Rs. 15/- per unit.

From the following data, present the cost and profit per unit of each batch order :

Month	Batch output (Numbers)	Materials Cost Rs.	Labour Cost Rs.
January 2016	1,250	6,250	2,500
February 2016	1,500	9,000	3,000
March 2016	1,000	5,000	2,000

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

Month	Total Overheads Rs.	Labour Hours
January 2016	12,000	4,000
February 2016	9,000	4,500
March 2016	15,000	5,000

Question 10

A company is manufacturing building bricks and fire bricks. Both the products require two processes : Brick-forming and Heat-treating.

Time requirement for the two bricks are :

	Building Bricks	Fire Bricks
Forming per 100 Bricks	3 Hrs.	2 Hrs.
Heat-treatment per 100 Bricks	2 Hrs.	5 Hrs.

Total cost of two the departments in one month were :-

Forming	Rs. 21,200
Heat-treatment	Rs. 48,800

Production during the month was :

Building Bricks	1,30,000 Nos.
Fire Bricks	70,000 Nos.

Prepare a statement of manufacturing cost for the two varieties of bricks.

****

157

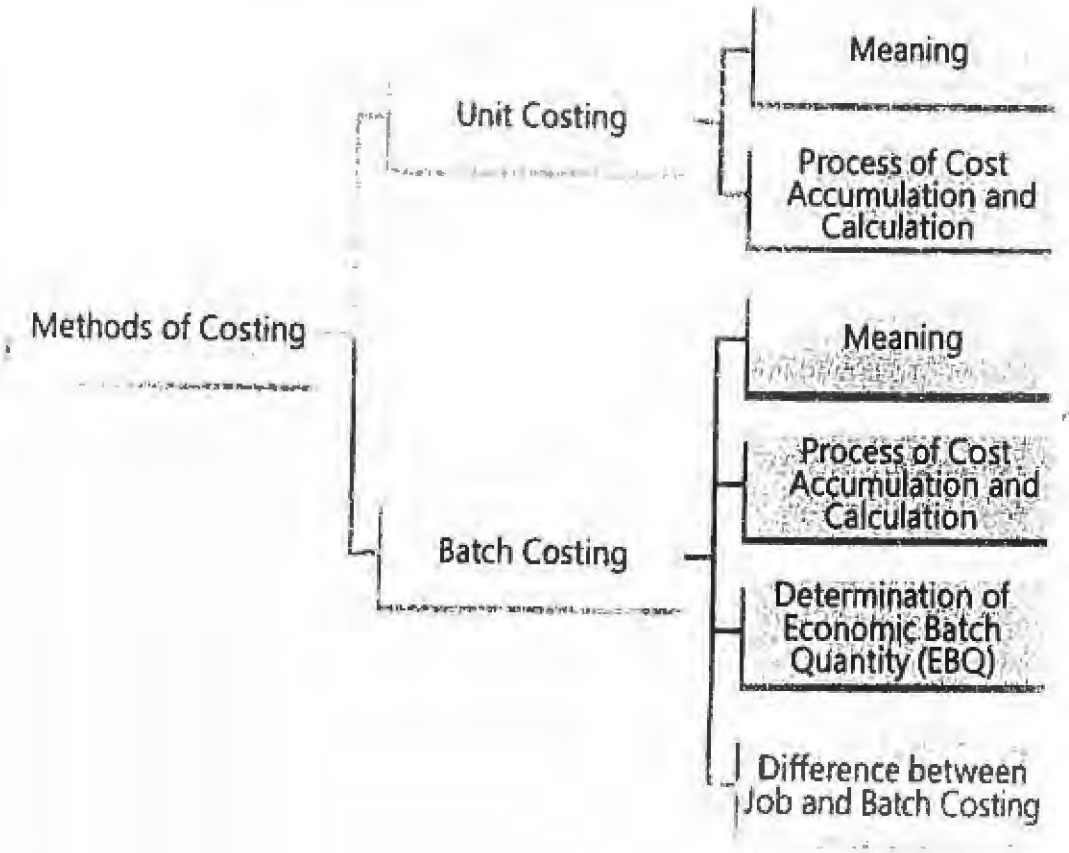
HOME WORK

CHAPTER 8

LEARNING OUTCOMES

- ☐ Describe Unit Costing method.
- ☐ Prepare and calculate the cost under Unit Costing.
- ☐ Describe Batch Costing methods.
- ☐ Explain the accounting entries for cost elements under the method.
- Determine the cost for a batch
- Differentiate between Job Costing and Batch Costing

OVERVIEW



10

ILLUSTRATION 1 Q No- 1

The following data relate to the manufacture of a standard product during the 4-week ended 28th February 20X8:

Raw Materials Consumed	₹4,00,000
Direct Wages	₹2,40,000
Machine Hours Worked	3,200 hours
Machine Hour Rate	₹40
Office Overheads	10% of works cost
Selling Overheads	₹20 per unit
Units produced and sold	10,000 at ₹120 each

You are required to find out the cost per unit and profit for the 4- week ended 28th February 20X8.

Page No.
Date

STATEMENT SHOWING COST SHEET

28-2-20X8 — 10000 UNITS

	TOTAL	P.U.
DIRECT COST		
(1) DIRECT MATERIAL	400000	40.00
(2) DIRECT LABOUR	240000	24.00
(3) DIRECT EXP	-	
PRIME COST	640000	64.00
INDIRECT COST		
F.O (3200x40)	128,000	12.80
FACTORY COST	768000	76.80
ADMIN O.H (10% X 768000)	76800	7.68
COST OF PRODUCTION	844800	84.48
SELLING O.H	200000	20.00
COST OF SALES	1044800	104.48
PF	155200	15.52
SALES	1200000	120.00

Page No.
Date

Q No. 2

ILLUSTRATION 2

Atharva Pharmacare Limited produced a uniform type of product and has a manufacturing capacity of 3,000 units per week of 48 hours. From the records of the company, the following data are available relating to output and cost of 3 consecutive weeks

Week Number	Units Manufactured	Direct Material (₹)	Direct Wages (₹)	Factory Overheads (₹)
1	1,200	9,000	3,600	31,000
2	1,600	12,000	4,800	33,000
3	1,800	13,500	5,400	34,000

Assuming that the company charges a profit of 20% on selling price, find out the selling price per unit when the weekly output is 2,000 units

Page No.
Date

STATEMENT SHOWING COST SHEET

	2000 UNITS	
	TOTAL	P.U.
DIRECT COST		
(1) DIRECT MAT	$(\frac{9000}{1200} \times 2000) = 15000$	7.50
(2) DIRECT LAB	$(\frac{3600}{1200} \times 2000) = 6000$	3.00
(3) DIRECT EXP	-	
PRIME COST	21000	10.50
F.O.	35000	17.50
F. COST	56000	28.00
Pt $(\frac{20}{80} \times 56000)$	14000	7.00
SALES	70000	35.00

F.O. VCOST P.U = X FCOST = Y

$1200X + Y = 31000$

$1600X + Y = 33000$

$400X = 2000$

$X = 5$

$(200 \times 5) + Y = 31000 \quad Y = 25000$

$(2000 \times 5) + 25000 = 35000$

QNo-3

Page No.
Date

ILLUSTRATION 3

Arnav Confectioners (AC) owns a bakery which is used to make bakery items like pastries, cakes and muffins. AC use to bake at least 50 units of any item at a time. A customer has given an order for 600 muffins. To process a batch of 50 muffins, the following cost would be incurred:

Direct materials- ₹ 500

Direct wages- ₹ 50

Oven set- up cost ₹150

AC absorbs production overheads at a rate of 20% of direct wages cost. 10% is added to the total production cost of each batch to allow for selling, distribution and administration overheads.

AC requires a profit margin of 25% of sales value.

Determine the selling price for 600 muffins.

Page No.
Date

STATEMENT SHOWING BATCH COST- SHEET

$\left(\frac{600}{50}\right)$ = 12 BATCHES	$\left(\frac{\text{NO UNITS}}{\text{50 UNIT}}\right)$ =	NO OF BATCH
DIRECT COST		
(1) DIRECT MATERIAL	6000	500.00
(2) DIRECT LABOUR	600	50.00
(3) DIRECT EXP (SETUP COST)	1800	150.00
PRIME COST	8400	700.00
INDIRECT COST	120	10.00
F.O (20% WAGES)	(600 X 20%)	
F. COST	8520	710.00
ADMIN/SELLING (10% X 8520)	852	71.00
COST OF SALES	9372	781
PROFIT		
$\left(9372 \times \frac{25}{75}\right)$	3124	260.33
		1041.33

ILLUSTRATION 4 Qn:-4

A jobbing factory has undertaken to supply 200 pieces of a component per month for the ensuing six months. Every month a batch order is opened against which materials and labour hours are booked at actual. Overheads are levied at a rate per labour hour. The selling price contracted for is ₹ 8 per piece. From the following data present the cost and profit per piece of each batch order and overall position of the order for 1,200 pieces.

Month	Batch Output	Material cost (₹)	Direct wages (₹)	Direct labour hours
January	210	650	120	240
February	200	640	140	280
March	220	680	150	280
April	180	630	140	270
May	200	700	150	300
June	220	720	160	320

Page No.

STATEMENT SHOWING COST SHEET

MONTH	JAN		FEB		MARCH	
OUTPUT	210		200		220	
	TOTAL	P.U	TOTAL	P.U	TOTAL	P.U
DIRECT COST						
DMat	650	3.09	640	3.20	680	3.09
DLab	120	.57	140	.70	150	.68
D Exp						
(1) CHAR EXP	= 600	2.86	672	3.36	672	3.05
	(12000 X 240 / 4800)		(10580 X 280 / 4400)		(12000 X 280 / 5000)	
TOTAL COST	1370	6.52	1452	7.26	1502	6.82
PL	310	1.48	148	.74	258	1.18
SALES	1680	8.00	1600	8.00	1760	8.00
	MAY		JUNE		JULY	
UNITS	~~[illegible]~~ 180		200		220	
	TOTAL	P.U	TOTAL	P.U	TOTAL	P.U.
DIRECT COST						
DMaterial	630	3.50	700	3.50	720	3.27
DWag	140	.77	150	.75	160	.73
CHAR EXP	621	3.45	780	3.90	800	3.64
	(10580 X 270 / 4600)		(13000 X 300 / 5000)		(12000 X 320 / 4800)	
	1391	7.73	1630	8.15	1680	7.64
PL.	49	.27	(30)	(.15)	(80)	.36
SALES	1440	8.00	1600	8.00	1760	8.00

STATEMENT SHOWING ANALYSIS OF P&L

SALES (1200 X 8) 9600 — 9600

COST (1370 + 1452 + 1502 + 1391 + 1630 + 1680) / (210 + 200 + 220 + 180 + 200 + 220) 796 — 8804

(ILL 8.11)

QNo 5

Page No.
Date

ILLUSTRATION 5

Monthly demand for a product	*500 units*
Setting-up cost per batch	*₹ 60*
Cost of manufacturing per unit	*₹ 20*
Rate of interest	*10% p.a.*

Determine economic batch quantity.

$$E.O.Q = \sqrt{\frac{2AO}{C}}$$

A = ANNUAL CONSUMPTION = $(500 \times 12) = 6000$

O = ORDERING COST (SETTING UP) = 60.00

C = CARRYING COST = $(20 \times 10\%) = 2.00$

$$\sqrt{\frac{2 \times 6000 \times 60}{2}} = 600 \text{ UNITS}$$

(ILL-6)
8.11

UNIT 6

ILLUSTRATION 6

M/s. KBC Bearings Ltd. is committed to supply 48,000 bearings per annum to M/s. KMR Fans on a steady daily basis. It is estimated that it costs ₹ 1 as inventory holding cost per bearing per month and that the set up cost per run of bearing manufacture is ₹ 3,200

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

(ii) What would be the interval between two consecutive optimum runs?

(iii) Find out the minimum inventory cost?

$$EBQ = \sqrt{\frac{2AO}{C}}$$

A = ANNUAL = 48000

O = ORDERING = 3200
[SETUP]

C = CARRYING = 12
(HOLDING)
(1 X 12)

(i)

$$\sqrt{\frac{2 \times 48000 \times 3200}{12}} = 5060$$

(ii) $(48000 \div 5060) = 9.48$ (10)

$(365 \div 10) = 36.5$

(iii) $\frac{1}{2} \times 5060 \times 12 = 30360$

Qn-7

Page No.
Date

4. A customer has been ordering 90,000 special design metal columns at the rate of 18,000 columns per order during the past years. The production cost comprises ₹2,120 for material, ₹60 for labour and ₹20 for fixed overheads. It costs ₹1,500 to set up for one run of 18,000 column and inventory carrying cost is 5%.

(i) Find the most economic production run.

(ii) Calculate the extra cost that company incur due to processing of 18,000 columns in a batch.

A = ANNUAL = 90000

S = SETUP COST = 1500

C = CARRYING COST = 110

$(2120 + 60 + 20) \times 5\%$

$$E.B.Q = \sqrt{\frac{2 \times 90000 \times 1500}{110}} = 1567$$

STATEMENT SHOWING EXTRA COST

BATCH-SIZE	SETUP COST	CARRYING COST	
1567	$\frac{90000}{1567} \times 1500$	$\frac{1}{2} \times 1567 \times 110$	172370
	$= 86185$		
18000	$\frac{90000}{18000} \times 1500$	$\frac{1}{2} \times 18000 \times 110$	997500
	$= 7500$	$= 990000$	

8- Job cost - costing

ON-8

Page No. 3
Date

ILLUSTRATION 7

A Company has an annual demand from a single customer for 50,000 litres of a paint product. The total demand can be made up of a range of colour to be produced in a continuous production run after which a set-up of the machinery will be required to accommodate the colour change. The total output of each colour will be stored and then delivered to the customer as s single load immediately before production of the next colour commences.

The Set up costs are ₹ 100 per set up. The Service is supplied by an outside company as required.

The Holding costs are incurred on rented storage space which costs ₹ 50 per sq. meter per annum. Each square meter can hold 250 Litres suitably stacked.

You are required to calculate

(i) Calculate the total cost per year where batches may range from 4,000 to 10,000 litres in multiples of 1,000 litres and hence choose the production batch size which will minimize the cost.

(ii) Use the economic batch size formula to calculate the batch size which will minimise total cost.

STATEMENT SHOWING TOTAL COST

UNITS	SETUP COST	HOLDING COST	TOTAL COST
4000	$\frac{50000}{4000} \times 100 = 1250$	$\frac{1}{2} \times \frac{4000}{250} \times 50 = 400$	1650
5000	$\frac{50000}{5000} \times 100 = 1000$	$\frac{1}{2} \times \frac{5000}{250} \times 50 = 500$	1500
6000	$\frac{50000}{6000} \times 100 = 833$	$\frac{1}{2} \times \frac{6000}{250} \times 50 = 600$	1433
7000	$\frac{50000}{7000} \times 100 = 714$	$\frac{1}{2} \times \frac{7000}{250} \times 50 = 700$	1414
8000	$\frac{50000}{8000} \times 100 = 625$	$\frac{1}{2} \times \frac{8000}{250} \times 50 = 800$	1425
9000	$\frac{50000}{9000} \times 100 = 556$	$\frac{1}{2} \times \frac{9000}{250} \times 50 = 900$	1456
10000	$\frac{50000}{10000} \times 100 = 500$	$\frac{1}{2} \times \frac{10000}{250} \times 50$ 1000	1500

E.B.Q $= \sqrt{\frac{2 \times 50000 \times 100}{1.25}} =$ 7071 LTR

Page No.
Date

QNO-9

Practical Questions

1. Wonder Ltd. Has a capacity of 120,000 Units per annum as its optimum capacity. The production costs are as under

   Direct Material – ₹ 90 per unit

   Direct Labour- ₹60 per unit

   Overheads:

   Fixed: ₹ 30,00,000 per annum

   Variable : ₹100 per unit

   Semi Variable: ₹ 20,00,000 per annum upto 50% capacity and an extra amount of ₹ 4,00,000 for every 25% increase in capacity or part there of.

   The production is made to order and not for stocks.

   If the production programme of the factory is as indicated below and the management desires a profit of ₹20,00,000 for the year work out the average selling price at which each unit should be quoted.

   First 3 months: 50% capacity

   Remaining 9 months: 80% capacity

   Ignore Administration, Selling and Distribution overheads.

PRACTICAL QNO-1]

NOTE NO(1) PRODUCTION FOR THE YEAR

120000 UNITS

$(120000 \times \frac{50}{100} \times \frac{3}{12})$ ⇒ $(120000 \times \frac{9}{12} \times \frac{80}{100})$

= 15000 UNITS = 72000 UNITS

(15000 + 72000) = 87000 UNITS

FACTORY OVERHEADS = 19300,000

NOTE NO(2)

S.V

2600000

FIXED

3000000

VARIABLE

87000 X 100

= 8700000

50% 75% 100%

$(\frac{3}{12} \times 2000000)$ 2400000 $(2801000 \times \frac{9}{12})$

= 500000 = 2100000

Page No.
Date

STATEMENT SHOWING COST SHEET

PRODUCTION (NOGNOI)	87000 UNITS	
DIRECT COST		
DIRECT MATERIAL	7830000	90.00
DIRECT LABOUR	5220000	60.00
PRIME COST	13050000	150.00
INDIRECT COST		
F.O. (NOTE NO-2)	14300000	16.44
FACTORY COST	27350000	166.44
	2000000	170.92
SALES	29350000	337.36

DNO-16

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Date

2. Rio Limited undertakes to supply 1000 units of a component per month for the months of January, February and March 20X8. Every month a batch order is opened against which materials and labour cost are booked at actual. Overheads are levied at a rate per labour hour. The selling price is contracted at ₹15 per unit.

From the following data, present the profit per unit of each batch order and the overall position of the order for the 3,000 units.

Month	Batch Output (Numbers)	Material Cost (₹)	Labour Cost (₹)
January 20X8	1,250	6,250	2,500
February 20X8	1,500	9,000	3,000
March 20X8	1,000	5,000	2,000

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

Month	Overheads (₹)	Total Labour Hours
January 20X8	12,000	4,000
February 20X8	9,000	4,500
March 20X8	15,000	5,000

PRACTICAL-2)

STATEMENT SHOWING BATCH COST SHEET

	JAN 1250 UNITS		FEB 1500 UNITS		MARCH 1000 UNITS	
	TOTAL	P.U	TOTAL	P.U	TOTAL	P.U
	Rs	Rs	Rs	Rs	Rs	Rs
DIRECT COST						
DMat	6250	5.00	9000	6.00	5000	5
DLab.	2500	2.00	3000	2.00	2000	2
	8750	7.00	12000	8.00	7000	7
NOTIONAL F.O.	3750	3.00	3000	2.00	3000	3
FACTORY COST	12500	10.00	15000	10.00	10000	10
P/L	6250	5.00	7500	5.00	5000	5
SALES	18750	15.00	22500	15.00	15000	15.00

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Date

NOGNO(i)

FACTORY COST/O.H

	LABOUR HRS (NOGNO i)	x REC Rate (NOGNO ii)	=	F.O
JAN	1250	x 3	=	3750
FEB	1500	x 2	=	3000
MARCH	1000	x 3	=	3000

NOGN(i)

$\left(\frac{\text{Labour Cost}}{2}\right)$ = Labour hrs.

JAN (2500 ÷ 2) = 1250 hrs

Feb (3000 ÷ 2) = 1500 "

MARCH (2000 ÷ 2) = 1000 "

REC Rate = $\left(\frac{F.O}{HRS}\right)$ =

JAN $\left(\frac{12000}{4000}\right)$ = 3.00

Feb $\left(\frac{9000}{4500}\right)$ = 2.00

MARCH $\left(\frac{15000}{5000}\right)$ = 3.00

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Date

STATEMENT SHOWING ANALYSIS OF PROFITS

	₹
SALES (3000 UNITS X 15)	45000
COST (3000 X 10)	(30000)
PROFIT	15000

Q NO-11

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Date

3. X Ltd. is committed to supply 24,000 bearings per annum to Y Ltd. on steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is ₹ 324.
   (a) What would be the optimum run size for bearing manufacture?
   (b) Assuming that the company has a policy of manufacturing 6,000 bearings per run, how much extra costs the company would be incurring as compared to the optimum run suggested in (a) above?
   (c) What is the minimum inventory holding cost?

A = ANNUAL SUPPLY = 24000 - NOS
S = SETUP COST = 324
C = CARRYING COST (·10 X 12) = 1·20

(a) OPTIMUM RUN SIZE $\sqrt{\frac{2 \times 24000 \times 324}{1 \cdot 20}} = 3600$ Nos

(b)

RUN SIZE	SETUP COST	CARRYING COST	TOTAL COST
3600	$\frac{24000}{3600} \times 324 = 2160$	$\frac{1}{2} \times 3600 \times 1 \cdot 20 = 2160$	4320
6000	$\frac{24000}{6000} \times 324 = 1296$	$\frac{1}{2} \times 6000 \times 1 \cdot 20 = 3600$	4896

(c) MINIMUM INV- HOLDING COST = 2160

ONU2

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Date

ILLUSTRATION 2

A shop floor supervisor of a small factory pre¬sented the following cost for Job No. 303, to determine the selling price.

	Per unit (₹)
Materials	70
Direct wages 18 hours @ ₹ 2.50 (Deptt. X 8 hours; Deptt. Y 6 hours; Deptt. Z 4 hours)	45
Chargeable expenses	5
	120
Add : 33-1/3 % for expenses cost	40
	160

Analysis of the Profit/Loss Account (for the year 20X2)

		(₹)		(₹)
Materials used		1,50,000	Sales less returns	2,50,000
Direct wages :				
Deptt. X	10,000			
Deptt. Y	12,000			
Deptt. Z	8,000	30,000		
Special stores items		4,000		
Overheads :				
Deptt. X	5,000			
Deptt. Y	9,000			
Deptt. Z	2,000	16,000		
Works cost		2,00,000		
Gross profit c/d		50,000		
		2,50,000		2,50,000
Selling expenses		20,000	Gross profit b/d	50,000
Net profit		30,000		
		50,000		50,000

It is also noted that average hourly rates for the three Departments X, Y and Z are similar.

You are required to :

(i) Draw up a job cost sheet.

(ii) Calculate the entire revised cost using 20X2 actual figures as basis.

(iii) Add 20% to total cost to determine selling price.

Page No.
Date

STATEMENT SHOWING JOB COST SHEET

		Rs
DIRECT COST		
Material		70
Labour.		
DEPT		
X	(8 hr x 2.50) = 20	
Y	(6 hr x 2.50) = 15	
Z	(4 hr x 2.50) = 10	
	45	45
DIRECT EXP		
CHAK EXP		5
	PRIME COST	120
O.H		
(X)	$\left(\frac{5000}{10000} \times 100\right)$ = 50% x 20 =	10
(Y)	$\left(\frac{9000}{12000} \times 100\right)$ = 75% x 15 =	11.25
(Z)	$\left(\frac{2000}{8000} \times 100\right)$ = 25% x 10 =	2.5
	23.75	23.75
		143.75
S.O	$\left(\frac{20000}{200000} \times 100\right)$	14.38
		158.13
Pt	(158.13 x 20%)	31.63
		189.76

Practical Questions

1. In a factory following the Job Costing Method, an abstract from the work-in-progress as on 30th September was prepared as under.

Job No.	Materials (₹)	Direct hrs.	Labour (₹)	Factory Overheads applied (₹)
115	1325	400 hrs.	800	640
118	810	250 hrs.	500	400
120	765	300 hrs.	475	380
	2,900		1,775	1,420

Materials used in October were as follows :

Materials Requisition No.	Job No.	Cost (₹)
54	118	300
55	118	425
56	118	515
57	120	665
58	121	910
59	124	720
		3,535

A summary for labour hours deployed during October is as under :

Job No.	Number of Hours	
	Shop A	Shop B
115	25	25
118	90	30
120	75	10
121	65	--
124	25	10
	275	75
Indirect Labour : Waiting of material	20	10
Machine breakdown	10	5
Idle time	5	6
Overtime premium	6	5
316	101	

A shop credit slip was issued in October, that material issued under Requisition No. 54 was returned back to stores as being not suitable. A material transfer note issued in October indicated that material issued under Requisition No. 55 for Job 118 was directed to Job 124.

The hourly rate in shop A per labour hour is ₹ 3 per hour while at shop B, it is ₹ 2 per hour. The factory overhead is applied at the same rate as in September. Job 115, 118 and 120 were completed in October.

You are asked to compute the factory cost of the completed jobs. It is the practice of the management to put a 10% on the factory cost to cover administration and selling overheads and invoice the job to the customer on a total cost plus 20% basis. What would be the invoice price of these three jobs?

Date

NO@NO (1)

DIRECT- MATERIAL COST

	115	118	120
SMAT. RET@NO			
54		300	
55		425	
56		515	
57	665	-	665
	-	1240	665
RETURNED-54		(300)	
55		(425)	
		515	

NO@NO (2) DIRECT Labour COST

	115	118	120
SHOP-A	= 75 (25 X 3)	= 270 (90 X 3)	= 285 (75 X 3)
SHOP-B	50 (25 X 2)	60 (30 X 2)	20 (10 X 1)
	125	330	245

NO@NO (3) F-O

REC- RATE = $\left(\frac{\text{F-O}}{\text{wages}} \times 100\right)$

JOB NO	
115	$\left(\frac{640}{800} \times 100\right) = 80\%$
118	$\left(\frac{400}{500} \times 100\right) = 80\%$
120	$\left(\frac{390}{475} \times 100\right) = 80\%$

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	Wage	× 80%	F.O
115	125	× 80% =	100
118	330	× 80% =	264
120	~~(580)~~ 245	× 80% =	~~464~~ ~~(580)~~ 196

NOGNO(4)

VALUATION OF SWIP

	115	118	130
Mat	1325	810	765
Lab	800	500	475
F.O	640	400	380
	2765	1710	1620

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PRACTICAL-NO-1

STATEMENT SHOWING INVOICE PRICE

JOB NO-	115	118	120
	Rs	Rs	Rs.
DIRECT COST			
DIRECT MATERIAL (NOTE NO1)	-	~~[illegible]~~ 515	665
DIRECT- LABOUR (NOTE NO-2)	125	330	~~[illegible]~~ 245
PRIME COST	125	~~[illegible]~~ 845	835
INDIRECT COST			
F.O (NOTE NO-3)	100	264	~~[illegible]~~ 196
GROSS- FCOST	225	~~[illegible]~~ 1109	~~[illegible]~~ 1106
OPENING WIP (NOTE NO 4)	2765	1710	1620
FACTORY COST	2990	~~[illegible]~~ 2819	~~[illegible]~~ 2726
ADMIN/OFF/SELLING 10%	299	~~[illegible]~~ 2819	~~[illegible]~~ 272.6
COST OF SALES	3289	~~[illegible]~~ 3100.9	~~[illegible]~~ 2998.6
20% PL-	657.8	620.18	599.72
INVOICE PRICE	3948.80	3721.08	3598.32

CHAPTER - 6
PROCESS COSTING

Question 1

The product of a company passes through three distinct process to completion. From past experience, it is ascertained that normal wastage, in each process, is as under :

Process	Wastage	Sale value of wastage
A	2%	25 paise per unit
B	4%	50 paise per unit
C	2.5%	60 paise per unit

The expenses are as follows :

	Process A	Process B	Process C
Materials	12,000	10,000	9,000
Direct Labour	16,000	5,000	4,900
Manufacturing exps.	2,000	3,400	3,590
Othr factory Exps.	3,500	2,005	2,004

4000 units were intitially process A' at a cost of Rs. 13,560. The output of each process was as under :

Output	Process
A	3,850
B	3,600
C	3,500

From the above information pass journal entries

Question 2

A product through two distinct process A and B & thereafter, it is transferred to finished stock.

Prepare process accounts from the following information :

	Process A	Process B
Material Consumed	Rs. 20,000	
No. of units input	10,000	
Direct labour	4,000	14,000
Manufacturing overheads	8,000	20,000
Output (units)	8,500	8,000
Normal loss	10%	15%
Value of scrap	0.50	0.80

Question 3

A product passes through three processes – A, B & C. The details of expenses incurred on the three processes during the year 2016 were as under :

Process	A	B	C
Units issued / introduced	10,000		
Cost per unit Rs. 100			
Sundry Material	10,000	15,000	5,000
Labour	30,000	80,000	65,000
Direct Expenses	6,000	18,150	27,200
Selling price per unit of output	120	163	250

Management expenses during the year were Rs. 80,000/- and selling expenses were Rs. 50,000/-. These are not allocable to the process.

Actual output of the processes was :

A – 9,300 units, B – 5,400 units and C – 2,100 units. Two – third of the output of process A and one – half of the output of process – B was passed on the next process and the balance was sold. The entire output of process – C was sold.

The normal loss of the three process, calculated on the input of every process was :

Process – A 5%; Process – B 15% and Process – C 20%.

The loss of process A was sold at Rs. 2 per unit, that of B at Rs. 5 per unit and of process C at Rs. 10 per unit.

Prepare the three process accounts and profit and loss account.

Question 4

The product of a manufacturing unit passes through two distinct processes. From past experience the incidence of wastage Is ascertained as under :

Process A	2 per cent
Process B	10 per cent

In each case the percentage of wastage is computed on the number of units entering the process concerned. The sales realization of wastage in Process A and B are Rs. 25 per 100 units and Rs. 50 per 100 units respectively.

The following information is obtained for the month of April, 2016 : 40,000 units of crude material were introduced in process A at a cost of Rs. 16,000.

	Process A	Process B
Other Material	Rs. 16,000	Rs. 5,000
Direct Labour	9,000	8,000
Direct Expenses	8,200	1,500
	Units	Units
Output	39,000	36,500
Finished Product Stock :		
April 1	6,000	5,000
April 30	5,000	8,000
Value of Stock per unit on April : 1st	1.20	1.60

Stocks are valued and transferred to subsequent process at weighted average costs.

Prepare respective Process Accounts and Stock Accounts.

Question 5

A product is manufactured by passing through three processes. A, B and C. In process C, a by-product is also produced which is then transferred to process D where it is completed. For the first week in October, actual data included :

Process	A	B	C	D
Normal loss of input	5%	10%	5%	10%
Scarp value (per unit)	Rs. 1.50	Rs. 2.00	Rs. 4.00	Rs. 2.00
Estimated sales value of by-product (per unit)	--	--	8.00	--
Output (units)	5,760	5,100	4,370	--
Output of by-products (units)	--	--	510	450
Direct materials (6000 units)	Rs. 12,000	--	--	--
Direct materials added in process	5,000	9,000	4,000	220
Direct wages	4,000	6,000	2,000	200
Direct expenses	800	1,680	2,260	151

Budgeted production overhead for the week Rs. 30,500

Budgeted direct wages for the week Rs. 12,200

Your are required to prepare :

(a) accounts for Process A, B, C and D.

(b) abnormal loss account and abnormal gain account.

Question 6

A product passes through three process A, B & C 10,000, units at a cost of Rs. 1 were issued to process A. The other direct expenses were :

	Process A	Process B	Process C
Sundry Materials	1,000	1,500	1,480
Direct labour	5,000	8,000	6,500
Direct Expenses	1,050	1,188	1,605

The wastage of process A was 5% and process B 4%. The wastage of process A was sold at Re. 0.25 per unit and that of B at Re. 0.50 per unit and that of C at Re. 1 per unit. The overhead charges were 168% of direct labour. The final product was sold at Rs. 10 per unit, fetching a profit of 20% on sales.
Find the % of wastage in process C.

Question 7

The input to a purifying process was 16,000 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. Indirect materials of negligible weight were introduced into the process at a cost of Rs. 336. The actual output from the process weighed 15,000 kgs. The normal yield of the process is 92%. Any difference in weight between the input of basic material and output of purified material (product) is sold @ Re. 0.50 per kg.

The process is operated under a licence which provides for the payment of royalty @ Rs. 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

Question 8

The product X is processed by passing the chemicals C through four processes where the output of the earlier process becomes the input of the subsequent process. The loss of materials expressed as percentage of input is,
process – (i) 20%, (ii) 10%, (iii) 16 2/3 %, (iv) 8 1/3%.
The material lost does not have any resale value.
Calculate : **(a) The direct Material cost involved for one kg. of X: if C costs Rs. 8 per kg.**

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IPCC - COSTING

Question 9

An article passes through successive operations from the raw material to the finished product stage. The following data are available from the production record of a particular month.

	No. of pcs. Input	No. of pcs Rejected	No. of pcs. Output
Process 1	60,000	20,000	40,000
2	66,000	6,000	60,000
3	48,000	8,000	40,000

(i) Determine the input required to introduce in the first operation in number of pieces in order to obtain finished output 100 pieces after the last operation.

(ii) Calculate the cost of raw material required to produce one piece of finished product given the following information.

Weight of finished product is 0.10 kgs. and the price of raw material is Rs. 20 per kg.

Question 10

A Ltd. produces product 'AXE' which passes through two processes before it is completed and transferred to finished stock. The following data relate to October 2005.

	Process I	Process II	Finished stock
Opening stock	7,500	9,000	22,500
Direct Material	15,000	15,750	--
Direct wages	11,200	11,250	--
Factory overheads	10,500	4,500	--
Closing stock	3,700	4,500	11,250
Inter-process profit included in open stock	--	1,500	8,250

Output of process I is transferred to 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 are valued at prime cost. Finished stock is valued at the price at which it is received from process. II. Sales during the period is Rs. 1,40,000.

Required-process cost accounts and finished goods account knowing the profit element at each stage.

****

CHAPTER 10

LEARNING OUTCOMES

- ☐ State the meaning of Process and Operation Costing.
- ☐ Discuss the treatment of process loss and gains in cost accounting.
- ☐ Compute equivalent completed production units.
- ☐ Discuss the various methods of valuation of work in process.
- ☐ State the meaning and treatment of Inter-process profits.

CHAPTER OVERVIEW

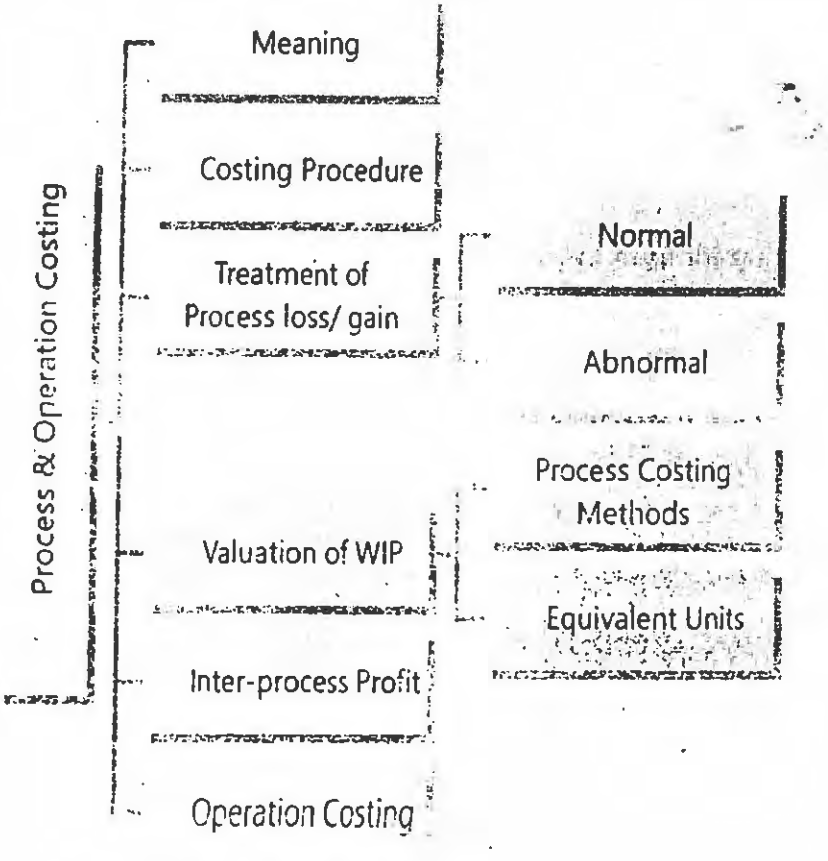

ILLUSTRATION 1 Q NO. 11

Q NO 11

From the following data, prepare process accounts indicating the cost of each process and the total cost. The total units that pass through each process were 240 for the period.

	Process I(₹)	Process II(₹)	Process III(₹)
Materials	1,50,000	50,000	20,000
Labour	80,000	2,00,000	60,000
Other expenses	26,000	72,000	25,000

Indirect expenses amounting to ₹ 85,000 may be apportioned on the basis of wages. There was no opening or closing stock.

NOTIONAL STATEMENT SHOWING ALLOCATION OF INDIRECT EXP. = 85000

	(I)	II	(III)
WAGES RATIO	80000 :	200000 :	60000
	20000	50000	15000

PROCESS I A/C

PARTICULARS	QTY	AMT	PARTICULARS	QTY	AMT
TO MATERIAL	240	150000	By PROCESS II A/C	240	276000
TO LABOUR		80000			
TO OTHER EXP		26000	(276000/240) @ 1150		
TO IN EXP (NOTIONAL)		20000			
	240	276000		240	276000

PROCESS II A/C

TO PROCESS I	240	276000	By PROCESS II A/C.	240	648000
TO MAT A/C		50000			
TO LAB A/C		200000			
TO OTH EXP		72000	(648000/240) @ 2700		
TO IN EXP (NOTIONAL)		50000			
	240	648000		240	648000

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PROCESS - III A/C

PARTICULARS	QTY	AMT	PARTICULARS	QTY	AMT
TO PROCESS II A/C	240	648000	BY FINISHED STOCK A/C	240	768000
TO MAT		20000			
TO LAB		60000	(768000/240		
TO OH EXP		25000	= @3200		
TO IND EXP (NOTE 01)		15000			
	240	768000		240	768000

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[EX NO-1]
[10.5]

EX NO-12

Example-1

A product passes from Process- I and Process- II. Materials issued to Process- amounted to ₹ 40,000, Wages ₹ 30,000 and manufacturing overheads were ₹ 27,000. Normal loss anticipated was 5% of input. 4,750 units of output were produced and transferred-out from Process-I. There were no opening stocks. Input raw material issued to Process I were 5,000 units. Scrap has no realisable value.

You are required to show Process- I account, value of normal loss and units transferred to Process-II.

EX NO-12 (1)

INPUT = 5000 UNITS

NORMAL LOSS
5% of 5000 = 250 UNITS

EXP OUTPUT
4750 UNITS

PROCESS I A/C

PARTICULARS	QTY	AMT	PARTICULARS	QTY	AMT
TO MAT A/C	5000	40000	BY NORMAL A/C	250	—
TO WAGES		30000			
			BY FINISHED GOODS (PROCESS II)	4750	97000
TO O.H A/C		27000			
	5000	97000	(97000/4750) @	5000	97000

C.P.U = (TOTAL COST − Real N'LOSS / INPUT − NORMAL LOSS)

QNO-13

Example-2

A product passes from Process- I and Process- II. Materials issued to Process- I amounted to ₹ 40,000, Wages ₹ 30,000 and manufacturing overheads were ₹ 27,000. Normal loss anticipated was 5% of input. 4,750 units of output were produced and transferred-out from Process-I. There were no opening stocks. Input raw material issued to Process I were 5,000 units. Scrap has realisable value of ₹2 per unit.

You are required to show Process- I account, value of normal loss and units transferred to Process-II.

WNO(1) INPUT

5000 UNITS

NLOSS
5% X 5000
= 250 @ 2
= 500

Exp output
(5000 − 250)
= 4750 X 20.315
= 96500

C.P.U = $\left(\frac{97000 - 500}{5000 - 250}\right)$ = 20.315

PARTICULARS	Qty	Amt	PART	Qty	Amt
TO Mat	5000	40000	By NLOSS A/c	250	500
TO wages		30000			
TO Manu O'H		27000	By PROCESS II	4750	96500
	5000	97000		5000	97000

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Q No- 14

Example-3

A product passes from Process- I and Process- II. Materials issued to Process- I amounted to ₹ 40,000, Wages ₹ 30,000 and manufacturing overheads were ₹ 27,000. Normal loss anticipated was 5% of input. 4,550 units of output were produced and transferred-out from Process-I. There were no opening stocks. Input raw material issued to Process I were 5,000 units. Scrap has realisable value of ₹2 per unit.

You are required to show Process- I account, value of normal loss, abnormal loss and units transferred to Process-II.

WKG NO (1) INPUT = 5000 UNITS

NLOSS
5% 5000 = 250
× 2
= 500

EXP OUTPUT
4750

ACTUAL
4550 UNITS × 96500/4750 = 92437

ABNCL
200 × 96500/4750 = 4063

C.P.U. = (97000 − 500)/(5000 − 250) = 96500/4750 = 20.31

PART	QTY	AMT	PART	QTY	AMT
TO MAT	5000	40000	BY NL A/C	250	500
TO WAGES		30000	BY ABNL A/C	200	4063
TO O'H		27000	BY PROC II	4550	92437
	5000	97000		5000	97000

NORMAL LOSS A/C

TO PROCESS IA	250	500	BY CASH A	250	500

ABNORMAL LOSS A/C

TO PROC IA/C	200	4063	BY CASH A	200	400
			BY COSTING P/L	—	3663

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Example-4

A product passes from Process- I and Process- II. Materials issued to Process- I amounted to ₹ 40,000, Wages ₹ 30,000 and manufacturing overheads were ₹ 27,000. Normal loss anticipated was 5% of input. 4,850 units of output were produced and transferred-out from Process-I. There were no opening stocks. Input raw material issued to Process I were 5,000 units. Scrap has realisable value of ₹2 per unit.

You are required to show Process- I account, value of normal loss, abnormal loss/ gain and units transferred to Process-II.

WNOTNO (1) INPUT = 5000 Units

N Loss: (5/5000) = 250 × 2 = 500

Exp output: 4750

Actual: 4850 Units × 96500/4750 = 98532

Ab gain: 100 × 96500/4750 = 2032

C.P.O = (97000 − 500)/(5000 − 250) = (96500/4750) = 20.31

PROCESS I A/C

PARTICULAR	QTY	AMT	PART	QTY	AMT
TO Mat A/C	5000	40000	BY NLoss A/C	250	500
TO Lab A/C		30000			
TO OH A/C		27000	By Process II A/C	4850	98532
TO Ab Gain	100	2032			
	5100	99032		5100	99032

NORMAL LOSS A/C

TO Process I	250	500	By Ab Gain	100	200
			By Cash	150	300

AB NORM-GAIN A/C

TO NL A/C	100	200	By Process I A/C	100	2032
TO Costing P&L		1832			

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ILLUSTRATION 2

A product passes through three processes. The output of each process is treated as the raw material of the next process to which it is transferred and output of the third process is transferred to finished stock.

	Process-I(₹)	Process-II(₹)	Process-III(₹)
Materials issued	40,000	20,000	10,000
Labour	6,000	4,000	1,000
Manufacturing overhead	10,000	10,000	15,000

10,000 units have been issued to the Process-I and after proc¬essing, the output of each process is as under:

Process	Output	Normal Loss
Process-I	9,750 units	2%
Process-II	9,400 units	5%
Process-III	8,000 units	10%

No stock of materials or of work-in-process was left at the end. Calculate the cost of the finished articles.

WORKING (1) PROCESS (I)

INPUT = 10000 UNITS

NORMAL LOSS
2% X10000
= 200X0
= 0

EXP OUTPUT
9800

ACTUAL
9750 UNITS X5.7142
=55714

ABNOR
50X5.7142
=286

C.P.U2 $\left(\frac{56000 - 0}{10000 - 200}\right) = 5.7142$

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PROCESS II A/C

PART	QTY	AMT	PART	QTY	AMT
To Material	10000	40000	By Normal A/c	200	—
To Lab		6000			
To Manufacturing O'H		10000	By Abnormal A/c	50	286
			By Process II A/c	9750	55714
	10000	56000		10000	56000

(a) NORMAL (2) PROCESS (II)

INPUT = 9750

NORMAL
5% of 9750 = 488
= 0

EXPECTED OUTPUT
9262 UNITS

ACTUAL OUTPUT (9400 × 89714 / 9262) = 91051

ABNORMAL (138 × 89714 / 9262) = 1337

C.P.U = (89714 − 0) / (9750 − 488) = 89714 / 9262 = 9.69

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PROCESS II A/C

To	Process I	9750	55714	By N.L.A/C	488	0
	To Mat-		20000			
	To Lab		4000	By Process III A/C	9400	91051
	To Mo.		10000			
	To Abnormal	138	1337			
		9888	91051		9888	91051

PROCESS (III)

INPUT = 9400 UNITS

NORMAL
10% of 9400
= 940
× 0
= 0

EXPECTED
8460 units

ACTUAL
8400 × 11705 / 8460
= 11068

ABNORMAL
460 × 11705 / 8460
= 6364

CPU = 11705 − 0 / 9400 − 940 = 11705 / 8460 = 1383

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PROCESS III A/C

PART	QTY	AMT	PART	QTY	AMT
TO PROCESS II A/C	9400	91051	BY NUP	940	0
TO MAT		10000	BY ADNU	460	6364
TO LAB		1000			
TO OH		15000	BY FIN GOOD A/C	8000	110687
	9400	117051		9400	117051

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Q NO-17

RST Limited processes Product Z through two distinct processes – Process- I and Process- II. On completion, it is transferred to finished stock. From the following information for the year 20X1-X2, prepare Process- I, Process- II and Finished Stock A/c:

Particulars	Process- I	Process- II
Raw materials used	7,500 units	--
Raw materials cost per unit	₹ 60	--
Transfer to next process/finished stock	7,050 units	6,525 units
Normal loss (on inputs)	5%	10%
Direct wages	₹ 1,35,750	₹ 1,29,250
Direct Expenses	60% of Direct wages	65% of Direct wages
Manufacturing overheads	20% of Direct wages	15% of Direct wages
Realisable value of scrap per unit	₹ 12.50	₹ 37.50

6,000 units of finished goods were sold at a profit of 15% on cost. Assume that there was no opening or closing stock of work-in-process.

PROCESS I A/C

INPUT = 7500 UNITS

NORMAL LOSS (5% X 7500)

= 375 X 12.50

= 4687.50

SAY = 4688

C.P.U = (69950 - 4688) / (7500 - 375)

(689662 / 7125) = 96.7946

EXPOUT 7125 UNITS

ABNORMAL LOSS 375 X (689662 / 7125) = 7259

AGAINST (7050 X 689662 / 7125) = 682403

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PROCESS I A/C

TO MAT A/C (7500 X 60)	7500	450000	BY NUV A/C	375	4688
TO DWG	–	135750			
			BY ABNW A/C	75	7259
TO EXP (60% X 135750)		81450			
TO MAINT (20% X 135750)		27150	BY PROCESS II A/C	7050	682403
	7500	694350		7500	694350

PROCESS (II)

INPUT = 7050

NORM
10% X 7050
= 705 X 3750
= 26438

EXP OUTPUT
6345

ACTUAL
$\frac{88615}{6345} \times 6525 = 913824$

ABNORMAL
$\frac{88615 \times 180}{6345} = 25209$

C.P.U. $\frac{915053 - 26438}{7050 - 705} = \frac{888615}{6345} = 140.096$

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PROCESS II A/C

To Process I A/C	7050	682403	By Normal Loss A/C	705	26438
To Mat		[illegible]			
To Lab A/C		129250	By Finished Stock A/C	6525	913824
To Depl (5% of 129250)		84013			
To Mat Emp. (15% X 129250)		19387			
To Abnormal Loss A/C	180	25209			
	7230	940262		7230	940262

NORMAL LOSS A/C

To Process I	375	4688	By Cash A/C	375	4688
To Process II A/C	705	26438	By Abnormal Gain A/C	180	6750
			By Cash A/C	525	19688

ABNORMAL LOSS A/C

To Process I A/C	75	7259	By Cash A/C	75	[illegible]937
			By Costing P&L A/C		6322
	75	7259		75	7259

ABNormal Gain A/C

To Normal Loss A/C	180	6750	By Process II A/C	180	25209
To Costing P&L A/C		18459			

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COSTING P(L) A/C

TO COST OF SALES (6000 X 140.04496)	6000	840298	BY SALE (840298 X 115%)	6000	966343
			By Abnormal		18459
TO ABNORMAL		6322			
TO Net P/L		138182			
	6000	984802		6000	984802

QNO 18

ILLUSTRATION 6

A Ltd. produces product 'AXE' which passes through two processes before it is completed and transferred to finished stock. The following data relate to October 20X4 :

	Process- I (₹)	Process- II (₹)	Finished Stock (₹)
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	--
Closing stock	3,700	4,500	11,250
Inter-process profit included in opening stock	--	1,500	8,250

Output of Process- I is transferred to 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 ₹ 1,40,000.

Prepare Process cost accounts and finished goods account showing the profit element at each stage.

PROCESS I A/C

	COST	PT	TOTAL		COST	PT	TOTAL
TO OPWIP	7500	-	7500	BY PII A/C	40500	13500	54000
TO DMAT	15000	-	15000				
TO DW.	11200	-	11200				
	33700		33700				
TO closing STOCK	(3700)		(3700)				
	30000		30000				
TO FO.	10500		10500				
	40500	-	40500				
TO PL-		13500	13500				
	40500	13500	54000		40500	13500	54000

IF T.P = 100

PT = 25 (0.n) 75

(40500 X 100 / 75) = 54000

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PROCESS II A/C

PART	COST	PL	TOTAL	PART	COST	PL	TOTAL
TO STOCK	7500	1500	9000	By FG	75750	36750	112500
TO PII A/C	40500	13500	54000				
TO MAT	15750	–	15750				
TO WG	[illegible]	–	[illegible]				
	11250		11250				
	75000	15000	90000				
CLOSING WIP	(3750)	(750)	(4500)				
	71250	14250	85500				
TO OH	4500	–	4500				
	75750	14250	90000				
PL (90000×20/80)	–	22500	22500				
	75750	36750	112500		75750	36750	112500

FINISHED GOOD A/C

PART	COST	PL	TOTAL	PART	COST	PL	TOTAL
TO FG STOCK	14250	8250	22500	By Sale	82425	57575	140000
TO PII	75750	36750	112500				
	90000	45000	135000				
CLOSING STOCK	(7575)	(3675)	(11250)				
	82425	41325	123750				
	–	16250	16250				
	82425	57575	140000		82425	57575	140000

CHAPTER – 7

PROCESS COSTING -CONCEPT OF EQUIVALENT PRODUCTION

Question 1

During a month 40,000 units were introduced into process A. The process cost were :

	Rs.
Direct Materials	3,02,000
Direct Wages	2,07,000
Factory overhead	50% if direct wages

The normal loss was estimated at 10% on input. At the end of the month, 32,000 units have been produced and transferred to process B. 5,000 units have been scrapped (scrapped units had been completely processed and realised Rs. 5/- per unit) and 3000 units were incomplete and the stage of completion in respect of these units was estimated to be :

Material	75%
Labour	50%
Overhead	50%

Find out (a) Equivalent production, (b) Cost per unit, (c) value of output to be transferred and show the necessary accounts.

Question 2

During a month 8,000 units were introduced into Process 1. The process costs for the month amounted to:

	Rs.
Direct Materials	76,000
Direct Labour	42,900
Production overhead	26,400

Other particulars were :

Normal Loss : 10% of input	
Units processed and Transferred to process 2	5,000
Units Scrapped (completely processed)	600

2,400 units were incomplete and the stage of completion these units was estimated to be:

Materials	100%
Labour and Overheads	75%

Units scrapped have a realisable market value of Rs. 5.00 per unit.

Find out equivalent production, average cost per unit and prepare the necessary accounts.

Question 3

Following information is available regarding process A for the month of February, 2016:

Production Record

Units in process as on 1.2.2016	4,000
(All materials used, 25% complete for labour and overhead)	
New units introduced	16,000
Units completed	14,000
Units in process as on 28-2-2016	6,000
(All materials used, ~~33%~~ $33\frac{1}{3}$% complete for labour and overhead)	

Cost Records

Work-in-process as on 1.2.2016	Rs.
Materials	6,000
Labour	1,000
Overhead	1,000
	8,000
Cost during the month	
Materials	25,600
Labour	15,000
Overhead	15,000
	55,600

Presuming that average method of inventory is used, prepare :

(i) Statement of equivalent production
(ii) Statement showing cost for each element.
(iii) Statement of appointment of cost.
(iv) Process cost account for process A.

Question 4 FIFO Method + LIFO Method

From the following particulars extracted from the books of New Colour Ltd. for the month of March 2016 prepare-

(a) Statement of equivalent production, (b) Statement of apportionment of cost and (c) Process Account.

1.	Opening Stock as on 1st March @ Rs. 4 per unit Degree of completion : Material 100 %; Labour & Overhead 40 per cent.	200 units
2.	Introduced during March	1050 units
3.	Transfer to next process	1100 units
4.	Closing Stock as on 31st March	150 units

Degree of completion : Material 100 per cent;
Labour & Overhead 70 per cent.

Other relevant information regarding the Process Account is :

Material cost	3,150
Labour cost	4,500
Production Overhead	2,250
Total	9,900

Question 5 FIFO + Weighted Method

Opening work-in-progress	(2,000 units)
Material (100% complete)	Rs. 5,000
Labour (60% complete)	3,000
Overhead (60% complete)	1,500
	9,500

Units introduced into this process ; 8,000

There are 2,000 units in process, and stage of completion is estimated to be :

Material	~~10%~~ 100%.
Labour	50%
Overhead	50%

8,000 units are transferred to next process.

The process costs for the period are :

	Rs.
Material	95,000
Labour	60,000
Overhead	30,000

Find the value of:

a) Output transferred and
b) Closing work-in-progress using average cost method.

Question 6

The following data pertains to process 1 for March 2016 of Beta Limited :

Opening work in progress 1,500 units at Rs. 15,000

Degree of completion :-

Material 100% Labour and overheads 33 $^{1}/_{3}$%

Input of Materials 18,500 Units at Rs. 52,000

Direct Labour Rs. 14,000

Overheads Rs. 28,000

Closing Work in Progress 5000 units

Degree of Completion Materials 90%

and Labour and Overheads 30%

Normal Process Loss is 10% of total input (opening work in progress units + units put in)

Scrap value Rs. 2.00 per unit.

Units transferred to the next process 15,000 units.

You are required to :-

(a) Compute equivalent units of production.

(b) Compute cost per equivalent unit for each cost element i.e. materials, labour and overheads.

(c) Compute the cost of finished output and closing work in progress.

(d) Prepare the process and other accounts.

Assume (i) FIFO Method is used by the company.

(ii) The cost of opening work in progress is fully transferred to the next.

Question 7

The following data are available in respect of process 1 for February, 2016 :

(1) Opening stock of work in process : 800 units at a total cost of Rs. 4,000.

(2) Degree of completion of opening work in process :

Materials	100%
Labour	60%
Overheads	60%

(3) Input of materials at a total cost of Rs. 36,800 for 9,200 units.

(4) Direct wages incurred Rs. 16,740.

(5) Production overhead Rs. 8,370.

(6) Units scrapped 1,200 units. The stage of completion of these units was :

Materials	100 %
Labour	80 %
Overheads	80 %

(7) Closing work in process : 900 units. The stage of completion of these units was:

Materials	100 %
Labour	70 %
Overheads	70 %

(8) 7,900 units were completed and transferred to the next process.

(9) Normal loss is 8% of the total input (opening stock plus units put in)

(10) Scrap value is Rs. 4 per unit.

You are required to :

(a) Compute equivalent production.

(b) Calculate the cost per equivalent unit for each element.

(c) Calculate the cost of abnormal loss (or gain), closing work in process and the units transferred to the next process using the FIFO method.

(d) Show the process Account for February, 2016.

Question 8

The following data relate to Process Q :

(i)	**Opening Work-in-process**	**4,000 units**	
	Degree of completion :		
	Materials	100%	Rs. 24,000
	Labour	60%	Rs. 14,400
	Overheads	60%	Rs. 7,200
(ii)	**Received during the month of April, 2016 from Process P :**		
		40,000 units	Rs. 1,71,000
(iii)	**Expenses incurred in Process Q during the month :**		
	Materials		Rs. 79,000
	Labour		Rs. 1,38,230
	Overheads		Rs. 69,120
(iv)	**Closing work-in-process**	**3,000 units**	
	Degree of completion :		
	Materials	100%	
	Labour and overheads	50%	
(v)	**Units scrapped**	**4,000 units**	
	Degree of completion :		
	Materials	100%	
	Labour & Overhead	80%	

(vi) Normal loss : 5% current input.

(vii) Spoiled goods realised Rs. 1.50 each on sale.

(viii) Completed units are transferred to warehouse.

Required :

Prepare :

(i) Equivalent units statement

(ii) Statement of cost per equivalent unit and total costs.

(iii) Process Q Account

(iv) Any other account necessary.

Question 9

SG Ltd. produces a product which passes two processes namely CRA and REF. The particulars for May 2016 are as under :

	Units	Rs.	Rs.
(i) Stock as on 1st May, 2016			
Raw materials	--	--	25,000
Work-in-process-CRA	5000	--	--
Direct Materials, 100% complete	--	62,500	--
Direct Labour, 50% complete	--	15,000	--
Overheads, 50% complete	--	18,000	95,500
Work-in-process-REF	1,000	--	--
Direct Materials, 100% complete	--	1,00,000	--
Direct Labour	--	3,250	--
Overheads, 25% complete	--	2,600	1,05,850
(ii)Costs and output for May 2016:			
Raw materials purchased	--	--	3,50,000
Raw materials issued to :			
Process CRA	--	2,61,450	--
Process REF	--	67,150	3,28,600
Other cost of Process CRA :			
Direct labour	--	1,16,250	--
Overheads	--	1,32,690	2,48,940
Other cost of process REF :			
Direct labour	--	76,750	--
Overheads	--	61,114	1,37,864
		Units	
(iii) Finished output of process CRA transferred to Process REF	--	20,000	--
Finished output of Process REF transferred to stock of finished goods	--	20,200	--
(iv) On 31st May 2016, the stocks of work-in-process are :			
Process CRA	--	4,000	--
Degree of completion :			
Raw material 100%			
Labour and overheads			
25% Process REF		800	--
Degree of completion :			
Raw material 100%			
Labour and overheads 50%			

DKC

PROCESS COSTING – CONCEPT OF EQUIVALENT RODUCTION

You are required to prepare statement showing the following for both the processes :

(a) Cost per unit of equivalent production;
(b) Value of closing stock as on 31st May, 2016;
(c) Process cost accounts.

Question 10

The following data are available in respect of Process 3 for the month of April :

Direct materials added in process		Rs. 776
Direct labour		386
Production overhead		768
Transfer from Process 2 :	4,200 units valued at	Rs.1,560
Transfer to Process 4 :	3,650 units	
Stock at 1st April :	600 units valued at	Rs. 390
Degree of completion :		
Materials added in process	60%	
Labour	50%	
Overhead	40%	
Stock at 30th April : 800 units		
Degree of completion :		
Materials added in process	80%	
Labour	70%	
Overhead	60%	
Units scrapped : 350		
Degree of completion :		
Materials added in process	100%	
Labour	80%	
Overhead	80%	

Normal loss is 10% of throughout

All units scrapped can be sold for Rs. 0.10 per unit.

You are required to prepare :-

a) A statement showing the cost per unit of production and the value of the output;
b) An account for Process 3
c) An abnormal loss or abnormal gain account.

Question 11

Wye Chemical p.l.c. manufactures a range of products in a variety of processes and the data given below relate to Process 3 for the month of April.

You are required to prepare :

(a) A statement showing the cost per unit and the value of the output;
(b) An account for Process 3;
(c) An Abnormal Gain or Loss Account.

Transfer from Process 2	10,800 units	Rs. 7,980
Transfer to Process 4	9,650 units	--
Direct materials added during process	--	2,019
Direct wages incurred in process	--	2,889
Production overheads apportioned to process	--	6,482

There is a normal loss in process of 10% of the output. All units scrapped can be sold at Rs. 0.20 each :

Opening work-in-progress	**1200 units**	
Degree of completion :	Materials added in process	40%
	Direct wages	60%
	Production overhead	70%
Closing work-in-progress	**1000 units**	
Degree of completion :	Materials added in process	80%
	Direct wages	60%
	Production overhead	40%
Units scrapped	**1,350 units**	
Degree of completion :	Materials added in process	50%
	Direct wages	40%
	Production overhead	20%

Question 12

A company within the food industry mixes powdered ingredients in two different processes to produce one product. The output of process 1 becomes the input of process 2 and the output of process 2 is transferred to the packing department.

From the information given below, you are required to open accounts for process 1, process 2, abnormal loss and packing department and to record the transactions for the week ended 11th May, 2016.

Process 1

Input ;

Material A- 6,000 kilograms at 50 paise per kilogram

Material B- 4,000 kilograms at Rupee 1 per kilogram

Mixing labour 430 hours at Rs. 2 per hour

Normal loss 5% of weight input, with no disposed of at 16 paise per kilogram

Output 9,200 kilograms.

No work in process at the beginning or end of the week.

Process 2

Material - C 6,600 kilograms at Rs. 1.25 per kilogram

Material - D 4,200 kilograms at Rs. 0.75 per kilogram

Flavouring Essence Rs. 300

Mixing labour 370 hours at Rs. 2 per hour

Normal loss 5% of weight input, with no disposal value

Output 18,000 kilograms.

No work in progress at the beginning of the week but 1,000 kilograms in process at the end of the week and estimated to be only 50% completed so far as labour and overhead were concerned.

Overhead of Rs. 3,200 incurred by the processes to be absorbed on the basis of mixing labour hours.

Question 13

Following data are available for a product for the month of July, 2016 :

	Process I	Process II
Opening work-in-progress	NIL	NIL
	Rs.	Rs.
Costs incurred during the month :		
Direct materials	60,000	--
Labour	12,000	16,000
Factory overheads	24,000	20,000
Units of production :		
Received in Process	40,000	36,000
Completed and transferred	36,000	32,000
Closing work-in-progress	2,000	?
Normal loss in process	2,000	1,500

Production remaining in Process has to be valued as follows :

Materials	100%
Labour	50%
Overheads	50%

There has been no abnormal loss in Process II.

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

Question 14

A company manufactures a product which involves two consecutive processes, viz. Pressing and Polishing. For the month of October, 2016, the following information is available :

	Pressing	Polishing
Opening Stock	--	--
Input of units in process	1,200	1,000
Units completed	1,000	500
Units under process	200	500
Material Cost	Rs. 96,000	Rs. 8,000
Conversion Cost	Rs. 3,36,000	Rs.54,000

For incomplete units in process, charge materials cost at 100 per cent and conversion cost at 60 per cent in the Pressing Process and 50 per cent in Polishing Process. Prepare a statement of cost and calculate the selling price per unit which will result in 25 per cent profit on sale price.

****

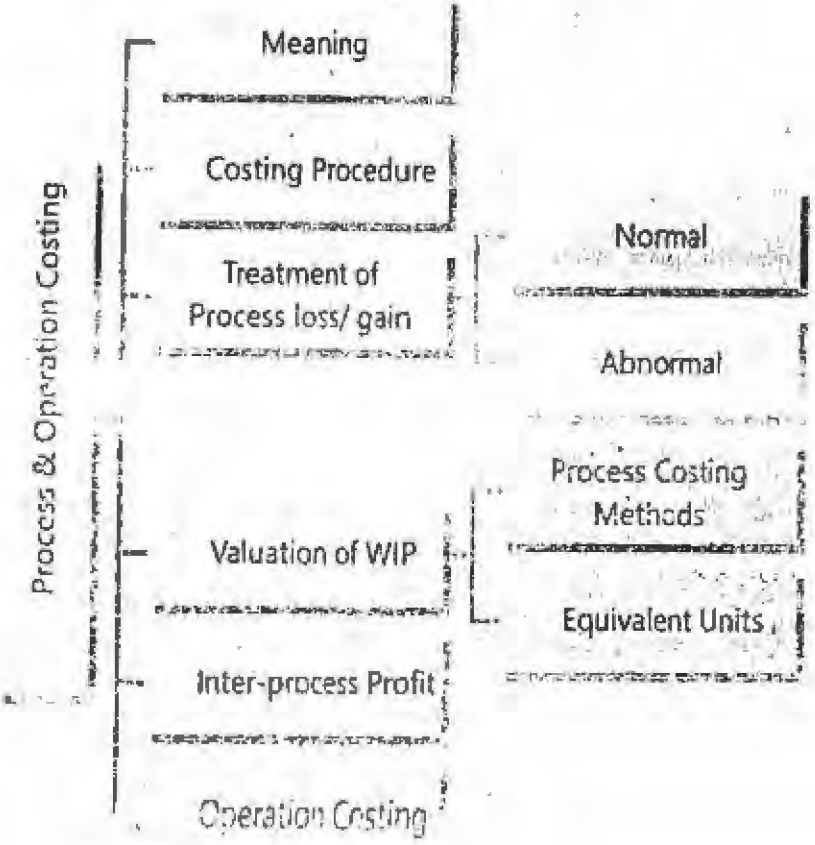
HOME WORK

CHAPTER 10

LEARNING OUTCOMES

- ☐ State the meaning of Process and Operation Costing.
- ☐ Discuss the treatment of process loss and gains in cost accounting.
- ☐ Compute equivalent completed production units.
- ☐ Discuss the various methods of valuation of work in process.
- ☐ State the meaning and treatment of Inter-process profits.

CHAPTER OVERVIEW



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I.I.

QNO75

ILLUSTRATION 4

Opening work-in-process 1,000 units (60% complete); Cost ₹ 1,10,000. Units introduced during the period 10,000 units; Cost ₹ 19,30,000. Transferred to next process - 9,000 units.

Closing work-in-process - 800 units (75% complete). Normal loss is estimated at 10% of total input including units in process at the beginning. Scraps realise ₹10 per unit. Scraps are 100% complete.

Using FIFO method, compute equivalent production and cost per equivalent unit. Also evaluate the output.

ILL-4

FIFO

OPENING WIP = 1000
INPUT = 10000
11000

NORMAL LOSS
10% × 11000
= 1100

EXP-OUTPUT
9900 UNITS

CLOSING WIP
800

EXP-OUTPUT
9100 UNITS

MAT
75%

CONV. COST

FOODS
9000 UNITS

ABN LOSS
100 UNITS

FOODS
1000

FOODS (II)
8000
100%

Page No.

SUBNO(1) STATEMENT SHOWING EQV PROD

INPUT	PART	OUTPUT	%	QTY
	INPUT			
1000	OPWIP			
10000	INPUT			
	FGOOD(T)	1000	40%	400
	FGOOD	8000	100%	8000
	AN(II)(OS)	1100	—	—
	WIP	800	75%	600
	ABLOS	100	100%	100
11000		11000		9100

SUBNO(2)

STATEMENT SHOWING COST PER UNIT

COST	÷ EQVPRD	= C.P.U
MATERIAL		
LAB & OH		
1930000		

REL-INV (1100X10) (11000)

1919000 ÷ 9100 = 210.88

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SOLN10(3)

STATEMENT SHOWING VALUATION OF OUTPUT

FINISHED GOODS.

	UNITS		= AMT
FGOODS(I) OF COST		X Rate	= 110000
OF WIP	400	X 210·88	= 84352
		(I)	194352

FGOODS (II)

COST 8000 X 210·88 = 1687040

1881392

ABNORMAL LOSS

COST 100 X 210·88 = 21088

CLOSING WIP 600 X 210·88 = 126528

EXTRA PROCESS A/C

TO OP WIP	1000	110000	BY FGOODS	9000	1881392
TO COST	10000	1930000	BY NORM	1600	11000
			BY ABNO	100	21088
			BY WIP	600	126528
	11000	2040000			

QUOTE

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Date

Ill - 5

ILLUSTRATION 5

Refer to information provided in Illustration 4 above and solve this by Weighted Average Method:

NOGNO (1)

WNOGNO(i)

OPWIP = 1000 UNITS
INPUT = 10000 "
11000 "

NLOS
1100 Units

EXPOUPUT.
9900

CLOSINGWIP
800 X 75%.
= 600

EXPGOODS.
9100

FGOODS.
9000

ABNU
100

STATEMENT SHOWING EQV PRODUCTION

INPUT	PART	OUPUT	%	OUPUT
1000	OPWIP			
10000	INPUT			
	FGOODS	9000	100%	9000
	WIP	800	75%	600
	NLOS	1100	—	—
	ABNU	100	100%	100
11000		11000		9700

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SUPNO (2)

STATEMENT SHOWING EOV COST

T.COST		
OP COST	=	110000
INPUT	=	1930000
		2040000
RMANLOM = (1100X10)		(11000)
		2029000 ÷ 9700 = 209.18

SUPNO (2)

STATEMENT SHOWING VALUATION OF OUTPUT

FLOODS	9000 UNX 209.18 =	1882620
ABNLOM	1001 X 209.18 =	20918
closing WIP	600 X 209.18 =	125508

EXTRA

PLOOTING A/C

TOOPWIP	1000	110000	BY NU A/C	1100	11000
TO INPUT	10000	1930000	BY ABNLOM	100	20918
			BY FLOODS	9000	1882620
			BY WIP	600	125508
				11000	

Q No-17

Practical Question

1. Following information is available regarding Process-I for the month of February, 20X5 :

Production Record:	
Units in process as on 1.2.20X5	
(All materials used, 25% complete for labour and overhead)	4,000
New units introduced	16,000
Units completed	14,000
Units in process as on 28.2.20X5	
(All materials used, 33-1/3% complete for labour and overhead)	6,000
Cost Records:	
Work-in-process as on 1.2.20X5	(₹)
Materials	6,000
Labour	1,000
Overhead	1,000
	8,000
Cost during the month	
Materials	25,600
Labour	15,000
Overhead	15,000
	55,600

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-I.

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(PRACTICAL QN-1)
10.25

PROCESS I

OPWIP= 4000 — Mat 100%
Lab&OH 25%

INPUT= 16000
20000

FINISHED GOODS
14000

CLOSING WIP
6000

Mat 100%
Lab&OH 33 1/3 %

SOLN NO(1)

STATEMENT SHOWING FOR PRODUCTION

INPUT	PARTICULARS	OUTPUT	Mat	Lab	O.H
			%	%	%
4000	O/P WIP				
16000	INPUT				
	FINISHED GOOD	14000	100% 14000	100% 14000	100% 14000
	CLOSING WIP.	6000	100% 6000	$33\frac{1}{3}$% 2000	$33\frac{1}{3}$ 2000
20000		20000	20000		16000

SOLN NO(2)

STATEMENT SHOWING COST PER UNIT.

		C.P.U
MATERIAL	(25600 + 6000) ÷ 20000 =	1.58
LABOUR	(15000 + 1000) ÷ 16000 =	1.00
O.H	(15000 + 1000) ÷ 16000 =	1.00

Page No. | Date

SCUP NO - (3)

STATEMENT SHOWING VALUATION OF STOCK

FINISHED GOODS

	QTY		C.P.U		TOTAL
Mat	14000	X	1.58	=	22120
lab	14000	X	1.00	=	14000
OH	14000	X	1.00	=	14000
					50120

W.I.P. (CLOSING)

Mat	6000	X	1.58	=	9480
lab	2000	X	1.00	=	2000
O'H.	2000	X	1.00	=	2000
					13480

PROCESS I A/C

To O/p W.I.P	4000	8000	By F Goods	14000	50120
To Mat	16000	25600	By W.I.P	6000	13480
To lab		15000			
To OH.		15000			
	20000	63600		20000	63600

Process & Operation Costing

ENO-18

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Date

2. Following details are related to the work done in Process-Iby XYZ Company during the month of March 20X5:

		(₹)
Opening work-in process (2,000 units)		
Materials		80,000
Labour		15,000
Overheads		45,000
Materials introduced in Process-I (38,000 units)		14,80,000
Direct Labour		3,59,000
Overheads		10,77,000
Units scrapped : 3,000 units		
Degree of completion :		
Materials	100%	
Labour and overheads	80%	
Closing work-in process : 2,000 units		
Degree of completion :		
Materials	100%	
Labour and overheads	80%	

Units finished and transferred to Process-II: 35,000 units

Normal Loss :

5% of total input including opening work-in-process.

Scrapped units fetch ₹ 20 per piece.

You are required to prepare :

(i) Statement of equivalent production

(ii) Statement of cost

(iii) Statement of distribution cost, and

(iv) Process-I Account, Normal Loss Account and Abnormal Loss Account.

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NOTE NO(1)

PROCESS(I)

OPWIP= 2000 UNITS
INPUT= 38000 "

40000 "

NLOD
5% X 40000
= 2000 UNITS

EXP-OUT-PUT
38000 Units

CLOSING WIP.
2000

EXP GOOD
36000

MAT
100%

LAB & OH
80%

ACTUAL
35000 Units

ABNW
1000

MAT
100%

LAB & OH
100%

MAT
100%

LAB
80%

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SCHEDULE (1) STATEMENT SHOWING EQUIVALENT PRODUCTION

INPUT	PARTICULARS	OUTPUT	Mat'l %	Mat'l Eq	Lab & OH %	Lab & OH Eq
2000	OPWIP					
38000	INPUT					
	Finished	35000	100%	35000	100%	35000
	Closing WIP	2000	100%	2000	80%	1600
	Normal	2000	—	—	—	—
	Abnormal	1000	100%	1000	80%	800
40000		40000		38000		37400

SCHEDULE (2) STATEMENT SHOWING C.P.U

Mat = 1560000
(80000 + 1480000)

R.M. Lost (2000 × 20) (40000)

1520000 ÷ 38000 = 40.00

Lab & OH
(15000 + 45000 + 359000 + 1077000) ÷ 37400 = 40.00

SCHEDULE (3) STATEMENT SHOWING EQUIVALENT PRODUCTION VALUATION.

FINISHED GOODS

Mat	35000 × 40 =	1400000
Lab	35000 × 40 =	1400000
O/H	[illegible] ×	[illegible]

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CLOSING W.I.P.

Mat	2000 X 40 =	80000
Lab&OH	1600 X 40 =	64000
		144000

ABNCW.

Mat	1000 X 40 =	40000
Lab	800 X 40 =	32000
		72000

PROCESS A/C (I)

To Opwip	2000	140000	By NCOD A/C	2000	40000
To Mat	38000	1480000	By ABNC	1000	72000
To Lab		359000	By FNCOD	35000	2800000
To OH		1077000	By WIP	2000	144000
	40000	3056000		40000	3056000

NORMAL LOSS A/C

To PA	2000	40000	By CASH A	2000	40000

ABNCW A/C

To PA/C	1000	72000	By CASH A/C	1000	20000
			By Costing P/L		
	1000	72000		1000	72000

3. A company produces a component, which passes through two processes. During the month of April, 20X5, 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 material	₹15,000
Direct wages	₹18,000
Factory overheads	₹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	₹4,000
Direct wages	₹3,500
Factory overheads	₹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.

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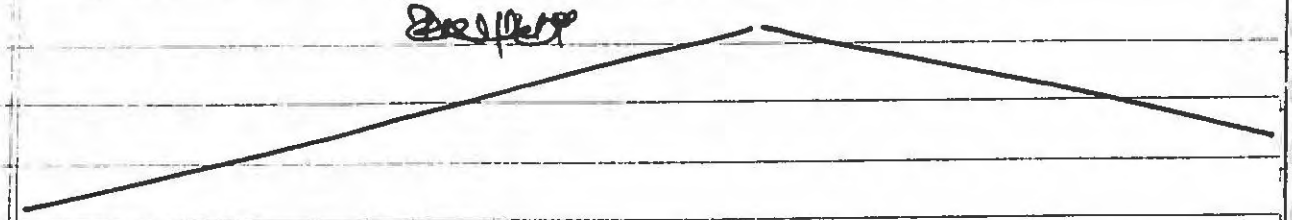
NOTE(1)

INPUT = 40000 Unb.



FINISHED GOODS. 30000 Unb

CLOSING WIP 10000

Mat.	Labour	Mat	Labour
100%	100%	100%	50%

SOLN NO(1)

STATEMENT SHOWING EQV PRODUCTION

INPUT	PARTICULARS	OUTPUT	Mat	Labour
40000	INPUT			
	Finished Goods	30000	100% 30000	100% 30000
	WIP	10000	100% 10000	50% 5000
40000		40000	40000	35000

SOLN NO(2) STATEMENT SHOWING COST

Mat 15000 ÷ 40000 = .375

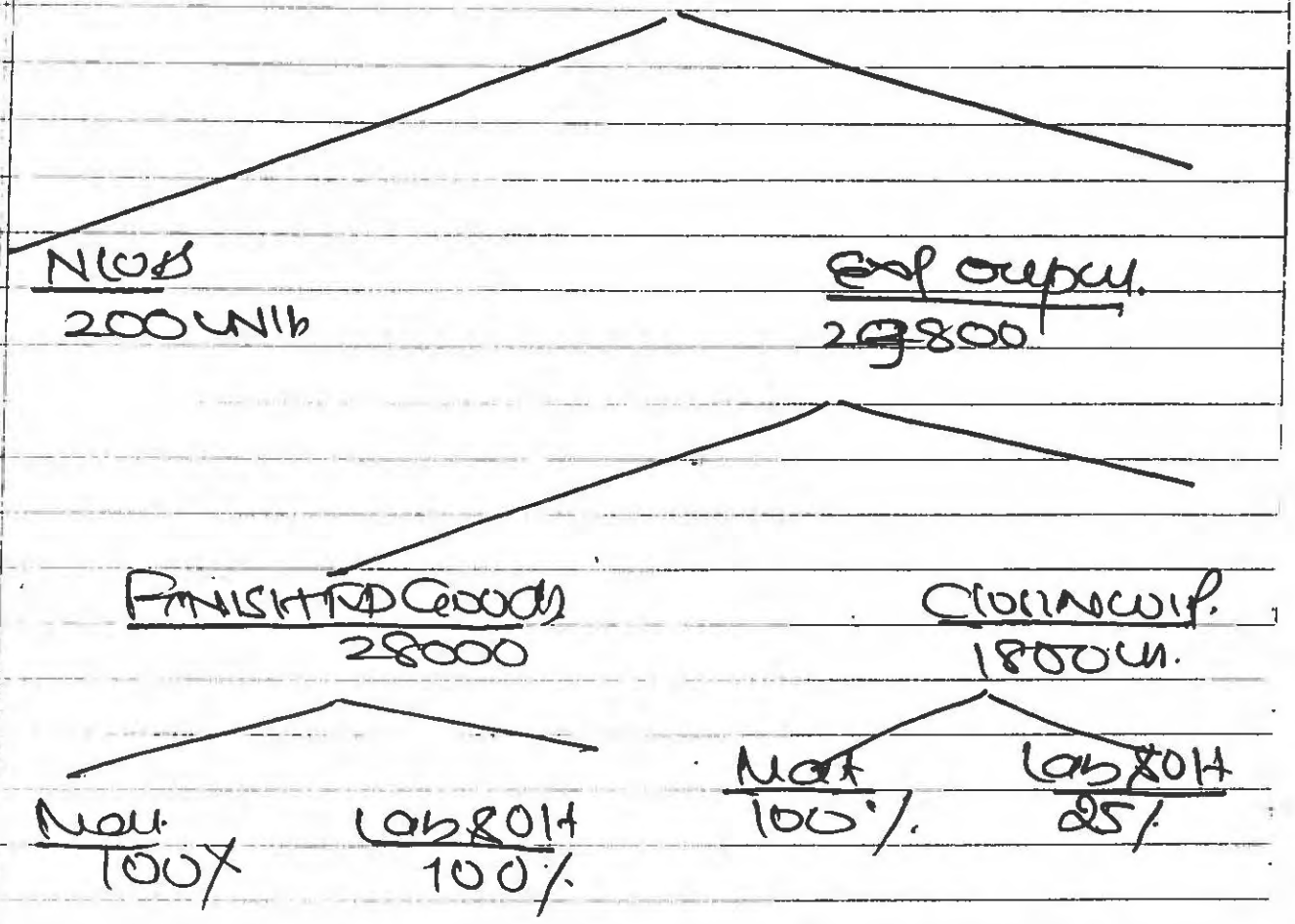
Labour 30000 ÷ 35000 = .857

(18000 + 12000)

Page No.
Date

PROCESS (I)

RECD FROM PROCESS (I) = 30000 UNITS



INPUT	PART	OUTPUT	MAT.	LAB & OH.
28000	INPUT FGOODS	28000	100% 28000	100% 28000
	WIP	1800	100% 1800	25% 450
	NLOS	200	@ —	— —
30000		30000	29800	28450
	SCRAP(2)			
	MAT	36 KGS	÷ 29800 =	1.24
	LAB & OH	8000	÷ 28450 =	.28

Page No:
Date

SCLPNO(3)

STATEMENT SHOWING EQV PRODUCTION VALUATION

FINISHED GOODS.

			Rs
MATERIAL	30000 X ·375 =		11250
LAB&OH·	30000 X ·857 =		25710
		Bal fig →	36960
			36965

WIP.

MATERIAL	10000 X ·375 =	3750
LAB&OH·	5000X ·857 =	4285
		8035

PROCESS II A/C

TO MAT	40000	15000	BY PROCESS II A/C.	30000	36965
TO LABR		18000			
TO OH		12000	By closing WIP	10000	8035
	40000	45000		40000	45000

Page No.
Date

SOLN NO (3)

STATEMENT SHOWING VALUATION OF OUTPUT

			Rs
FINISHED WOOD.			
MAT	28000 X	1·24	34720
LAB & OH.	28000 X	·28	7840
			42560
	PACING		4000
			46560
WIP.			
MAT	1800 X	1·24 =	2232
LAB & OH	450 X	·28 =	126
			2358

PROCESS A/C (II)

TO P WIP	—	—	BY P WOOD	28000	46560
TO MAT (P II)	30000	36965			
		3500	BY WIP (Bal fg)	1800	2405
TO L & OH		~~4000~~			
TO OH		4500	BY W/W A/C	200	—
TO PACING		4000			
	30000	48965			48965

CHAPTER - 8

CONTRACT COSTING

Question 1

A contractor commenced the work on a particular contract on 1.3.2016. He usually closed his books of accounts for the year on 31st Dec. each on which day the following data is available:-

	Rs.
Materials sent to site	43,000
Foreman's charges	12,620
Labour	1,00,220

A machine costing Rs. 30,000 remained in use on site for 1/5th of the year, its working life was estimated at 5 years and scrap value is Rs. 2,000/-. A supervisor is paid Rs. 2,000/- per month and hand devoted one half of his time on the contract.

All other expenses were Rs. 14,000/- the materials on site were of Rs. 2,500/-. The contract price was Rs. 4,00,000/- on 31.12.2016, 2/3 of the contract was completed, however, the architect certified only Rs. 2,00,000 of which 90% was cash received. Prepare the Contract Account.

Question 2

A firm of contractors obtained a contract to build a house for Rs. 6,00,000/-.

The work commenced on 1st April, 2015, and the following expenditure was incurred during the year ended 31st March, 2016.

	Rs.
Plants and Tools	20,000
Stores and Materials	80,000
Wages	80,000
Sundry Expenses	7,000
Establishment charges	18,000

Some of the materials were found in excess and was, ultimately sold for Rs. 17,000 while their cost price was Rs. 14,000, portion of the plant was scrapped and sold as scrap for Rs. 5,000.

The value of the plant and tools on site on 31st March 2016 was Rs. 8,000/- and the value of the stores and materials site was Rs. 5,000/-.

90% of the work done was certified for Rs. 3,20,000 which 80% was received in cash.

Prepare contract account for the year ended on 31st March, 2016.

Question 3

The Hindustan Construction Co. Ltd., undertook a contract for Rs. 4,00,000 on 1st July, 2016.
The following expenses were incurred upto 31st December, 2016 :-

	Rs.
Materials issued from Stores	35,000
Materials charged direct	5,000
Direct Charges	2,000
Wages	20,000

The amount of work certified was Rs. 80,000 of which the contractors received 75% cash.
The transaction for the year 2017 were as follows :-

	Rs.
Materials issued from stores	90,000
Wages	40,000
Direct charges	4,000

The cost of a special Plant and Machinery issued on 1st January, 2017 for the contract was Rs. 80,000.

Further work certified during the year amounted to Rs. 2,00,000, 75% of which was received for in cash. Work done not certified as on 31st December, 2017 was valued at Rs. 15,000/-. Special plant is to be depreciated at 25% per annum on the original cost.

Materials on site valued at Rs. 10,000.

The contract was completed on 30th April, 2018 upto which date the following further expenses were incurred :-

	Rs.
Materials issued from stores	40,000
Materials charged direct	7,000
Direct Charges	1,350
Wages	15,000

The General exp. each year is to be taken at 5% of the amount of materials consumed and wages paid during the year. On 30th April, 2018 the plant was value at Rs. 50,000. The materials at site were sold for Rs. 7,000 and those returned to stores amounted to Rs. 13,000.
Prepare contract accounts for 2016, 2017 and 2018.

Question 4

Y Ltd. is a jobbing firm that undertakes sub-contract work that is normally not done by a main contractor. It's Trial Balance as on 1.1.2016:

	Dr.	Cr.
Share Capital	--	2,00,000
Profit & Loss A/c	--	50,000
Fixed Assets	80,000	--
Sundry Creditors	--	10,000
Cash & Bank Balance	15,000	--
Stock of Raw Material	30,000	--
Sundry Debtors	1,20,000	--
Bills Receivable	15,000	--
	2,60,000	2,60,000

During the year it undertook two small contracts - contract A for Rs. 60,000/- and contract B for Rs. 32,000/-. Details are given below.

Contract A : The material in stock was consumed and labour cost of Rs. 8,000 was incurred. One plant having W.D.V. of Rs. 15,000 on 1.1.2016 was put at the site on which depreciation at the rate of 15% p.a. is to be provided. The contractor paid Rs. 40,000/- being 80% of work certified. The work done but not certified is value (at cost) at Rs. 4,000 which was subsequently certified at Rs. 6,000/-. The contract is ultimately completed in 2017.

Contract B : Material purchased amounted to Rs. 12,000. Labour cost incurred amounted to Rs. 2,000/-. Overhead amounted to Rs. 1,000. The contractor certified the work as per the terms of contract and paid 80% thereof the work uncertified is value at Rs. 3,000/-. The collection from debtors amounted to Rs. 80,000. The payment creditors amounted to Rs. 13,000/-. Bills receivable accepted by Mr. X was honoured by him. Other office expenses amounted to Rs. 18,000/-. Depreciation on other assets is to be provided at the rate of 10% p.a. New fixed assets are purchased in December for Rs. 1,00,000/- on which the dep. is to be provided in 2017. Cash on hand as on 31.12.2016 is Rs. 25,600/-. You are requested to prepare two contract accounts and the Balance Sheet as on 31.12.2016.

Question 5

Deluxe Limited undertook a contract for Rs. 5,00,000 on 30th June, 2016 when the accounts were enclosed the following details about the contract were gathered :

Materials Purchased	Rs. 1,00,000
Wages paid	45,000
General Expenses	10,000
Plant purchased	50,000
Material on Hand 30.6.2005	25,000
Wages Accrued 30.6.2005	5,000
Work Certified	2,00,000
Cash Received	1,50,000
Work Uncertified	15,000
Dep. of plant	5,000

The above contract contained as escalator clause which read as follows :-

"In the event of prices of materials and rates of wages increased by more than 5% the contract price would be increased accordingly by 25% of the rise in the case 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. Workings should form part of the answer.

Question 6

A Contractor commenced a building contract on October 1, 2016. The price is Rs. 4,40,000.The following data pertaining to the contract for the year 2017-18 has been compiled from his books and is as under :

		Rs.
April 1, 2017	Work-in-progress not certified	55,000
	Materials at site	2,000
2017-18	Expenses incurred:	
	Material issued	1,12,000
	Wages paid	1,08,000
	Hire of plant	20,000
	Other expenses	34,000
March 31, 2018	Material at site	4,000
	Work-in-progress: Not certified	8,000
	Work-in-progress: Certified	4,05,000

The cash received represents 80% of work certified. It has been estimated that further costs to complete the contract will be Rs. 23,000 including the materials at site as on March 31, 2018.

Required:

Determine the profit on the contract for the year 2017-18 on prudent basis, which has to be credited to P/L A/c.

Question 7

MNP Construction Ltd. commenced a contract on April 1, 2016. The total contract was for Rs. 17,50,000. 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 2016-17 and estimated expenditure in 2017-18 are given below:

	2016-17 (Actuals)	2017-18 (Estimated)
	Rs.	Rs.
Material issued	3,00,000	5,50,000
Labour : Paid	2,00,000	2,50,000
: Outstanding at end	20,000	30,000
Plant purchased	1,50,000	--
Expenses : Paid	75,000	1,50,000
: Prepaid at end	15,000	--
Plant returned to store (historical cost)	50,000	1,00,000 (on Dec. 31, 2017)
Material at site	20,000	50,000
Work certified	8,00,000	Full
Work uncertified	25,000	--
Cash received	6,00,000	Full

The plant is subject to annual depreciation @25% of WDV Cost. The contract is likely to be completed on Dec. 31, 2017. Prepare the Contract A/c. **Determine the profit on the contract for the year 2016-17 on prudent basis, which has to be credited to P/L A/c.**

Question 8

Brock Construction Ltd. commenced a contract on November 1, 2017. The total contract was for Rs. 39,37,500. 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. Annual expenditure for the period November 1, 2017 to October 31, 2018 and estimated expenditure for November 1, 2018 to March 31, 2019 are given below:

	November 1, 2017 to October 31, 2018 (Actuals)	November 1, 2018 to March 31, 2019 (Estimated)
	Rs.	Rs.
Materials issued	6,75,000	12,37,500
Labour : Paid	4,50,000	5,62,500
Prepaid	25,000	---
Outstanding	---	2,500
Plant purchased	3,75,000	---
Expenses: Paid	2,00,000	3,50,000
Outstanding	50,000	25,000
Plant return to store	75,000	3,00,000
(historical cost)	(on March 31, 2018)	(on March, 2019)

Work certified	20,00,000	Full
Work uncertified	75,000	
Cash received	17,50,000	
Material at site	75,000	37,500

The plant is subject to annual depreciation @33 1/3% on written down value method. The contract is likely to be completed on March 31, 2019.

Required:

Prepare the contract A/c. Determine the profit on the contract for the year November, 2017 to October, 2018 on prudent basis, which has to be credited to P/L A/C.

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 31.3.2017 are as under :

	(Rs.000's)
Materials issued to site	5,000
Direct wages paid	3,800
Plant hired	700
Site office costs	270
Materials returned from site	100
Direct expenses	500
Work certified	10,000
Progress payment received	7,200

A special plant was purchased specifically for this contract at Rs. 8,00,000 and after use on this contract till the end of 31.3.2017, it was valued at Rs. 5,00,000. The cost of materials at site at the end of the year was estimated at Rs. 18,00,000. Direct wages accrued as on 31.3.2017 was Rs. 1,10,000.

Required :

Prepare the Contract Account for the year ended 31.3.2017 and compute the profit to be taken to the Profit and Loss Account.

Question 10

Paramount Engineers are engaged in construction and erection of a bridge under a long-term contract. The cost incurred upto 31.3.2017 was as under:

Fabrication	**Rs. in lakhs**
Direct Materials	280
Direct Labour	100
Overheads	60
	440
Erection cost to date	110
	550

The contract price is Rs. 11 crores and the cash received on account till 31.3.2017 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 contract as at 31.3.2017.

Question 11

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	1,70,000
Estimated further expenditure to complete the contract (including contingencies)	34,000
Contract Price	3,06,000
Work Certified	2,00,000
Work Not Certified	17,000
Cash Received	1,63,200

****

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HOME WORK

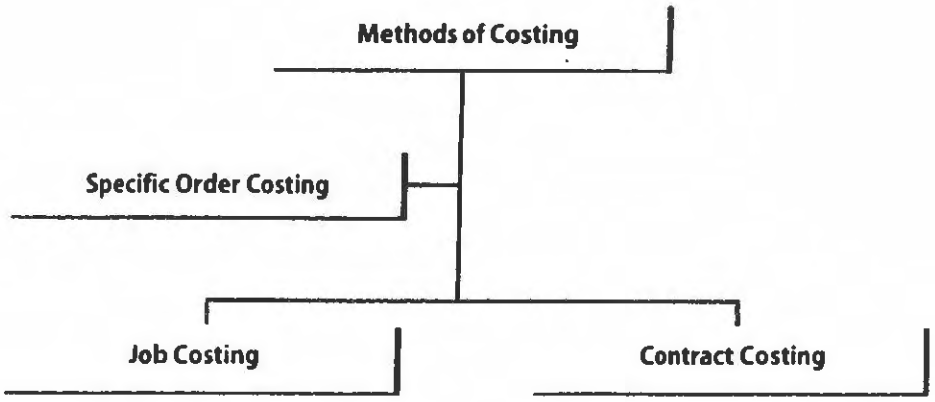
CHAPTER 9

JOB AND CONTRACT COSTING

LEARNING OUTCOMES

- ❒ Describe Job Costing methods.
- ❒ Explain the accounting entries for cost elements under both the methods.
- ❒ Determining cost for a job.
- ❒ Ascertain the cost of a contract, Progress payment, Retention money, Value of work certified, Cost of Work not certified.
- ❒ Discuss Escalation clause, Cost plus contract.
- ❒ Compute Notional or Estimated profit from a contract.

CHAPTER OVERVIEW



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Date

(Ill c-3) 9.15 (GIVEN)

CONTRACT A/C

TO TOTAL EXP	2250000	By CONT PRICE	3250000
TO P&L	250000		
TO NOT P/L	750000		
	3250000		3250000

ILLUSTRATION 3

Compute estimated of profit on a contract (which has been 90% complete) from the following particulars :

	(₹)
Total expenditure to date	*22,50,000*
Estimated further expenditure to complete the contract (including contingencies)	*2,50,000*
Contract price	*32,50,000*
Work certified	*27,50,000*
Work uncertified	*1,75,000*
Cash received	*21,25,000*

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Date

ILLUSTRATION 4

The following expenses were incurred on a contract :

	(₹)
Materials purchased	*6,00,000*
Material drawn from stores	*1,00,000*
Wages	*2,25,000*
Plant issued	*75,000*
Chargeable expenses	*75,000*
Apportioned indirect expenses	*25,000*

The contract was for ₹ 20,00,000 and it commenced on January 1, 20X1. The value of the work completed and certified upto 30th November, 20X1 was ₹ 13,00,000 of which ₹ 10,40,000 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, 20X1 was ₹ 60,000. There were also lying on the site materials of the value of ₹ 40,000. It was estimated that the value of plant as at 31st December, 20X1 was ₹ 30,000.

You are required to compute value of work certified, cost of work not certified and notional profit on the contract till the year ended 31st December, 20X1.

(ILL-4 9.17)

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CONTRACT A/C FOR THE YEAR ENDED

TO Mat A/C	600000	By Cost c/f	
TO Mat A/C	100000		
TO Wage A/C	225000	By Mat A/C	40000
TO Plant A/C	75000	By Plant A/C	30000
TO Other Exp	75000		
TO R&D Exp	25000	By Cost c/f	1030000
To			
	1100000		1100000
To Cost c/d	1030000	By WIP	
		Work Cert	1300000
To Net P/L	330000	Work Uncert.	60000
	1360000		1360000

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Date

ILLUSTRATION 5

A contractor prepares his accounts for the year ending 31st December each year. He commenced a contract on 1st April, 20X1.

The following information relates to the contract as on 31st December, 20X1:

	(₹)
Material issued	*2,51,000*
Wages	*5,65,600*
Salary to Foreman	*81,300*

A machine costing ₹ 2,60,000 has been on the site for 146 days, its working life is estimated at 7 years and its final scrap value at ₹ 15,000.

A supervisor, who is paid ₹ 8,000 p.m. has devoted one-half of his time to this contract.

All other expenses and administration charges amount to ₹ 1,36,500.

Material in hand at site costs ₹ 35,400 on 31st December, 20X1.

The contract price is ₹ 20,00,000. On 31st December, 20X1 two-third of the contract was completed. The architect issued certif-icates covering 50% of the contract price, and the contractor had been paid ₹ 7,50,000 on account.

Prepare Contract A/c and show the notional profit or loss as on 31st December, 20X1.

IL(-5)
9.18

CONTRACT A/C FOR 1-4-20X1 TO 31-12-20X1

To Mat A/c	251000	By Mat s/a	~~15000~~ 35400
To wages A/c	565 600		
To For salary	81300		
To Machine	260000	By Plant A/c	246000
		Cost 260000	
To Rep salary (8000×9)×1/2	36000	Dep (14000)	
		((260000 − 15000)/7 × 146/365)	
To other exp	136500		
		By cost c/f	1049000
	1330400		
To cost b/d	1049,000	By WIP	
		" Work cert (2000000 × 50/100)	1000000
To N.P	213500	" Work uncert	262500
	1262500		1262500
To costing P/L A/c		By N.P	213500
To Res count	213500		213500

NOTE NO (i) STATEMENT SHOWING CALCULATION OF UNCERTIFIED WORK

$\left(\frac{1049000}{66.67} \times 16.67\right) = \underline{262250}$

NOTE NO (ii) $\frac{2}{3} \times 213500 \times \frac{750000}{2000000}$

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M/S BANSAL

CONTRACT A/C FOR THE YEAR - 20X1

To Mat A/c	675000	By Plant at site Cost 300000 Dep 25% (75000)	225000
To Wag A/c	620000		
" Tran Cost	30000		
" Oth exp	30000		
" Plant	300000		
		By Bal c/f	(1430000)
	1655000		1655000
To Bal b/d	1430000	By WIP	
~~To Notional~~	(65000)	By Work Cert	1350000
		By Work Unc.	15000
		By ~~Notional~~ Costing Profit A/c	(65000)
	~~1365000~~		~~1365000~~
	1430000		1430000

ILLUSTRATION 6

M/s. Bansals Construction Company Ltd. took a contract for ₹ 60,00,000 expected to be completed in three years. The following particulars relating to the contract are available :

	20X1 (₹)	20X2 (₹)	20X3 (₹)
Materials	*6,75,000*	*10,50,000*	*9,00,000*
Wages	*6,20,000*	*9,00,000*	*7,50,000*
Transportation cost	*30,000*	*90,000*	*75,000*
Other expenses	*30,000*	*75,000*	*24,000*
Cumulative work certified	*13,50,000*	*45,00,000*	*60,00,000*
Cumulative work uncertified	*15,000*	*75,000*	*—*

Plant costing ₹ 3,00,000 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 for three years and total estimated profit/ loss from the contract.

Page No.

CONTRACT A/C FOR THE YEAR ENDED 20X2

TO PLANT A/C			BY PLANT A/C	126563
			COST 168750	
TO PLANT A/C	168750		DEP 25% (42187)	
" WORKCERT	4500000			
" WORKNOR	75000			
TO MAT A/C	900000		BY CONTRACTEE A/C	600000
" WAG A/C	750000		BY NET COS	
" TRAN A/C	75000		COSTING P/C A/C	366187
" OTHER EXP	24000			
	6492750			

ESTIMATED COSTING PROFIT BLOW A/C

20X1 TO NOTLOS	65000			
			20X2 BY CONT A/C	103875
20X3 TO NOTLOS	366187			
TO FST PL	607563			
	1038750			103875

Page No.

CONTRACT A/C (FOR THE YEAR ENDED 20X2)

To Plant at site	225,000	By W/P	
		WORK CERTIFIED	4500000
To W/P		WORK UNCERTIFIED	75000
WORK CERT	1350,000		
WORK UNCERT	15000	By Plant at site	168750
		COST / W.D.V. 225000	
To Mat A/C	1050000		
" Wages A/C	900000	DEP (56250)	
" TRANSP COST	90000	(225000 × 25/100)	
" Other exp	75000		
" NOT-PT	(1038750)		
	4743750		4743750
To Costing P/L		By NOT PT	1038750
To Res Cont			
	1038750		1038750

A contractor has entered into a long term contract at an agreed price of ₹ 17,50,000 subject to an escalation clause for materials and wages as spelt out in the contract and corresponding actual are as follows :

	Standard		Actual	
Materials	**Qty (tons)**	**Rate (₹)**	**Qty (tons)**	**Rate (₹)**
A	5,000	50.00	5,050	48.00
B	3,500	80.00	3,450	79.00
C	2,500	60.00	2,600	66.00
Wages	**Hours**	**Hourly Rate (₹)**	**Hours**	**Hourly Rate (₹)**
X	2,000	70.00	2,100	72.00
Y	2,500	75.00	2,450	75.00
Z	3,000	65.00	3,100	66.00

Reckoning the full actual consumption of material and wages the company has claimed a final price of ₹ 17,73,600. Give your analysis of admissible escalation claim and indicate the final price payable.

STATEMENT SHOWING FINAL CLAIM

MATERIALS		STANDARD RATE	ACTUAL RATE	VARIATION	VARIATION X STANDARD QTY = ESCALATION CLAIM	
	A	50	48	(2)	(2) X 5000 =	(10000)
	B	80	79	(1)	(1) X 3500 =	(3500)
	C	60	66	6	6 X 2500 =	15000
						1500
WAGES						
	X	70.00	72.00	(2)	(2) X 2000 =	4000
	Y	75.00	75.00	-		
	Z	65.00	66.00	(1)	(1) X 3000 =	3000
						7000
			FINAL	CLAIM	=	8500

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Date

STATEMENT SHOWING FINAL PRICE PAYABLE

AGREED PRICE	1750000
AGREED ESCALATION	
MATERIAL COST	1500
LABOUR COST	7000
	1758500

Statement showing final price payable

Agreed price		₹ 17,50,000
Agreed escalation :		
Material cost	₹ 1,500	
Labour cost	₹ 7,000	₹ 8,500
Final price payable		₹ 17,58,500

The claim of ₹ 17,73,600 is based on the total increase in cost. This can be verified as shown below:

Statement showing total increase in cost

	Standard Cost			Actual Cost			Increase/ (Decrease)
	Qty/ hrs	Rate (₹)	Amount (₹)	Qty/hrs (₹)	Rate (₹)	Amount (₹)	
	(a)	(b)	(c) = (a) × (b)	(d)	(e)	(f) = (d) × (e)	g = (f) − (c)
I. Materials							
A	5,000	50.00	2,50,000	5,050	48.00	2,42,400	(7,600)
B	3,500	80.00	2,80,000	3,450	79.00	2,72,550	(7,450)
C	2,500	60.00	1,50,000	2,600	66.00	1,71,600	21,600
			6,80,000			6,86,550	6,550
II. Wages							
X	2,000	70.00	1,40,000	2,100	72.00	1,51,200	
Y	2,500	75.00	1,87,500	2,450	75.00	1,83,750	
Z	3,000	65.00	1,95,000	3,100	66.00	2,04,600	
			5,22,500			5,39,550	17,050
							23,600

Contract price	₹ 17,50,000
Add : Increase in cost	₹ 23,600
The final price claimed by the company	₹ 17,73,600

This claim is not admissible because escalation clause covers only that part of increase in cost, which has been caused by inflation.

Note : It is fundamental principle that the contractee would compensate the contractor for the increase in costs which are caused by factors beyond the control of contractor and not for increase in costs which are caused due to inefficiency or wrong estimation.

Practical Questions

1. In a factory following the Job Costing Method, an abstract from the work-in-progress as on 30th September was prepared as under.

Job No.	Materials (₹)	Direct hrs.	Labour (₹)	Factory Overheads applied (₹)
115	1325	400 hrs.	800	640
118	810	250 hrs.	500	400
120	765	300 hrs.	475	380
	2,900		1,775	1,420

Materials used in October were as follows :

Materials Requisition No.	Job No.	Cost (₹)
54	118	300
55	118	425
56	118	515
57	120	665
58	121	910
59	124	720
		3,535

A summary for labour hours deployed during October is as under :

Job No.	Number of Hours	
	Shop A	Shop B
115	25	25
118	90	30
120	75	10
121	65	--
124	25	10
	275	75

	20
	10
	5
	6

A shop credit slip was issued in [illegible] No. 54 was returned back to store [illegible] issued in October indicated that [illegible] 118 was directed to Job 124.

The hourly rate in shop A per labour hour is ₹ 3 per hour while at shop B, it is ₹ 2 per hour. The factory overhead is applied at the same rate as in September. Job 115, 118 and 120 were completed in October.

You are asked to compute the factory cost of the completed jobs. It is the practice of the management to put a 10% on the factory cost to cover administration and selling overheads and invoice the job to the customer on a total cost plus 20% basis. What would be the invoice price of these three jobs?

2. Compute a conservative estimate of profit on a contract (which has been 90% complete) from the following particulars. Calculate the proportion of profit to be taken to Costing Profit & Loss Account under various methods and give your recommendation.

	(₹)
Total expenditure to date	4,50,000
Estimated further expenditure to complete the contract (including contingencies)	25,000
Contract price	6,12,000
Work certified	5,50,800
Work uncertified	34,000
Cash received	4,40,640

CONTRACT A/C

TOTAL EXP	450000	By WORK CERT	550800
TO NOT PL	134800	By WORK UNCERT	34000
	584800		584800
TO COST INC P&L A/C		BY NOT PL	
TO RES			

COMPUTATION OF ESTIMATED PROFIT

TO COST upto date	450000	By CONT PRICE	612000
TO EST EXP	25000		
TO EST PL	(137000)		
	612000		612000

3. AKP Builders Ltd. commenced a contract on April 1, 20X2. The total contract was for ₹ 5,00,000. Actual expenditure for the period April 1, 20X2 to March 31, 20X3 and estimated expenditure for April 1, 20X3 to December 31, 20X3 are given below:

Particulars	20X2 - X3 (Actual)	20X3 - X4 (9 months) (estimated)
Materials issued	90,000	85,750
Wages : Paid	75,000	87,325
Outstanding at the end	6,250	8,300
Plant	25,000	-
Sundry expenses : Paid	7,250	6,875
Prepaid at the end	625	-
Establishment charges	14,625	-

A part of the material was unsuitable and was sold for ₹ 18,125 (cost being ₹ 15,000) and a part of plant was scrapped and disposed off for ₹ 6,875. The value of plant at site on 31 March, 20X3 was ₹ 7,750 and the value of material at site was ₹ 4,250. Cash received on account to date was ₹ 4,75,000, representing 80% of the work certified. The cost of work uncertified was valued at ₹ 27,375.

The contractor estimated further expenditure that would be incurred in completion of the contract :

- The contract would be completed by 31st December, 20X3.
- A further sum of ₹31,250 would have to be spent on the plant and the residual value of the plant on the completion of the contract would be ₹3,750.
- Establishment charges would cost the same amount per month as in the previous year.
- ₹ 10,800 would be sufficient to provide for contingencies.

Required : Prepare Contract Account for the year ended 31st March, 20X3, and calculate estimated total profit on this contract.

Page No.
Date

CONTRACT A/C (20X2 - 20X3)

To Mat A/C	90000	By Mat sold A/C	18125
To wages A/C (75000 + 6250)	81250	By Plant sold A/C	2875
		By PLANT AT SITE	7750
TO PLANT A/C	25000		
		By Mat at site	4250
To Indirect exp (7250 - 625)	6625		
		By WIP CON A/C	
To Est exp	14625	WORK CFK	218750
To Costing P/C A/C (18125 - 15000)	3125	(75000 × 100/80) WORK UNCFK	27375
To Notpt	58500		
	279125		279125
		By Notpt	58500

Page No.
Date

MEMORANDUM CONTRACT A/C FOR EST PT

TO MAT A/C (90000 + 85750 - 15000)	160750	BY PLANT AT SITE 5010	2875
TO WAGES CONT (75000 + 87325 + 8300)	170625	BY PLANT AT SITE	3750
TO PLANT A/C	25000		
TO PLANT A/C	31250		
TO EST EXP (14625 + 10969) (14625 X 9/12)	25594		
TO WAGES EXP (7250 + 6875)	14125		
		BY CONT-PRICE	500000
TO EST P/L	79281		506625
79281 X			

4. RST Construction Ltd. commenced a contract on April 1, 20X1. The total contract was for ₹ 49,21,875. It was decided to estimate the total profit on the contract and to take to the credit of Costing Profit and Loss A/c that proportion of estimated profit on cash basis, which work completed bore to total contract. Actual expenditure for the period April 1, 20X1 to March 31, 20X2 and estimated expenditure for April 1, 20X2 to September 30, 20X2 are given below :

	April 1, 20X1 to March 31, 20X2 (Actual) (₹)	April 1, 20X2 to Sept. 30, 20X2 (Estimated) (₹)
Materials issued	7,76,250	12,99,375
Wages : 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, 20X1)	3,00,000 (on September 30, 20X2)
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, 20X2.

Required: Prepare the Contract A/c for the year ended 31st March, 20X2 and determine the estimated profit on the contract.

	TO MAT A/C	776250	BY PLANT A/C	82500
	TO WAGE A/C	492500	COST 100000	
(517500 + (37500) + 12500)			DEP (12500)	
	TO PLANT A/C	400000	(100000 × 25/100 × 1/2)	
	TO EXP	235000		
(225000 + 85000 - 15000)			BY PLANT a/c	225000
			(400000 - 100000) = 300000	
	TO NOT PL	766250	Dep @ 25%. (75000)	
			By Mat at site.	82500
			By WIP (WORK CERT	2250000
			WORK UNCERT	25000
		2670000		

Page No.

COMPUTATION OF ESTIMATED PL LOSS

To Mat A/c	2075625	By Mat Cont	42500
(776250 + 1299375)		By PLANT RETURNED	87500
To Wages Cont (517500 + 618750 + 5750)	1142000		
To PLANT A/C	400000	By PLANT at sic cost	196875
		400000	
		(100000) RETURNED	
		300000	
		(75000)	
To EXP (225000 + 375000 + 10000)	610,000	$\left(\frac{300000 \times 25}{100} \times \frac{6}{12}\right)$	
		$\left(\frac{225000 \times 25}{100} \times \frac{6}{12}\right)$	
		225000	
		(28125)	
To Est PL	(1021125)	By CONTRACTEE A/C	4921875
			5248750

IPCC (New Syllabus) Q book + Study material & Suggested Q & Answers.

DANI KI COSTING
MOBILE No.-9820030925

COSTING INDEX

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DKC
SAB-KUCHH

CHAPTER – 9

OPERATING COSTING

Question 1

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, 2016.

	Rs.
Wages of drivers, conductors and cleaners	24,000
Salaries of office staff	10,000
Diesel oil and other oil	35,000
Repairs and maintenance	8,000
Taxation, insurance etc.	16,000
Depreciation	26,000
Interest and other expenses	20,000
	1,39,000

Actually, passengers carried were 75 percent of seating capacity. All buses ran of all days of the month. Each bus made one round trip per day.

Find out the cost per passenger km.

Question 2

A transport service company is running 4 buses between 2 towns which are 50 kms. apart, seating capacity of each bus is 40 passengers. The following particulars were obtained from their books for April, 2016.

	Rs.
Wages of drivers, conductors and cleaners	2,400
Salaries of office supervisory staff	1,000
Diesel oil and other oils	4,000
Repairs and maintenance	800
Taxation, insurance etc.	1,600
Depreciation	2,600
Interest and other charges	2,000
	14,400

Actual passengers carried were 75% of the seating capacity. All 4 buses ran on all days of the month, and each bus made one round trip per day.

Find the cost per passenger kilometre.

Question 3

Mr. X owns 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%

(iv) **Following are the other details :**

Cost of the bus	Rs. 6,00,000
Salary of the driver	Rs. 2,800 p.m.
Salary of the Conductor	Rs. 2,200 p.m.
Salary of the part-time Accountant	Rs. 200 p.m
Insurance of the bus	Rs. 4,800 p.a.
Diesel consumption 4 kms	
per litre at	Rs. 6 per litre
Road tax	Rs. 1,500 p.a.
Lubricant oil	Rs. 10 per 100 kms.
Permit fee	Rs. 315 p.m.
Repairs and maintenance	Rs. 1,000 p.m.
Depreciation of the bus @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 be indicated per passenger for the journeys :

(i) Delhi to Chandigarh
(ii) Delhi to Agra
(iii) Delhi to Jaipur.

Question 4

Janta Transport Co. has ben given a route 20 kms. long for running buses. The company has a fleet of 10 buses, each costing Rs. 50,000 and having a life of 5 years without any scrap value.

From the following estimated expenditure and ther details calculate the bus fare to be charged from each passenger :-

i)	Insurance charges	3% per annum
ii)	Annual tax	Rs. 1,000 per bus
iii)	Total garages charges	Rs. 1,000 per month
iv)	Annual repairs	Rs. 1,000 per bus
v)	Driver's salary	Rs. 150 per month per bus
vi)	Conductor's salary	Rs. 100 per month per bus
vii)	Commission to be shared equally between driver and conductor	10% of the takings
viii)	Cost of the stationery	Rs. 500 per month
ix)	Manager's salary	Rs. 2,000 per month
x)	Accountant's salary	Rs. 1,500 per month
xi)	Petrol and oil	Rs. 25 per 100 kms.

Each bus will make 3 round trips carrying on an average 40 passengers on each trip. The bus will run on an average 25 days a month.

Assuming 15% profit on takings, calculate the bus fare to be charged from each passenger.

Question 5

Mr. Jaika owns a fleet of taxies and the following information was available from the records maintained by him :-

i)	Number of taxies	10
ii)	Cost of each taxi	Rs. 20,000
iii)	Salary of manager	600 p.m.
iv)	Salary of accountant	500 p.m.
v)	Salary of cleaner	200 p.m.
vi)	Salary of mechanic	400 p.m.
vii)	Garage Rent	600 p.m.
viii)	Insurance premium	5% p.a.
ix)	Annual Tax	Rs. 600 per taxi
x)	Driver's Salary	Rs. 200 per taxi p.m.
xi)	Annual Repairs	Rs. 1,000 per taxi

Total life of a taxi is about Rs. 2,00,000 kms. A taxi runs, in all 3,000 kms. in a month of which it is empty 30% of the time. Petrol consumption is one litre for 10 Kms. @ Rs. 1.80 per litre. Oil and other sundries are Rs. 5 per 100 kms. From the above information find out the effective cost per km.

Question 6

Shanker has been promised a contract to run a tourist car on a 20 kms. long route for the chief executive of a multinational firm. He buys a car costing Rs. 1,50,000. The annual cost of insurance and taxes are Rs. 4,500 and 900 respectively. He has to pay Rs. 500 per month for a garage, where he keeps the car when it is not in use. The annual costs are estimated at Rs. 4,000/-. The car is estimated to have a life of 10 years, at the end of which the scrap value is like to be Rs. 50,000.

He hires a driver who is to be paid Rs. 300 per month plus 10% of takings as commission. Other incidental expenses are estimated at Rs. 200 per month.

Petrol and oil will cost Rs. 10 per km. 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 be the charge per round trip?

Question 7

SMC is a public school having 5 buses each plying in different directions for the transport of its school students. In view of a large number of students availing of the buses, the buses work 2 shifts daily both in the morning and in the afternoon, the buses are garaged in the school. The work load of the buses has been so arranged that in the morning the first trip picks up the senior students and the second trip plying an hour later picks up the junior students and similarly in the afternoon the first trip drops junior students and an hour later the second trip takes the senior students home.

The distance travelled by each bus one way is 8 kms. The school works 25 days in a month and remains closed for vacation in May, June & December. Bus fee is payable for all 12 months.

The details of expenses are as under :-

Cost of the one Bus	Rs. 1,50,000
Driver's salary	Rs. 450 p.m. per diriver
Cleaner's salary	Rs. 350 p.m.
(Salary payable for all 12 months)	
(One cleaner employed for all 5 buses)	
License fees, taxes etc.	Rs. 860 per bus p.a.
Insurance	Rs. 1,000 per bus p.a.
Repairs & Maintenance	Rs. 3,500 per bus p.a.
Life	12 years

Scrap value	Rs. 30,000 each
Diesel cost	Rs. 2 per litre
Kms. per litre	4

Seating capacity of each bus is 50 students. The seating capacity is fully occupied during the whole year. Students picked up and dropped within the range of 4 kms. of distance from school are charged half fare and fifty % of the students are in this category. Ignore interest. Since the charges are based on average costs, you are required to :-

i) **Prepare a statement showing the expenses of operating a single bus and the fleet of 5 buses for a year.**

ii) Work out the average cost per student in respect of per month.
   a) Students falling within the range of 4 kms. from school,
   b) Students falling outside the above range.

Question 8

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 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 students home. The distance travelled by each bus, one way is 16 kms. The school works 24 days in a month and remains closed for vacation in May and June. The bus fee however, is payable by the students for all the 12 months in a year.

The details of expenses for the year 2016-17 are as under :

Driver's salary – payable for all the 12 months	Rs. 5,000 per month per driver
Cleaner's salary payable for all the 12 months (one cleaner has been employed for every 5 buses)	Rs. 3,000 per month per cleaner
Licence Fees, Taxes etc	Rs. 2,300 per bus per annum
Insurance Premium	Rs. 15,600 per bus per annum
Repairs and Maintenance	Rs. 16,400 per bus per annum
Purchase price of the bus	Rs. 16,50,000 each
Life of the bus	16 years
Scarp value	Rs. 1,50,000
Diesel Cost	Rs. 18.50 per litre

Each bus gives an average of 10 kms per litre 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 travelled as under :

Students 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 :

(i) Prepare a statement showing the expenses of operating a single bus and the fleet of 25 buses for a year.

(ii) Work out average cost per student 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.

Question 9

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 tonnes-kms' and 'Commercial tonnes-kms'.

Question 10

Global Transport Ltd. charges Rs.90 per ton for its 6 ton truck lorry load from city 'A' to city 'B'. The charges for the return journey are Rs. 84 per ton. No concession or reduction in these rates is made for any delivery of goods at intermediate station 'C'. In January, 2016 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. 1,200 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' to city 'C' and city 'B' are 140 kms. and 300 kms. respectively.

Annual fixed costs and maintenance charges are Rs. 60,000 and Rs. 12,000 respectively. Running charges spent during January, 2016 are Rs. 2,944.

You are required to find out the cost per absolute ton-kilometre and the profit for January, 2016.

Question 11

M/s. Eagle Transport Ltd. charges Rs. 60 per tonne for a 5-tonne lorry load from Calcutta to Durgapur. The charge for the return trip is Rs. 56 per tonne.

In the month of July 2016, WBX 4889 made ten outward journeys with full load out of which 3 tonnes were unloaded at Burdwan twice in the month. It returned once without any load from Burdwan.

The details of expenses are as follows :

Annual Fixed charges	Rs. 19,200
Annual maintenance charges	Rs. 9,600
Monthly operating charges	Rs. 1,202
Additional data available are :-	
Distance from Burdwan to Calcutta	120 kms.
Distance from Durgapur to Calcutta	210 kms.

WBX 4889 carried a load of 8 tonnes 5 times in the month, while returning from Durgapur but once caught by the police and fined Rs. 1,000.

You are required to calculate the cost per-tonne-km and also the profit in July 2016 assuming that no concession is given for delivery at intermediate stages.

Question 12

A factory which uses a large amount of coal is situated between two collieries X and Y, the former being 5 kms. and the latter 10 kms. distant from the factory. A fleet of lorries of 5 tonnes carrying capacity is used for the collection of coal from the collieries. The lorries average a speed of 20 kms. per hour when running and regularly take 10 minutes in the factory premises to unload. At colliery X loading time average 30 minutes per load, whereas at colliery Y 20 minutes.

Drivers wages, licence, insurance, depreciation, garage, rent and similar charges are noticed to cost Rs. 6 per hour operated. Fuel oil, tyres etc, are noticed to cost 60 paise per km run.

Draw up a statement showing the cost per tonne km. of carrying coal from each colliery. If the coal is of equal quality and price at both places, from which colliery should the purchases be made?

Question 13

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.

Driver's wages, depreciation, insurance and taxes are 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-kilometer of carrying mineral from each mine.

Question 14

Remix makes ready-mixed cement and operates a small fleet vehicles which delivers the product to customers within its delivery area.

Maintenance records for the previous five years reveal :

Year	Mileage of vehicles	Maintenance cost
1.	1,70,000	Rs. 13,500
2.	1,80,000	Rs. 14,000
3.	1,65,000	Rs. 13,250
4.	1,60,000	Rs. 13,000
5.	1,75,000	Rs. 13,750

Transport statistics reveal :

Vehicles	No. of Journeys each day	Average tonnages carried to customers (tonnes)	Average distance to customers (miles)
1	6	4	10
2	4	4	20
3	2	5	40
4	2	6	30
5	1	6	60

There are five vehicles operating a five-day week, for 50 weeks a year.

Inflation can be ignored.

Standard cost data includes :

Driver's wage are Rs. 150 each per week.

Supervisors/relief driver's wages are Rs. 200 week.

Depreciation, on a straight-line basis with no residue value.

	Cost	Life
Loading Equipment	Rs. 1,00,000	5 years
Vehicles	Rs. 30,000 each	5 years

Petrol/Oil cost 20 paise per mile.

Repair 7 1/2 paise per mile.

Vehicle licences cost Rs. 400 p.a. for each vehicle.

Insurance cost Rs. 600 p.a. for each vehicle.

Tyres cost Rs. 3,000 p.a. in total

Miscellaneous costs Rs. 2,250 p.a. in total

You are required to :

Calculate a standard rate per tonne/mile of operating the vehicles.

Question 15

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 travelled, 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/day tonnes
1	16	4	6
2	40	2	9
3	30	3	8

The analysis of maintenance cost and the total distance travelled during the last two years is as under :

Year	Total Distance travelled	Maintenance Cost Rs.
1	1,60,200	46,050
2	1,56,700	45,175

The following are the details of expenses for the year under review :

Diesel	:	Rs. 10 per litre. Each litre give 4 km. per litre of diesel on an average.
Drivers' salary	:	Rs. 2,000 per month
License and taxes	:	Rs. 5000 per annum per truck
Insuranse	:	Rs. 5,000 per annum for all three vehicles.
Purchase price per truck	:	Rs. 3,00,000. Life 10 years. Scrap Value at the end of life is Rs. 10,000.
Oil and sundries	:	Rs. 25 per 100 km. run.
General Overhead	:	Rs. 11,084 per annum.

The vehicles operate 24 days per month on an average.

Required :

(i) Prepare an Annual Cost Statement covering the fleet of three vehicles.

(ii) Calculate the cost per km. run.

(iii) Determine the freight rate per tonne km. to yield a profit of 10% on freight.

Question 16

A city municipality arranges for the removal of its garbage by means of a motor vehicle transport. The following vehicles are maintained :

No. of Vehicles	Specification
30	5 tonne lorries
40	3 tonne lorries
50	2 tonne lorries
20	4 tonne lorries

On an average, each lorry makes 5 trips per day and the each trip covers on average distance of 6 km. Each lorry carries garbage weighing only 50% of capacity. Taking an annual average, 10% of the lorries are laid up for repairs every day.

The following are the monthly expenses :-

Items of cost	Monthly expense Rs.
Salary of superintendent vehicles dept.	1,800
Salaries of 4 transport foreman	600 each
Wages of 200 drivers	100 each
Wages of 300 labourers	80 each
Consumable stores	20,000
Petrol	80,000
Replacement of tyres, tubes & accessories	6,000
Garage rent and rates (adjusted in the books of the municipality)	2,500
Gas and electricity charges	800
Miscellaneous	15,000
Lubricant	10,000

There is a repairs workshop attached to the Motor Vehicles Department which also carries out repairs for office cars and other vans and vehicles, 50% of the superintendent's salary is debited to the workshop and stipulated charges to be borne by the Transport Department for the services of the workshop are Rs. 15,000 a month.

Assuming that a month consists of 30 days, calculate the cost per tonne-km. for removal of garbage.

Question 17

A company is considering three alternative proposals for conveyance facilities for its sales personnel who have to do considerable travelling, approximately 20,000 kilometres every year. The proposals are as follows :

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

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

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

The following further details are available :

Petrol Rs. 0.60 per km.

Repairs and Maintenance Rs. 0.20 km.

Tyre Rs. 0.12 per km.

Insurance Rs. 1,200 per car per annum.

Life of the cars 5 years with annual mileage of 20,000 kms.

Resale value : Rs. 20,000 at the end of the fifth year.

Work out the relative costs of three proposals and rank them.

Question 18

Maharaja Hotel has three types of suites for its customers viz. single room, double room and three rooms respectively. State the rent to be charged for each type of suite on the basis of the following data :-

i) The number of suites of each types are :-

a)	Three-room suites	20
b)	Double room suites	30
c)	Single-room suites	100

ii) The occupancy of each type of suite is as follows :-

		Summer	Winter
a)	3 room suites	60%	20%
b)	2 room suites	80%	20%
c)	1 room suites	90%	50%

iii) The annual expenses are as follows :-

a) Staff salaries Rs. 2,20,000

b) Room attendant's wages when occupied :

		Summer	Winter
		Rs.	Rs.
(a)	3 room suites	4	6
(b)	2 room suites	3	4.50
(c)	1 room suites	2	3

c) **Lighting, heating and power for full month when occupied both for summer and winter.**

		Lighting	Power
(a)	3 room suites	80	40
(b)	2 room suites	60	30
(c)	1 room suites	40	20

	Rs.
d) Repairs and renovation	42,000
Linen etc.	45,000
Interior Decoration	50,000
Sundries	31,550

e) Depreciation :

Building @5% on Rs. 14,00,000
Furniture & fixture @ 10% on Rs. 1,00,000
Air conditioner @ 10% on Rs. 2,00,000

iv) Summer may be assumed for 7 months and winter to be 5 months in a year, A month may be taken as 30 days.
v) Profit including interest on investment @ 25% on cost.
vi) The rent of the double-room suites is to be fixed 1 1/2 times the single-room suites and that of 3 room suites as twice the single room suite.

Question 19

Public Health Centre runs an Intensive Medical care unit. For this purpose, it has hired a building at a rent of Rs. 5,000 per month with the understanding that it would bear the repairs and maintenance charges also.

The unit consists of 25 beds and 5 more beds can be comfortably accommodated when the occasion demands. The permanent staff attached to the unit are as follows :
2 supervisors each at salary of Rs. 500/- per month
4 nurses each at salary of Rs. 300/- per month
2 ward boys, each at salary of Rs. 150/- pre month.

Though the unit was open for the patients all the 365 days in a year. Scrutiny of accounts in 2016 revealed that only for 120 days in the year, the unit had the full capacity of 25 patients per day and for another 80 days, it had on an average 20 beds only occupied per day. But there were occasions when the beds were full, extra beds were hired at a charge of Rs. 5/- per bed per day and this did not come to more than 5 beds extra then the normal capacity on any one day. The total hire charged for extra beds incurred for the whole year amount to Rs. 2,000.

The unit engaged expert doctors from outside to attend on the patients and the fees were paid on the basis of the number of patients attended and time spent by them and on an average it worked out to Rs. 10,000 per month in 2016.

The other expenses for the year were as under :-

	Rs.
Repairs and maintenance	3,600
Food supplied to patients	44,000
Janitor and other services for them	12, 500
Laundry charges for their bed linen	28,000
Medicines supplied	35,000
Cost of oxygen, X-Ray etc. other than directly borne for treatment of patients	54,000
General administration charges allocated to the unit	49,550

i) If unit recovered an overall amount of Rs. 100/- per day on an average from each patient, what is the profit per patient per day made by the unit in 2016.

ii) The unit wants to work on a budget for 2017, but the number of patients requiring intensive medical is very uncertain factor. Assuming that same revenue and expenses will prevail in 2017, in the first instance, work out the number of patient days required by the unit to breakeven.

****

272

HOME-WORK

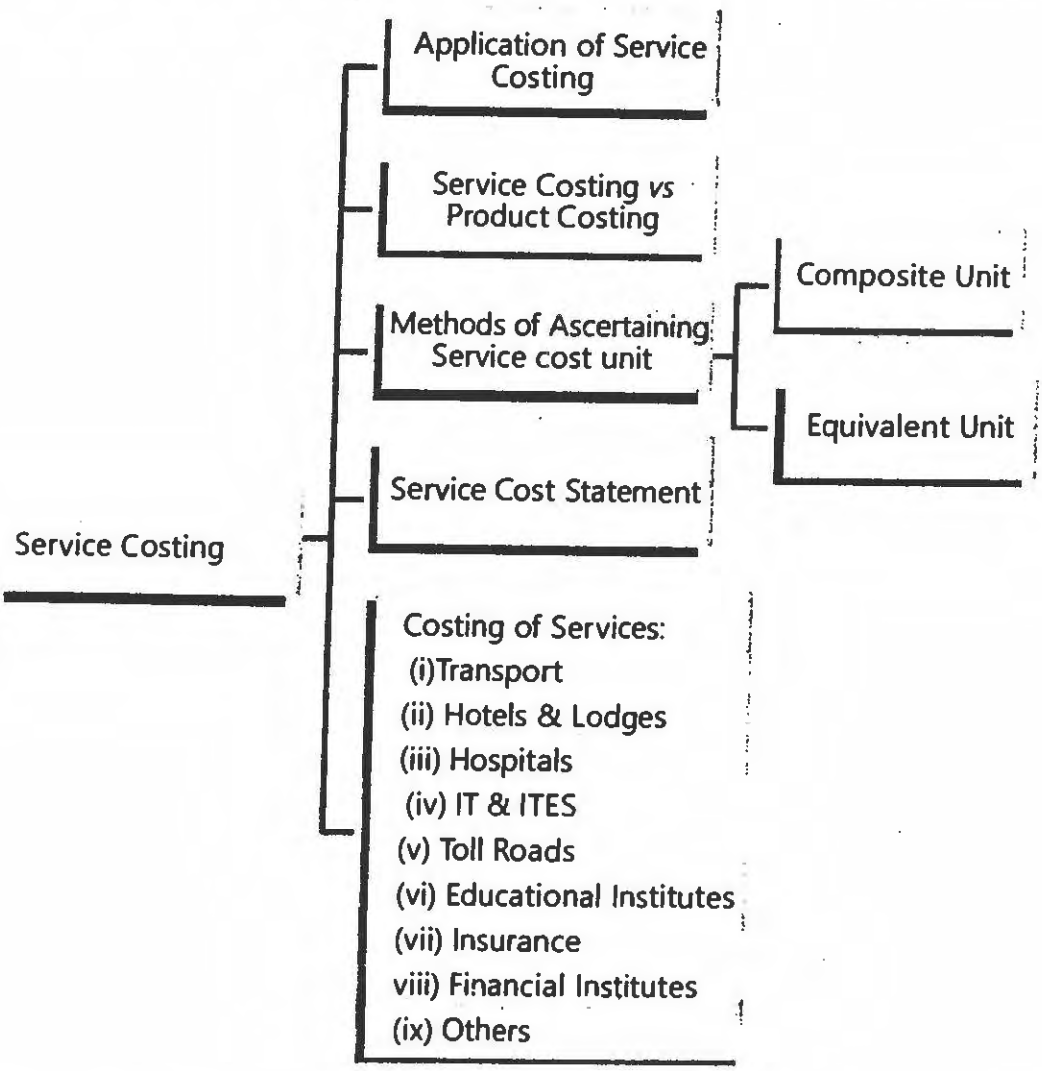
CHAPTER 12

SERVICE COSTING

LEARNING OUTCOMES

- ☐ Discuss the cost accounting method for service sectors.
- ☐ State the units used in different service sectors.
- ☐ Calculate the costs for different service industries.

CHAPTEROVERVIEW



HOME-WORK SERVICE COST-UNIT 273

DKC HOME-WORK. Page No. Date

IL-(1)/12.04 ON-20

STATEMENT SHOWING ABSOLUTE TONNE KMS

A TO B BTOC CTOA

(20 MT × 80 kms) + (12 × 120) + (16 × 160)

= (1600 + 1440 + 2560) = 5600 MT/KMS

STATEMENT SHOWING SIMPLE AVG. COMMERCIAL TONNE KMS

$$= \left(\frac{20MT + 12MT + 16MT}{3}\right) \times (80 + 120 + 160)$$

= 5760 MT/KMS

ILLUSTRATION 1 ON-20

A Lorry starts with a load of 20 MT of Goods from Station 'A'. It unloads 8 MT in Station 'B' and balance goods in Station 'C'. On return trip, it reaches Station 'A' with a load of 16 MT, loaded at Station 'C'. The distance between A to B, B to C and C to A are 80 Kms, 120 Kms and 160 Kms, respectively. Compute "Absolute MT-Kilometer" and "Commercial MT – Kilometer".

(MT = Metric Ton or Ton).

DKC

FOR EX-12.5 QNO 21

STATEMENT SHOWING NO OF EQV ROOM DAY / RENT

RENT PER DAY / PER ROOM STANDARD = X

STANDARD

100 X 360 DAYS X X = 36000X

DELUXE

50 X 360 X 2.5X = 45000X

LUX

30 X 360 X 5X = 54000X

135000

DKC

For Example : QNO 21

A hotel has three types of suites for its customers, viz., Standard, Deluxe and Luxurious

Following information is given:

Type of suite	Number of rooms	Room Tariff
Standard	100	--
Deluxe	50	2.5 times of the Standardsuits
Luxurious	30	Twice of the Deluxesuits

The rent of Deluxe suite is to be fixed at 2.5 times of the Standard suite and that of Luxurious suite as twice of the Deluxe suite.

COSTING OF TRANSPORT SERVICE

DKG

QNO 22

STEP NO(1). (ILL-2)/12.7

STATEMENT SHOWING TOTAL KMS / TOTAL PASS KMS FOR APRIL-20X7

KMS = (5 BUSES X 40 KMS X 30 DAYS X 2) = 12000

PASS KMS = (12000 X 40 SEATS X 75%) = 360000

STEP NO(2) STATEMENT SHOWING NORMAL OPERATING COST FOR APRIL-20X7

(1) SALARY OF DRIVER	24000
(2) SALARY OF SUP	10000
(3) DIESEL & OIL.	40000
(4) REP & MAINT	8000
(5) TAXATION & INS.	16000
(6) DEP.	26000
(7) INT.	20000
	144000
COST PER PASS/KM = (144000 ÷ 36000) =	.40

ILLUSTRATION 2 QNO-22

AXA Passenger Transport Company is running 5 buses between two towns, which are 40 kms apart. Seating capacity of each bus is 40 passengers. Following details are available from their books, for the month of April 20X7:

	Amount (₹)
Salary of Drivers, Cleaners and Conductors	24,000
Salary to Supervisor	10,000
Diesel and other Oil	40,000
Repairs and Maintenance	8,000
Taxation and Insurance	16,000
Depreciation	26,000
Interest	20,000
	1,44,000

Actual passengers carried were 75% of the seating capacity. All the four buses run on all days for the month. Each bus made one round trip per day. Calculate cost per passenger – Kilometer.

DKC

Page No. Date

QNo-23

(ILL-3 12'9)

IF TAKINGS = 100

COMMISSION = 10 (10% X 100)

PROFIT 15 (15% X 100)

25

COST 75

SOLN (1)

STATEMENT SHOWING TOTAL KMS/ TOTAL PASS KMS/ FOR THE YEAR

KMS = 1 BUS X 40 KMS X 3 ROUND TRIPS X 2 X 25 X 12

= 72000 KMS X 40 SEATS = 2880000

ILLUSTRATION 3 QNo-23

ABC Transport Company has given a route 40 kilometers long to run bus.

(a) The bus costs the company a sum of ₹10,00,000

(b) It has been insured at 3% p.a. and

(c) The annual tax will amount to ₹20,000

(d) Garage rent is ₹2,000 per month.

(e) Annual repairs will be ₹20,000

(f) The bus is likely to last for 5 years

(g) The driver's salary will be ₹3,000 per month and the conductor's salary will be ₹2,000 per month in addition to 10% of takings as commission [To be shared by the driver and conductor equally].

(h) Cost of stationery will be ₹1,000 per month.

(i) Manager-cum-accountant's salary is ₹7,000 per month.

(j) Petrol and oil will be ₹500 per 100 kilometers.

(k) The bus will make 3 up and down trips carrying on an average 40 passengers on each trip.

(l) The bus will run on an average 25 days in a month.

Assuming 15% profit on takings, calculate the bus fare to be charged from each passenger.

Page No.
Date

SOLN(2) STATEMENT SHOWING TOTAL TAKINGS FOR THE YEAR

		₹
(1)	INSURANCE COST (1000000 X 3%)	30000
(2)	TAX	20000
(3)	GARAGE RENT (2000X12)	24000
(4)	ANNUAL REPAIR	20000
(5)	DEP (1000000 / 5 YEARS)	200000
(6)	DRIVER SALARY (3000X12)	36000
(7)	COND SALARY (2000X12)	24000
(8)	COST OF STATIONERY (1000X12)	12000
(9)	MANAGER/CUM A/C SALARY (7000X12)	84000
(10)	PETROL & OIL ($\frac{500}{100 KMS}$ X 72000) =	360000
	TOTAL COST	810000
	COMMISSION (10% X 1080000) =	108000
	PROFIT (15% X 1080000) =	162000
	$\frac{(810000 \times 100)}{75}$	1080000

TAKING PER PASS PER KM = (1080000 ÷ 2880000) = .375

BUS FARE (40 KMS X .375) = 15

Page No.

CNO-5 24

ILLUSTRATION 4

SMC is a public school having five buses each plying in different directions for the transport of its school students. In view of a larger 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 home.

The distance travelled by each bus one way is 8 km. The school works 25 days in a month and remains closed for vacation in May, June and December. Bus fee, 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	*₹ 4,500 per month per driver*
Cleaner's salary	*₹ 3,500 per month*
(Salary payable for all 12 months)	
(one cleaner employed for all the five buses)	
Licence fee, taxes, etc.	*₹ 8,600 per bus per annum*
Insurance	*₹ 10,000 per bus per annum*
Repairs & maintenance	*₹ 35,000 per bus per annum*
Purchase price of the bus	*₹ 15,00,000 each*
Life of each bus	*12 years*
Scrap value of buses at the end of life	*₹ 3,00,000*
Diesel cost	*₹ 45.00 per litre*

Each bus gives an average mileage of 4 km. per litre 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 up to 4 km. of distance from the school are charged half fare and fifty per cent of the students travelling in each trip are in this category. Ignore interest. Since the charges are to be based on average cost you are required to:

(i) Prepare a statement showing the expenses of operating a single bus and the fleet of five buses for a year.

(ii) Work out the average cost per student per month in respect of –

(A) students coming from a distance of upto 4 km. from the school and

(B) students coming from a distance beyond 4 km. from the school.

Page No. | Date

DKC

ILL-4
12.10

QN 24

STATEMENT SHOWING NO OF KMS PER BUS PER YEAR

(8 TRIPS × 8 KMS × 25 Days × 9 MONTHS)

= 14400 KMS

NO OF STUDENTS
JUNIOR = 50
SENIOR = 50
100

4 KMS (50/×100) = 50 | 8 KMS (50/×100) = 50

FARE x | $\times 2x$

$= (50x + 100x) = 150$

$x = \left(\dfrac{31500}{150}\right)$ ANS NO i
$= 210$

ANS NO (ii) STATEMENT SHOWING BUS FARE/COST PER MONTH / PER STUDENT

	PER MONTH / PER STU.
4 KM →	210
8 KM →	420 (210×2)

Page No.
Date

SOLN (1)

STATEMENT SHOWING NORMAL OPERATION COST ~~[illegible]~~ SINGLE BUS / FIVE BUSES

	SINGLE BUS	FIVE BUSES
	Rs	Rs.
(1) DRIVER SALARY	54000 (4500 X 12)	270000 (54000 X 5)
(2) CLEANER SALARY	8400 (3500 X 12) / 5	42000 (8400 X 5)
(3) LIC / TAXES	8600	43000 (8600 X 5)
(4) INSURANCE	10000	50000 (10000 X 5)
(5) REP & MAINT	35000 ~~(1500000-300000)~~ / 5	175000
(6) DEP	100000 (1500000 - 300000) / 12	500000
(7) DIESEL-COST	162000 (1400 X 45 / 4)	810000
	378000	1890000
	÷ 12	÷ 12
MONTHLY	= 31500	= 157500

Page No.
Date

Q No-60 Q No-25

ILLUSTRATION 5

Global Transport Ltd. charges ₹ 90 per ton for its 6-ton truck lorry load from city 'A' to city 'B'. The charges for the return journey are ₹ 84 per ton. No concession or reduction in these rates is made for any delivery of goods at intermediate station 'C'.

In January 20X8, 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 was once caught by police and ₹ 1,200 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', but it returned without any load once only from 'C' station to 'A' station. The distance from city 'A' to city 'C' and city 'B' are 140 km. and 300 km. respectively.

Annual fixed costs and maintenance charges are ₹ 60,000 and ₹ 12,000 respectively. Runningcharges spent during January 20X8 are ₹ 2,944.

You are required to find out the cost per absolute ton-kilometre and the profit for January, 20X8.

DKC

(ILL-5)

12.13

Page No.

Date

QNo 25

SolNo(1)

STATEMENT SHOWING ABSOLUTE TONNE KMS FOR JAN 20X8

OUT-WARD JOURN

A TO B — A TO C — C TO B

(6 TONNES X 300 KMS X 10) + (6 TONNES X 140 X 2) + (4 TONNES X 160 X 2)

= (18000 + 1680 + 1280)

INWARD JOUR

B TO A — B TO A

(5 TIMES X 8 TONNES X 300) (6 TIMES X 6 TONNES X 300)

= 12000 + 10800

B TO C

(1 X 6 TONNES X 160)

= 960

TOTAL TONNE KMS (18000 + 1680 + 1280 + 12000 + 10800 + 960) = 44720

COST PER TONNE KMS = (TOTAL COST (Sol No-2) / TONNE/KMS)

.20 = (8944 / 44720)

Page No.
Date

SLOPNO (2) — QN10-25

STATEMENT SHOWING NORMAL OPERATING COST FOR JAN - 20X8

		Rs
FIXED COST	(60000 ÷ 12)	5000
MAINT COST	(12000 ÷ 12)	1000
RUNN CHAR		2944
		8944

SLOPNO (3)

STATEMENT SHOWING ANALYSIS OF PROFIT FOR JAN - 20X8

	Rs	
REVENUES		13368
OUT-WARD JOUR		
(12 X 6 TONNES X 90) =	6480	
INWARD JOUR		
(5 X 8 TONNES X 84) =	3360	
(7 X 6 TONNES X 84) =	3528	
	13368	
OPERATING EXP SLOPNO (2)		(8944)
		4424
PENALTY		(1200)
		3224

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Date

Q No 26

ILLUSTRATION 6

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 20X8 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.

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PKC

ILL-6

12.15

Omo-26

TAKINGS = 100

RENT (5% X 100) = 5

PROFIT (20% X 100) = 20

25

COST

75

SOLN (1)

STATEMENT SHOWING NO OF OCCUPIED ROOMDAYS / RENT

RENT FOR SINGLE ROOM / PER DAY = x

SINGLE ROOM

(100 Rooms X 360 days X 100%) = 36000 x

DOUBLE ROOM

(50 Rooms X 360 days X 80%) = 14400 X 2.5x

= 36000x

TRIPLE ROOM

(30 ROOMS X 360 days X 60%) = 6480 X 5x

= 32400

(36000x + 36000x + 32400x) = 104400

Page No. | Date

SEC NO (2)

STATEMENT SHOWING NORMAL OPERATING COST FOR THE YEAR / TAKING FOR THE YEAR

	Rs.
(1) STAFF SALARIES	1425000
(2) ROOM att wag.	450000
(3) Lighting Heating Power.	215000
(4) REP & RENO.	123500
(5) LAUNDRY CHARGES	80500
(6) INT - DEC.	74000
(7) SUNDRIES.	153000
(8) BUILDING RENT (10000 X 12)	120000
	~~2521000~~
	2641000
RENT (5% X 3521333.33)	176066.67
PROFIT (20% X 3521333.33)	704266.66
	3521333.33

TOTAL TAKING

$\left(\frac{2641000 \times 100}{75}\right)$ ~~(2521000 X 100 / 075)~~

RENT PER DAY PER ROOM - SINGLE ROOM

$x = (3521333.33 \div 104400) =$ 33.73

FINAL ANS RENT PER DAY PER ROOM

SINGLE ROOM →	33.73	=	33.73
DOUBLE ROOM →	33.73 X 2.5	=	84.325
THREE ROOM →	33.73 X 5	=	168.65

Q.No-9 Q.No-27

Page No.
Date

ILLUSTRATION 8

ABC Hospital runs a Critical Care Unit (CCU) in a hired building. CCU consists of 35 beds and 5 more beds can be added, if required.

Rent per manth - ₹ 75,000

Supervisors – 2 persons – ₹ 25,000 Per month – each

Nurses – 4 persons – ₹ 20,000 per month – each

Ward Boys – 4 persons – ₹ 5,000 per month – each

Doctors paid ₹2, 50,000 per month – paid on the basis of number of patients attended and the time spent by them

Other expenses for the year are as follows:

Repairs (Fixed) – ₹ 81,000

Food to Patients (Variable) – ₹ 8, 80,000

Other services to patients (Variable) – ₹ 3, 00,000

Laundry charges (Variable) – ₹ 6,00,000

Medicines (Variable) – ₹ 7,50,000

Other fixed expenses – ₹10, 80,000

Administration expenses allocated – ₹ 10,00,000

It was estimated that for 150 days in a year 35 beds are occupied and for 80 days only 25 beds are occupied.

The hospital hired 750 beds at a charge of ₹100 per bed per day, to accommodate the flow of patients. However, this does not exceed more than 5 extra beds over and above the normal capacity of 35 beds on any day.

You are required to –

(a) Calculate profit per Patient day, if the hospital recovers on an average ₹2,000 per day from each patient

(b) Find out Breakeven point for the hospital.

COSTING OF HOSPITAL

Page No.
Date

ILL-8 ON 27

SOLNO(1)

STATEMENT SHOWING CALCULATION OF PATIENT DAYS

	NOS
35 BEDS X 150 DAYS =	5250
25 BEDS X 80 DAYS =	2000
EXTRA BEDS	750
	8000

SOLNO(2)

STATEMENT SHOWING ANALYSIS OF PROFIT

NO OF BED DAYS	8000 (SOLNO(1))	
	TOTAL	PER PAT
(A) REVENUES	16000000	2000
(B) VARIABLE COST (SOLNO3)	(5605000)	(700.625)
(C) A-B=C = CONTRIBUTION	10395000	1299.375
(D) FIXED COST (SOLNO4)	4861000	607.625
PROFIT-LOSS	5534000	691.75

B.E.P = $\left(\frac{4861000}{1299.375}\right)$ = 3741.02

3742

Page No.
Date

SOLN NO(3) STATEMENT SHOWING V. COST

		Rs
(1)	DOCTOR fees (250000 X12)	3000000
(2)	FOOD TO PATIENTS	880000
(3)	OTHER SERVICES TO PAT.	350000
(4)	LAUNDRY CHARGES	500000
(5)	MEDICINES	750000
(6)	BED HIRE- CHARGES	75000
		5605000

SOLN NO(4) STATEMENT SHOWING FIXED COST

(1)	RENT (75000 X12)	=900000
(2)	SUPERVISOR (2X 25000 X 12)	=600000
(3)	NURSES (4 X 20000 X12)	=960000
(4)	WARD BOYS (4 X 5000X 12)	=240000
(5)	Repairs	=81000
(6)	OTHER FIXED COST	=1080000
(7)	ADMIN -EXP- ALLOCATED	=1000000
		4861000

Q No-10 Q No-28

Page No.
Date

ILLUSTRATION 9

Following are the data pertaining to Infotech Pvt. Ltd, for the year 20X6-X7

	Amount (₹)
Salary to Software Engineers (5 persons)	15,00,000
Salary to Project Leaders (2 persons)	9,00,000
Salary to Project Manager	6,00,000
Repairs & maintenance	3,00,000
Administration overheads	12,00,000

The company executes a Project XYZ, the details of the same as are as follows:

Project duration – 6 months

One Project Leader and three Software Engineers were involved for the entire duration of the project, whereas Project Manager spends 2 months' efforts, during the execution of the project.

Travel expenses incurred for the project – ₹1,87,500

Two Laptops were purchased at a cost of ₹ 50,000 each, for use in the project and the life of the same is estimated to be 2 years

Prepare Project cost sheet

COSTING OF IT-ITES

Page No.
Date

(ILL-9/12.23) QNO-28

COSTING FOR I.T & I.T.E.S

INFOTECH-PVT-LTD

STATEMENT SHOWING PROJECT COST-SHEET

20X6- 20X7

DURATION OF PROJECT -6MONTHS

		Rs
(1)	SALARY OF SOFT-WARE-ENGINEERS (3X*25000X6 MONTH)	450000
(2)	SALARY OF PROJECT LEADER. (3750 X6)	225000
(3)	SALARY OF PROJECT-MANAGER (50000 X2)	100000
	TOTAL SALARY	775000
	OVERHEADS (50% X775000) =	387500
	OVERHEADS RECT-RATE = (OVERHEADS/SALARY) = (1500000/3000000 X100) = 50%	
	TRAVEL EXP	187500
	DEP ON LAPTOP (50000X2) (100000/2years X [redacted]/5years)	25000
	TOTAL PROJECT COST	1375000

* SALARY OF SOFTWARE ENGINEERS/PERMONTH PER-ENGINEER

(1500000 ÷ 5)/12 = 25000

SALARY OF PROJECT LEADER/PERMONTH/PER P.L

(900000 ÷ 2)/12 = 37500

SALARY OF PROJECT MAN = 75000

Q.No-6 Q.No 29

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Date

ILLUSTRATION 10

BHG Toll Plaza Ltd built a 60 km. long highway and now operates a toll plaza to collect tolls from passing vehicles using the same. The company has invested ₹600 crore to build the road and has estimated that a total of 60 crore vehicles will be using the highway during the 10 years toll collection tenure. Toll Operating and Maintenance cost for the month of April 20X7 are as follows:

(i) Salary to –

- *Collection Personnel (3 Shifts and 4 persons per shift) -₹150 per day per person*
- *Supervisor (2 Shifts and 1 person per shift) -₹ 250 per day per person*
- *Security Personnel (3 Shifts and 2 persons per shift) -₹150 per day per person*
- *Toll Booth Manager (2 Shifts and 1 person per shift) -₹400 per day per person*

(ii) Electricity – ₹ 80,000

(iii) Telephone – ₹ 40,000

(iv) Maintenance cost – ₹ 30 Lacs

(v) The company needs 25% profit over total cost to cover interest and other costs.

Required:

(i) Calculate cost per kilometer.

(ii) Calculate the toll rate per vehicle (assume there is only one type of vehicle).

(ILL-10) COSTING OF TOLL ROADS

Page No.
Date

ON-29

SOLN(1) B.H.G. TOLL-PLAZA LTD

GIVEN → TOTAL KMS = 60

(ASSUME- ONLY ONE TYPE VEHICLE)

		B.
(A)	APPORTIONMENT OF CAPITAL COST $\left(\frac{6000}{10} \times \frac{1}{12}\right)$	50000000
(B)	OPERATING COST	
(I)	SALARY OF COLLECTION PERSONNEAL. (3SHIFTS X 4PERSON X 150perdays X 30days)	54000
(II)	SUPERVISOR SALARY (2SHIFTS X 1PERSON X 250 X 30days)	15000
(III)	SALARY OF SECURITY PERSONNEL. (3SHIFT X 2PERSONS X 150) X 30days.	27000
(IV)	TOLL BOOTH MANAGER (2SHIFTS X 1PERSON X 400 X 30days)	24000
(V)	ELECTRICITY	80000
(VI)	TELEPHONE	40000
(C)	MAINT-COST	3000000
		5324000

Page No.
Date

SLPNO(2)

STATEMENT SHOWING CALCULATION OF COST PER KM

$= \left(\frac{\text{TOTAL COST}}{\text{TOTAL KMS}}\right)$

$= \left(\frac{53240000}{60\text{KMS}}\right) = 887333.333$

SLPNO(3)

STATEMENT SHOWING TOLL RATE PER VEHICLE

	₹
TOTAL COST	53240000
PROFIT 25%	13310000
	66550000

$\left(\frac{66550000}{*5000000}\right) = 13.31$

* NO OF VEHICLES USING HIGHWAY PERMONTH

$\frac{\text{TOTAL ESTIMATED VEHICLES}}{10\text{years}} \times \frac{1\text{MONTH}}{12\text{MONTHS}}$

$\left(\frac{6000}{10\text{year}} \times \frac{1\text{month}}{12\text{months}}\right) = 5000000$

COSTING FOR FINANCIAL INSTITUTIONS

Page No.
Date

ILL-11

STATEMENT SHOWING COST-SHEET

		₹
(1)	DIRECT LABOUR COST	80000
(2)	OVER HEAD COST (25% × 12000)	3000
		83000

COST PER APPLICATION = $\frac{83000}{100}$ = 830

QNo-@ 30

ILLUSTRATION 11

The loan department of a bank performs several functions in addition to home loan application processing task. It is estimated that 25% of the overhead costs of loan department are applicable to the processing of home-loan application. The following information is given concerning the processing of a loan application:

Direct professional labor:

	(₹)
Loan processor monthly salary:	*80,000*
(4 employees @ ₹ 20,000 each)	
Loan department overhead costs (monthly)	
Chief loan officer's salary	*5,000*
Telephone expenses	*750*
Depreciation Building	*2,800*
Legal advice	*2,400*
Advertising	*400*
Miscellaneous	*650*
Total overhead costs	*12,000*

You are required to compute the cost of processing home loan application on the assumption that one hundred home loan applications are processed each month.

Page No.
Date

COSTING FOR POWER HOUSE

(ILL-12) CHAMBAL THERMAL POWER STATION

STATEMENT SHOWING COST SHEET

TOTAL UNITS GENERATED 1000000

	TOTAL COST Rs	PER KWH Rs
FIXED COST		
(1) PLANT SUPERVISION	300000	·30
(2) ADMIN OVERHEADS	2000000	2·00
(3) DEP (20000000 X 5%)	1000000	1·00
OPERATING LABOUR	1500000	1·50
(4) LUBRICANT SPARE PARTS	400000	·40
(5) REPAIRS & MAINT	500000	·50
(6) COAL- COST	8500000	8·50
TOTAL COST	6550000	6·55

ILLUSTRATION 12 QNO-16 31

From the following data pertaining to the year 20X7-X8 prepare a cost statement showing the cost of electricity generated per kWh by Chambal Thermal Power Station.

Total units generated 10,00,000 kWh

	Amount (₹)
Operating labour	15,00,000
Repairs & maintenance	5,00,000
Lubricants, spares and stores	4,00,000
Plant supervision	3,00,000
Administration overheads	20,00,000

5 kWh. of electricity generated per kg of coal consumed @ ₹4.25 per kg. Depreciation charges @ 5% on capital cost of ₹ 2,00,00,000.

Page No. | Date

Q No- 32

Practical Questions

1. Mr. X owns a bus which runs according to the following schedule:

(i) Delhi to Chandigarh and back, the same day.

Distance covered:	250 km. one way.
Number of days run each month :	8
Seating capacity occupied	90%.

(ii) Delhi to Agra and back, the same day.

Distance covered:	210 km. 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 km. one way
Number of days run each month :	6
Seating capacity occupied	100%

(iv) Following are the other details:

Cost of the bus	₹ 12,00,000
Salary of the Driver	₹ 24,000 p.m.
Salary of the Conductor	₹ 21,000 p.m.
Salary of the part-time Accountant	₹ 5,000 p.m.
Insurance of the bus	₹ 4,800 p.a.
Diesel consumption 4 km. per litre at	₹ 56 per litre
Road tax	₹ 15,915 p.a.
Lubricant oil	₹ 10 per 100 km.
Permit fee	₹ 315 p.m.
Repairs and maintenance	₹ 1,000 p.m.
Depreciation of the bus	@ 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 be indicated per passenger for the journeys:

(i) Delhi to Chandigarh (ii) Delhi to Agra and (iii) Delhi to Jaipur.

TEST- YOUR- KNOWLEDGE

Page No.
Date

Q NO - 37

PRACTICAL QN (1)

TOTAL TAKINGS = 100

PASSENGERS TAX = 20
PROFIT = 30
50

COST
50

SOLN NO (1)

STATEMENT SHOWING TOTAL KMS / TOTAL PASSENGER KMS.

(I) DELHI TO CHANDIGARH

KMS (250 X 2 X 8) = 4000
PASSKMS (4000 X 50 X 90%) = 180000

(II) DELHI TO AGRA

KMS (210 KMS X 2 X 10) = 4200
PASSKMS (4200 X 50 X 85%) = 178500

(III) DELHI TO JAIPUR

KMS (270 KMS X 2 X 6) = 3240

PASSKMS (3240 X 50 X 100%) 162000

TOTAL KMS = (4000 + 4250 + 3240) = 11440
TOTAL PASSKMS = (180000 + 178500 + 162000)
= 520500

Page No.
Day TOTAL

STEP NO(2) STATEMENT SHOWING TOTAL TAKINGS PER MONTH PER BUS

			Rs
(1)	DEP $\left(1200000 \times \frac{20}{100} \times \frac{1}{12}\right)$	=	20000
(2)	SACARY OF DRIVER	=	24000
(3)	SACARY OF CONDUCTOR	=	21000
(4)	SACARY OF PART-TIME ACC	=	5000
(5)	INSURANCE BUS (4800 ÷ 12)	=	400
(6)	DIESEL COST $\left(\frac{11440 \times 56}{4 \text{ KMS}}\right)$	=	160160
(7)	ROAD TAX (15915 ÷ 12)		1326.25
(8)	LUBRICANTS OIL $\left(11440 \times \frac{10}{100}\right)$	=	1144
(9)	PERMIT - Fees.		315
(10)	REP & MAINT		1000
			234345.25
	PASSTAX (20 % 468690.50)	=	93738.10
	PROFIT (30% X 468690.50)	=	140607.15
			468690.5
	TOTAL TAKINGS	=	

$\left(\frac{234345.25 \times 100}{50}\right)$

Page No.
Date

SOLN NO (3)

COST PER PASS/PER KM = $\left(\frac{468690.50}{520500}\right)$

= .90

STATEMENT SHOWING BUS FARE PER PASSENGER

DELHI TO CHAND. 250 KM X .90 = 225

DELHI TO AGRA. 70 X .90 = 189

DELHI JAIPUR = 243

DKC

Page No.
Date

ONO-15 ONO 33

2. A company is considering three alternative proposals for conveyance facilities for its sales personnel who has to do considerable traveling, approximately 20,000 kilometres every year. The proposals are as follows:

(i) Purchase and maintain its own fleet of cars. The average cost of a car is ₹ 6,00,000.

(ii) Allow the Executive use his own car and reimburse expenses at the rate of ₹ 10 per kilometer and also bear insurance costs.

(iii) Hire cars from an agency at ₹ 1,80,000 per year per car. The company will have to bear costs of petrol, taxes and tyres.

The following further details are available:

Petrol ₹6 per km.	Repairs and maintenance ₹0.20 per km.
Tyre ₹0.12 per km.	Insurance ₹ 1,200 per car per annum
Taxes ₹ 800 per car per annum	Life of the car: 5 years with annual mileage of 20,000 km.

Resale value ₹ 30,000 at the end of the fifth year.

Work out the relative costs of three proposals and rank them.

Page No. Date

PRACTICAL - QNO-2

STATEMENT SHOWING ANALYSIS OF PROPOSAL

	PURCHASE AND MAINTAIN OWN-CAR	RENT-EXP	HIRE THE-CAR AGENCY
KMS	20000	20000	20000
(1) DEP	= 104000 (600000-80000 / 5)	= 200,000 (20000KMX10)	180,000
(2) PETROL	= 120000 (20000X6)	-	120000
(3) TYRES	2400 (20000X12)	-	2400
(4) TAXES	800	-	800
(5) Repairs	4000 (20000X12)	-	-
(6) INSURANCE	1200	1200	-
TOTAL COST	232400	201200	303200
KMS	÷20000	÷ 20000	÷ 20000
COST PER KM	11.62	10.06	15.16
RANK	II	I	III

PRACTICAL QN - 3 SAME- ILL-NO- 12

CHAPTER – 10

JOINT PRODUCT & BY PRODUCTS

Question 1

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 2016, the following are the summarised cost data:-

	Joint Expenses	Separate Expenses	
		BOMEX	BRUCIL
	Rs.	Rs.	Rs.
Materials	1,00,000	6,000	4,000
Labour	50,000	20,000	18,000
Overheads	30,000	10,000	6,000
Selling Price per unit		98	34
Estimated profit per unit on sale of BRUCIL			4
		Units	Units
No. of units produced		2,000	2,000

The factory uses reverse cost method of accounting for by-products whereby the sales value of by-products after deduction of 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 allocate to BOMEX.

(ii) The product-wise and overall profitability of the factory for April 2016.

Question 2

XY Ltd. manufactures three products- A, B and C. The actual joint expenses of manufacture for a period were 8,000. It was estimated that the profit on each product as a percentage of sales would be 30%, 25% and 15% respectively. Subsequent expenses were as follows :

	A	B	C
Material	100	75	25
Direct Wages	200	125	50
Overheads	150	125	75
	450	325	150
Sales were	6,000	4,000	2,400

Prepare statement showing the apportionment of re-joint expenses of manufacture over different products.

Question 3

In the course of manufacture of the main product 'P' by-products 'A' and 'B' also emerge. The joint expenses of manufacture amount to Rs. 1,19,550. All the three products are processed further after separation and sold as per details given below :

	Main product 'P'	By-products 'A'	'B'
Sales	Rs. 90,000	60,000	40,000
Costs incurred after Separation	Rs. 6,000	5,000	4,000
Profit as percentage on sales	25	20	15

Total fixed selling expenses are 10% of total cost of sales which apportioned to the three products in the ratio of 20:40:40.

(i) Prepare a statement showing the apportion of joints cost to the main-products and the two by-products.

(ii) If the by-product 'A' is not subjected to further processing and is sold at the points of separation, for which there is a market at Rs. 58,500 without incurring any selling expenses, would you advise its disposal at this stage ?

Show the workings.

Question 4

Pre-separation costs :

Material	Rs. 10,000
Wages	Rs. 5,000
Production O.H.	Rs. 5,000
Production :	
Product X	1000 units
Y	6000 units
Z	4000 units

Apportion the joint costs to the products if the value assigned for X, Y and Z are Rs. 8, Rs. 5 and Rs. 3 per unit respectively.

Question 5

A company's plant processes 1,50,000 kgs of raw material in a month to produce two products viz., 'P' and 'Q'. The cost of raw material is Rs. 12 per kg. The process costs per month are :

	Rs.
Direct Materials	90,000
Direct Wages	1,20,000
Variable Overheads	1,00,000
Fixed Overheads	1,00,000

The loss in process is 5% of input and the output ration 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. 1,85,000 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 ?

Question 6

The Sunshine Oil Company purchases crude vegetable oil. It does refining of the same. The refining process results in four products at the split off point: M.N.Q 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, 2016), the output at split off point was :

Product M	3,00,000	gallons
Product N	1,00,000	gallons
Product O	50,000	gallons
Product P	50,000	gallons

The joint cost of purchasing the crude vegetable oil and processing it were Rs. 40,00,000.

Sunshine had no beginning or ending inventories. Sales of Product O in October were Rs.20,00,000. Total output of products M, N and P was further refined and then sold. Data related to October, 2016 are as follows:

	Further Processing Cost to Make Super Products	Sales
Super M'	Rs. 80,00,000	Rs. 1,20,00,000
Super N'	Rs. 32,00,000	Rs. 40,00,000
Super P'	Rs. 36,00,000	Rs. 48,00,000

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, 2016 production :

Product M	Rs. 20,00,000
Product N	Rs. 12,00,000
Product P	Rs. 28,00,000

You are required to answer:

(i) How the joint cost of Rs. 40,00,000 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, 2016 operating profits by making different decisions about the further refining of product M, N or P? Show the effect of any change you recommend on operating profits.

Question 7

X Ltd. is in the Food Processing industry. In one of its processes, three joint products are manufactured. Traditionally, the company has appointed costs incurred up to the Joint product's separation point on the basis of weight of output of the product.

You have been recently appointed Cost Accountant, and have been investigating process cost and accounting procedure.

You are required to prepare statements for management to show :

(a) The profit or loss of each product as ascertained using weight basis of apportioning pre-separation point cost.

(b) The optimal contribution which could be obtained from the manufacturing of these products.

The following process data for December are given costs incurred up to separation point Rs. 96,000.

	Product A	Product B	Product C
Cost incurred after separation point	20,000	12,000	8,000
Selling price per ton :			
Completed product	500	800	600
Estimated, if sold at separation point	250	700	450
Output	100 Tons	60 Tons	80 Tons

The cost of any unused capacity after the separation point should be ignored.

Question 8

You are the management accountant of a company operating a simple chemical process producing from a single raw material four different products – A,B,C and D. Your production director is considering proposals to discontinue certain work at present done on these products and has therefore asked you to prepare a report giving :

(a) A statement of the profit made or loss incurred on each of the four products A,B,C and D, under present conditions :

(b) As assessment of the change in the profit or loss give in answer to (a) above, if the proposals being considered were adopted :

(c) Any recommendations you consider you should put forward arising out of the assessment.

Your report should be based on the information given below :

The cost of the raw material for the year just ended was Rs. 33,500 and the initial processing costs amounted to a further Rs. 64,100. All the four products A,B,C and D are produced simultaneously at a single split-off point. Product C is sold immediately without further processing.

The other three products are subject to further processing before being sold.

It is the company's policy to apportion the costs prior to split off point on a suitable sales value basis.

The output, sales and additional processing costs for the past year were as follows :-

Product	Output in units	Sales	Addition Processing costs
A	4,00,000	96,000	20,000
B	89,725	29,000	16,000
C	5,000	4,000	--
D	9,000	30,000	1,000

The proposals being considered by the production directors are to sell to other processors the products immediately after the split-off point without any of the present additional processing being done. The additional processing costs of products A,B and D would then either no longer be incurred or be charged to an alternative profitable use. The prices per unit to be obtained from the other processors would be :

A	0.16
B	0.20
C	0.80
D	2.50

Question 9

The yield of a certain process in 80% as to the main product 15% as to the by – product and 5% as to the process loss.

The material put in process (5,000 Units) cost is 23.75 per unit and all other charges are Rs. 14,250 of which power cost accounted for 33 1/3%. It is ascertained that power is chargeable as to the main product and by-product in the ratio of 10:9.

Draw up a statement showing the cost of the by-product.

Question 10

During a month 1,010 units were put into process to produce simultaneously three products-A, B and C. When the joint products were physically distinguishable, it was found that 1,000 units were actually produced consisting of : A 500 units, B 300 units and C 200 units. The process loss of 10 units are estimated to have no market value. Other particulars are :

Cost up to the point of separation :

Direct Materials	Rs. 10,000
Direct Labour	Rs. 6,000
Variable overheads	Rs. 4,000

Post-separation-point costs (Variable)

	Per unit (Rs.)
A	6.00
B	4.00
C	1.50

Selling price :

A	36.00
B	30.00
C	23.50

Fixed costs (total) Rs. 1,800.

Find out the value of joint product and profits made by them.

Question 11

In a chemical manufacturing company, three products A, 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 products. The cost data for a month are as under :

	Rs.
Cost of raw materials introduced in department P	12,68,800
Direct Wages department	
P	3,84,000
Q	96,000
R	64,000
S	36,000

Factory overheads of Rs. 4,64,000 are to be apportioned to the departments on direct wages basis.

During the month under reference, the company sold all three products after processing them further as under :

Products	A	B	C
Output sold kg.	44,000	40,000	20,000
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 :

(i) Prepare a statement showing the apportionment of joint costs to joint products.

(ii) Present a statement showing product-wise and total profit for the month under reference as per the company's current processing policy.

(iii) What processing decision should have been taken to improve the profitability of the company.

(iv) Calculate the product-wise and total profit arising from your recommendation in (iii) above.

Question 12

Application of closing stock in joint product & by-product. A company processes a raw material in its Department 1 to produce three products, viz. A, B and X at the same split-off stage. During a period 1,80,000 kgs of raw materials were processed in department I at a total cost of Rs. 12,88,000 and the resultant output of A, B and X were 18,000 kgs, 10,000 kgs and 54,000 kgs respectively.

A and B were further processed in Department 2 at a cost of Rs. 1,80,000 and Rs. 1,50,000 respectively. X was further processed in Department 3 at a cost of Rs. 1,08,000. There is no waste in further processing. The details of sales effected during the period were as under :

	A	B	X
Quantity Sold (kgs.)	17,000	5,000	44,000
Sales Value	12,24,000	2,50,000	7,92,000

There were no opening stocks. If these products were sold at split-off stage, the selling prices of A, B and X would have been Rs. 50, Rs. 40 and Rs. 10 per kg respectively.

Required :

(i) Prepare a statement showing the apportionment of joint costs to A, B and X.

(ii) Present a statement showing the cost per kg of each product indicating joint cost, further processing cost and total cost separately.

(iii) Prepare a statement showing the product-wise and total profit for the period.

(iv) State with supporting calculations as to whether any or all the products should be further processed or not.

Question 13

Inorganic Chemicals purchases salt and processes it into more-refined products such as caustic soda, chlorine and PVC (Polyvinyl chloride). During the month of April, 2016, Inorganic Chemicals purchased salt for Rs. 10,00,000. Conversion cost of Rs. 15,00,000 were incurred upto the split-off point, at which time two saleable products were produced: Caustic Soda and Chlorine. Chlorine can be further processed into PVC. The April production and sales information are as follows:

	Production	Sales	Sales Price per Ton
Caustic Soda	1,200 tons	1,200 tons	Rs. 1,250
Chlorine	800 tons		
PVC	500 tons	500 tons	Rs. 5,000

All 800 tons of chlorine were further processed, at an incremental cost of Rs. 5,00,000 to yield 500 tons of PVC. There were no by-products or scrap from this further processing of chlorine. There were no beginning or ending inventories of caustic soda, chlorine or PVC in April.

There is an active market for chlorine. Inorganic Chemicals could have sold all its April production of chlorine at Rs. 1,875 a ton.

Required:

(i) Calculate, how the joint costs of Rs. 25,00,000 would be allocated between Caustic soda and Chlorine under each of the following methods:
   (1) sales value at split off;
   (2) physical measure (tons); and
   (3) estimated net realizable value.

(ii) What is the gross margin percentage of Caustic soda and PVC under the three methods cited in requirement (i)

(iii) Lifetime Swimming Pool Products offer to purchase 800 tons of Chlorine in May, 2016 at Rs. 1,875 a ton. This sale would mean that no PVC would be produced in May. How would accepting the offer affect May Operating Income ?

Question 14

Pokemon Chocolates manufactures and distributes chocolate products. It purchase 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 chocolates –powder liquor base and 30 gallons of milk-chocolate liquor base.

The chocolate powder liquor base is further processed into chocolate powder. Every 20 gallons of chocolate-powder liquor base yields 200 pounds of chocolate powder. The milk-chocolate liquor base is further processed into milk-chocolate. Every 30 gallons of milk-chocolate liquor base yields 340 pounds of milk chocolates.

Production and sales date for October, 2016 are :

- Cocoa beans processed 7,500 pounds
- Cost of processing Cocoa beans to split off point (including purchase of beans) = Rs. 7,12,500

	Production	Sales	Selling Price
Chocolate powder	3,000 pounds	3,000 pounds	Rs. 190 per pound
Milk Chocolate	5,100 pounds	5,100 pounds	Rs. 237.50 per pound

The October, 2016 separable costs of processing chocolate-powder liquor into chocolate powder are Rs. 3,02,812.50. The October, 2016 separable costs of processing milk chocolate liquor base into milk-chocolate are Rs. 6,23,437.50.

Pokemon fully processes both its intermediate products into chocolate powder or milk-chocolate. There is an active market for these intermediate products. In October, 2016, Pokemon could have sold the chocolate powder liquor base for Rs. 997.50 a gallon and the milk-chocolates liquor base for Rs. 1,235 a gallon.

Required:

i. Calculate how the joint cost of Rs. 7,12,500 would be allocated between the chocolate powder and milk-chocolate liquor bases under the following methods:
   a) Sales value at split off point
   b) Physical measure (gallons)
   c) Estimated net realisable value, (NRV) and
   d) Constant gross-margin percentage NRV.

ii. What is the gross-margin percentage of the chocolate powder and milk-chocolate liquor bases under each of the methods in requirement (i)

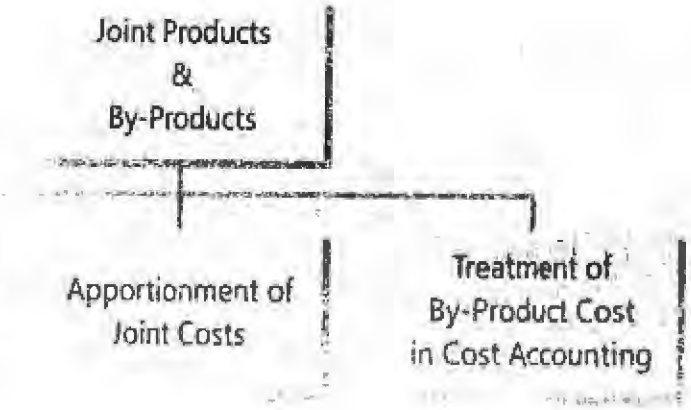
iii. Could Pokemon have increased its operating income by a change in its decision to fully process both of its intermediate products? Show your computations.

******

CHAPTER 11

LEARNING OUTCOMES

- Discuss the meaning of Joint products and By- products.
- Differentiate between joint products and by- products.
- Discuss the various methods of apportionment of joint costs to joint products and to by- products.
- State the treatment of by-product's cost in cost accounting.



Q No-15

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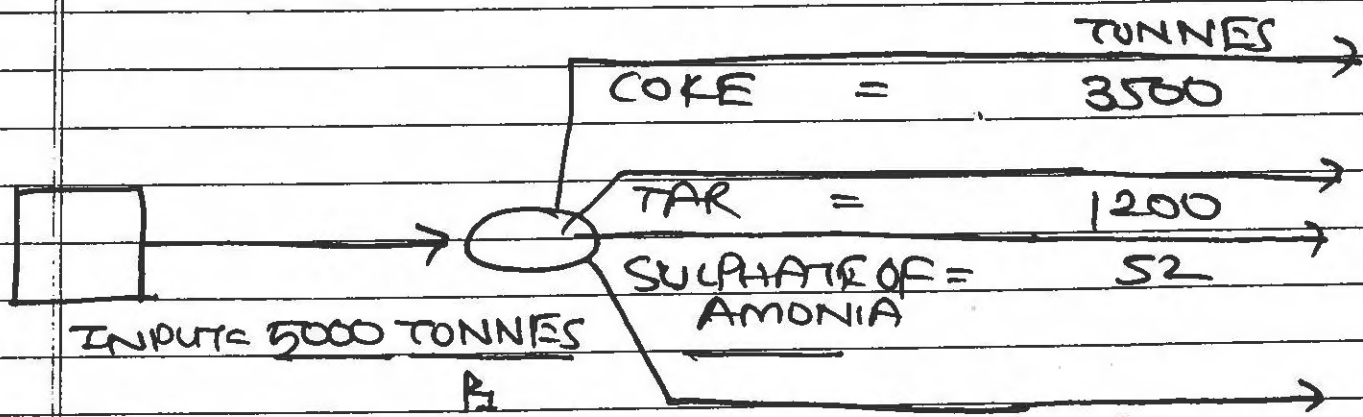
Date

ILLUSTRATION 1

A coke manufacturing company produces the following products by using 5,000 tons of coal @ ₹1,100 per ton into a common process.

Coke	*3,500 tons*
Tar	*1,200 tons*
Sulphate of ammonia	*52 tons*
Benzol	*48 tons*

Apportion the joint cost amongst the products on the basis of the physical unit method.



4800
NLW 200
INPUT 5000

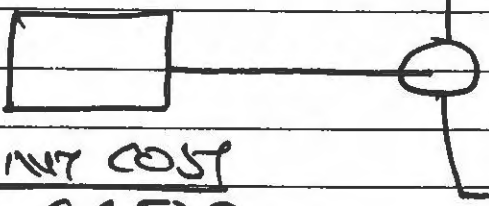
STATEMENT SHOWING ALLOCATION OF JOINT COST

	COKE	TAR	S.A.	BEN	TOTAL
OUTPUT	3500	1200	52	48	4800
LOSS	146	50	2	2	200
	3646	1250	54	50	5000
JOINT COST 5500000	401046	137493	5939	5520	

UNO – 16

Example: An entity incurs a joint cost of ₹ 64,500 in producing two products A (200 units), B (200 units) and earns a sales revenue of ₹ 86,000 by selling @ ₹ 170 per unit of product A and product B @ ₹ 260 per unit. Further processing costs for products A and B are ₹ 4,000 and ₹ 32,000 respectively the joint cost can be apportioned to products A and B as follows:

11.5



	Sale.
A	
200 UNITS X 170 =	34000
Sep cost	4000
B	
200 UNITS X 260 =	52000
Sep cost	32000

STATEMENT SHOWING ALLOCATION OF JOINT COST

	A	B
EST N.R.V.		
SALES A(P2)	34000	52000
PL –	—	—
SELLING ex	—	—
Sep Exp	(4000	(32000)
EST N.R.V	30000 :	20000
JOINT COST 64500	38700	25800

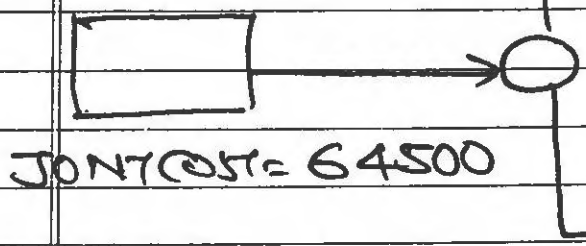
30000 : 20000

ENO-17

Example: An entity incurs a joint cost of ₹ 64,500 in producing two products A (200 units), B (200 units) and earns a saies revenue of ₹ 86,000 by selling @ ₹ 170 per unit of product A and product B @ ₹ 260 per unit.

EX-11.6

	UNITS	S.P	SALES
A	200	X 170 =	34000
B	200	X 260 =	52000
			86000



$$(\%) = \left(\frac{\text{TOTAL JOINT COST}}{\text{TOTAL SALES}}\right) \times 100$$

$$= \left(\frac{64500}{86000}\right) \times 100$$

$$= 75\%$$

STATEMENT SHOWING ALLOCATION OF JOINT COST

A	(34000 X 75%) =	25500
B	(52000 X 75%) =	39000

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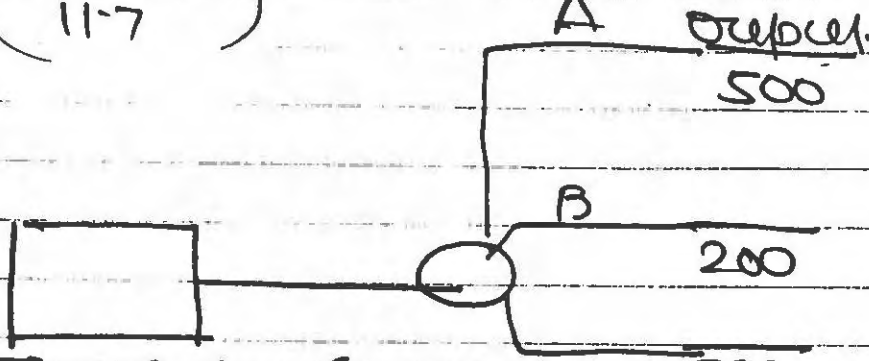
QNO-18

(ILC-2 11-7)



A Output.	500
B	200
C	300
	1000

Avg - UNIT COST = $\left(\frac{60000}{1000}\right)$ = 60.00

STATEMENT SHOWING ALLOCATION OF JOINT COST

	A	B	C
OUTPUT	500 :	200 :	300
	× 60	× 60	× 60
JOINT COST →	30000	12000	18000
	(QNO-18)		

ILLUSTRATION 2

Find out the cost of joint products A, B and C using average unit cost method from the following data:

(a) Pre-separation Joint Cost ₹ 60,000

(b) Production data:

Products	*Units produced*
A	*500*
B	*200*
C	*300*
	1,000

Q No 19

following data :

Sales

A : 100 kg @ ₹ 60 per kg.

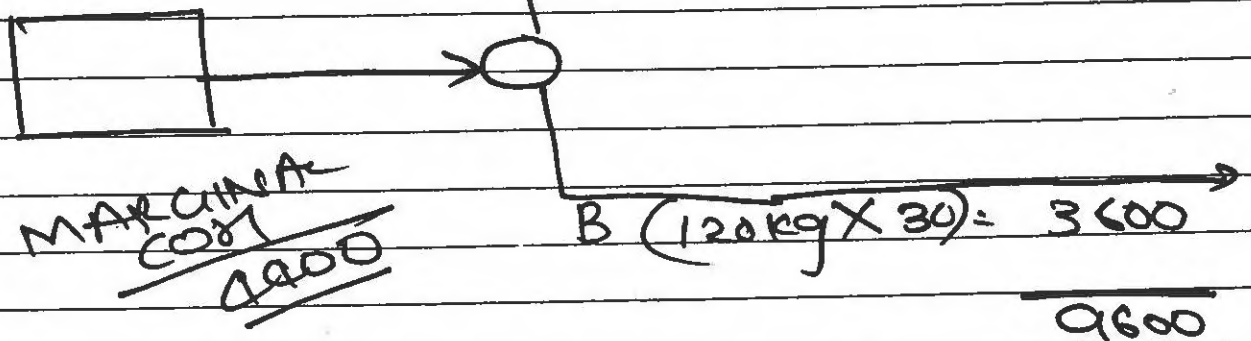
B : 120 kg @ ₹ 30 per kg.

Joint costs

Marginal cost ₹ 4,400

Fixed cost ₹ 3,900

(11.8)



MARGINAL COST 4400

9600

Sale = 9600

M cost (4400)

5600

STATEMENT SHOWING ALLOCATION OF JOINT COST

		A	B
MARGINAL cost	4400	100kg = 2000	120kg = 2400
SALES	9600	6000	3600
M-COST	(4400)	(2000)	(2400)
CONT	5200	4000	1200
FCOST	3900	3000	900

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Joint Prod & by Prod.
ONO-20

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Date

Practical Question

1. Sun-moon Ltd. produces and sells the following products:

Products	Units	Selling price at split-off point (₹)	Selling price after further processing (₹)
A	2,00,000	17	25
B	30,000	13	17
C	25,000	8	12
D	20,000	10	-
E	75,000	14	20

Raw material costs ₹35,90,000 and other manufacturing expenses cost ₹ 5,47,000 in the manufacturing process which are absorbed on the products on the basis of their 'Net realisable value'. The further processing costs of A, B, C and E are ₹12,50,000; ₹1,50,000; ₹ 50,000 and ₹ 1,50,000 respectively. Fixed costs are ₹4,73,000.

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 maximise its profits? If yes, then submit a statement showing income forecast arising out of adoption of that plan.

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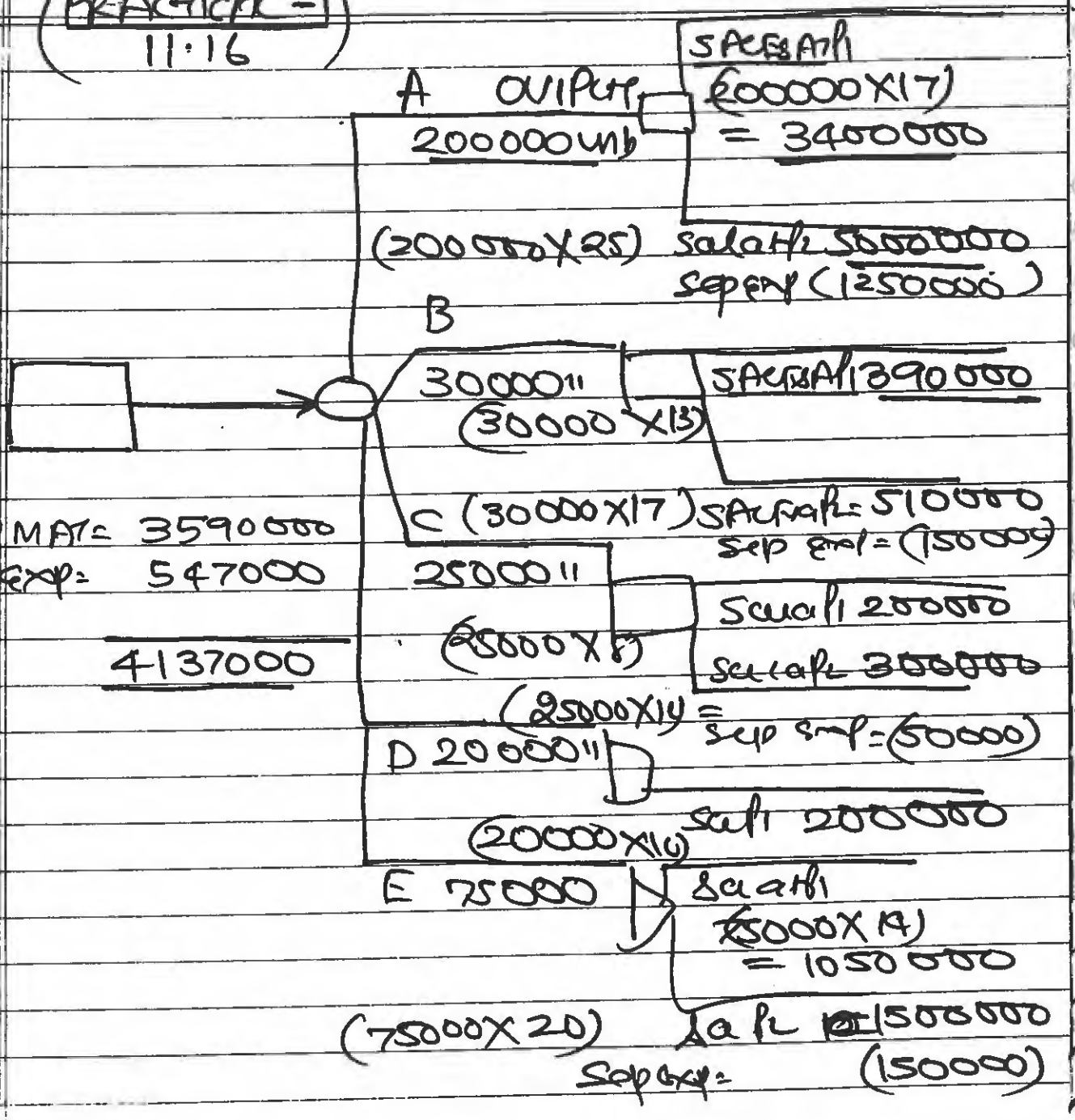
Date

(PRACTICAL - 1)
11.16



NOTE NO(1)

STATEMENT SHOWING ALLOCATION OF JOINT COST

	A	B	C	D	E
SALES AM (P2)	5000000	510000	300000	200000	1500000
Sep Exp	(1250000)	(150000)	(30000)	(-)	(150000)
	3750000	360000	250000	200000	1350000
JCOST	2625000	252000	175000	140000	945000

4137000

Page No. | Date

ANSNO(C)

STATEMENT SHOWING ANALYSIS OF P&L a/c

PARTICULARS	A	B	C	D	E	TOTAL
Sales at	P1	P1	P1	P1	P1	
Sales	3400000	390000	200000	200000	1050000	5,240,000
JOINT COST (NOTIONAL)	(2625000)	(252000)	(175000)	(140000)	(945000)	(4137000)
	775000	138000	25000	60000	105000	1103000
FIXED						(473000)
						630,000

STATEMENT SHOWING ANALYSIS OF PE
(AFTER FURTHER PROCESS.)

	A	B	C	D	E	
	P2	P2	P2	P1	P2	TOTAL
SALES	50,00,000	510000	300000	200000	1500000	7510000
J. COST	(2625000)	(252000)	(175000)	(140000)	(945000)	(4137000)
Expen	(1250000)	(150000)	(50000)	—	(150000)	(1600000)
CONT	1125000	108000	75000	60000	405000	1773000
F.COST						(473000)
						1300000

STATEMENT SHOWING ANALYSIS FOR FURTHER PROCESS

	A	B	C	E
SALES (P2)	5000000	510000	3000000	1500000
SALES (P1)	(3400000)	(390000)	(200000)	(1050000)
INC-SALES	1600000	120000	100000	450000
Expen	(1250000)	(150000)	(50000)	(150000)
INCR	350000	(30000)	50000	300000
	P2	P1	P2	P2

Page No.
Date

STATEMENT SHOWING ANALYSIS OF MAX PT.

Product	A	B	C	D	E	TOTAL
Scarce	P_2	P_2	P_2	P_1	P_2	
Sales	5000000	390000	300000	200000	1500000	7390000
V. Cost	(2625000)	(252000)	(175000)	(140000)	(945000)	(4137000)
Separ	(1250000)	—	(50000)	—	(150000)	
	1125000	138000	75000	60000	405000	1803000
						(473000)
						1330000

ILLUSTRATION 4

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 ₹40,000. Conversion of ₹60,000 were incurred upto the split off point, at which time two sealable products were produced. Chlorine can be further processed into PVC.

The July production and sales information is as follows:

	Production (in ton)	Sales Quantity (in ton)	Selling price per ton (₹)
Caustic Soda	1,200	1,200	50
Chlorine	800	—	—
PVC	500	500	200

All 800 tons of Chlorine were further processed, at an incremental cost of ₹ 20,000 to yield 500 tons of PVC. There was 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 ₹ 75 per ton.

CHAPTER – 11
COST CONTROL ACCOUNTS
(INTEGRATED & NON-INTEGRATED ACCOUNTS)

Question 1

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

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

Question 2

Journalise the following transactions assuming that cost and financial transactions are integrated:

	Rs.
Raw materials purchased	2,00,000
Direct materials issued to production	1,50,000
Wages paid (30% indirect)	1,20,000
Wages charged to production	84,000
Manufacturing expenses incurred	84,000
Manufacturing overhead charged to production	92,000
Selling and distribution costs	20,000
Finished products (at cost)	2,00,000
Sales	2,90,000
Closing stock	*Nil*
Receipts from debtors	69,000
Payments to creditors	1,10,000

Question 3

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, 2016.

(Narrations are not required)

	Rs.
Raw materials purchased (50% on Credit)	6,00,000
Materials issued to production	4,00,000
Wages paid (50% Direct)	2,00,000
Wages charged to production	1,00,000
Factory overheads incurred	80,000

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Factory overheads charged to production	1,00,000
Selling and distribution overheads incurred	40,000
Finished goods at cost	5,00,000
Sales (50% Credit)	7,50,000
Closing stock	Nil
Receipts from debtors	2,00,000
Payments to creditors	2,00,000

Question 4

On 31st March, 2016 the following balances were extracted from the books of the SUPREME MANUFACTURING COMPANY :-

	Dr. Rs.	Cr. Rs.
Stores Ledger Control A/c.	35,000	
Work in Progress Control A/c.	38,000	
Finished Goods Control A/c.	25,000	
Cost Ledger Control A/c.		98,000
	98,000	98,000

The following transactions took place in April, 2016 :

	Rs.
Raw Materials :-	
Purchased	95,000
Returned to suppliers	3,000
Issued to production	98,000
Returned to stores	3,000
Productive wages	40,000
Indirect labour	25,000
Factory overhead expenses incurred	50,000
Selling and Administrative expenses	40,000
Cost of finished goods transferred to warehouse	2,13,000
Cost of Goods sold	2,10,000
Sales	3,00,000

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 Control 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 A/c.
(g) Trial Balance as at 30th April, 2016.

Question 5

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 :

		Rs.
Balances at the beginning of the month :		
Stores Ledger Control Account		25,000
Work in Progress Control Account		20,000
Finished Goods Control Account		35,000
Prepaid Production Overheads brought forward from previous month		3,000
Transaction during the month :		
Materials Purchased		75,000
Materials Issued :	Rs.	
To Production	30,000	
To Factory Maintenance	4,000	34,000
Materials transferred between batches		
Total wages paid :	Rs.	
To Direct workers	25,000	
To Indirect workers	5,000	30,000
Direct wages charged to batches		20,000
Recorded non-productive time of direct workers		5,000
Selling and Distribution Overheads incurred		6,000
Other Production Overheads incurred		12,000
Sales		1,00,000
Cost of Finished Goods Sold		80,000
Cost of Goods completed and transferred into finished goods during the month		65,000
Physical value of work in progress at the end of the month		40,000

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 Accounts
(d) Production Overheads Control Account
(e) Profit and Loss Account.

Question 6

From the following details show the necessary accounts in the Cost Ledger

	Materials	***Work-in-Progress***	***Finished Stock***
	Rs.	**Rs.**	**Rs.**
Opening Balance	8,000	5,000	10,000
Closing Balance	11,000	9,000	12,000
Transactions during the period:		Rs.	
Materials purchased		25,000	
Wages paid		10,000	
		(including Rs. 2,000 indirect)	
Overheads incurred		8,000	
Overheads absorbed		9,000	
Sales		50,000	

Question 7

Acme Manufacturing Co. Ltd. opens the costing records, with the balances as on 1st July, 2016 as follows :

	Rs.	**Rs.**
Material control A/c.	1,24,000	
Work-in-progress A/c.	62,500	
Finished Goods A/c.	1,24,000	
Production Overheads A/c.	8,400	
Administration Overhead		12,000
Selling and Distribution Overhead A/c.	6,250	
General Ledger Control A.c		3,13,150
	3,25,150	3,25,150

The following are the transactions for the quarter ended 30th September 2016 :

	Rs.
Materials purchased	4,80,100
Materials issued jobs	4,77,400
Materials to works maintenance	41,200

Materials to administration office	3,400
Materials to selling department	7,200
Wages direct	1,49,300
Wages Indirect	65,000
Transportation for incoming materials	8,400
Production overheads	2,42,250
Absorbed overheads production	3,59,100
Administration overheads	74,000
Administration allocation to production	52,900
Administration allocation to sales	14,800
Sales overheads	64,200
Sales overheads absorbed	82,000
Finished goods produced	9,58,400
Finished goods sold	9,77,300
Sales Realisation	14,43,000

Make up the various accounts as you envisage in the Cost Ledger and prepare a Trial Balance as at 30th September, 2016.

Question 8

The following balances were extracted from a company's ledger as on 31st December, 2106.

	Rs.	Rs.
Raw materials control A/c.	48,836	
Work-in-progress control A/c.	14,745	
Finished stock control A/c.	21,980	
Nominal ledger control A/c.		85,561
	85,561	85,561

Further transactions took place during the following quarter as follows :

	Rs.
Factory overhead – allocated to WIP	11,786
Goods finished – at cost	36,834
Raw materials purchased	22,422
Direct wages – allocated to WIP	18,370
Cost of goods sold	42,000
Raw materials – issued to production	17,000
Raw materials – credited by suppliers	1,000
Inventory audit – raw material losses	1,300
WIP rejected (with no scrap value)	1,800
Customer's returns (at cost) of finished goods	3,000

Prepare all the Ledger Accounts in Cost Ledger.

Question 8

As on 31st March, 2016, the following balances existed in a firm's Cost Ledger :

	Dr. Rs.	Cr. Rs.
Stores Ledger Control A/c	3,01,435	
Work-in-Progress Control A/c	1,22,365	
Finished Stock Ledger Control A/c	2,51,945	
Manufacturing Overhead Control A/c		10,525
Cost Ledger Control A/c		6,65,220
	6,75,745	6,75,745

During the next three months the following items arose:

	Rs.
Finished product (at cost)	2,10,835
Manufacturing overhead incurred	91,510
Raw materials purchased	1,23,000
	Rs.
Factory Wages	50,530
Indirect Labour	21,665
Cost of Sales	1,85,890
Material issued to production	1,27,315
Sales returned at Cost	5,380
Material returned to suppliers	2,900
Manufacturing overhead charged to production	77,200

You are required to pass the Journal Entries; write up the accounts and schedule the balances, stating what each balance represents.

COST- CONTROL
7- Cost Actg syst. (QNO-8 / 89)
QNO-9

Page No. 1
Date

ILLUSTRATION 1

As on 31st March, 20X3, the following balances existed in a firm's Cost Ledger:

	Dr. (₹)	Cr. (₹)
Stores Ledger Control A/c	3,01,435	
Work-in-Process Control A/c	1,22,365	
Finished Stock Ledger Control A/c	2,51,945	
Manufacturing Overhead Control A/c		10,525
Cost Ledger Control A/c		6,65,220
	6,75,745	6,75,745

During the next three months the following items arose:

	(₹)
Finished product (at cost)	2,10,835
Manufacturing overhead incurred	91,510
Raw materials purchased	1,23,000
Factory Wages	50,530
Indirect Labour	21,665
Cost of Sales	1,85,890
Material issued to production	1,27,315
Sales returned at Cost	5,380
Material returned to suppliers	2,900
Manufacturing overhead charged to production	77,200

You are required to pass the Journal Entries; write up the accounts and schedule the balances, stating what each balance represents.

QNO-10 (QNO-6 / 87)

ILLUSTRATION 2

From the following details show the necessary accounts in the Cost Ledger

	Materials (₹)	Work-in-Process (₹)	Finished Stock (₹)
Opening balance	8,000	5,000	10,000
Closing balance	11,000	9,000	12,000

Transactions during the period:	(₹)
Materials purchased	25,000
Wages paid (including ₹ 2,000 indirect)	10,000
Overheads incurred	8,000
Overheads absorbed	9,000
Sales	50,000

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ILLUSTRATION 3

On 31st March, 20X3 the following balances were extracted from the books of the Supreme Manufacturing Company:

	Dr. (₹)	Cr. (₹)
Stores Ledger Control A/c	*35,000*	
Work-in-Process Control A/c	*38,000*	
Finished Goods Control A/c	*25,000*	
Cost Ledger Control A/c		*98,000*
	98,000	*98,000*

The following transactions took place in April 20X3:

	(₹)
Raw Materials:	
-Purchased	95,000
-Returned to suppliers	3,000
-Issued to production	98,000
-Returned to stores	3,000
Productive wages	40,000
Indirect wages	25,000
Factory overhead expenses incurred	50,000
Selling and Administrative expenses	40,000
Cost of finished goods transferred to warehouse	2,13,000
Cost of Goods sold	2,10,000
Sales	3,00,000

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 Control A/c
(b) Stores Ledger Control A/c
(c) Work-in-Process Control A/c
(d) Finished Goods Stock Control A/c
(e) Factory Overhead Control A/c
(f) Costing Profit and Loss A/c
(g) Trial Balance as at 30th April, 20X3.

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Cost Actg system (QNo-7 / 87)

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QNo-12

ILLUSTRATION 4

Acme Manufacturing Co. Ltd. opens the costing records, with the balances as on 1st July, 20X2 as follows:

	(₹)	(₹)
Material Control A/c	*1,24,000*	
Work-in-Process Control A/c	*62,500*	
Finished Goods Control A/c	*1,24,000*	
Production Overhead Control A/c	*8,400*	
Administrative Overhead Control A/c		*12,000*
Selling & Distribution Overhead Control A/c	*6,250*	
Cost Ledger Control A/c		*3,13,150*
	3,25,150	*3,25,150*

The following are the transactions for the quarter ended 30th September 20X2:

	(₹)
Materials purchased	*4,80,100*
Materials issued to jobs	*4,77,400*
Materials to works maintenance	*41,200*
Materials to administration office	*3,400*
Materials to selling department	*7,200*
Wages direct	*1,49,300*
Wages indirect	*65,000*
Transportation for indirect materials	*8,400*
Production overheads	*2,42,250*
Absorbed production overheads	*3,59,100*
Administration overheads	*74,000*
Administration allocation to production	*52,900*
Administration allocation to sales	*14,800*
Sales overheads	*84,200*
Sales overheads absorbed	*82,000*
Finished goods produced	*9,58,400*
Finished goods sold	*9,77,300*
Sales realisation	*14,43,000*

Make up the various accounts as you envisage in the Cost Ledger and prepare a Trial Balance as at 30th September, 20X2.

Cost Acctg System

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Date

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ILLUSTRATION 5

(a) 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, 20X3:

(i) Incomplete Ledger Entries:

Materials Control A/c

	(₹)		(₹)
To Balance b/d	32,000		

Work-in-Process Control A/c

	(₹)		(₹)
To Balance b/d	9,200	Finished Goods Control A/c	1,51,000

Payables (Creditors) A/c

	(₹)		(₹)
To Balance b/d	19,200	Balance b/d	16,400

Manufacturing Overheads Control A/c

	(₹)		(₹)
To Cost Ledger Control A/c (Amount spent)	29,600		

Finished Goods Control A/c

	(₹)		(₹)
To Balance b/d	24,000	By Balance b/d	30,000

(ii) Additional Information:

(1) The cash-book showed that ₹ 89,200 have been paid to creditors for raw-material.

(2) Ending inventory of work-in-process included material ₹ 5,000 on which 300 direct labour hours have been booked against wages and overheads.

(3) The job card showed that workers have worked for 7,000 hours. The wage rate is ₹ 10 per labour hour.

(4) Overhead recovery rate was ₹ 4 per direct labour hour.

You are required to complete the above accounts in the cost ledger of the company:

(ILL-5)

MATERIAL CONA/C

To Balb/d	32000	By WIP CONT	53000
To STORES CONT	92000		
		By Bal C/F	71000
	124000		124000

WIP CONA/C

To Balb/d	9200	By FINISHED GOODS CONA/C	151000
To Wage CONT	70000	By Bal c/f.	
To FO. CONT	28000	Mat 5000	
		Lab 300X10=3000	
		O.H 300X4 = 1200	9200
To Mat CONT (Bal Fig)	53000		
	160200		160200

CREDITORS CONTA/C (PAYABLE)

To CASH/BANK	89200	By Balb/d.	16400
		By PURCHASES	92000
To Bal c/f	19200		
	108400		108400

MAN-O.H CONA/C

To COST L. CONT	29600	By WIP CONT (7000 X4)	28000
		By Costing P/L/A/C (UNOFL RFN)	1600
	29600		29600

Page No.
Date

FINISHED GOODS CONT A/C

TO Balbd	20000	By Cost of Sales	45000
To WIP CONT	151000		
		By Bal c/f	
	175000		30000
	Wages CONT A/C		
To Cost L. CONT (7000 X 10)	70000	By WIP CONT	70000

Cost Actg system (QNo-2 / 84) QNo-14

Page No. 5

Date

ILLUSTRATION 6

Journalise the following transactions assuming that cost and financial transactions are integrated:

	(₹)
Raw materials purchased	*2,00,000*
Direct materials issued to production	*1,50,000*
Wages paid (30% indirect)	*1,20,000*
Wages charged to production	*84,000*
Manufacturing expenses incurred	*84,000*
Manufacturing overhead charged to production	*92,000*
Selling and distribution costs	*20,000*
Finished products (at cost)	*2,00,000*
Sales	*2,90,000*
Closing stock	*Nil*
Receipts from debtors	*69,000*
Payments to creditors	*1,10,000*

Cost Acctg System

Q NO- 15

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Date

ILLUSTRATION 7

Bangalore Petrochemicals Co. keeps books on integrated accounting system. The following balances appear in the books as on 1st January, 20X2.

	DR. (₹)	CR. (₹)
Stores Ledger control A/c	18,000	
Work-in-Process Control A/c	17,000	
Finished Goods Control A/c	13,000	
Bank A/c	10,000	
Creditors A/c		8,000
Fixed assets A/c	55,000	
Debtors A/c	12,000	
Share capital A/c		80,000
Provision for depreciation A/c		5,000
Profit and loss A/c		32,000
	1,25,000	1,25,000

Transaction for the year ended 31st Dec., 20X2 were as given below:

	(₹)	(₹)
Wages-direct	87,000	
Wages-indirect	5,000	92,000
Purchase of materials (on credit)		1,00,000
Materials issued to production		1,10,000
Materials for repairs		2,000
Goods finished during the year (at cost)		2,15,000
Sales (credit)		3,00,000
Cost of goods sold		2,20,000
Production overhead absorbed		48,000
Production overhead incurred		40,000
Administration overhead incurred (production)		12,000
Selling overhead incurred		14,000
Payments of creditors		1,01,000
Payments of debtors		2,90,000
Depreciation on machinery		1,300
Prepaid rent (included in factory overheads)		300

Write up accounts in the integrated ledger.

(ILL-1)

Page No.
Date

STORES-LEDGER-CONTRA

To Bal b/d	18000	By W.I.P. CONT	110000
To RM CONTRA	100000	By O.H. CONTRA	2000
		By Bal c/f	(6000)
	118000		118000

W.I.P. CONTRA

To Bal b/d	17000	By FIN GOODS CONT	215000
To RM CONT	110000		
To P&D O.H CONT	48000	By Bal c/f	(47000)
To WAGES CONT	87000		
	262000		262000

FINISHED GOODS CONTRA

To Bal b/d	13000	By Cost of goods sold	220000
To W.I.P CONT	215000		
To ADMIN O/H CONT	12000		
		By Bal c/f	(20000)
	240000		240000

BANK A/c

To Bal b/d	10000	By wages CON A/c	92000
To Debtors	290000	By PWD O/H	40000
		By ADMIN O/H	12000
		By S.O. CONT	14000
		By CLFD TON	101000
		By Bal c/f	41000
	300000		300000

CREDITORS CON A/c

To BANK	101000	By Bal b/d	10000
To Bal c/f	7000	By STORES CONT	100000
	108000		108000

FIXED ASSETS A/c

To Bal b/d	55000	By Bal c/f	55000

DEBTORS A/c

To Bal b/d	12000	By BANK	290000
To Sales CONT	300000	By Bal c/f	22000
	312000		312000

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SHARE CAPITAL A/C

To Bal c/f	80000	By Bal b/d	80000

PROVISION FOR DEP.

To Bal/cf	6300	By Bal b/d	5000
		By Prod O·H (Dep)	1300
	6300		6300

PROFIT & LOSS A/C

To Cost of Sales	234000	By Bal b/d.	32000
		By Sales	300000
To Bal c/f	98000		
	332000		332000

WAGES - CON A/C

To Bank	92000	By WIP Con A/c	87000
		By Prod O·H Cont	5000
	92000		92000

PRODUCTION O.H. CONTAC

TO STORES CONT	2000	By W.I.P CONT	48000
TO BANK	40000		
TO PROD Rep	1300		
TO WAGES CONT	5000	By PREPAID RENT	300
	48300		48300

SALES CONTAC

TO COSTING PLA	300000	By DEBTORS CONT	300000

COST OF GOODS SOLD

TO FIN GOODS	220000	By COSTING PLACE	234000
TO S&D OH	14000		
	234000		234000

ADMIN O.H CONT

TO BANK	12000	By WIP CONT	12000

SELLING O.H CONT

TO BANK	19000	By COST of SALES CONT	19000

PREPAID RENTAC

TO P&D O.H	300	By Balance	300

Cost Acty System (DNO-5 86)

Page No. 7

Date

DNO-16

ILLUSTRATION 8

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:

	(₹)	(₹)
Balances at the beginning of the month:		
Stores Ledger Control Account		25,000
Work-in-Process Control Account		20,000
Finished Goods Control Account		35,000
Prepaid Production Overheads brought forward from previous month		3,000
Transactions during the month:		
Materials Purchased		75,000
Materials Issued:		
To production	30,000	
To factory maintenance	4,000	34,000
Materials transferred between batches		5,000
Total wages paid:		
To direct workers	25,000	
To indirect workers	5,000	30,000
Direct wages charged to batches		20,000
Recorded non-productive time of direct workers		5,000
Selling and Distribution Overheads Incurred		6,000
Other Production Overheads Incurred		12,000
Sales		1,00,000
Cost of Finished Goods Sold		80,000
Cost of Goods completed and transferred into finished goods during the month		65,000
Physical value of work-in-Process at the end of the month		40,000

The production overhead absorption rate is 150% of direct wages charged to work-in-Process.

Required:

Prepare the following accounts for the month:

(a) Stores Ledger Control Account.

(b) Work-in-Process Control Account.

(c) Finished Goods Control Account.

(d) Production Overhead Control Account.

(e) Costing Profit and Loss Account.

Cost Acctg system

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Date

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ILLUSTRATION 10

Following are the figures extracted from the Cost Ledger of a manufacturing unit.

	(₹)
Stores:	
Opening balance	*15,000*
Purchases	*80,000*
Transfer from WIP	*40,000*
Issue to WIP	*80,000*
Issue to repairs and maintenance	*10,000*
Sold as a special case at cost	*5,000*
Shortage in the year	*3,000*
Work-in-Process:	
Opening inventory	*30,000*
Direct labour cost charged	*30,000*
Overhead cost charged	*1,20,000*
Closing Balance	*20,000*
Finished Products :	
Entire output is sold at 10% profit on actual cost from work-in-process.	
Others :	
Wages for the period	*35,000*
Overhead Expenses	*1,25,000*

Ascertain the profit or loss as per financial account and cost accounts and reconcile them.

(ILL-10)

STORES - LEDGER - CONT A/C

To Balbd	15000	By W-I-P CONT	80000
To Cost-L-CONT	80000	By O H CONT	10000
To W-I-P CONT	40000	By Cost-L-CONT (SALES/COST)	5000
		By [illegible] O·H CON A/C	3000
		By Bal c/f	37000
	135000		135000

W-I-P. L-CON A/C

To Balbd	30000	By Stos-L-CON A/C	40000
To STORES-L-CONT	80000		
To Lab CONT	30000	By [illegible] CONT A/C Bal c/f	250000
To O·H CONT	120000		
		By Bal c/f	20000
	260000		260000

COST - LEDGER CONT

To STORES-L-CONT	5000	By Balbd	
		By STORES-L-CONT	80000
		By Wages CONT	35000
		By O·H CONT	125000

Wages / Lab CONT

TO CASH CONT	35000	By WIP CONT	30000
		By O·H CONT	5000

O·H CONT

TO STORE CONT	10000		
TO STORE CONT	3000		
TO COST CONT	125000	By WIP CONT	120000
TO DIVAG CONT	5000		
		By Bal c/f	23000
	143000		143000

	Rs.
FINISHED GOODS — COST	200000
PL — 10%	20000
	220000

Step No (1) Statement showing Cost-Sheet

DIRECT			Rs
	DMat	(80000-40000)	40000
	DLabr		30000
		PRIME COST	70000
INDIRECT			
	F.O.		120000
			190000
		OPWIP	30000
		CLOSINGWIP	(20000)
			200000
		Pt 10%	20000
			220000

PROFIT & LOSS A/C			
TOMAT A/C	53000	By Sale	220000
OPStock 15000			
Purchase 80000		By WIP Closing	20000
Return/sale (5000)			
Closing (37000)			
TOWage	35000	By Net Loss	(3000)
TOOPWIP	30000		
TOO'H	125000		
	243000		243000

PROFIT COST SHEET			20000
	MATER	UNDER CHARGED	(13000)
	Wages	UNDER CHARGED	(5000)
	F.O.	UNDER CHARGED	(5000)
		NET LOSS PL A/C	(3000)

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ILLUSTRATION 11

The following figures have been extracted from the Financial Accounts of a manufacturing firm for the first year of its operation:

	(₹)
Direct Material Consumption	50,00,000
Direct Wages	30,00,000
Factory Overhead	16,00,000
Administration Overheads (production related)	7,00,000
Selling and Distribution Overheads	9,60,000
Bad Debts	80,000
Preliminary Expenses written off	40,000
Legal Charges	10,000
Dividends Received	1,00,000
Interest Received on Deposits	20,000
Sales (1,20,000 units)	1,20,00,000
Closing Stock:	
Finished Goods (4,000 units)	3,20,000
Work-in-Process	2,40,000

The cost accounts for the same period reveal that the direct material consumption was ₹ 56,00,000. Factory overhead is recovered at 20% on prime cost. Administration overhead is recovered at ₹ 6 per unit of production. Selling and distribution overheads are recovered at ₹ 8 per unit sold.

Prepare the Profit and Loss Accounts both as per financial records and as per cost records. Reconcile the profits as per the two records.

Cost Acctg System

Page No. 12
Date

Practical Problems EN0-19

1. The following incomplete accounts are furnished to you for the month ended 31st October, 20X2.

Stores Ledger Control Account

1.10.20X2	To Balance	₹ 54,000

Work in Process Control Account

1.10.20X2	To Balance	₹ 6,000

Finished Goods Control Account

1.10.20X2	To Balance	₹ 75,000

Factory Overheads Control Account

Total debits for October, 20X2		₹ 45,000

Factory Overheads Applied Account

₹

Cost of Goods Sold Account

Creditors for Purchases Account

1.10.20X2 By Balance ₹ 30,000

Additional information:

(i) The factory overheads are applied by using a budgeted rate based on direct labour hours. The budget for overheads for 20X2 is ₹ 6,75,000 and the budget of direct labour hours is 4,50,000.

(ii) The balance in the account of creditors for purchases on 31.10.20X2 is ₹ 15,000 and the payments made to creditors in October, 20X2 amount to ₹ 1,05,000.

(iii) The finished goods inventory as on 31st October, 20X2 is ₹ 66,000.

(iv) The cost of goods sold during the month was ₹ 1,95,000.

(v) On 31st October, 20X2 there was only one unfinished job in the factory. The cost records show that ₹ 3,000 (1,200 direct labour hours) of direct labour cost and ₹ 6,000 of direct material cost had been charged.

(vi) A total of 28,200 direct labour hours were worked in October, 20X2. All factory workers earn same rate of pay.

(vii) All actual factory overheads incurred in October, 20X2 have been posted.

You are required to find:

(a) Materials purchased during October, 20X2.

(b) Cost of goods completed in October, 20X2.

(c) Overheads applied to production in October, 20X2.

(d) Balance of Work-in-process Control A/c on 31st October, 20X2.

(e) Direct materials consumed during October, 20X2.

(f) Balance of Stores Ledger Control Account on 31st October, 20X2.

(g) Over absorbed or under absorbed overheads for October, 20X2.

PRACTICAL - PROBLEMS - UNIT

STORES LEDGER CONTROL

20X2			20X2	
1-10	To Bal b/d	54000	By WIP Cont A/c	78000
	To Purchases	90000	By Bal c/f	66000
		144000		144000

W.I.P. LEDGER CONTROL

1-10	To Bal b/d	60000	By Finished Goods Cont A/c	186000
	To Wages Cont	70500		
	To O/H Cont (28200 X 1.50)	42300		
	To Mat Cont	78000		
			By Bal c/f	10800
			Mat- 60000	
			Lab 30000	
			O/H (1200 X 1.5) 1800	
		196800		196800

FINISHED GOODS CONTROL

1-10	To Bal b/d	75000	By Cost of goods sold	195000
	To WIP Cont	186000		
			By Bal c/f	66000
		261000		261000

FACTORY O/H CONT

1-10	To Bank	45000	By WIP Cont A/c	42300
			By Under/Over P&A A/c (UNDER REC)	2700

20X2

COST OF GOODS SOLD CONT

20X2

CREDITOR FOR PURCHASE

31-10	TO BANK	105000	BY Bank		30000
			BY PURCHASE (Bal fig)		(90000)
31-10	TO P&L C/F	(15000)			
		120000			120000

WAGES CONTROL

TO BANK. (28200 X 2.50)	70500	BY WIP CONT		70500

WORKING NOTE NO(1)

Rec Rate - Per hr = $\left(\frac{675000}{450000}\right)$

= 1.50 Per/hr.

Wage Rate Per hr = $\left(\frac{3000}{1200}\right)$

= 2.50

Cost Acctg System

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Date

Q10-20

2. 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:

	₹ (in lakhs)
Stores Ledger Control Account	80
Work-in-Process Control Account	20
Finished Goods Control Account	430
Building Construction Account	10
Cost Ledger Control Account	540

During the month, the following transaction took place:

Materials	–	Purchased		40
		Issued to production		50
		Issued to factory maintenance		6
		Issued to building construction		4
Wages	–	Gross wages paid		150
		Indirect wages	40	
		For building construction	10	
Works Overheads	–	Actual amount incurred		160
		(excluding items shown above)	20	
			8	
		Absorbed in building construction	5	
		Under absorbed		
Royalty paid (related to production)				
Selling, distribution and administration overheads				25
Sales				450

At the end of the month, the stock of raw material and work-in-Process was ₹ 55 lakhs and ₹ 25 lakhs respectively. The loss arising in the raw material accounts is treated as factory overheads. The building under construction was completed during the month. Company's gross profit margin is 20% on sales.

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(PRACTICAL)

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COST LEDGER CON A/C

To Bal Con	450	By Bal b/d	540
To Building Cont	44	By Stores L Cont	40
		By W.O. Cont	160
To Bal c/f	483	By Wages Cont	150
		By Royalty Cont	5
		By S.D & ADMIN	25
		By Costing P&L A/c	57
	977		977

STORES-LEDGER CON A/C

To Bal b/d	80	By WIP Cont	50
To Cost L Cont	40	By F.O. Cont (Issued to F. Maint)	6
~~To ... A/c~~	~~...~~	By Building Cont	4
		By W.O. Cont A/c	5
		Bal fig/LOD	
		By Bal c/f	55
	120		120

W.I.P. LEDGER CON A/C

To Bal b/d	20	By F.Good Cont	333
To Stores Con A/c	50		
To Wage Cont	100		
To F.O	~~...~~ 183		
To Roy Cont	5		
~~To ...Con~~	~~...~~		
	358	By Bal c/f	25
			358

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Date

WORKS O.H CON A/C

TO STORES CONT	6	BY BUILDING CONT	20
TO WAGES CONT	40		
TO COST L CONT	160	BY WIP CON (Bal Fig)	183
TO STORES CONT (LUD)	5	BY COSTING PL A/C (UNDER ABS.)	8
	211		211

WAGES CON A/C

TO COST L CONT	150	BY W.O. CON A/C	40
		BY BUILDING CON A/C	10
		BY WIP CONT	100
	150		150

ROYALTY CON A/C

TO COST CON A/C	5	BY WIP CONT	5

FINISHED GOODS CON A/C

TO Bal b/d	430	BY COST OF GOOD SOLD (450X80%)	360
TO WIP CON	333		
		BY Bal C/F	403
	763		763

COST OF GOODS SOLD CON A/C

TO FE GOOD CONT	360	~~TO COSTING P&L~~	~~360~~
~~TO BAL~~	~~360~~	BY COST OF SALE	360

SALE CONT

TO COSTING P&L	450	BY COST L CON	450

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SELLING & DIST & O'H CONT

TO COST-L-CONT	25	By cost of sale	25
	COST OF SALE CONTAC		
TO C.O.G.S	360	By COSTING PCAC	385
TO S&DIS	25	By cost of sale	25
	COSTING PCAC		
TO cost of sal.	385	By SALES CONTAC	450
TO W.O CON	8		
TO COST-L-CONT	57		
	450		450
	BUILDING CONTAC		
TO Building	10	By COST-L-CONT	44
TO STORES CONT	4		
TO W.I.P CONT	10		
TO F.O CONT	20		
	44		44
	TRIAL-BALANCE	DR	CR
			483
COST-L-CONTROL		55	
STORES-L-CONT		25	
W.I.P-L-CONT			
Periods CONT		403	
		483	483

Prepare the relevant control accounts to record the above transactions in the cost ledger of the company.

3. Dutta Enterprises operates an integral system of accounting. You are required to pass the Journal Entries for the following trans¬actions that took place for the year ended 30th June, 20X2.

(Narrations are not required.)

Raw materials purchased (50% on Credit)	6,00,000
Materials issued to production	4,00,000
Wages paid (50% Direct)	2,00,000
Wages charged to production	1,00,000
Factory overheads incurred	80,000
Factory overheads charged to production	1,00,000
Selling and distribution overheads incurred	40,000
Finished goods at cost	5,00,000
Sales (50% Credit)	7,50,000
Closing stock	Nil
Receipts from debtors	2,00,000
Payments to creditors	2,00,000

4. *The following figures are extracted from the Trial Balance of Go-getter Co. on 30th September, 20X2:*

	Dr. (₹)	CR (₹)
Inventories:		
Finished Stock	80,000	
Raw Materials	1,40,000	
Work-in-Process	2,00,000	
Office Appliances	17,400	
Plant & Machinery	4,60,500	
Building	2,00,000	
Sales		7,68,000
Sales Return and Rebates	14,000	
Materials Purchased	3,20,000	
Freight incurred on Materials	16,000	
Purchase Returns		4,800
Direct employee cost	1,60,000	

cost Acctg system

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Indirect employee cost	18,000	
Factory Supervision	10,000	
Repairs and Upkeep Factory	14,000	
Heat, Light and Power	65,000	
Rates and Taxes	6,300	
Miscellaneous Factory Expenses	18,700	
Sales Commission	33,600	
Sales Travelling	11,000	
Sales Promotion	22,500	
Distribution Deptt.—Salaries and Expenses	18,000	
Office Salaries and Expenses	8,600	
Interest on Borrowed Funds	2,000	

Further details are available as follows:

(i) Closing Inventories:

Finished Goods

Raw Materials

Work-In-Process 92,000

(ii) Accrued expenses on:

Direct employee cost 8,000

Indirect employee cost 1,200

Interest on Borrowed Funds 2,000

(iii) Depreciation to be provided on:

Office Appliances 5%

Plant and Machinery 10%

Buildings 4%

(iv) Distribution of the following costs:

Heat, Light and Power to 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 condensed Profit and Loss Statement of Go-getter Co. for the year ended 30th September, 20X2 along with supporting schedules of:

(i) Cost of Sales.

(ii) Selling and Distribution Expenses.

(iii) Administration Expenses.

CHAPTER 12

RECONCILIATION OF COST & FINANCIAL ACCOUNTS

Question 1

The financial records of Modern Manufacturers Ltd. Reveal the following for the year ended 30-6-2016.

		Rs.
Sales(20,000 units)		4,000
Materials		1,600
Wages		800
Factory Overheads		720
Office & Administrative Overheads		416
Selling & Distribution Overheads		288
Finished Goods (1,230 units)		240
Work-in-progress:		
Materials	48	
Labour	32	
Overheads(Factory)	32	112
Goodwill written off		320
Interest on Capital		32

In costing records factory overhead is charged at 100% wages, administration overhead 10% of factory cost & selling & distribution overhead at the rate of Rs. 16 per unit sold.

Prepare a statement reconciling the profit as per costs records with the profit as per financial records of the company.

Question 2

The following figures have been extracted from the financial accounts of the manufacturing firm for the first year of its operation:

	Rs.
Direct Material Consumption	50,00,000
Direct Wages	30,00,000
Factory Overheads	16,00,000
Administrative Overheads	7,00,000
Selling & Distribution Overheads	9,60,000

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Bad Debts	80,000
Preliminary Expenses Written Off	40,000
Legal Charges	10,000
Dividends Received	1,00,000
Interest Received on Deposits	20,000
Sales (1,20,000 units)	1,20,00,000
Closing Stocks:	
Finished Goods(4,000units)	3,20,000
Work in Progress	2,40,000

The cost accounts for the same period reveal that the direct material consumption was Rs. 56,00,000. Factory Overheads is recovered at 20% on prime cost. Administration Overheads is recovered at Rs.6/- per unit of production. Selling & Distribution Overheads are recovered at Rs. 8 per unit sold.

Prepare the Profit & Loss Account both as per financial record & as per cost records. Reconcile the profits as per the two records.

Question 3

Given below is the Trading & Profit & Loss & Account of a Company for the year ended 31st March, 2016.

	Rs.			Rs.
To Materials	27,40,000	By Sales(60,000 units)		60,00,000
To Wages	15,10,000	By Stock(2,000 units)		1,60,000
To Factory Expenses	8,30,000	By Work-in-progress:	Rs.	
To Administrative Expenses	3,82,400	Materials	64,000	
To Selling Expenses	4,50,000	Wages	36,000	
To Preliminary Expenses Written off	60,000	Factory Expenses	20,000	1,20,000
To Net Profit	3,25,600	By Dividend received		18,000
	62,98,000			**62,98,000**

The company manufacturers standard units. In the Cost Accounts:

(i) Factory expenses have been allocated to production at 20% of Prime Cost;

(ii) Administrative expenses at Rs. 6 per unit produced; &

(iii) Selling expenses at Rs. 8 per unit sold.

Prepare the Cost sheet of the company & reconcile the same with the profit disclosed by the Financial Accounts.

Question 4

M/s Sellwell has furnished you the following information from the financial books for the year ended 31st, December, 2016:-

Profit & Loss Account

For the year ended 31ST December,2016.

	Rs.		Rs.
Opeing Stock of Finished Goods:		Sales 10,250 units	3,58,750
500 units@ Rs. 17.50 each	8,750	Closing Stock of Finished Goods:	
Materials Consumed	1,30,000	250 units @ Rs 25 each	6,250
Wages	75,000		
Gross Profit c/d	1,51,250		
	3,65,000		3,65,000
Factory Overheads	47,375	Gross Profit c/d	1,51,250
Administrative Overheads	53,000	Interest	125
Selling Expenses	27,500	Rent Received	5,000
Bad Debts	2,000		
Preliminary Expenses	2,500		
Net Profit	24,000		
	1,56,375		**1,56375**

The cost sheet shows : (i) the cost of materials as Rs. 13 per unit; (ii) the labour cost as Rs. 7.50 per unit; (iii) the factory overheads are absorbed at 60% of labour cost ; (iv) the administration overheads are absorbed at 20% of factory cost; (v) selling expenses are charged at Rs. 3 per unit; (vi) the opening stock of finished goods is valued at Rs. 22.50 per unit.

You are required:

i. The cost sheet showing the number of units produced and the cost of production by elements of costs, per unit & in total

ii. The statement of profit or loss as per costs accounts for the year ended 31st December 2016.

iii. The statement showing the reconciliation of profit or loss as shown by the cost accounts with profits as shown by the financial accounts.

Question 5

The financial books of the company reveal the following data for the year ended 31st March,2016.

	Rs
Opening Stock:	
Finished goods 875 units	74,375
Work-in-process	32,000
1.4.15 to 313.2016	
Raw Materials Consumed	7,80,000
Direct Labour	4,50,000
Factory Overheads	3,00,000
Goodwill	1,00,000
Administration Overheads	2,95,000
Dividend Paid	85,000
Bad Debts	12,000
Selling & Distribution Overheads	61,000
Interest Received	45,000
Rent Received	18,000
Sales 14,500 units	20,80,000
Closing Stock: Finished Goods 375 units	41,250
Work-in-process	38,667

The cost records provide as under:

- Factory overheads are absorbed at 60% of direct wages.
- Administration overheads are recovered at 20% of factory cost.
- Selling & 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 & Cost Profit Reporting.

Required:

(i) Prepare statements for the year ended 31st March, 2016 to show

- The profit as per financial records
- The profit as per costing records

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

Question 6

Niting Engineering Co. manufactures two sizes of machine components, Size A & Size B.

The following data refer to the year ended 31 st December,2016.

	Size A	Size B
Production	125 units	400 units
Sales	120 units	360 units
	Rs.	Rs.
Wages cost per unit	40	30
Material cost per unit	15	12
Selling Price Per Unit	125	90

All expenses other than wages & materials are analysed under works overheads which during the year amounted to Rs. 9,000 & office overhead which amounted to Rs. 10,000. In fixing the selling price it was estimated that works overheads should be taken at 50% on wages & office overhead expenses at 33 1/3 on works cost. **You are required to compute the following:**

(a) Total cost of each unit on the basis of the above overhead percentages;

(b) The net profit for the year shown by the financial accounts valuing unsold stocks at actual material & wages cost plus works overhead at 50% on wages; &

(c) The reconciliation of net profit in (b) above with the estimated total net profit based on cost figures.

Question 7

The net profit shown by Financial Accounts of a company amounted to Rs. 2,85,500 while the Profits as per Cost Accounts for that period was Rs. 3,88,600. On reconciliation, the following differences were noticed:-

(i) The following items were included in the financial books:-

Directors Fees(Dr.)	Rs. 6,500
Bank Interest (Cr.)	300
Income Tax (Dr.)	83,000

(ii) Bad & Doubtful debts for Rs. 5,700 were written off in Financial books.

(iii) Overheads in Cost Accounts absorbed were Rs. 85,000 while the actuals were Rs. 83,200.

(iv) A net loss of Rs. 10,000 on sale of old machinery was dealt with in financial books.

Reconcile the Profit between the cost & financial accounts.

Question 8

A manufacturing company disclosed a net loss of Rs. 3,47,000 as per their cost accounts for the year ended March 31,2016. The financial accounts however disclosed a net loss of Rs. 5,10,000 for the same period. The following information was revealed as a result of scrutiny of the figures of 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 Statement.

****

RECONILIATION

Page No.
Date

QNo-9

ILLUSTRATION 9

The following figures are available from the financial records of ABC Manufacturing Co. Ltd. for the year ended 31-3-20X3.

	(₹)
Sales (20,000 units)	*25,00,000*
Materials	*10,00,000*
Wages	*5,00,000*
Factory Overheads	*4,50,000*
Office and administrative Overhead (production related)	*2,60,000*
Selling and distribution Overheads	*1,80,000*
Finished goods (1,230 units)	*1,50,000*

	(₹)	(₹)
Work-in-Process:		
Materials	30,000	
Labour	20,000	
Factory overheads	20,000	70,000
Goodwill written off		2,00,000
Interest on capital		20,000

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 ` 10 per unit sold.

Prepare a statement reconciling the profit as per cost records with the profit as per financial records.

21

Page No.

Date

QNO-9

(IL-9 / 7.36)

SOLUTION(I) STATEMENT SHOWING COST SHEET

31-3-20X3

PRODUCTION (20000 +1230)= UNITS=	21230
DIRECT COST	
(i) DIRECT MATERIAL	1000000
(ii) DIRECT LABOUR	500000
(iii) DIRECT EXP	–
PRIME COST	1500000
INDIRECT COST	
F.O. (100% 500000)	500000
GROSS FACTORY COST	2000000
OPENING WIP	–
CLOSING WIP	(70000)
FACTORY COST	1930000
ADMIN O.H (10% X 1930000)	193000
COST OF PRODUCTION	2123000
OPENING FIN GOODS	–
CLOSING FIN GOODS $\left(\frac{2123000}{21230} \times 1230\right)$	(123000)
COST OF GOODS SOLD	2000000
SELLING & DIST EXP (20000X10)	200000
COST OF SALES	2200000
PG	300000

QNo 9 365

SCHNO (2) P. LOSS A/C FOR THE YEAR 21-3-X3

PART	Rs	PART	Rs
TO Mat	1000000	BY SALES	2500000
TO Lab	500000		
TO F.O	450000	BY WIP	70000
TO A.O	260000		
TO S.O.	180000	BY F.Wood	150000
TO Goodwill	200000		
TO INT	20000		
TO Neapt	(110000)		
	2720000		2720000

SCHNO (3) STATEMENT SHOWING RECONC

PROFIT AS PER COST SHEET	300000
OVER-RECY OF F.O.	50000
UNDER RECY OF O.A.	(67000)
UNDER VALUATION OF CLOSING FIN GOODS	27000
OVER RECY OF SELLIN O.H	20000
ITEMS NOT CONDS IN COST	
Goodwill	(200000)
INT	(20000)
PROFIT AS PER P.LOSS A/C	110000

(ILL-11)
7.14

Page No.
Date

QNo-10

[SAME - QNO - DKC]
QNo-2/90

ILLUSTRATION 11

The following figures have been extracted from the Financial Accounts of a manufacturing firm for the first year of its operation:

	(₹)
Direct Material Consumption	50,00,000
Direct Wages	30,00,000
Factory Overhead	16,00,000
Administration Overheads (production related)	7,00,000
Selling and Distribution Overheads	9,60,000
Bad Debts	80,000
Preliminary Expenses written off	40,000
Legal Charges	10,000
Dividends Received	1,00,000
Interest Received on Deposits	20,000
Sales (1,20,000 units)	1,20,00,000
Closing Stock:	
Finished Goods (4,000 units)	3,20,000
Work-in-Process	2,40,000

The cost accounts for the same period reveal that the direct material consumption was ₹ 56,00,000. Factory overhead is recovered at 20% on prime cost. Administration overhead is recovered at ₹ 6 per unit of production. Selling and distribution overheads are recovered at ₹ 8 per unit sold.

Prepare the Profit and Loss Accounts both as per financial records and as per cost records. Reconcile the profits as per the two records.

Page No.
Date

(PRACTICAL ON 04) ON-11
7.5)

ON-9 DFC/32

Q No 12

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Date

following information is available from the financial books of a company having rmal production capacity of 60,000 units for the year ended 31st March, 20X3:
Sales ₹ 10,00,000 (50,000 units).

(ii) There was no opening and closing stock of finished units.

(iii) Direct material and direct wages cost were ₹ 5,00,000 and ₹ 2,50,000 respectively.

(iv) Actual factory expenses were ₹ 1,50,000 of which 60% are fixed.

(v) Actual administrative expenses related with production activities were ₹ 45,000 which are completely fixed.

(vi) Actual selling and distribution expenses were ₹ 30,000 of which 40% are fixed.

(vii) Interest and dividends received ₹ 15,000.

books for the year ended 31st March, 20X3.

(b) Prepare a statement reconciling profits shown by financial and cost books.

QNo73

6. M/s. H.K. Piano Company showed a net loss of ₹ 4,16,000 as per their financial accounts for the year ended 31st March, 20X3. The cost accounts, however, disclosed a net loss of ₹ 3,28,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of books:

		(₹)
(i)	Factory overheads under-recovered	6,000
(ii)	Administration overheads over-recovered	4,000
(iii)	Depreciation charged in financial accounts	1,20,000
(iv)	Depreciation recovered in costs	1,30,000
(v)	Interest on investment not included in costs	20,000
(vi)	Income-tax provided	1,20,000
(vii)	Transfer fees (credit in financial books)	2,000
(viii)	Stores adjustment (credit in financial books)	2,000

Prepare a Memorandum reconciliation account.

Page No.
Date

PRACTICAL – PROBLEM
7.53 / 7.64 ON 6/3

MEMORANDUM – RECONCILIATION ACCOUNT

TO LOSS AS PER COST-RECORD	328000	BY ADM O.H.	4000
		BY DEP (130000 – 120000)	10000
TO F.O.	6000		
		BY INT ON INV.	20000
TO IN. TAX	120000		
		BY TRANSFER Fee	2000
		BY STORES Adj	2000
		BY NET LOSS AS PER PCA	416000
	454000		454000

CHAPTER 13

STANDARD COSTING

Question 1

Compute the Sales & Sales Margin Variances from the data given below:

Product	Budgeted Quantity Units	Actual Quantity Units	Budgeted Sale Price Per Unit Rs.	Actual Sale Price Per Unit Rs.	Standard cost per unit Rs.
X	240	400	50	45	30
Y	160	200	25	20	15

Question 2

From the following information about sales, calculate necessary sales variances:

Product	Budgeted Quantity Units	Budgeted Sale Price Per Unit	Actual Quantity Units Rs.	Actual Sale Price Per Unit Rs.
A	5000	50.00	6200	55.00
B	4000	60.00	5600	62.50
C	3000	70.00	5000	80.00

Question 3

NJ Ltd. Selling the product A,B & C, budgeted the following sales for a period:

A = 2000 units at Rs. 50 per unit

B = 3200 units at Rs. 25 per unit

C = 5000 units at Rs. 20 per unit

During the same period the actual sales were

A = 2400 units at Rs. 45 per unit

B = 3500 units at Rs. 24 per unit

C = 4800 units at Rs. 25 per unit

The standard cost per unit of A,B,C, were Rs. 25/- Rs. 15/- & Rs. 10/- respectively, where as actual cost per unit were Rs. 27/-, Rs.16/- & Rs.9/- respectively.

Compute necessary profit variances.

Question 4

Compute the following variances from the data given below:

1. Sales variances based on Margin.
2. Sales variances based on Turnover.

Product	Budgeted Quantity Units	Actual Quantity Units	Budgeted Sale Price Per Unit Rs.	Actual Sale Price Per Unit Rs.	Standard Cost Per Unit Rs.	Actual Cost Per Unit Rs.
M	2000	2200	100	95	80	82
N	3000	2600	80	85	60	65
O	5000	4400	60	65	50	53
P	10000	12000	40	40	30	36

Question 5

To obtain an output of 100 units of product X, 800 kgs of material is required at a budgeted price of Rs. 5 per kg. During the month, the actual output was 500 units. The actual material consumption was 4,400 KGS @ Rs. 5.30 per kg. You are required to calculate various material cost variances.

Question 6

The standard quantity of material required is 4 kgs per unit of output. The relevant figures are as under:

Material	A	B	C	D
Standard Mix %	30%	40%	20%	10%
Standard Price per kg(Rs.)	1.25	1.50	3.50	3.00
Actual Qty used (kgs)	1180	1580	830	440
Actual Price per kg(Rs.)	1.30	1.80	3.40	3.00

Actual output for the period was 1,000 units.

Calculate necessary variances.

Question 7

To produce a product, 3 types of materials are required as per following standards:

Materials	Kgs	Price per kg
A	100	5
B	60	10
C	40	15
Total	200	

The standard loss is 10% of gross input. During a given period following were the details of materials used for the production for the output of 4500 kg.

Materials	Kgs	Price per kg
A	2800	6
B	1600	9
C	900	14
Total	5300	

You are required to ascertain various material cost variances.

Question 8

The standard set for a chemical mixture of a firm is as under:

Material	Standard Mix %	Standard Price per kg (Rs.)
A	40	20
B	60	30

The standard loss in production is 10%. During the period, the actual consumption and price for an output of 189 kgs are as under:

Material	Actual Quantity in kgs	Actual Price Per kg (Rs.)
A	90	18
B	120	34

Calculate the variances.

Question 9

Vinayak Ltd produces an article blending two raw material A & B. It operates a standard costing system. The standard mix of A & B are 40% & 60% respectively while their standard prices per kg are Rs.4 & Rs. 3 respectively.

The normal loss in processing is 15%. During April, the company produced 1700 kg of output. The position of stock and purchases for the month of April is as under:

Material	Stock on 1-Apr	Stock on 30-Apr	Purchased	Cost of Purchase
A	35kg	5kg	800 kg	Rs.3,400
B	40 kg	50kg	1,200 kg	Rs.3,000

Analyse the material cost variances into

a. Price
b. Mix &
c. Yield

DKC

IPCC-COSTING

Question 10

The standard & actual figures of a firm are as under:

Standard Time for the job	1000 hours
Standard Rate per hour	Rs.0.50
Actual Time paid	900 hours
Actual wages paid	Rs.360

Compute the variances.

if Ab.normal Idle time is 100hrs

Question 11

To produce 100 units of a product, 3 types of workers are required as per following standards:

180 hours of skilled labour @ Rs. 5 per hour

120 hours of semi -skilled labour @ Rs. 3 per hour

300 hours of unskilled labour @ Rs. 2 per hour

Part A

During September 2016 following were the details of labour hours recorded for the output of 1600 units.

3000 hours of skilled labour @ Rs. 5.20 per hour

2000 hours of semi -skilled labour @ Rs. 2.50 per hour

5000 hours of unskilled labour @ Rs. 1.80 per hour

You are required to ascertain all labour cost variances.

Part B

During September 2016 following were the details of labour hours recorded for the output of 1600 units.

2800 hours of skilled labour @ Rs. 5.20 per hour

1900 hours of semi -skilled labour @ Rs. 2.50 per hour

5300 hours of unskilled labour @ Rs. 1.80 per hour

You are required to ascertain all labour cost variances.

Question 12

A gang of workers normally consists of 35 men, 15 women & 10 boys. They are paid at standard hourly rates as:

Men	Rs. 0.80
Women	Rs. 0.60
Boys	Rs. 0.40

In a normal working week of 40 hours, the gang is expected to produce 2,000 units of output. During the week ended 31st December 2016, the gang consisted of 34 men, 12 women & 9 boys. The actual wages paid were @ Rs. 0.70, Rs. 0.65 & Rs. 0.30, respectively. 1,900 units were produced.

You are required to ascertain all labour cost variances.

Question13

Mr M provides the following information relating to 1,000 units of product 'ZED' during the month of April 2004:

Standard Price Per kg of Raw Material	- Rs.3
Actual total direct material cost	- Rs. 10,000
Standard Direct Labour Hours	- 1,600
Actual Direct Labour Hours	- 1,800
Total standard direct labour cost	- Rs. 8,000
Standard Variable Overhead per direct Labour hour	- Rs1
Total Standard Variable Overheads	- Rs 1,600
Actual Total Variable Overheads	- Rs 1,620

The material usage variance is Rs 600 adverse & the overall cost variance per unit of ZED is Rs. 0.07 adverse as compared to the total standard cost per unit of ZED of Rs. 21.

You are required to compute the following:

(a) Standard quantity of raw material per unit of ZED

(b) Standard direct labour rate per hour.

(c) Standard direct material cost per unit of ZED.

(d) Standard direct labour cost per unit of ZED

(e) Standard total material cost for the output.

(f) Actual total direct labour cost for the output.

(g) Material Price Variance.

(h) Labour Rate Variance.

(i) Labour efficiency variance.

(j) Variable Overhead expenditure variance.

(k) Variable Overheads efficiency variance.

Question14

Z Ltd. Uses standard costing system in manufacturing of its single product 'M'.

The standard cost per unit of M is as follows:

		(Rs.)
Direct Materials	2 metres @ Rs. 6 per metre	12.00
Direct Labour	1 hour @ Rs. 4.40 per hour	4.40
Variable Overhead	1 hour @ Rs. 3 per hour	3.00
		19.40

During July, 2016, 6000 units of M were produced & the related data are as under:

Direct Material acquired	- 19000 mts@ 5.70 per mts
Material consumed	- 12670 mts
Direct labour -?hours @ Rs.-?per hour	- Rs. 27,950
Variable Overheads incurred	- Rs. 20,475

The variable overhead efficiency variance is Rs. 1,500 adverse. Variable overheads are based on direct labour hours.

There was no stock of raw material in the beginning.

You are required to compute the missing figure & work out all the relevant variances.

Question 15

XYZ Ltd. Has furnished you the following for the month of August:

	Budget	Actual
Output (units)	30,000	32,500
Hours	30,000	33,000
Fixed Overhead Rs.	45,000	50,000
Working days	25	26

Calculate the fixed overhead variances.

Question16

X Ltd. Has furnished you the following for the month of October:

	Budget	Actual
Output (units)	1,00,000	1,26,000
Hours	20,000	25,200
Fixed Overhead Rs.	2,40,000	2,64,600
Working days	25	24

There were 5,040 hours of abnormal idle item included in actual hours.

Calculate the fixed overhead variances.

Question 17

Calculate the fixed overhead variances.

	Budget	Actual
Output (units)	1,00,000	1,25,000
Hours	1,20,000	1,40,000
Fixed Overhead Rs.	12,00,000	14,40,600
Working days	24	25

There were 4,000 hours of abnormal idle time included in actual hours.

Question 18

Standcost Corporation produces three products: A,B & C . The master budget called for the sale of 10,000 units of A at Rs. 12; 6,000 units of B at Rs. 15 & 8,000 units of C at Rs. 9. In addition the standard variable cost for each product was Rs. 7 for A, Rs. 9 for B, & Rs. 6 for C. In fact the firm actually produced & sold 11,000 units of A at 11.50, S000 units of B at Rs. 15.10 & 9,000 units of C at Rs.8.55.

The firm uses two inputs to produce each of the products X & Y. The standard price per unit of material X is Rs.2 & for a unit of material Y is Rs. 1.The materials budgeted to be used for each product were:

DKC

Products	Materials (units)	
	X	Y
A	2	3
B	4	1
C	1	4

The firm actually used 54,000 units of X at a cost of Rs.1,09,620 & 72,000 units of Y at a cost of Rs. 73,000.

Required:

Determine the mix quantity & rate variance for sales as well as the yield, mix & price variance for materials.

Question 19

Following is the standard cost card of a component:

Materials	2 units at Rs. 15	Rs.30
Labour	3 hours at Rs. 20	Rs.60
Total Overheads	3 hours at Rs.10	Rs.30

During a particular month 10,000 units of the components were produced and the same was found to be at 60% capacity of the budget. In preparing the variance report for the month, the cost accountant gathered the following information:

Labour	Rs.6,50,000
Variable Overheads	Rs. 2,00,000
Fixed Overheads	Rs.3,00,000
Material Price Variance	Rs.70,000(A)
Material cost variance	Rs.50,000(A)
Labour Rate Variance	Rs.50,000(F)
Fixed overhead expenditure variance	Rs.50,000(A)

You are required to prepare from the above details:

(i) Actual Material Cost incurred

(ii) Standard Cost of Material Actually Consumed

(iii) Labour efficiency variance

(iv) Variable OH efficiency variance

(v) Variance OH expenditure variance

(vi) Fixed Overheads Cost Variance

(vii) Fixed Overheads Expenditure Variance

(viii) Fixed Overheads Volume Variance

****

CHAPTER 13

STANDARD COSTING

LEARNING OUTCOMES

- ☐ Discuss the meaning of standard cost and variances.
- ☐ Differentiate between controllable and uncontrollable variances.
- ☐ Analyse and compute variances related to material, labour and overheads.

STANDARD COSTING

Page No.
Date

HOME-WORK

QNO-20

ILLUSTRATION 1

The standard and actual figures of product 'Z' are as under:

	Standard	Actual
Material quantity	*50 units*	*45 units*
Material price per unit	*₹ 1.00*	*₹ 0.80*

Calculate material cost variance.

(ILL-1 / 13.14) QNO-20

MATERIAL VARIANCE - ACTUAL PRODUCTION=

STANDARD			ACTUAL		
QTY	Rate	Amt	QTY	Rate	Amt
50	1	50	45	.80	36

MATERIAL COST VARIANCE (50-36)
= 14(F)

(STANDARD COST - ACTUAL COST)

Material Usage VARIANCE

(SQ - AQ) X SR

(50 - 45) X 1
= 5 (F)

Material Rate VA

(SR - AR) X AQ

(1 - .80) X 45
= 9(F)

Page No.
Date

TW-3

QNO-21

ILLUSTRATION 2

NXE Manufacturing Concern furnishes the following information:

Standard:	*Material for 70 kg finished products*	*100 kg.*
	Price of material	*₹ 1 per kg.*
Actual:	*Output*	*2,10,000 kg.*
	Material used	*2,80,000 kg.*
	Cost of Materials	*₹ 2,52,000*

Calculate: (a) Material usage variance, (b) Material price variance, (c) Material cost variance.

QNO-21

NOTE NO(1) STANDARD INPUT FOR ACTUAL OUTPUT

OUTPUT
70 kg
210000 kg

INPUT
100 kg
$\left(\frac{210000 \times 100}{70}\right)$
$= 300000$ kg

MATERIAL VARIANCE — ACTUAL PRODUCTION = 210000

STANDARD			ACTUAL		
QTY	RATE	AMT	QTY	RATE	AMT
300000	X 1 =	300000	280000	·90	252000

MATERIAL COST VARIANCE (300,000 − 252000)
= 48000 (F)

MATERIAL USAGE VAR
(300000 − 280000) X1
= 20000 (F)

MATERIAL RATE VAR
(1 − ·90) X280000
= 28000 (F)

Page No.
Date

ILL-3

QNO- 23

ILLUSTRATION 3

The standard cost of a chemical mixture is as follows:

40% material A at ₹ 20 per kg.

60% material B at ₹ 30 per kg.

A standard loss of 10% of input is expected in production. The cost records for a period showed the following usage :

90 kg material A at a cost of ₹ 18 per kg.

110 kg material B at a cost of ₹ 34 per kg.

The quantity produced was 182 kg. of good product.

Calculate all material variances.

NOTE NO (1) QNO-23

STANDARD INPUT FOR ACTUAL OUTPUT

INPUT	LOSS	OUTPUT
100 kg	10	90
$\left(\frac{182 \times 100}{90}\right)$		182

$= 202.22$

'A' — 40% — 80.89 kg

'B' — 60% — 121.33 kg

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Date

SCOPNO(1)

MATERIAL VARIANCE – ACTUAL PRODUCTION = 182

STANDARD			ACTUAL		
Kg	Rate	Amt	Kg	Rate	Amt
A 80·89	X 20 =	1617·80	90	X 18 =	1620
B 121·33	X 30 =	3639·90	110	X 34 =	3740
202·22		5257·70	200		5360

MATERIAL COST VARIANCE (5257·70 − 5360)

= 102·30 (A)

MATERIAL USAGE VAR

A (80·89 − 90) X 20
= 182·2 (A)
B (121·33 − 110) X 30
= 339·90 (F)
157·70 (F)

MATERIAL RATE VAR

(20 − 18) X 90 = 180 (F)
(30 − 34) X 110 = 440 (A)
260 (A)

MATERIAL SUB USAGE VAR

(202·22 − 200) X $\frac{5257·70}{202·20}$
= 57·73 (F)

MATERIAL MIX VAR

(A) ($\frac{80·89}{202·22}$ X 200)
= (80 − 90) X 20 = 200 (A)
(B) ($\frac{121·33}{202·2}$ X 200)
(120 − 110) X 30 = 300 (F)
100 (F)

MATERIAL YIELD VARIANCE

INPUT	OUTPUT
202·22	182
200	180

(182 − 180) $\frac{5257·70}{182}$ = 57·73 (F)

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Date

(IL-4) QNO-24

LABOUR VARIANCE

STANDARD			ACTUAL		
HR	Rate	Amt	HR	Rate	Amt
1000	X ·50	= 500	900	·40	= 360

LABOUR COST VARIANCE

(500 - 360) = 140 (F)

Lab Effval	Lab Ratevar
(1000 - 900) X ·50	(·50 - ·40) X 900
= 50 (F)	= 90 (F)

QNO-24

ILLUSTRATION 4

The standard and actual figures of a firm are as under

Standard time for the job	*1,000 hours*
Standard rate per hour	*₹ 0.50*
Actual time taken	*900 hours*
Actual wages paid	*₹ 360*

Compute the variances

Q No-25

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Date

ILLUSTRATION 5

The standard labour employment and the actual labour engaged in a week for a job are as under:

	Skilled workers	Semi-skilled workers	Unskilled workers
Standard no. of workers in the gang	32	12	6
Actual no. of workers employed	28	18	4
Standard wage rate per hour	3	2	1
Actual wage rate per hour	4	3	2

During the 40 hours working week, the gang produced 1,800 standard labour hours of work. Calculate :

(a) Labour Cost Variance
(b) Labour Rate Variance
(c) Labour Efficiency Variance
(d) Labour Mix Variance
(e) Labour Yield Variance

Q No-25

STANDARD HRS FOR ACTUAL PRODUCTION

SK-Lab $32 \times 40 = \frac{1280 hrs}{2000} \times 1800 = 1152$

SEMI-Lab $12 \times 40 = \frac{480}{2000} \times 1800 = 432$

UNSKLab $6 \times 40 = \frac{240}{2000} \times 1800 = 216$

1800

ACTUAL HRS FOR ACTUAL PRODUCTION

SKLab $28 \times 40 = 1120$

SEMI $18 \times 40 = 720$

UNSK. $4 \times 40 = 160$

2000

Page No.
Date

LABOUR VARIANCE

	STANDARD			ACTUAL	
	Hrs	Rate	Amt	Hrs	Rate	Amt
SK	1152	X 3	= 3456	1120	X 4	= 4480
SEMI	432	X 2	= 864	720	X 3	= 2160
UNSK	216	X 1	= 216	160	X 2	= 320
	1800		4536	2000		6960

MATERIAL COST VAR (4536 - 6960) = 2424 (A)

LABOUR EFF VAR	LABOUR RATE VAR
SK (1152 - 1120) X 3 =	(3 - 4) X 1120 =
SEMI (432 - 720) X 2 =	(2 - 3) X 720 =
UNSK (216 - 160) X 1 =	(1 - 2) X 160 =
= 96 (F)	= 1120 (A)
= 576 (A)	= 720 (A)
= 56 (F)	= 160 (A)
424 (A)	2000 (A)

Sub
LABOUR EFF VAR / LABOUR EFF VAR

$(1800 - 2000) \times \frac{4536}{1800}$

= 504 (A)

LAB-MIX-VAR

SK $\left(\frac{1152}{1800} \times 2000\right)$

$= (1280 - 1120) \times 3 = 480$ (F)

SEMI $\left(\frac{432}{1800} \times 2000\right)$

$= (480 - 720) \times 2 = 480$ (F)

UNSK $\left(\frac{216}{1800} \times 2000\right)$ 80 (F)

Page No.

QNC-26

ILLUSTRATION 6

The overhead expense budget for a factory producing to a capacity of 200 units per month is as follows:

Description of overhead	Fixed cost per unit in (₹)	Variable cost per unit in (₹)	Total cost per unit in (₹)
Power and fuel	1,000	500	1,500
Repair and maintenance	500	250	750
Printing and stationary	500	250	750
Other overheads	1,000	500	1,500
	₹ 3,000	₹ 1,500	4,500

The factory has actually produced only 100 units in a particular month. Details of overheads actually incurred have been provided by the accounts department and are as follows:

Description of overhead	Actual cost
Power and fuel	₹ 4,00,000
Repair and maintenance	₹ 2,00,000
Printing and stationary	₹ 1,75,000
Other overheads	₹ 3,75,000

You are required to compute the production volume variance and the overhead expenses variance.

QNC-26

FIXED O·H VARIANCE

BUDGET | ACTUAL

UNITS	R·R	EXP	Units	EXP
200	3000	600000	100	

F·O· VOLUME VARIANCE

(200 − 100) × 3000 = 300000 (A)

V·O· VARIANCE — AP/WD = 100 Units

Units	Rate	Amt	Units	Rate	Amt
100	1500	150000			

OVERHEADS EXP VAR

(600000 + 150000) − 1150000 = 400000 (A)

Q No 27

Page No.
Date

ILLUSTRATION 7

The following information was obtained from the records of a manufacturing unit using standard costing system.

	Standard	Actual
Production	4,000 units	3,800 units
Working days	20	21
Fixed Overhead	₹ 40,000	₹ 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 variances

(ii) Volume variance

(IH-7 / 13.29) QNS-27

Page No. | Date

FIXED O.H VARIANCE

BUDGET

Units	R.R	Exp
4000	10	40000
Hrs	R.R	Exp
		40000
Days	R.R	Exp
20	2000	40000

ACTUAL

Units	Exp
3800	39000
Hrs	Exp
	39000
Days	Exp
21	39000

V.O. VARIANCE - ACTUAL PROD = 3800

Units	Rate	Amt
3800	X 3 $\left(\frac{12000}{4000}\right)$	= 11400

Units	Rate	Amt
3800	3.16	12000

F.O. A/C

To Bank	39000	By Req (3800 X 10)	38000
		Bal/R	(1000)

Ans No (b)

F.O. COST VARIANCE (38000 - 39000) = 1000 (A)

b(i) F.O. EXP VAR (40000 - 39000) = 1000 (F)

b(ii) F.O volume VAR (4000 - 3800) X 10 = 2000 (A)

V.O. COST VAR (11400 - 12000) = 600 (A)

V.O. EXP/RATE VAR (3 - 3.16) X 3800

V.O. EFF VAR (3800 - 3800) X 3

QNO-28

Practical Questions

1. For making 10 kg. of CEMCO the standard material requirements is:

Material	Quantity	Rate per kg. (₹)
A	8	6.00
B	4	4.00

During April, 1,000 kg of CEMCO were produced. The actual consumption of materials is as under:

Material	Quantity (Kg.)	Rate per kg. (₹)
A	750	7.00
B	500	5.00

Calculate (A) Material Cost Variance; (b) Material Price Variance; (c) Material usage Variance.

STANDARD INPUT FOR ACTUAL OUTPUT

QNO-28 Output 10 kg → 1000

Input (8+4) = 12 kg → 1200 kg

A 800 kg

B 400 kg

SOL NO(1) MATERIAL VARIANCE - ACTUAL = 100

	STANDARD Qty	Rate	Amt	ACTUAL Qty	Rate	Amt
A	800	6	4800	750	7.00	5250
B	400	4	1600	500	5.00	2500
	1200		6400	1250		7750

MATERIAL COST VAR(6400 − 7750) = 1350 (A)

Mat Usage Var

A (800 − 750) × 6 = 300 (A)

B (400 − 500) × 4 = 400 (A)

100 (A) ~~200 (A)~~

Mat Rate Var

(6 − 7) × 750

(4 − 5) × 500

= 750 (A)

= 500 (A)

1250 (A)

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Q No-(2) Q No-29

2. The standard mix to produce one unit of product is as follows:

Material X	60 units @ ₹ 15 per unit	=	900
Material Y	80 units @ ₹ 20 per unit	=	1,600
Material Z	100 units @ ₹ 25 per unit	=	2,500
	240 units		5,000

During the month of April, 10 units were actually produced and consumption was as follows:

Material X	640 units @ ₹ 17.50 per unit	=	11,200
Material Y	950 units @ ₹ 18.00 per unit	=	17,100
Material Z	870 units @ ₹ 27.50 per unit	=	23,925
	2460 units		52,225

Calculate all material variances.

Q No-29

STANDARD INPUT FOR ACTUAL OUTPUT

MATERIAL	OUTPUT	X	INPUT	= TOTAL
X	60	X	10	600
Y	80	X	10	800
Z	100	X	10	1000
				2400

MATERIAL VARIANCE - ACTUAL PRODUCTION = 10 UNITS

	STANDARD			ACTUAL		
	QTY	RATE	AMT	QTY	RATE	AMT
(X)	600	X 15 =	9000	640	X 17·50 =	11200
(Y)	800	X 20 =	16000	950	X 18·00 =	17100
(Z)	1000	X 25 =	25000	870	X 27·50 =	23925
	2400		50000	2460		52225

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SOLN NO(2) MATERIAL COST VARIANCE

(50000 - 52225)

= 2225 (A)

Material Usage VAR

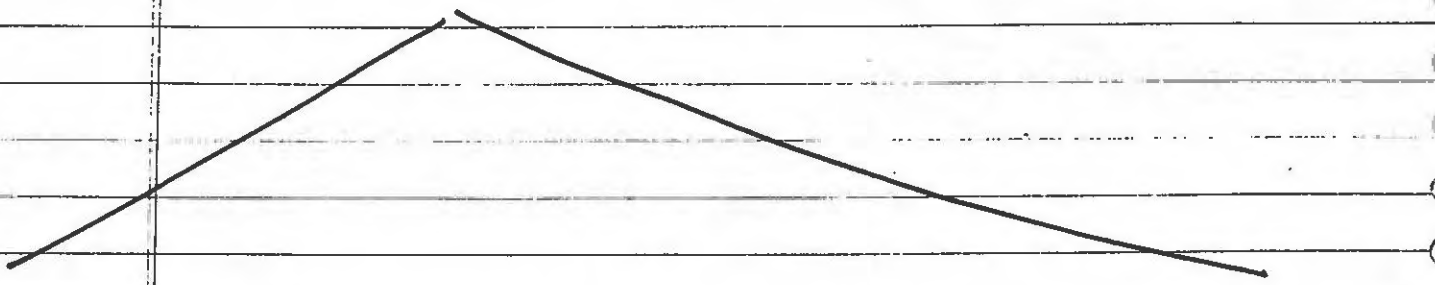
X (600 - 640) X 15 = 600 (A)
Y (800 - 950) X 20 = 3000 (A)
Z (1000 - 870) X 25 = 3250 (F)

~~2250 (F)~~ 350 (A)

Mat Rate VAR

(15 - 17.50) X 640 = 1600 (A)
(20 - 18.00) X 950 = 1900 (F)
(25 - 27.50) X 870 = 2175 (A)

1875 (A) ~~5625 (A)~~



Material sub Usage VAR

(2400 - 2460) X 50000/2400

= 1250 (A)

Material - MIX - VAR

(X) (600/2400 X 2460)
= (615 - 640) X 15 = 375 (A)
(Y) (800/2400 X 2460)
= (820 - 950) X 20 = 2600 (A)
(Z) (1000/2400 X 2460)
= (1025 - 870) X 25 = 3875 (F)

900 (F)

MATERIAL YIELD VAR

INPUT	Output
2400	10
2460	10.25

(10.25 - 10) X 50000/10

= 1250 (A)

(QNo-(3) 13:35)

QNo-30

3. The following standards have been set to manufacture a product:

Direct Material:	(₹)
2 units of A @ ₹ 4 per unit	8.00
3 units of B @ ₹3 per unit	9.00
15 units of C @ ₹1 per unit	15.00
	32.00
Direct Labour: 3 hrs @ ₹8 per hour	24.00
Total standard prime cost	56.00

The company manufactured and sold 6,000 units of the product during the year. Direct material costs were as follows:

12,500 units of A at ₹ 4.40 per unit

18,000 units of B at ₹ 2.80 per unit

88,500 units of C at ₹ 1.20 per unit

The company worked 17,500 direct labour hours during the year. For 2,500 of these hours, the company paid at ₹ 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 variances.

QNO-30

STANDARD INPUT FOR ACTUAL OUTPUT

INPUT	OUTPUT	X	INPUT	=	TOTAL
A	6000 Unb	X	2	=	12000
B	6000 "	X	3	=	18000
C	6000 "	X	15	=	90000

STANDARD HR FOR ACTUAL PUPUON

6000X3 = 18000

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MATERIAL VARIANCE Actual Prod = 6000

INPUT	Qty	X Rate	Amt	Qty	Rate	Amt
A	12000	X 4 =	48000	12500	X 4·40 =	55000
B	18000	X 3 =	54000	18000	X 2·80 =	50400
C	90000	X 1 =	90000	88500	X 1·20 =	106200
	120000		192000	119000		211600

Mat Cost VAR (192000 − 211600)
= 19600 (A)

Mat Usage VAR

A (12000 − 12500) X 4 = 2000 (A)
B (18000 − 18000) X 3 = 0
C (90000 − 88500) X 1 = 1500 (F)
500 (A)

Mat Rate VAR

(4 − 4·40) X 12500 = 5000 (A)
(3 − 2·80) X 18000 = 3600 (F)
(1 − 1·20) X 88500 = 17700 (A)
19100 (A)

Mat sub usage VAR

(120000 − 119000) X $\frac{192000}{120000}$
= 1600 (F)

Mat MIX VAR

(A) $\left(\frac{12000}{120000} \times 119000\right)$
= (11900 − 12500) X 4
= 2400 (A)

(B) $\left(\frac{18000}{120000} \times 119000\right)$
= (17850 − 18000) X 3
= 450 (A)

(C) $\left(\frac{90000}{120000} \times 119000\right)$
= (89250 − 88500) X 1
750 (F)
2100 (A)

Mat YIELD VAR

INPUT	OUTPUT
120000	6000
119000	5950

(5950 − 6000) X $\frac{192000}{6000}$
= 1600 (F)

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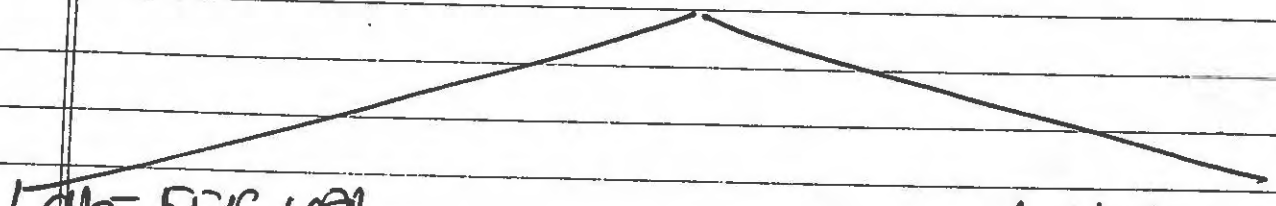
Labour variance – Actual production = Good

Hrs	Rate	Amt	hrs	Rate	Amt
18000	× 8 =	144000	2500 ×	12 =	30000
			15000 ×	8 =	120000
					150000

Labour cost var (144000 – 150000)

= 6000 (A)



Lab Eff var

(18000 – @17500) × 8

= 4000 (F)

Lab Rate var

(8 – 12) × 2500

(8 – 8) × 15000

= 10000 (A)

= –

10000 (A)

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QNO-31

4. [illegible] the following standards for factory overheads.

Variable overhead per unit: ₹ 10/-

Fixed overheads per month ₹ 1,00,000

Capacity of the plant 20,000 units per month.

[illegible] are as follows:

[illegible] ₹ 3,00,000

[illegible] units

Required:

Calculate [illegible]

(i) Production volume variance

(ii) Overhead expense variance

QNO (4) QNO-31

F.O

BUDGET			ACTUAL	
UNITS	R.R	Exp	Units	Exp
20000	5	100000	15000	

V.O

Units	Rate	Amt	Units	Rate	Amt
15000	10	150000			

300000

F.O. volume VARIANCE

(20000 − 15000) × 5 = 25000 (A)

O.V. VARIANCE

(100000 + 150000) − (300000)

= 50000 (A)

QNO-32 398

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PRACTICAL QNO 5

5. 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 ₹ 1,44,000 per month. The standard time required to manufacture one unit of product is 4 hours.
In April, 20X2, the company worked [redacted] and produced 5,305 units of output. The actual fixed overheads were ₹ 1,42,000.
Compute:
(i) Expense variance
(ii) Volume variance
(iii) Total fixed overheads variance.

F.O. QNO-32

BUDGET			ACTUAL	
UNITS	R.R	Exp	UNits	Exp
6000	24	144000	5305	142000
(24000÷4)				
HB	R.R	Exp	HRs	Exp
120X25X8=24000	X 6 =	144000	20160	142000
Days	R.R	Exp	DAYS	Exp
25	5760	144000	24	142000

F.O.A/C

To Bank	142000	By Rem (5305X24)	127320
			14680
	142000		142000

F.O. Cost Var (127320-142000)
= 14680 (A)

Volume
F.O. [illegible] Var
(6000-5305)X24
= 16680 (A).

Exp.
Fo[illegible]V.
(144000-142000)
= 2000 (F)

399

(6) QNo-33

6. Following information is available from the records of a factory:

	Budget	Actual
Fixed overhead for June, 20X2	₹ 10,000	₹ 12,000
Production in June, 20X2 (units)	2,000	2,100
Standard time per unit (hours)	10	–
Actual hours worked in June	–	21,000

Compute:

(i) Fixed overhead cost variance,

(ii) Expenditure variance,

(iii) Volume variance.

QNo-33

F.O

BUDGET — ACTUAL

Units	R.R	Exp	Units	Exp
2000	5	10000	2100	12000

Hrs	R.R	Exp	Hrs	Exp
20,000 (2000X10)	.5	10000	21000	

Days	R.R	Exp	Days	Exp
		10000		

FO. A/c

To Bank	12000	By Rec (2100X5) By U.R.	10500 / 1500
	12000		12000

F.O. Cost Var (10500 − 12000) = 1500 (A)

F.O. Exp Var: (10000 − 12000) = 2000 (A)

F.O. Volume Var: (2000 − 2100) X5 = 500 (F)

Q NO-7 Q NO- 34

7. XYZ Ltd. has furnished you the following information for the month of August, 20X2:

	Budget	Actual
Output (units)	30,000	32,500
Hours	30,000	33,000
Fixed overhead	₹ 45,000	50,000
Variable overhead	₹ 60,000	68,000
Working days	25	26

Calculate overhead variances.

Q NO 34

F.O

BUDGET

UNIT	R.R	EXP
30000	1.50	45000
HR	R.R	EXP
30000	1.50	45000
DAY	R.R	EXP
25	1800	45000

ACTUAL

UNIT	EXP
32500	50000
HR	EXP
33000	50000
DAY	EXP
26	50000

V.O. VARIANCE — ACTUAL UNIT = 32500

STANDARD HR	Rate	Amt
32500 X	2 =	65000

ACTUAL hr	Rate	Amt
33000	2.06	68000

$\left(\frac{30000}{30000} \times 32500\right)\left(\frac{60000}{30000}\right)$

F.O A/C

To BANK	50000	By Rej (32500 X 1.5)	48750
			1250

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F·O· COST VARIANCE =
(48750 − 50000) = 1250 (A)

F·O EXP VAR
(45000 − 50000)
= 5000 (A)

F·O Volume VAR
(30000 − 32500) X 150
= 3750 (F)

F·O capacity VAR
(30000 − 33000) X 1.5
= 4500 (F)

F·O Eff VAR

	UNITS	HRS
	30000	30000
	32500	32500

(32500 − 33000) X 1.50
= 750 (A)

F·O calendar VAR
(25 − 24) X 1800
= 1800 (F)

F·O Revised capacity VAR

	Days	HRS
	25	30000
	26	31200

(31200 − 33000) X 1.50
= 2700 (F)

V·O·COST VARIANCE
(65000 − 68000) = 3000 (A)

V·O EFF VAR
(32500 − 33000) X 2
= 1000 (A)

V·O EXP/RATE V
(2 − 2.06) X 33000
= 2000 (A)

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Q No 35

8. S.V. Ltd has furnished the following data:

	Budget	Actual, July (20X2)
No. of working days	25	27
Production in units	20,000	22,000
Fixed overheads	₹ 30,000	₹ 31,000

Budgeted fixed overhead rate is ₹ 1.00 per hour. In July, 20X2, the actual hours worked were 31,500.

Calculate the following variances:

(i) Volume variance.

(ii) Expenditure variance.

(iii) Total overhead variance.

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Q No - 8

FIXED OVERHEADS

BUDGET

UNITS	R.R	Exp
20000	1500	30000
HR	R.R	Exp
30000	1	30000
Days	R.R	Exp
25	1200	30000

ACTUAL

Units	Exp
22000	31000
HR	Exp
31500	31000
Days	Exp
27	31000

F.O. COST VARIANCE

To Bank	31000	By Recy (22000 X 1.50)	33000
To O/R	2000		

F.O. COST VAR

(33000 - 31000) = 2000 (F)

Volume
F.O. ~~Exp~~ VAR
(20000 - 22000) X 1.5
= 3000 (F)

Exp
F. ~~[illegible]~~ VAR
(30000 - 31000)
= 1000 (A)

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QNo+9)

QNo-31

9. 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	₹ 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	₹ 1,56,000

Calculate fixed overhead variances:

(a) Expenditure Variance

(b) Volume Variance,

(c) Fixed Cost Variance.

QNo-31

FIXED O.H

BUDGET — ACTUAL

Units	R.R	Exp	Units	Exp
150000 (150000 X 1)	1	150000	153090 (27 X 6300 X .90)	156000

Hrs	R.R	Exp	Hrs	Exp
150000 (25 X 6000)	1	150000	6300	156000

Days	R.R	Exp	Days	Exp
25		150000	27	156000

F.O.AC

To Bank 156000	By Rec 153090 (153090 X 1)	153090
To 2	By V/R 2910	

F.O. COST VAR
(153090 − 156000)
= 2910 (A)

F.O. EXP VAR
(150000 − 156000) = 6000 (A)

F.O. VOLUME VAR
(150000 − 153090) X 1

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QNO-37

10. J.K. Ltd. manufactures NXE by mixing three raw materials. For every batch of 100 kg. of NXE, 125 kg. of raw materials are used. In April, 20X2, 60 batches were prepared to produce an output of 5,600 kg. of NXE. The standard and actual particulars for April, 20X2 are as follows :

	(a)	(b)	(c)	(d)	(e)
A	50	20	60	21	5,000
B	30	10	20	8	2,000
C	20	5	20	6	1,200

Calculate all variances.

Q-37

STANDARD INPUT FOR ACTUAL OUTPUT.

INPUT 125 — OUTPUT 100

$\frac{5600 \times 125}{100}$ = 7000 kg — 5600

A	B	C
50%	30%	20%
= 3500 kg	2100 kg	1400 kg

ACTUAL INPUT (60 × 125) = 7500 kg

A	60%	× 7500	=	4500 kg
B	20%	× 7500	=	1500 "
C	20%	× 7500	=	1500 "

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MATERIAL VARIANCE

ACTUAL PRODUCTION 5600 Kg

STANDARD				ACTUAL		
	Kg	Rate	Amt	Kg	Rate	Amt
A	3500	X 20 =	70000	4500	X 21 =	94500
B	2100	X 10 =	21000	1500	X 8 =	12000
C	1400	X 5 =	7000	1500	X 6 =	9000
	7000		98000	7500		115500

MATERIAL COST VARIANCE

(98000 - 115500) = 17500 (A)

Material Usage VAR

A (3500 - 4500) X 20 = 20000 (A)
B (2100 - 1500) X 10 = 6000 (F)
C (1400 - 1500) X 5 = 500 (A)
14500 (A)

Material Rate VAR

(20 - 21) X 4500 = 4500 (A)
(10 - 8) X 1500 = 3000 (F)
(5 - 6) X 1500 = 1500 (A)
3000 (A)

MATERIAL SUB USAGE VAR

(7000 - 7500) X 98000/7000
= 7000 (A)

MATERIAL MIX VAR

(A) (3500/7000 X 7500)
= (3750 - 4500) X 20

(B) (2100/7000 X 7500) = 15000 (A)
(2250 - 1500) X 10

(C) (1400/7000 X 7500) = 2500 (F)
(1500 - 1500) X 5

MATERIAL YIELD VAR

INPUT	OUTPUT
7000	5600
7500	
6000	98000

CHAPTER – 14
MARGINAL COSTING

Question 1

A company has an opening stock of 6,000 units of output. The production planned for the current period is 24,000 units & expected sales for the current period amount to 28,000 units. The selling price per unit is expected to Rs. 10. The variable cost was Rs. 5 per unit during the previous period, but is expected to be Rs 6 per unit during the coming period. What is the Break Even Volume for the current period if the total fixed costs for the current period is R. 86,000 ? Assume that the First-in-First-out Method is followed.

Question 2

A company has an opening stock of 6,000 units of output. The production planned for the current period is 23,000 units & expected sales for the current period amount to 28,000 units. The selling price per unit of output is Rs. 10. Variable cost per unit is expected to Rs. 6 per unit while it was only Rs. 5 per unit during the previous period. What is Break-Even Volume for the current period if the total fixed costs for the current period is Rs. 1,06,000? Also Indicate profit for the current period.

Assume that the Last in First out System is followed.

Question 3

A Pharmaceutical company produces formulations having a shelf life of one year. The company has an opening stock of 30,000 boxes on 1 st January, 2016 & expected to produce 1,30,000 boxes as was in the just ended year of 2015. Expected sale would be 1,50,000 boxes. Costing department has worked out escalation in cost by 25% on variable cost & 10% on fixed cost. Fixed cost for the year 2015 is Rs. 40 per unit. New price announced for 2016 is Rs. 100 per box. Variable cost on opening stock is Rs. 40 per box. You are required to compute Breakeven volume for the year 2016.

Question 4

From the under mentioned figures calculate:

(i) P/V ratio & the total fixed expense;

(ii) Profit or Loss arising from the sales of Rs.12,000;

(iii) Sales required to earn a profit of Rs.2,000;

(iv) Sales required to break-even.

	Sales Rs.	Profit Rs.
First Period	14,433	385
Second Period	18,203	1,139

Question 5

The following figures relates to a company manufacturing a varied range of products:

Period	Total Sales Rs.	Total Costs Rs.
1	3,900	3,480
2	4,300	3,760

Calculate:

(a) P/V Ratio;

(b) Total Fixed Expenses;

(c) Break-even Sales;

(d) Profit or Loss arising from the sale of Rs. 4,000

(e) Sales required to earn a profit of Rs. 750.

State your assumptions in the above calculations.

Question 6

(a) X

(b) Calcutta company Ltd. Manufactures & sells four types of products under the brand names ACE, UTILITY, LUXURY & SUPREME. The sales mix in value-comprises of:

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. 6,00,000 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. 1,59,000 per month. Calculate the break-even point for the products on an overall basis.

(c) It has been proposed to change the sales mix as follows, the total sales per month remaining Rs.6,00,000:

Brand	Percentage
ACE	25%
UTILITY	40%
LUXURY	30%
SUPREME	5%
	100%

Assuming that this proposal is implemented, calculate the new break – even point.

Question 7

Anuradha Enterprise manufactures & sells black phenyl worth Rs. 20,000, white phenyl worth Rs. 25,000, scented phenyl worth Rs. 10,000 and naphthalene balls worth Rs. 5,000 every month. The firm's total fixed costs per month are Rs. 14,700. The variable costs are: on black phenyl 60%, on white phenyl 68%, on scented phenyl 80% & on naphthalene balls 40%.

The proprietress, Ms Anuradha Shah, being basically a science graduate, wonders at what combined sales volume does she really start earning profit. Please help her in arriving at such a sales volume.

Question 8

Two competing companies ABC Ltd. & XYZ Ltd. Produce & sell the same type of product in the same market. For the year to end Marchb2016 their forecasted profit & loss accounts are as follows:

	ABC Ltd. (Rs.)	XYZ Ltd. (Rs.)
Sales	2,50,000	2,50,000
Less: Variable Cost of Sales	1,50,000	2,00,000
Less: Fixed Cost	75,000	25,000
For casted Net Profit Before Tax	25,000	25,000

You are required to compute:

(1) P/V Ratio

(2) Break Even Sales Volume

(3) You are also required to state which company is likely to earr greater profit in conditions of:(a) Low Demand & (b) High Demand

Question 9

The following are the cost & sales data of a manufacturer selling three products X,Y &Z.

Products	Selling Price Per Unit (Rs.)	Variable Cost Per Unit(Rs.)	Percent of Rupees Sales Volume
X	4	3	20
Y	5	4	40
Z	8	6	40

Capacity of the manufacturer is Rs. 15 lakhs total sales volume. Annual fixed cost 2,30,000.

(1) Find the break even point in Rupees. (2) Calculate his profit or loss at 80% capacity.

Question 10

Evenkeel Ltd. Manufacturers and sells a single product X whose price is Rs. 40 per unit & the variable cost is Rs. 16 per unit.

(a) If the fixed cost for this year are Rs. 4,80,000 & the annual sales are at 60% margin of safety, calculate the rate of net return on sales assuming an income tax level of 40%.

(b) For the next year, it is proposed to add another product line Y whose selling price would be Rs. 50 per unit & the variable cost Rs. 10 per unit. The total fixed costs are estimated at Rs. 6,66,600. The sales mix of X:Y would be 7:3. At what level of sales net year would Evenkeel Ltd. Break even? **Give separately for both X & Y the break even sales in rupees & quantities.**

Question 11

AEC Office Supplies Corporation retails Two products – a Standard and a Deluxe version of a designer ball point pen. The budgeted income statement is as under:

	Standard	Deluxe	Total
Sales(in units)	1,50,000	50,000	2,00,000
	(Rs.)	(Rs.)	(Rs.)
Sales:			
@Rs. 20 per unit	3,00,000		
@Rs. 30 per unit	--	15,00,000	45,00,000
Variable Costs:			
@Rs. 14 per unit	21,00,000	--	
@Rs. 18 per unit	--	9,00,000	30,00,000
Contribution	9,00,000	6,00,000	15,00,000
Fixed Costs			12,00,000
Profit			3,00,000

Required:

(1) Calculate the breakeven point in units assuming that the planned sales mix is maintained.

(2) Calculate the breakeven point in units:

If only standard version is sold &

If only deluxe version is sold

(3) Suppose 2,00,000 units are sold, of which only 20,000 units are deluxe quality, calculate the profit.

Calculate breakeven point if these relationships persist in the next accounting period.

Question 12

Ever Forward Ltd., is manufacturing and selling two products : Splash & Flash at selling prices of Rs. 3 & Rs. 4 respectively. The following sales strategy has been outlined for the year 2016.

(i) Sales planned for year will bw Rs. 7.20 lakhs in the case of splash and Rs. 3.50 lakhs in the case of Flash.

(ii) To meet competition, the selling price of splash will be reduced by 20% & that of Flash by 12.5%.

(iii) Break even is planned at 60% of the total sales of each product.

(iv) Profit for the year to be achieved is planned as Rs. 69,120 in the case of Splash & Rs. 17,500 in the case of Flash. This would be possible by launching a cost reduction programme and reducing the present annual fixed expenses of Rs. 1,35,000 allocated as Rs. 1,08,000 to Splash & Rs. 27,000 to Flash.

You are required to present the proposal in financial terms giving clearly the following information:

(a) Number of units to be sold of Splash & Flash to breakeven as well as the total number of units of Splash & Flash to be sold during the year.

(b) Reduction in fixed expenses product-wise as envisaged by the Cost Reduction programe.

Question 13

The break even point of manufacturing company is Rs. 1,60,000. Fixed Cost is Rs.48,000. Variable cost is Rs. 12 per unit.

Required :

Determine the contribution margin-rate.

Question 14

Titan Engineering is operating at 70 percent capacity & 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 capacity level to 95 percent with the following modifications:

(i) The selling price will be reduced by 8 per cent.

(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 figure, with the working, that will be needed to earn Rs. 10 crores over and above the present profit & also meet 20% interest on the additional capital.

(b) What will be the revised?

(i) Break even point (ii) P/V Ratio

(ii) Margin of Safety

Question 15

Paramount Food products is a new entrant in the market for chocolates. It has introduced a new product Sweetee. This is a small rectangular chocolate bar. The bars are wrapped in aluminum foil & packed in attractive cartons containing 50 bars. A carton is therefore considered the basic sales unit. Although management had made a detailed estimates of costs and volumes prior to undertaking this venture, new projections based on actual cost experience are now required.

Income statements for the last two quarters are each thought to be representative of the cost and productive efficiency we can expect in the next few quarters. There were virtually no inventories on hand at the end of each quarter. The income statements reveal the following:

	First Quarter	Second Quarter
Sales:		
50,000 x Rs.24	12,00,000	--
70,000 x Rs.24	--	16,80,000
Cost of goods sold	7,00,000	8,80,000
Gross Margin	5,00,000	8,00,000
Selling & Administration	6,50,000	6,90,000
Net Income (Loss Before Tax)	(1,50,000)	1,10,000
Tax (Negative)	(60,000)	44,000
Net Income (Loss)	90,000	66,000

(1) MANAGEMENT WOULD LIKE TO KNOW THE B.E.P IN TERMS OF QTY CARTONS SALES

Question 16

The following information of a company is available for the year 2016:

	Rs.
Sales	40,000
Raw Materials	20,000
Direct Wages	6,000
Variable & Fixed OH	10,000
Profit	4,000
Units sold	200 Nos.

In the year 2017, wages rate will increase by 50% and fixed costs will decrease by Rs. 600. If 300 units are sold in 2017 the total fixed & variable OH will be 11,400. How many units should be sold in 2017, so that the same amount of profit per unit as in year 2016 may be earned?

Question 17

A company makes 1,500 units of a product for which the profitability statement is given below:

		Rs.
Sales		1,20,000
Direct Materials	30,000	
Direct Labour	36,000	
Variable Oil	15,000	
Subtotal VARIABLE Cost	81,000	
Fixe Cost	16,800	
Total Cost		97,800
Profit		22,200

After the first 500 units of production, the company has to pay a premium of Rs. 6 per unit towards overtime labour. The premium so paid has been included in direct labour cost of Rs. 36,000 given above.

You are required to compute the break even period.

****

U15. (HOME-WORK) DKC

CHAPTER 14

MARGINAL COSTING

LEARNING OUTCOMES

- Explain the meaning and characteristics of Marginal Costing.
- Differentiate between Marginal Costing and Absorption Costing.
- Describe the meaning of CVP Analysis and apply the same in making short term managerial decisions.
- Describe the meaning and application of Break-even point, Margin of safety, Angle of incidence etc. and apply the same in making computations.
- Calculate and explain the various formulae used in CVP analysis.
- Apply the concepts of marginal costing and CVP analysis in short term decision making.

MARGINAL—COSTING 4/6

(HOME- WORK)

Q.NO-18

(EX NO (1))

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Example 1: Amav Ltd. produces 10,000 units of product Z by incurring a total cost of ₹3,50,000. Break-up of costs are as follows:

(i) Direct Material @ ₹10 per unit, ₹1,00,000,

(ii) Direct employee (labour) cost @ ₹8 per unit, ₹80,000

(iii) Variable overheads @ ₹2 per unit, ₹20,000

(iv) Fixed overheads ₹1,50,000 (upto a volume of 50,000 units)

In this example, if Arnav Ltd. wants to know marginal cost of producing one extra unit from the current production i.e. 10,001st unit. The marginal cost would be the change in the total cost due production of this 10,001st extra unit. The extra cost would be ₹20, as calculated below:

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	10
[illegible]	[illegible]	80,00[illegible]	8
(iii) Variable overheads @ ₹2 [illegible]	20,000	20,002	2
[illegible]	1,50,000	1,50,000	0
[illegible]	[illegible]	[illegible]	20

(Exno-2)
14.4

Page No.
Date

QNo-19

Example 2: Arnav Ltd. produces 10,000 units of product Z by incurring a total cost of ₹4,80,000. Break-up of costs are as follows:

(i) Direct Material @ ₹10 per unit, ₹1,00,000,

(ii) Direct employee (labour) cost @ ₹8 per unit, ₹80,000

(iii) Variable overheads @ ₹2 per unit, ₹20,000

(iv) Machine set up cost @ ₹1,200 for a production run (100 units can be manufactured in a run)

(v) Depreciation of a machine specifically used for production of Z ₹10,000

(iv) Apportioned fixed overheads ₹1,50,000.

Analysis of the costs:

In the example, the direct cost of producing 10,001st unit is 1,220 but it is not the marginal cost of producing one extra unit rather marginal cost of running one extra production run (batch).

Page No.
Date

ILL-1 19-11 Q NO-20
SAMPLE - DKC -

ILLUSTRATION 1

WONDER LTD. manufactures a single product, ZEST. The following figures relate to ZEST for a one-year period:

	50%	10
Sales and production (units)	400	
	3,20,000	
	1,60,000	

Selling and distribution costs:		
- Variable	1,60,000	3,20,000
- Fixed	2,40,000	2,40,000

The normal level of activity for the year is 800 units. Fixed costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted. There were no stocks of ZEST at the beginning of the year.

In the first quarter, 220 units were produced and 160 units were sold.

Required:

(a) What would be the fixed production costs absorbed by ZEST if absorption costing is used?
(b) What would be the under/over-recovery of overheads during the period?
(c) What would be the profit using absorption costing?
(d) What would be the profit using marginal costing?

REFER- MARGINAL VS ABSORPTION COSTING
CHAPTER @ DKC INTER BOOK - 3

Q no.21

QNo21

Example 3: ABC Ltd. manufacturing a single product, incurring variable costs of ₹ 300 per unit and fixed costs of ₹ 2,00,000 per month. If the product sells for ₹ 500 per unit, the breakeven point shall be calculated as follows;

EXNO (3)
14.18

S.P 500.00

V.P
300

CONTRIBUTION
(500-300) X 1000unit = 200000

FIXED COST
200000

PT
0

B.E.P = $\left(\frac{200000}{200}\right)$ = 1000 UNIT

420

ILLUSTRATION 2

ONO 22

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 is no beginning or ending inventories.

Required:

(i) Estimate breakeven sales level quantity and cash breakeven sales level quantity.

(i) S.P 37.50

V.P

17.50

CONTRIBUTION

$(37.50 - 17.50) \times 175000$ u/p $= 3500000$

FIXED COST = 3500000

PT

0

(ii) CASH - B.E.P - POINT

S.P 37.50 P.U

V.P

V.COST 17.50 P.U.

CONTRIBUTION

$(\quad - 17.50) \times$ (10000) $= 2000000$

CASH - FIXED COST

PROFIT

0

	Rs
TOTAL =	3500000
DEP =	1500000
	2000000

Q No-23

EX NO-(4)

Example 4: Arnav Ltd. 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.

Sales mix (in quantity) is 4 units of Product- J and 3 units of Product- K

i.e. Sales ratio is 4 : 3

(Avg- CONTRIBUTION- PER UNIT)

	J	K
S.P (P.U)		
V.P (1)		
CONT (P.U)	40·00	20·00
X RATIO	X 4	X 3
TOTAL CONTRIBUTION	= 160	60

Avg CONT. (P.U) = $\left(\frac{160+60}{4+3}\right)$

= 31.43

B.E.P = $\left(\frac{616000}{31.43}\right)$ = 19599.11 @ 19600

4 : 3

J

11200 Units

8400 Units

ILL-3 ONO-24

ILLUSTRATION 3

You are given the following particulars calculate:

(a) *Break-even point*

(b) *Sales to earn a profit of ₹ 20,000*

i. Fixed cost ₹ 1,50,000

ii. Variable cost ₹ 15 per unit

iii. Selling price is ₹ 30 per unit

B.E.P (POINTS)

S.P = 30.00

V.P 15.00

CONTRIBUTION (30-15) X 10000unit = 150000

FIXED COST 150000

P/L 0

EXP- SALES- FOR- REQD PL

S.P 30.00

V.P 15

CONTRIBUTION (30-15) X 11333.33 = 170000

FIXED COST 150000

P/L 20000

TU-4 QNo-95

ILLUSTRATION 4

A company has a P/V ratio of 40%. By what percentage must sales be increased to offset: 20% reduction in selling price?

PRESENT SALES = 100

V.COST 60% = 60

P.V.RATIO 40% = 40

PROPOSED S.P = 80

V.COST 60

CONTRIBUTION 20

SALES BE INCREASED TO OFFSET

S.P 100 − 20 = 80 + 80 = 160

V.C 60

CONT 20 + 20

NEW SALES = 160

OLD = 100

INC = 60

$\left(\frac{60}{100} \times 100\right) = 60\%$

Page No. | Date

• QN°-26

(III-5)

ILLUSTRATION 5

PQR Ltd. has furnished the following data for the two years:

	20X3	20X4
Sales	₹ 8,00,000	?
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 savings in the fixed cost in the year 20X4 due to the restructuring process. The company could maintain its sales quantity level of 20X3 in 20X4 by reducing selling price.

You are required to calculate the following:

(i) Sales for 20X4 in Value,

(ii) Fixed cost for 20X4,

(iii) Break-even sales for 20X4 in Value.

YEAR- 2003

SALES= 800000

B.E.P.(60%) X800000 = 480000

(40%) M.O.S X800000 = 320000

V.COST50% X480000 = 240000

CONTRIBUTION50% 480000 = 240000

50% V.COST X 320000 = 160000

50% CONTRIBUTION X 320000 = 160000

FIXED COST 240000 PL 0

FIXED COST 0 PL 160000

YEAR-2004

SALES 640000

B.E.P 78.125% X640000 = 500000

M.O.S 21.875% = 140000

V 62.5% X500000 =

CONT 37.5% X500000 = 187500

VCOST 62.5% X140000

CONT 37.5% X140000 = 52500

NO ENQU

SALES 100%

62.5% V.COST 240000 + 160000 = 400000

37.5% CONT 0

187500 0

52500

400000 62.5 X100

(9)

Question 27

Zed Ltd. manufactures two products P and Q and sells them at Rs. 215 and Rs. 320 per unit respectively. The variable costs per unit are as under:

	Product - P (Rs.)	Product - Q (Rs.)
Raw Materials:		
Material - X	22.00	28.00
Material - Y	8.00	32.00
Direct Wages (Rs. 6 per labour hour):		
Department - A	36.00	54.00
Department – B	18.00	36.00
Department – C	54.00	-
Department - D	-	72.00
Variable Overheads	23.00	14.30

The company procures raw materials against import license. The company operates at single shift a day of 8 hours for 300 days in a year. The number of workmen engaged are 30, 16, 18 and 24 in departments A, B, C and D respectively.

Neither the workers are subject to transfer from one department to another nor any new recruitment is possible at present. Fixed costs are Rs. 12,000 per month.

You are required to find out the following :

(a) The product-mix to yield maximum profit.

(b) The most profitable product if only one product is to be manufactured. Whether the answer will differ if license to import raw materials is released only for Rs. 1,80,000?

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Question 28

There are two products A and B. The selling prices, variable costs and machine hours required per unit are:

	A	B
Selling price (Rs.)	2.00	2.50
Variable cost (Rs.)	1.00	1.50
Machine hours	2	1

Find the more profitable product when plant capacity is limited.

Q No- (30) 29

A company manufactures four products. The cost data per unit are as under:

	A (Rs.)	B (Rs.)	C (Rs.)	D (Rs.)
Selling Price	90	71	100	86
Direct Materials	30	20	40	40
Direct Labour	24	18	30	12
Variable Overheads	12	9	15	6

The fixed costs are estimated at Rs.2,00,000 per month. The Compeny employs 250 direct workers, who work eight hours a day for 25 days a month. The direct wage rate is Rs.6 per hour. It is not possible for the company to increase its operation in the short run nor it is practicable to work overtime. The Company's policy does not allow sub-contracting of work.

The Marketing Director has forecast the following demand for a month:

Product	Units	Product	Units
A	5,500	C	6,250
B	5,000	D	8,250

The management desires you to revise the product mix in the following manner:

(a) To yield the maximum profit for the month.

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Ill-9 • QN°-31

ILLUSTRATION 9

A Ltd. Maintains margin of safety of 37.5% with an overall contribution to sales ratio of 40%. Its fixed costs amount to ₹ 5 lakhs.

Calculate the following:

i. *Break-even sales*
ii. *Total sales*
iii. *Total variable cost*
iv. *Current profit*
v. *New 'margin of safety' if the sales volume is increased by 7 ½ %.*

EXP SALES = 100% (1250000 × 100 / 62.5 = 2000000 ANS NO (ii))

B.E.P (62.5%) = (1250000 × 100 / 62.5)

(37.5%) M.O.S × 2000000 = 750000

(500000 × 100 / 40 = 1250000 ANS NO (i))

V.COST 60% × 1250000 = 750000 ANS NO (iii)

40% CONTRIBUTION = 500000

V.COST 60% · 750000 = 450000 (ANS (iii))

CONTRIBUTION (or) 750000 − 300000

FIXED COST = 500000

PL 0

FIXED COST − 300000 ANS NO (iv)

PL

(V) EXP SALES = (2000000 × 107.5%) = 2150000

B.E.P. 2000000

M.O.S 150000

ILLUSTRATION 10

By noting "P/V will increase or P/V will decrease or P/V will not change", as the case may be, state how the following independent situations will affect the P/V ratio:

(i) An increase in the physical sales volume;

(ii) An increase in the fixed cost;

(iii) A decrease in the variable cost per unit;

(iv) A decrease in the contribution margin;

(v) An increase in selling price per unit;

(vi). A decrease in the fixed cost;

(vii) A 10% increase in both selling price and variable cost per unit;

(viii) A 10% increase in the selling price per unit and 10% decrease in the physical sales volume;

(ix) A 50% increase in the variable cost per unit and 50% decrease in the fixed cost.

(x) An increase in the angle of incidence.

SOLUTION

Item no.	P/V Ratio	Reason
(i)	Will not change	
(ii)	Will not change	
(iii)	Will increase	
(iv)	Will decrease	
(v)	Will increase	
(vi)	Will not change	
(vii)	Will not change	Reasoning 1
(viii)	Will increase	Reasoning 2
(ix)	Will decrease	Reasoning 3
(x)	Will increase	Reasoning 4

A 10%increase in both selling price and variable cost per unit.

Reasoning 1. Assumptions: a) Variable cost is less than selling price.

b) Selling price ₹100 variable cost ₹ 90 per unit.

c) P/V ratio = $\frac{100-90}{100}$ = 10%

10% increase in S.P. = ₹110

10% increase in variable cost = ₹99

P/V ratio = = 10% i.e. P/v ratio will not change

Reasoning 2. Increase or decrease in physical sales volume will not change P/v ratio. Hence 10% increase in selling price per unit will increase P/V ratio.

Reasoning 3. Increase or decrease in fixed cost will not change P/V ratio. Hence 50% increase in the variable cost per unit will decrease P/V ratio.

Reasoning 4. Angle of incidence is the angle at which sales line cuts the total cost line. If it is large, it indicates that the profits are being made at higher

ONG-34

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ILLUSTRATION 12

M.K. Ltd. manufactures and sells a single product X whose selling price is ₹ 40 per unit and the variable cost is ₹ 16 per unit.

(i) If the Fixed Costs for this year are ₹ 4,80,000 and the annual sales are at 60% margin of safety, calculate the rate of net return on sales, assuming an income tax level of 40%

(ii) For the next year, it is proposed to add another product line Y whose selling price would be ₹ 50 per unit and the variable cost ₹ 10 per unit. The total fixed costs are estimated at ₹ 6,66,600. The sales mix of X : Y would be 7 : 3. At what level of sales next year, would M.K. Ltd. break even? Give separately for both X and Y the break-even sales in rupee and quantities.

EXP SALES FOR R200 PT = $\left(\frac{800000 \times 100}{40}\right)$ = 2000000

B.E.P. SALES (40%) $\left(\frac{480000 \times 100}{60}\right)$ = 800000

60% M.O.S. SALES X 2000000 = 1200000

V. COST 40% | 60% CONTRIBUTION = 480000 | 40% V COST X 1200000 = 480000 | 60% CONT X 1200000 = 720000

FIXED COST = 480000 | PT 0 | COST = 720000 PT

TAX 40% | 720000 - 288000 | P. A TAX 432000

NET RETURN ON SALES = $\left(\frac{\text{PROFIT AFTER TAX}}{\text{SALES}}\right) \times 100$

* X SP 40.00 = $\left(\frac{432000}{\quad}\right) \times 100$ = 21.6%

V.C = 24 | CONT = 16 | $\left(\frac{16}{40} \times 100\right) = 60\%$

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Avg-cont-(P.U)

	X	Y
S.P(P.U)	40.00	50.00
V.P (11)	(16.00)	(10.00)
CONT(11)	24.00	40.00
REQD RATIO	x 7	x 3
TOTAL CONT	= 168	= 120

$$\text{Avg-CONT-(P.U)} = \left(\frac{168 + 120}{7 + 3}\right)$$

$$= \underline{28.8}$$

$$\text{R.E.P} = \left(\frac{666600}{28.8}\right) = 23145.83$$

(X)	(Y)
7	3
16202.08	6943.74

ONE-35

ILLUSTRATION 13

X Ltd. supplies spare parts to an air craft company Y Ltd. The production capacity of X Ltd. facilitates production of any one spare part for a particular period of time. The following are the cost and other information for the production of the two different spare parts A and B:

Per unit	*Part A*	*Part B*
Alloy usage	*1.6 kgs.*	*1.6 kgs.*
Machine Time: Machine A	*0.6 hrs.*	*0.25 hrs.*
Machine Time: Machine B	*0.5 hrs.*	*0.55 hrs.*
Target Price (₹)	*145*	*115*

Total hours available: *Machine A 4,000 hours*
Machine B 4,500 hours

Alloy available is 13,000 kgs. @ ₹ 12.50 per kg.

Variable overheads per machine hours: *Machine A: ₹ 80*
Machine B: ₹ 100

Required

(i) Identify the spare part which will optimize contribution at the offered price.

(ii) If Y Ltd. reduces target price by 10% and offers ₹ 60 per hour of unutilized machinehour, what will be the total contribution from the spare part identified above?

STATEMENT SHOWING CONT- P.U.

	PART-A	PART-B
S.P (P.U)	145	115
V.P (1)		
Material	(20) (1.6kg X 12.50)	(20) (1.6kg X 12.50)
MACHINE-A	(48) (.60hm X 80)	(20) (.25hm X 80)
MACHINE-B	(50) (.50hm X 100)	(55) (.55hm X 100)
	27	20

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STATEMENT SHOWING CALCULATION OF LIMITING FACTOR

	PART-A	PART-B
MATERIALS	(13000 kg / 1.60 kg)	(13000 kg / 1.6 kg)
UNITS	= 8125 UNITS	= 8125 UNITS
MACHINE-A	(4000 hrs / .60 hrs)	(4000 hrs / .25 hrs.)
	= 6666.67 UNITS	= 16000 UNITS
MACHINE-B	(4500 hrs / .50 hrs)	(4550 hrs / .55 hrs)
	9000 UNITS	8181.82 UNITS

ANS NO (i)

STATEMENT SHOWING ANALYSIS OF MAXIMUM CONTRIBUTION

PRODUCTS	UNITS	×	CONT P.U	=	TOTAL
PART-A	6666	×	27	=	179982
PART-B	8125	×	20	=	162500

ANS NO (ii)

STATEMENT SHOWING REVISED CONT P.U

	PART-A	PART-B
CONT (P.U)	27.00	20.00
REDUCTION IN S.P	(14.50)	(11.50)
REVISED CONT (P.U)	(14.50) 12.50	8.50

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STATEMENT SHOWING UNUSED MACHINE HR.

	MACHINE		
PART 'A'	A	(4000 − (6666 × .6)	= .4 hr.
	B	(4500 − (6666 × .5)	= 1167.00
			1167.4
B	A	(4000 − (8125 × .25)	= 1968.75 hr
	B	(4500 − (8125 × .55)	= 31.25 "
			2000

STATEMENT SHOWING AN ANYSIS OF PR

	PART-A	PART-B
CONTRIBUTION	= 83325	= 69062.50
	(6666 × 12.50)	(8125 × 8.50)
HIRE-CHAR	= 70044	= 120000
	(1167.4 × 60)	(2000 × 60)
	153369	189062.50

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ILLUSTRATION 14

The profit for the year of R.J. Ltd. works out to 12.5% of the capital employed and the relevant figures are as under:

Sales	₹ 5,00,000
Direct Materials	₹ 2,50,000
Direct Labour	₹ 1,00,000
Variable Overheads	₹40,000
Capital Employed	₹ 4,00,000

The new Sales Manager who has joined the company recently estimates for next year a profit of about 23% on capital employed, provided the volume of sales is increased by 10% and simultaneously there is an increase in Selling Price of 4% and an overall cost reduction in all the elements of cost by 2%.

Required

Find out by computing in detail the cost and profit for next year, whether the proposal of Sales Manager can be adopted.

NOTIONAL SALES ₹ 500000

VARIABLE COST

CONTRIBUTION
(500000 - 390000)
= 110000

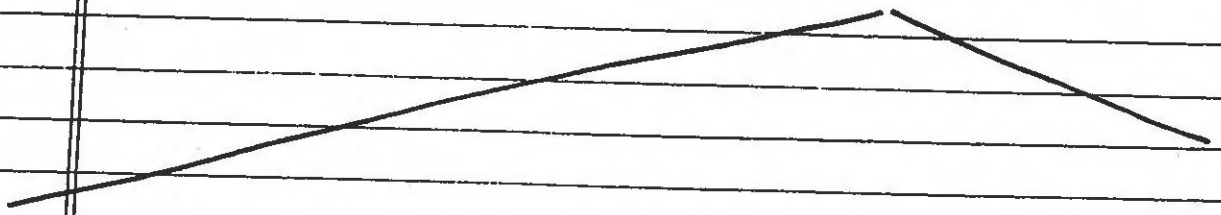
DMat 250000 | DLab 100000 | V.O 40000

FIXED COST
60000
(Bal-Fig)

PROFIT
50000
(400000 X 12.5%)

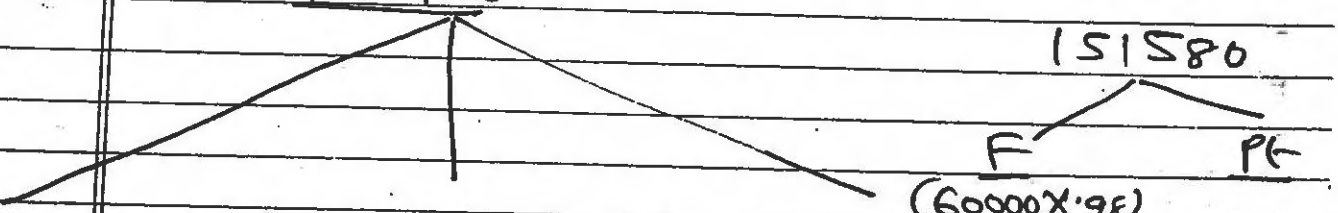
STATEMENT SHOWING COST & PROFIT THE NEXT YEAR

REVISED SALES (500000 × 110/-) = 550000
INC- IN PRICE 4% 22000
572000



VARIABLE COST 420420

CONTRIBUTION 151580



F (60000 × 98) = 58800

PF 92780

DIRECT MATERIAL (250000 × 1.1 × 98%) = 269500

DIRECT LABOUR (100000 × 1.1 × 1.08) = 4320

V.O (40000 × 1.1 × 98) = 107800

(%) PROFIT ON CAPITAL EMPLOYED = $100 \times \left(\frac{92780}{400000}\right)$

= 23.19%

SINCE THE PROFIT of 92780 IS MORE THAN 23% ON Capital employed the Proposal of

436

PRACTICAL QN – 1 QNO- Page No. Date 27

REFER- TOPIC – MARGINAL VS AB

Practical Questions

1. XYZ Ltd. has a production capacity of 2,00,000 units per year. Normal capacity utilisation is reckoned as 90%. Standard variable production costs are ₹11 per unit. The fixed costs are ₹3,60,000 per year. Variable selling costs are ₹3 per unit and fixed selling costs are ₹2,70,000 per year. The unit selling price is ₹20.

   In the year just ended on 30th June, 20X4, the production was 1,60,000 units and sales were 1,50,000 units. The closing inventory on 30th June was 20,000 units. The actual variable production costs for the year were ₹ 35,000 higher than the standard.

   (i) Calculate the profit for the year
   (a) by absorption costing method and
   (b) by marginal costing method.
   (ii) Explain the difference in the profits.

REFER- MARGINAL VS ABSORPTION COSTING @ DKC ENTER- CHAPTER – 4

QM.38

Q No-38 2. An Indian soft drink company is planning to establish a subsidiary company in Bhutan to produce mineral water. Based on the estimated annual sales of 40,000 bottles of the mineral water, cost studies produced the following estimates for the

	Total annual costs	Percent of Total Annual Cost which is Variable
Material	2,10,000	100%
Labour	1,50,000	80%
Factory Overheads	92,000	60%
Administration Expenses	40,000	35%

The Bhutanese production will be sold by manufacturer's representatives who will receive a commission of 8% of the sale price. No portion of the Indian office expenses is to be allocated to the Bhutanese subsidiary. You are required to

(i) Compute the sale price per bottle to enable the management to realize an estimated 10% profit on sale proceeds in Bhutan.

(ii) Calculate the break-even point in Ngultrum sales as also in number of bottles for the Bhutanese subsidiary on the assumption that the sale price is ₹ 14 per bottle.

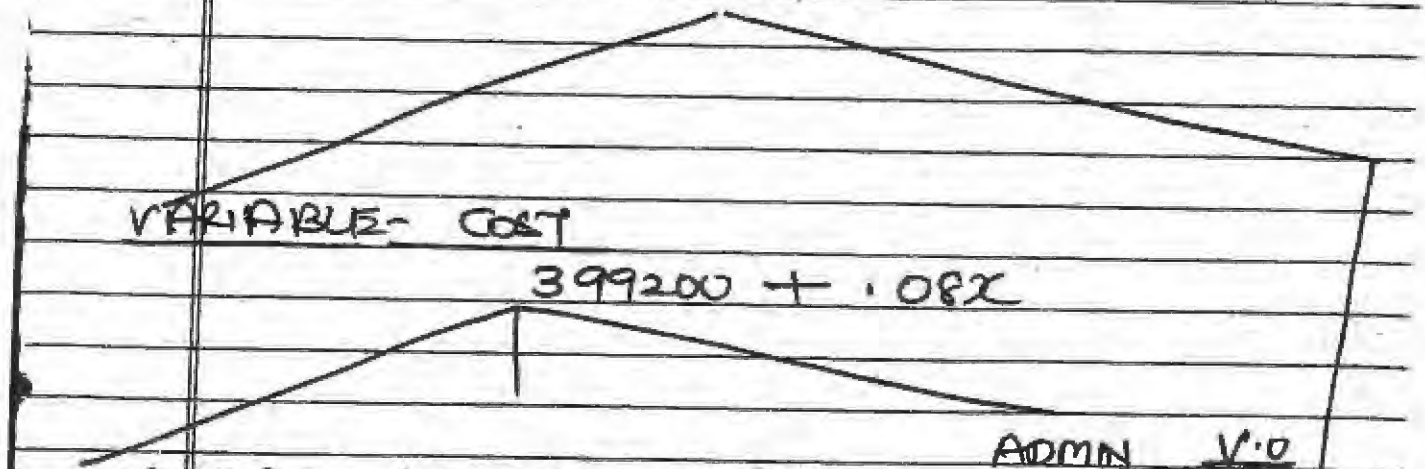
S.P (P.U) = $\frac{600000}{40000}$ = 15.00

$x = 399200 + .08x + 92800 + .10x$

$.82x = 492000$

$x = 600000$

SALES = x



VARIABLE COST

$399200 + .08x$

MATERIALS	LABOUR	F.O	ADMN G.H	V.O SUMM
210000	150000 X 80% = 120000	92000 X 60% = 55200	35% 40000 = 14000	.08x

92800

PROFIT

150000 X 20% = 30000

92000 X 40% = 36800

40000 X 65% = 26000

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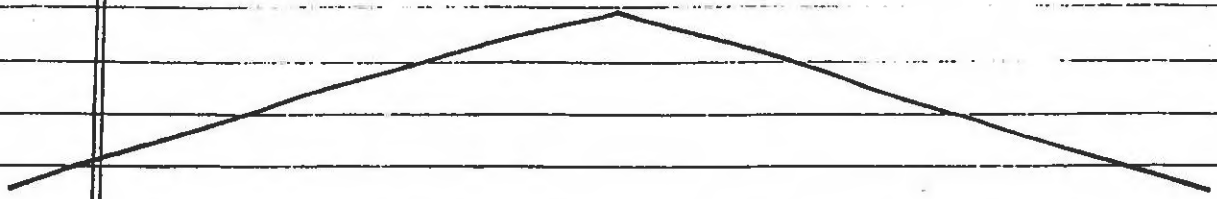
ON-39

B.E.P (POINTS)

S.P 14-00

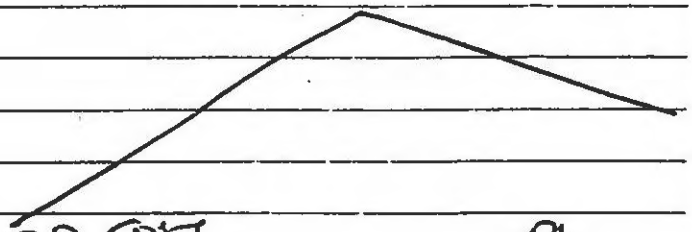


V.P

11.10

CONTRIBUTION

$(14-11.10) \times \frac{32000}{(UNITS)} = 92800$



FIXED COST	Pt
92800	0

B.E.P = Rs (32000 × 14) = 448000

VARIABLE COST

		Rs
MATERIAL	=	210000
Labour	=	120000
F.O	=	55200
ADMINOH	=	14000
COMMISSION (40000 × 14 × 8%)	=	44800
		444000
	÷	40000
	=	11.10

QNO-40

PRACTICAL QNO-3

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3. If P/V ratio is 60% and the Marginal cost of the product is ₹ 20. What will be the selling price?

S.P $\left(\frac{20}{40} \times 100\right) = 50.00$

V.P (40%) (60%) CONTRIBUTION

=20

Q NO-4 440

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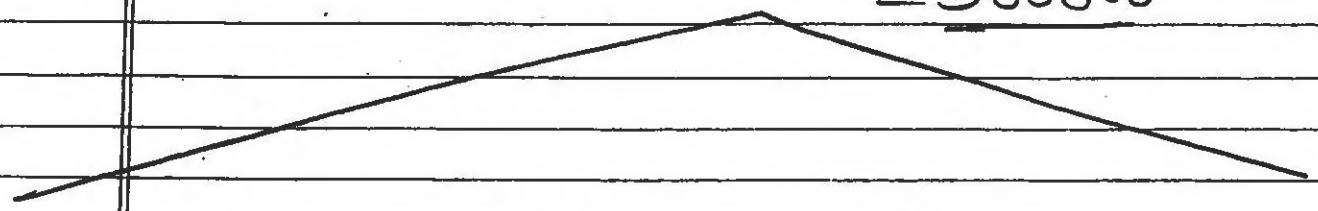
Date

PRACTICAL QNO-4

4. The ratio of variable cost to sales is 70%. The break-even point occurs at 60% of the capacity sales. Find the capacity sales when fixed costs are ₹ 90,000. Also compute profit at 75% of the capacity sales.

EXP SALES = $\frac{300000 \times 100}{60}$

= 500000

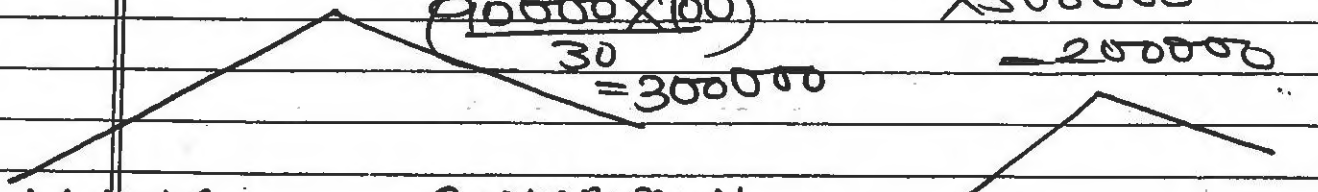


B.E.P. SALES (60%) (40%) M.O.SAFE.

$\frac{90000 \times 100}{30}$ = 300000

X500000

=200000

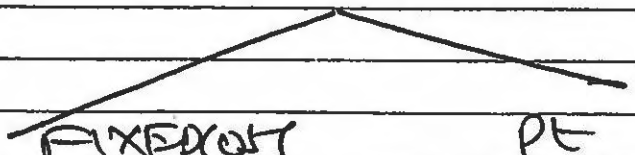


V.COST 70%

CONTRIBUTION 30% = 90000

VCOST 70% X200000 =140000

CONT 30% X200000 =60000



FIXED COST	PT	F	PT
90000	0	—	60000

UNO-42

PRACTICAL QN -(5)

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5.

			(₹)
(i)	Ascertain profit, when sales	=	2,00,000
	Fixed Cost	=	40,000
	BEP	=	1,60,000
(ii)	Ascertain sales, when fixed cost	=	20,000
	Profit	=	10,000
	BEP	=	40,000

EXP SALES = 200000

B.EP SALES 160000

M.O.S SALES 40000

V.COST 75% ×160000 120000

(25%) CONTRIBUTION = 40000

V.COST 75% 40000 = 30000

CONT 25% 40000 = 10000

FCOST 40000

PF 0

FCOST — PF 10000

P.V. RATIO = $\left(\frac{40000}{160000} \times 100\right)$ = 25%

EXP SALES = 60000

B.EP. = 40000

M.O.S. $\left(\frac{20000}{40000} \times 100\right)$ = 50%

PF = $\frac{20000 \times 10}{100}$ = 10%

V 50% F 20000 PF 0

V 50% F 0 PF = 10000

ONO-43

PRACTICAL-QNO-6

6. A company has three factories situated in 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:

(₹ in '000)

	Sales		Profit	
	Actual	Over/(Under) Budget	Actual	Over/(Under) Budget
North	1,100	(400)	135	(180)
East	1,450	150	210	90
South	1,200	(200)	330	(110)

(i) [illegible] (ii) break-even sales.

NORTH

000

	SALES	PROFIT
ACTUAL	1100	135
OVER/UNDER	(~~1000~~) 400	180
BUDGET	1500	315

P.V RATIO = $\left(\frac{315-135}{1500-1100}\right) = \left(\frac{180}{400}\right) \times 100$

= 45%.

VERIFICATION

ACTUAL SALES	BUDGET SALES = 1500
1100	
V.COST: 55%	V.COST: 55%/X150 = 825
CONT: 45%. X1100 = 495	CONT: 45%. X1500 = 675
FCOST: 360	FCOST: 360
PF: ~~360~~ 135	PF: 315

B.E.P = $\left(\frac{360}{45} \times 100\right) = 800$

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EAST

	SALES	PROFIT / LOV.
ACTUAL	1450	210
OVER/(UNDER)	(150)	(90)
	1300	120

VERIFICATION

ACTUAL 1450

V.COST — CONTRIBUTION

FIX COST — PF

BUDGET 1300

V COST — CONTRIBUTION

F COST — PF

P.V RATIO = $\left(\frac{210-120}{1450-1300}\right) \times 100 = \left(\frac{90}{150}\right) \times 100$

= 60%.

VERIFICATION

ACTUAL 1450

V COST — CONTRIBUTION

60% × 1450 = 870

EX FIX COST 660 — PF 210

BUDGET = 1300

V COST — CONTR

60% · 1300 = 780

F COST 660 — PF 120

B.E.P = $\left(\frac{\quad}{60}\right) \times 100$ = 1100

Q.NO 44 444

(PRACTICAL Q.NO-7)

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7. A company sells its product at ₹ 15 per unit. In a period, it produces and sells 8,000 units. It incurs a loss of ₹ 5 per unit. If the volume is raised to 20,000 units, it earns a profit of ₹ 4 per unit. Calculate break-even point both in terms of Value as well as in units.

	PERIOD (I)	PERIOD 2
SALES	= 120000 (8000 X 15)	= 300000 (20000 X 15)
PROFIT	(40000) (8000 X 5)	80000 (20000 X 4)

P.V. Ratio = $\left(\frac{120000}{180000}\right) \times 100 = 66.67\%$

VERIFICATION

Sales 120000 — V.Cost / CONT: 66.67% X 120000 = 80000 — F.Cost 120000 / PF. −40000

SALES = 300000 — V.Cost / CONT: 66.67% X 300000 = 200000 — F.Cost 120000 / PF 80000

B.E.P = $\left(\frac{120000}{66.67}\right) \times 100$

B.E.P (Units) = (180000 ÷ 15) = 12000 Unit

QNO-45

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8. The product mix of a Gama Ltd. is as under:

	Products	
	M	N
Units	54,000	18,000
Selling price	₹ 7.50	₹ 15.00
Variable cost	₹ 6.00	₹ 4.50

Find the break-even points in units, if the company discontinues product 'M' and replace with product 'O'. The quantity of product 'O' is 9,000 units and its selling price and variable costs respectively are ₹ 18 and ₹ 9. Fixed Cost is ₹ 15,000.

Avg-CONT- P.U

	N	O
S.P (P.U)	15.00	18
V.P (U)	(4.50)	(9)
CONT(U)	10.50	9.00
X Ratio		
18000 : 9000	X2	X1
2 : 1		
=	21.00	9.00
		=

Avg-CONT (P.U) = $\left(\frac{21+9}{2+1}\right)$ = 10.00

B.E.P = $\left(\frac{15000}{10}\right)$ = 1500

2 : 1

1000 : 500 Units

446

Q No 46

9. Mr. X has ₹ 2,00,000 investments in his business firm. He wants a 15 per cent return on his money. From an analysis of recent cost figures, he finds that his variable cost of operating is 60 per cent of sales, his fixed costs are ₹ 80,000 per year. Show computations to answer the following questions:

(i) What sales volume must be obtained to break even?

(ii) What sales volume must be obtained to get 15 per cent return on investment?

(iii) Mr. X estimates that even if he closed the doors of his business, he would incur ₹ 25,000 as expenses per year. At what sales would he be better off by locking his business up?

(i) B.E.P

SALES $\left(\frac{80000 \times 100}{40}\right) = 200000$

V. COST 60%

40% CONTRIBUTION = 80000

FIXED COST = 80000

PF 0

(ii) Expected Sales for Reqd Pt = $\left(\frac{110000 \times 100}{40}\right)$ = 275000

V COST

(40%) CONTRIBUTION = 110000

80000 FCost

PF

(200000 X 15%) = 30000

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SHUT DOWN POINT = $\left(\frac{80000 - 25000}{40}\right) \times 100$

$= 137500$

ENO-47

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Date

10. An automobile manufacturing company produces different models of Cars. The budget in respect of model 007 for the month of March, 20X5 is as under:

	40,000 Units ₹ In lakhs	₹ In lacs
Budgeted Output		
Net Realisation		700
Variable Costs:		
Materials	264	
Labour	52	
Direct expenses	124	440
Specific Fixed Cost	90	
Allocated Fixed	112.50	202.50
		642.50
		57.50
		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.

PRESENT SELLING PRICE P.U = 1750

(700 ÷ '40)

PRESENT VOLUME = 40000 UNITS

PROPOSED PRODUCTION

(40000 X '90) = 36000

PROPOSED SELLING PRICE P.U

(1750 X 1·10) = 1925

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STATEMENT SHOWING ANALYSIS OF PROFIT & LOSS.

Rs in lac.

REVISED SALES = 693
(36000 Unit × 1925)

V. COST

CONTRIBUTION = 297

(I) MATERIALS

$\frac{264 \times 36000}{40000} = 237.60$

FIXED COST	PROFIT
202.5	94.50

(II) Labour.

$\frac{52 \times 36000}{40000} = 46.80$

(III) DIRECT EXP

$\frac{129 \times 36000}{40000} = 111.60$

396

STATEMENT SHOWING REVISED VOLUME

SALES 1750 (P.U) (260 lacs)
584 44521. Unit

V. COST

Mater. = 660 × 1.10 = 726

CONTRIBUTION = 260

(1750 − 1166) =

	FIXED COST	PROFIT
1166	202.50	57.50

450

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(QNO-11) 14.47

QNO48

11. You are given the following data:

	Sales	Profit
Year 20X3	₹ 1,20,000	₹ 8,000
Year 20X4	₹ 1,40,000	₹ 13,000

Find out –

(i) P/V ratio,

(ii) B.E. Point,

(iii) Profit when sales are ₹1,80,000,

(iv) Sales required earn a profit of ₹12,000,

(v) Margin of safety in year 20X4.

ANS NO (i)

P.V. Ratio = $\left(\frac{\text{change in Pt}}{\text{change in Sales}} \times 100\right)$

25% = $\left(\frac{5000}{20000}\right) \times 100$

VERIFICATION :-

20X3

SALES = 120000

V. COST 75% × 120000 = 90000

CONT = 30000

FIX EXP COST 22000

PT 8000

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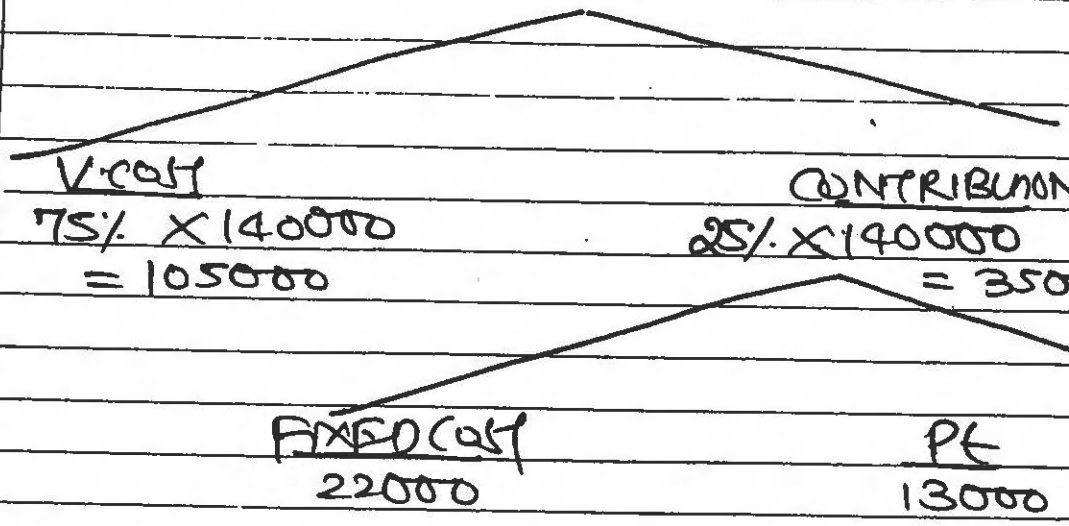
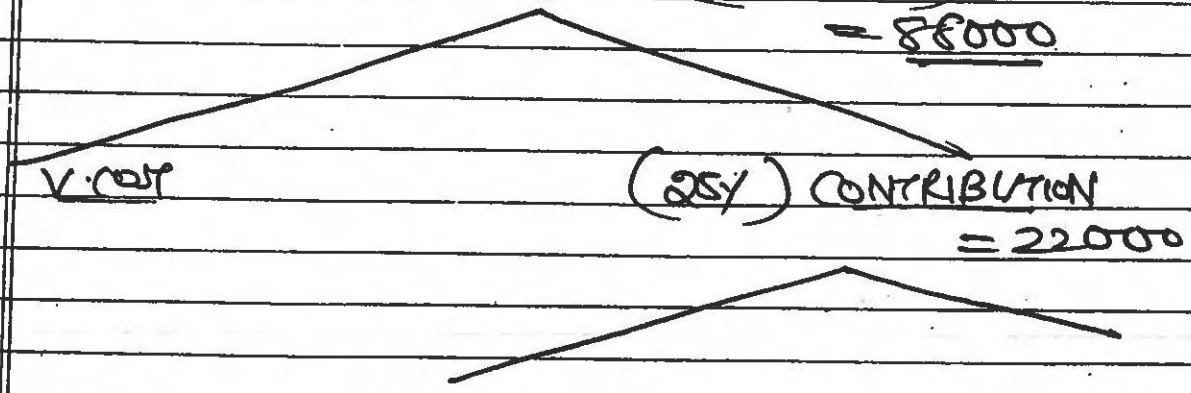
20X4

SALES = 140000



ANS NO (ii)

B.E.P $\left(\frac{22000}{25} \times 100\right)$ = 88000



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ANS NO (iii)

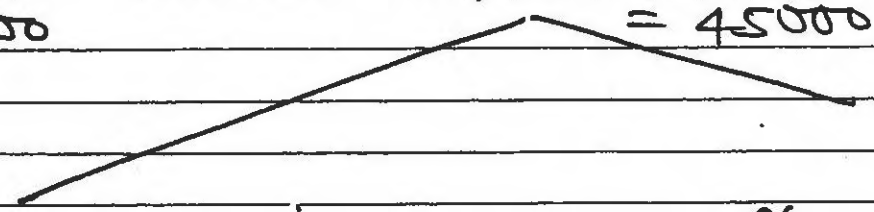
EXP-SALES = 180000

V. COST

75% × 180000
= 135000

CONTRIBUTION

25% × 180000
= 45000



FIXED COST
22000

PF
23000

ANS NO (iv)

EXP-SALES = $\frac{34000 \times 100}{25}$ = 136000

V. COST

25% CONTRIBUTION = 34000

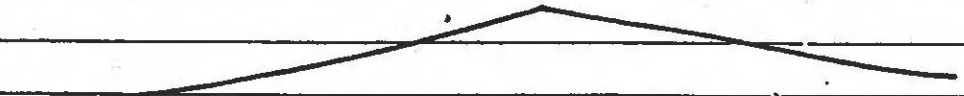
FCOST
22000

PF
12000

2004 20X4

ANS NO (v)

EXP-SALES = 140000



B.EP
88000

M.O.S
52000

• QNO-19

Page No.

12. A single product company sells its product at ₹ 60 per unit. In 20X3, the company operated at a margin of safety of 40%. The fixed costs amounted to ₹ 3,60,000 and the variable cost ratio to sales was 80%.

In 20X4, it is estimated that the variable cost will go up by 10% and the fixed cost will increase by 5%.

(i) Find the selling price required to be fixed in 20X4 to earn the same P/V ratio as in 20X3.

(ii) Assuming the same selling price of ₹ 60 per unit in 20X4, find the number of units required to be produced and sold to earn the same profit as in 20X3.

QNO-12

EXP- SALES- FOR- REQD PT =

$\left(\frac{1800000}{60} \times 100\right)$

= 3000000

(60%) B.E.P. $\left(\frac{360000}{20} \times 100\right)$

= 1800000

40% M.O.S.

× 3000000 = 1200000

V. COST 80% × 1800000 = 1440000

20% CONTRIBUTION = 360000

80% V. COST 1200000 = 960000

20% CONT × 120000 = 240000

FIXED COST	PT
= 360000	0

F COST	PT
–	240000

V. COST (P.U)	
(60 × 80%)	48
INC-BY (10%)	4.80
	52.80
FIXED COST	360000

378000

ANS NO (i)

S.P $\left(\frac{52.80}{80} \times 100\right) = 66.00$

V.P 80% = 52.80

CONTRIBUTION 20%

EXP SALES FOR REQD PROFIT

S.P 60.00

V.P 52.8

CONTRIBUTION $(60-52.80) \times 85833.33 = 618000$

FIXED COST 378000

PF 240000

N = 85833.33 X S94 85834

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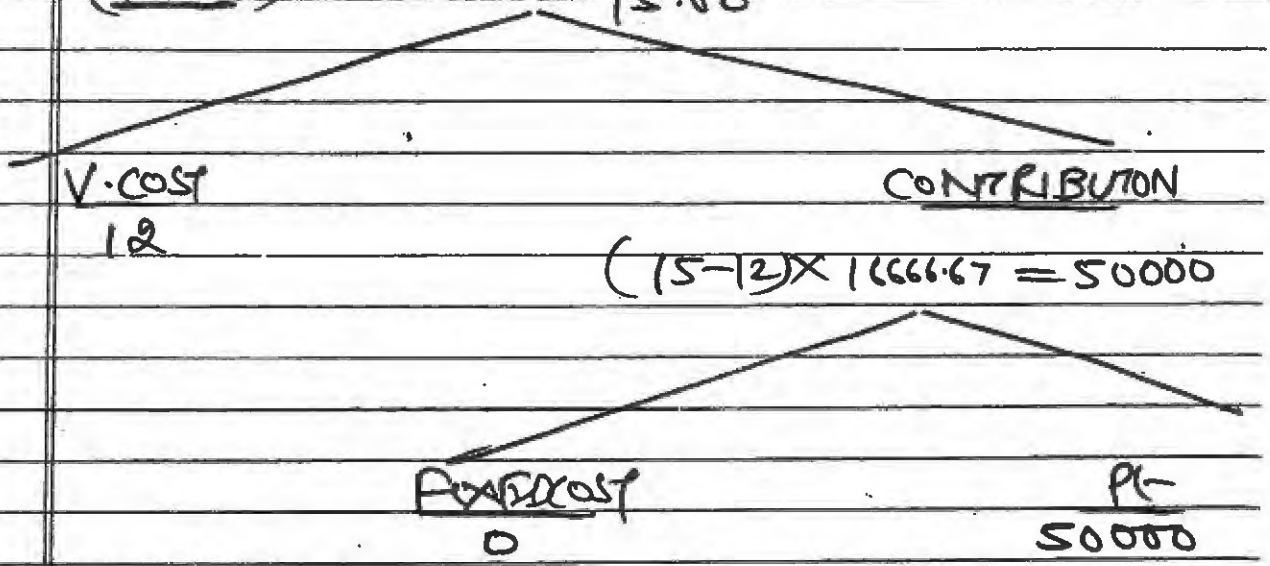
• QNO 50

13. A company has made a profit of ₹ 50,000 during the year 20X3-X4. If the selling price and marginal cost of the product are ₹ 15 and ₹ 12 per unit respectively, find out the amount of margin of safety.

EXP SALES – FOR REQD PT

(M.O.S) =



16666.67 UNIT

Rs (16666.67 X 15) = 250000

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• QNO-5]

14. (a) If margin of safety is ₹ 2[illegible]0,000 (40% of sales) and P/V ratio is 30% of AB Ltd, calculate its (1) Break even [illegible]les, and (2) Amount of profit on sales of ₹9,00,000.

(b) [illegible] Ltd has earned a contribution of ₹2,00,000 and net profit of ₹1,50,000 of sale of ₹ [illegible]. Calculate margin of safety?

ANS NO (a) (1)

EXP SALES FOR PROFIT = $\frac{240000 \times 100}{40}$ = 600000

B.E.P (60%) X 600000 = 360000

(40%) M.O.S = 240000

V.COST (70%) X 360000 = 252000

CONTRIBUTION (30%) X 360000 = 108000

70% V.COST X 240000 = 168000

30% CONT X 240000 = 72000

FIXED COST	PT	F COST	PT
108000	0	—	168000

(a) (2) EXP SALES = 900000

V.COST 70% X 900000 = 630000

CONTRIBUTION 30% X 900000 = 270000

FIX EXP COST	PT
[illegible]	[illegible]

QNo-52

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ANSNO(b)

FIXP-SALES =

B.E.P

M.O.S

$\frac{150000 \times 100}{25} = 600000$

75% V.COST 25% CONT 150,000

V.COST 75% CONTRIBUTION 25%

FIXED COST PT

F.COST 0 PT 150,000

NOENU(1) SALES = 800000

V.COST CONTRIBUTION 200000

P.V. RATIO = $\frac{200000 \times 100}{800000}$

= 25% 600,000 150000.

458

• Q No 9-53

15. [redacted] expenses of ₹ 4,50,000, with sales of ₹ 15,00,000 during the first half year. In the second half it

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.

EXP SALES = 1500000

V-COST

CONTRIBUTION = 750000

FIXED COST = 450000

PT = 300000

ANS NO (i)

P.V. RATIO = $\left(\frac{750000}{1500000} \times 100\right)$ = 50%.

EXP SALES = 1500000

B.E.P. SALES $\left(\frac{450000 \times 100}{50}\right)$ = 900000

ANS NO (iii)

M.O.S SALES

ANS NO (ii) = 600000

V.COST (50%) CONT = 450000

50% 600000

V.COST 50% 600000

CONT

PT

ANS NO (ii)

IND HALF YEAR

EXP SALES = $\frac{(300000 \times 100)}{50}$

= 600000

V-COST 50%.

CONTRIBUTION 50% = 300000

FIXED COST = 450000

PL = -150000

ANS NO (iii)

FULL-YEAR

EXP SALES = 2100000

B.E.P SALES $\frac{(900000 \times 100)}{50}$ = 1800000

M.O.S. SALES = 300000

V.COST (50%) CONT = 900000

$\frac{(50000 \times 100)}{50}$

V.COST 50% CONT = 150000

(150000 + 750000) = 900000

(300000 - 150000) = 150000

ONC-54

16. The following information is given by Star Ltd.:

Margin of Safety	₹ 1,87,500
Total Cost	₹ 1,93,750
Margin of Safety	3,750 units
Break-even Sales	1,250 units

Required :

Calculate Profit, P/V Ratio, BEP Sales (in ₹) and Fixed Cost.

EXP SALES = 5000 UNITS $\left(\frac{187500 \times 5000}{3750}\right)$ = 250000

B.E.P (1250 UNITS)

Rs = $\left(\frac{250000 \times 1250}{5000}\right)$ = 62500

(3750 UNITS)

M.O.S

Rs. = 187500

V. COST

(25%) CONTRIBUTION = 18750

VCOST (30%) CONT

– * 56250

FXD COST 18750

PT –

FCOST PT

— = 56250

* (250000 – 193750)

=

* $\left(\frac{56250}{187500}\right) \times 100$ = 30%.

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ON 56

18. The following are cost data for three alternative ways of processing the clerical work for cases brought before the LC Court System:

	A Manual (₹)	B Semi-Automatic (₹)	C Fully-Automatic (₹)
Monthly fixed costs:			
Occupancy	15,000	15,000	15,000
Maintenance contract	---	5,000	10,000
Equipment lease	---	25,000	1,00,000
Unit variable costs (per report):			
Supplies	40	80	20
Labour	₹200 (5 hrs × ₹40)	₹60 (1 hr × ₹60)	₹20 (0.25 hr × ₹80)

Required

(i) Calculate cost indifference points. Interpret your results.

(A) MANUAL VS SEMIAUTOMATIC

NO OF UNITS = X

$240X + 15000 = 140X + 45000$

$100X = 30000$

$X = 3000$ UNITS.

B MANUAL VS C-FULLY AUTOMATIC

$140X + 45000 = 120X + 125000$

$40X = 80000$

$X = 2000$ UNITS

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A & C

~~240x + 15000 = 40x + 125000~~

$240x + 15000 = 40x + 125000$

$200x = 110000$

$x = 550$ CNIL.

DECISION :-

463

QNO-57

19. XY Ltd. makes two products X and Y, whose res[illegible] and [illegible] You [illegible] given that the unit contribution of [illegible] of X, that the total of F_1 and F_2 is [illegible] of X F_2 is not considered) and th[illegible] X and Y. (i.e. X and Y make equal [illegible] respective fixed costs). There is no inventory build up as whatever is produced is sold.

Required .

Find out the values F1 and F2 and units contributions of X and Y.

B.E.P (X) = 1800 Units

GIVEN :-

PRODUCT 'X'

B.E.P

SP

V.P

CONTRIBUTION C X

FCost PE

F1 → 1800 CX 0

PRODUCT - Y

V.P

1800 C CONTRIBUTION

FCost PE

F1 + F2 = 150000 (FIXED COST)

B.E.P 'X' = 1800 UNITS

INDIFF POINT = 3000 UNITS

F1 = 1800Cx

F2 = 150000 - 1800Cx

EQUAL PROFIT = 3000 UNITS

3000Cx - F1 = 3000 x .8Cx - F2

3000Cx - F1 = 2400Cx - F2 (INDIFF)

CONT- FCOST = CONT- PROF.

3000Cx - 1800Cx = 2400Cx - 150000 + 1800Cx

3000Cx - 1800x = 2400Cx - 150000 + 1800Cx

1200Cx = 4900x - 150,000

-3000x = -150,000

x = 50

FIXED COST OF x = (1800 x 50) = 90000

FIXED COST y = (150000 - 90000) = 60000

x S.P = 50

y = S.P (50 x 80%) = 40

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VERIFICATION

X = [redacted]

B.E.P. M.O.S

V.COST CONT

V.COST CONTRIBUTION

50X1800 = 90000

Fcost Pt

FIX COST Pt

90000 0

Y

B.E.P M.OS

(4/5 X)

CONTRIBUTION

V.con V.con CONT

(50X80%) = 40 X 1500

= 60000

Pt F PF

COST 0

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INDIFF POINT

$X = Y \rightarrow 3000$ units

$50X - 90000 = 40X - 60000$

$10X = 30000$

$X = 3000$

EQUAL - PROFIT = 3000 units

	X	Y
CONTRIBUTION	(3000 X 50) = 150000	(3000 X 40) = 120000
FIXED	(90000)	(60000)
PROFIT	60000	60000

1.8 SHUT DOWN & DIVESTMENT

Question 58

G Ltd. produces and sells 95,000units of 'X'in a year at its 80% production capacity.The selling price of product is Rs.8 per unit. The variable cost is 75% of sales price per unit. The fixed cost is Rs 3,50,000. The company is continuously incurring losses and management plans to shut-down the plant. The fixed cost is expected to be reduced to Rs. 130000 additional cost of plant shut down are expected at Rs 15,000.

Should the plant be shut-down? What is the capacity level of production of shut-down point?

Question 59

Universe Ltd. manufactures 20,000 units of 'X' in a year at its normal production capacity. The unit cost as to variable costs and fixed costs at this level are Rs.13 and Rs.4 respectively.

Due to trade depression, it is expected that only 2,000 units of 'X' can be sold during the next year. The management plans to shut-down the plant. The fixed costs for the next year then is expected to be reduced to Rs.33,000. Additional costs of plant shut-down are expected

to be Rs.12,000. Should the plant be shut-down? What is the shut-down point if selling price per unit is Rs20.?

Question 60

A paint manufacturing company manufactures 2,00,000 per annum medium-sized tins of "Spray Lac Paints" when working at normal capacity. It incurs the following costs of manufacturing per unit :

	Rs.
Direct material	7.80
Direct labour	2.10
Variable overhead	2.50
Fixed overhead	4.00
Product cost (per unit)	16.40

Each unit (tin) of the product is sold for Rs. 21 with variable selling and administrative expenses of 60 paise per tin.

During the next quarter only 10,000 units can be produced and sold. Management plans to shut down the plant estimating that the fixed manufacturing cost can be reduced to Rs.74,000 for the quarter.

When the plant is operating, the fixed overheads are incurred at a uniform rate throughout the year. Additional costs of plant shut-down for the quarter are estimated at Rs. 14,000.

You are required :

(a) To express your opinion, along with the calculations, as to whether the plant should be shut down during the quarter, and

(b) To calculate the shut down point for quarter in units of product (i.e. in terms of number of tins).

Question 61

Supreme Ltd., which manufactures the component EXCEL, has achieved a turnover of Rs.6,00,000 for the calendar year 2002. The Manager of the company has informed that the company has worked at a profit volume ratio of 25% and margin of safety of 20%. But he feels due to severe competition, the selling price is to be reduced to maintain the same volume of sales for the year 2003. He does not expect any change in variable costs. He expects that due to cost reduction programme, the profit volume ratio and margin of safety will be 20% and 30% respectively and considerable saving in Fixed cost for 2003.

Even if the company prefers to shut down its operations for 2003, it expects to incur a minimum fixed cost of Rs. 60,000. You are expected to:

(I) Present the comparative statement for the year 2002 and 2003 showing under marginal costing.

(II) What will be minimum sales required, if it decides to shut down its unit in 2003?

Question : 62

	Rs.
Fixed Expenses @ 50% activity	15,000
Fixed Expenses when factory is shut down	10,000
Additional Expenses is closing down	1,000

Production @ 50% activity = 5,000 units

Contribution per unit Rs.1

From the above information find out the shut down point

Question 63

In 19x1, the turnover of a company, which operated at a margin of safety of 25% amounted to Rs. 9,00,000 and its profit volume ratio was 33 1/3 %. During 19x2, the company estimated that although the same volume of sales as in 19x1 would be maintained, the sales value would go down due to decrease in selling price. There will be no change in variable costs. The company proposes to reduce its fixed costs through an intensive cost reduction programme. These changes will alter the profit volume ratio and margin of safety to 30% and 40% respectively in 19x2.

Even if the company closed down its operations in 19x2, it would incur a minimum fixed cost of Rs. 50,000.

Require :

(i) Present a comparative statement indicating the sales, variable costs, fixed costs and profit for 19x1 and 19x2.

(ii) At what minimum sales will the company be better off by locking up in business in 19x2?

CHAPTER – 15

BUDGETING CONTROL

Question 1

A single product company estimated its sales for the next year quarter wise as under:

Quarter	Sales (Units)
I	30,000
II	37,500
III	41,250
IV	45,000

The opening stock of finished goods is 10,000 units & the company expects to maintain the closing stock of finished goods at 16,250 units at the end of the year. The production pattern in each of the year. The production pattern in each quarter is based on 80% of the sales of the current quarter & 20% of the sales of the next quarter.

The opening stock of raw materials in the beginning of the year is 10,000 kg. & the closing stock at the end of the year is required to be maintained at 5,000 kg. Each unit of finished output requires kg. of raw materials.

The company proposes to purchase the entire annual requirement of raw materials in the first three quarter in the proportion & at the prices given below:

Quarter	Purchase of raw materials % to total annual requirement In quantity	Price per kg.
I	30%	2
II	50%	3
III	20%	4

The value of opening stock of raw materials in the beginning of the year is Rs. 20,000. You are required to present the following for the next year, quarterwise:

(i) Production budget (in units).

(ii) Raw material consumption budget (in quantity)

(iii) Raw material purchase budget (in quantity & value)

(iv) Priced Stores ledger card of the raw material using First in First out method.

Question 2

A company manufactures three products namely A,B & C. The current pattern of sales of A,B & C is in the ratio of 8:2:1 respectively. The relevant data are as under:

VZProducts	A	B	C
Selling price per unit Rs.	130	230	417
Raw Materials per unit kg.	0.50	1.2	2.5
Direct Materials per unit kg	0.25	-	-
Skilled labour hours/unit	4	6	8
Semi-skilled labour hours per unit	2	2	3
Variable overheads Rs. Per unit	20	40	80

The prices of raw materials & direct materials respectively are Rs. 100 & Rs. 40 per kg. The wage rates of skilled & semi skilled labour respectively are Rs. 6& Rs. 5. Each operator works 8 hours a day for 25 days in a month.

The position of inventories are as under:

	Raw Materials Kg.	Direct Materials Kg.	A Units	B Units	C Units
Opening	600	400	400	100	50
Closing	650	260	200	300	50

The fixed overheads amount to Rs. 2,00,000 per month and the company desires a profit of Rs. 1,20,000 per month.

You are required to prepare the following for a month:

(i) Sales budget in quantity & value.

(ii) Production budget showing the quantity to be manufactured.

(iii) Purchase budget showing the quantity & value.

(iv) Direct labour budget showing the number of workers & wages.

Question 3

A company is engaged in the manufacture of specialized sub-assemblies required for certain electronic equipment's. The company envisages that in the forthcoming month, December, 1998, the sales will take a pattern in the ratio of 3:4:2 respectively of subassemblies, ACB, MCB & DP.

The following is the schedule of components required for manufacture :

DKC

Sub-assembly	Selling Price	Component requirements			
		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		Rs. 60	20	12	8

The direct labour time & variable overheads required for each of the sub-assemblies are:

	Labour Hours per sub-assembly		
	Grade A	Grade B	Variable overheads per sub-assembly
			Rs.
ACB	8	16	36
MCB	6	12	24
DP	4	8	24
Direct wage rate per hour Rs.	5	4	--

The labourers work 8 hours a day for 25 days a month.

The opening stocks of sub-assemblies and components for December,2016 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 Rs. 7,57,200 for the month and a monthly profit target of Rs. 12 lacs has been set.

The company is eager for a reduction of closing inventories for December, 2016 of sub-assemblies and components by 10% of quantity as compared to te opening stock. Prepare the following budgets for December 2016:

(i) Sales budget in quantity and value.

(ii) Production budget in quantity.

(iii) Component usage budget in quantity.

(iv) Component purchase budget in quantity & value.

(v) Manpower budget showing the number of workers and the amount of wages payable.

Question 4

A Company manufactures two Products A & B by making use of two types of materials, viz., X & Y. Product A requires 10 units of X & 3 units of Y. Product B requires 5 units of X & 2 units of Y. The price of X is Rs. 2 per unit & that of Y is Rs. 3 per unit. Standard hours allowed per product are 4 & 3, respectively.Budgeted wages rate is Rs. 8 per hour. Overtime premium is 50% & is payable, if a worker works for more than 40 hours a week. There are 150 workers.

The Sales Manger has estimated the sales of Product A to be 5,000 units & Product B 10,000 units. The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct worker in actually manufacturing the product is 80%, in addition, the non-productive downtime is budgeted at 20% of the productive hours worked. There are twelve 5 days weeks in the budget period & it is anticipated that sales & production will occur evenly throughout the whole period.

It is anticipated that the stock at the beginning of the period will be:

Product A 800 uits; Product B 1,680 units. The targeted closing stock expressed in terms of anticipated activity durig the budget period are Product A 12 days sales; Product B 18 days sales. The opening and closing stock of raw material of X & Y will be maintained according to requirement of stock position for Product A & B.

You are required to prepare the following for the next period:

(i) Material usage & Material purchase budget in terms of quantities & values.

(ii) Production Budget

(iii) Wages budget for the direct workers

Question 5

A factory which expects to operate 7,000 hours, i.e., at 70% level of activity, furnishes details of expenses as under:

Variable expenses	Rs. 1,260
Semi-Variable Expenses	Rs. 1,200
Fixed Expenses	Rs. 1,800

The semi-variable expenses go up by 10% between 85% & 95% activity & by 20% above 95% activity. Construct a flexible budget for 80, 90 & 100 percent activities.

Question 6

A department of Company X attains sale of R. 6,00,000 at 80 percent of its normal capacity and units expenses are given below:

Administration costs:	**Rs.**
Office Salaries	90,000
General Expenses	2 percent of sales
Depreciation	7,500
Rates & Taxes	8,750

Selling Costs:	
Salaries	8 percent of sales
Travelling Expenses	2 percent of sales
Sales office expenses	1 percent of sales
General Expenses	1 percent of sales
Distribution costs:	
Wages	15,000
Rent	1 percent of sales
Other Expenses	4 percent of sales

Draw up flexible administration, selling & distribution costs budget, operating at 90 percent, 100 percent & 110 percent of normal capacity.

Question 7

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 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 & 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 bonus of Rs. 88.50 for the month of January. The Workers Manager wonders how any one can claim a bonus when the Company has lost a sizeable contract.

The relevant figures are as under:

Indirect manufacturing Costs	Expenses for a normal month	Planned for January	Actual in January
	Rs.	Rs.	Rs.
Salary of foreman	1,000	1,000	1,000
Indirect Labour	720	900	600
Indirect Material	800	1,000	700
Repairs & Maintainence	600	650	600
Power	800	875	740
Tools consumed	320	400	300
Rates & 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 & figures.

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CHAPTER 15

BUDGET & BUDGETARY CONTROL

LEARNING OUTCOMES

- ❒ State the meaning and essentials of budget.
- ❒ Discuss the objectives and importance of budget and budgetary control.
- ❒ Describe the process of preparing budgets.
- ❒ List the different types of budgets.
- ❒ Differentiate between fixed and flexible budget.
- ❒ Prepare fixed and flexible budget.

CHAPTEROVERVIEW

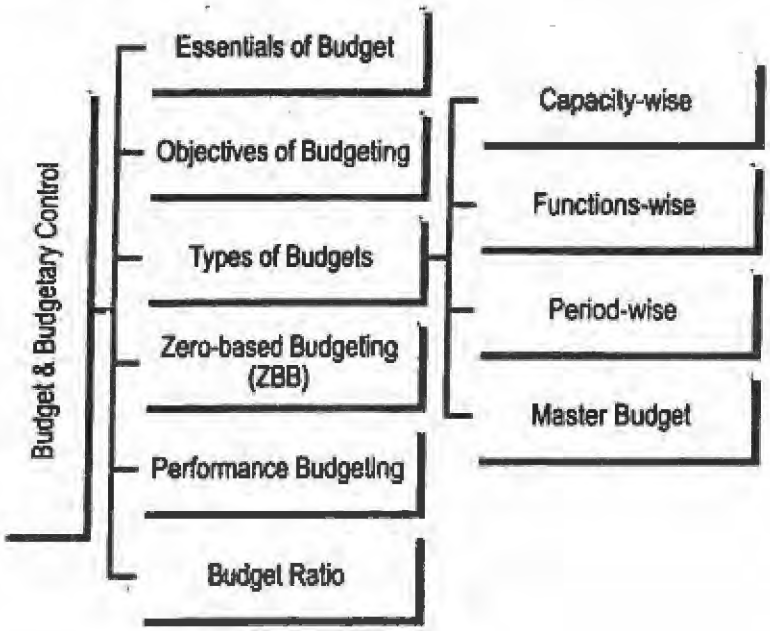

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ILLUSTRATION 3 Q No-10

Action Plan Manufacturers normally praduce 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.

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ILLUSTRATION 4

A single product company estimated its sales for the next year quarter-wise as under:

Quarter	Sales (Units)
I	30,000
II	37,500

III	41,250
IV	45,000

The opening stock of finished goods is 10,000 units and the company expects to maintain the closing stock of finished goods at 16,250 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 10,000 kg. and the closing stock at the end of the year is required to be maintained at 5,000 kg. Each unit of finished output requires 2 kg. of raw materials.

The company proposes to purchase the entire annual requirement of raw materials in the first three quarters in the proportion and at the prices given below:

Quarter	Purchase of raw materials as % to total annual requirement in quantity	Price per kg. (₹)
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 ₹ 20,000. 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.

ILLUSTRATION 5 ON 12 479

A company is engaged in the manufacture of specialised sub-assemblies required for certain electronic equipment. 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 sub-assemblies, ACB, MCB and DP.

The following is the schedule of components required for manufacture:

Sub-assembly	Selling Price	Component requirements			
		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 sub-assemblies and components by 10% of quantity as compared to the opening stock.*

Prepare the following budgets for December 20X2:

(a) *Sales budget in quantity and value.*

(b) *Production budget in quantity*

(c) *Component usage budget in quantity.*

(d) *Component purchase budget in quantity and value.*

(e) *Manpower budget showing the number of workers and the amount of wages payable.*

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ILLUSTRATION 6

Floatglass 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*

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STATEMENT SHOWING MASTER BUDGET

		Rs
SALES	(NOTE NO 1)	800000
COST OF PRODUCTION	(NOTE NO 2)	(574000)
GROSS PROFIT		226000
ADMIN & SELLING O·H	(NOTE NO 3)	(36000)
		190000

NOTE NO (1)

SALES :-

	Rs.
TOUGHNED GLASS	600000
BENT- GLASS	200000
	800000

NOTE NO (2) COST OF PRODUCTION

DIRECT MATERIAL	(60% X 800000)	480000
DIRECT LABOUR	(20 X 150 X 12) =	36000
DIRECT EXP		—
	PRIME COST	516000
INDIRECT COST		
FACTORY O·H.		—
(1) INDIRECT LABOUR	(	
(2) WORKS MANAGER	(500 X 12) =	6000
(3) FOREMAN	(400 X 12) =	4800
(4) STORES & SPARES		20000
(5) DEP ON MACHINE		12600
(6) LIGHT & POWER		3000
(7) REP & MAINT		8000
(8) OTHER SUND.	(10% X 36000)	3600
		58000
		574000

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ILLUSTRATION 7

Following data is available for DKG and Co:

Standard working hours	*8 hours per day of 5 days per week*
Maximum capacity	*50 employees*
Actual working	*40 employees*
Actual hours expected to be worked per four week	*6,400 hours*
Std. hours expected to be earned per four weeks	*8,000 hours*
Actual hours worked in the four- week period	*6,000 hours*
Standard hours earned in the four- week period	*7,000 hours.*

The related period is of 4 weeks. In this period there was a one special day holiday due to national event. Calculate the following ratios:

(1) Efficiency Ratio, (2) Activity Ratio, (3) Calendar Ratio, (4) Standard Capacity Usage Ratio, (5) Actual Capacity Usage Ratio. (6) Actual Usage of Budgeted Capacity Ratio.

MAXIMUM CAPACITY IN BUDGET PERIOD

(50 EMPLOYEES X 8 HR X 5 DAYS X 4 WEEKS) = 8000

BUDGET HRS.

(40 EMPLOYEES X 8 HR X 5 days X 4 WEEKS) = 6400

ACTUAL HRS. = 6000 HR.

STANDARD HRS FOR ACTUAL PRODUCTION = 7000

BUDGET - DAYS

(4 WEEKS X 5 DAYS) = 20

ACTUAL DAYS (20 - 1) = 19

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STATEMENT SHOWING RATIO

(1) EFF-RATIO = $\left(\frac{\text{STANDARD HR.}}{\text{ACTUAL HR}}\right) \times 100$

$116.67 = \left(\frac{7000}{6000} \times 100\right)$

(2) ACTIVITY RATIO = $\left(\frac{\text{STANDARD HR.}}{\text{BUDGETED HR}}\right) \times 100$

$109.37\% = \left(\frac{7000}{6400} \times 100\right)$

(3) Calendar RATIO = $\left(\frac{\text{AVAILABLE WORKING DAYS}}{\text{BUD-WORKING DAYS}}\right) \times 100$

$95\% = \left(\frac{19}{20} \times 100\right)$

(4) STANDARD CAPACITY RATIO = $\left(\frac{\text{BUD HRS.}}{\text{MAX-POSSIBLE HRS IN BUDGET PERIOD}}\right) \times 100$

(5) ACTUAL CAPACITY USAGE RATIO = $\left(\frac{\text{ACTUAL HRS WORKED}}{\text{MAX-POSSIBLE WORKING HRS IN PERIOD}}\right) \times 100$

$75\% = \left(\frac{6000}{8000} \times 100\right)$

(6) ACTUAL USAGE BUDGET RATIO FOR CAPACITY = $\left(\frac{\text{ACTUAL WORKING HRS}}{\text{BUDGET HRS}}\right) \times 100 = \left(\frac{6000}{6400} \times 100\right)$

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Practical Problems

1. 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.

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

The following increases in costs are expected during the year:

	Increase
Direct Materials	
Direct Labour	
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.

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STATEMENT SHOWING FLEXIBLE BUDGET

	PARTICULARS	NATURE OF EXP	TOTAL Rs
(1)	DIRECT MATERIAL (NOTE NO 1)	VARIABLE	1836000
(2)	DIRECT LABOUR (NOTE NO-2)	VARIABLE	892500
(3)	FACTORY O·H (NOTE NO-3)	VARIABLE	178500
		FIXED	220000
(4)	ADMIN O·H (NOTE NO-4)	~~VARIABLE~~	~~360000~~
		~~VARIABLE~~	
		~~FIXED~~	~~100000~~
		FIXED	176000
(5)	SELLING O·H (NOTE NO-4)	VARIABLE	367200
		FIXED	115000
	TOTAL COST		3785200
	PROFIT $\left(3785200 \times \frac{20}{80}\right)$		946300
			4731,500
		UNITS	85000 UNITS.

$\left(\frac{75000 \text{ UNITS} \times 85}{75}\right)$

NOTE NO(1) DIRECT MATERIAL

$\left(\frac{\text{~~1500000~~}}{\text{~~85000~~}} \times 85000\right) \times 108\% = 1836000$

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NOGNO-(2) DIRECT-Labour = 892500

~~850000~~ $\left(\frac{750000}{75000} \times 85000\right) \times 105\%$

NOGNO-(3)
FACTORY-O.H

SEMI-VARIABLE

$65000x + y = 330000$
$75000x + y = 350000$

$10000x = 20000$
$x = 2$
$(65000 \times 2) + y = 330000$

$y = 200000$

$200000 \times 10\% = 220000$
$85000 \times 2 = 170000 \times 105\% = 178500$
~~[illegible]~~

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NO6NO(4)

ADMINO-014

(60 000 X110%) = 176000

NO6NO(5)

SELLING O'H

65000 x + y = 360000

75000 x + y = 400000

10000x = 40000

x = 4

(65000X4) + y = 360000

y = 100000

F = 100 000 X 15% = 115000

V = (4X85000) 10% = 367200

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2. The accountant of manufacturing company provides you the following details for year 20X2:

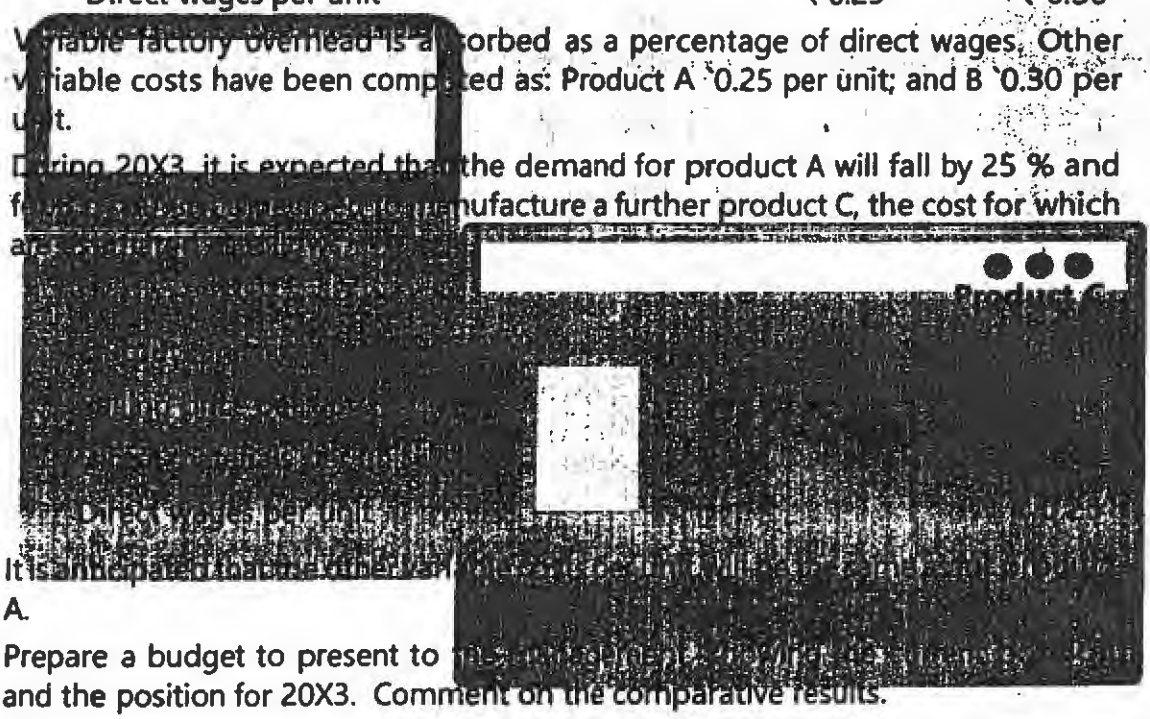
	(₹)		(₹)
Direct materials	1,75,000	Other variable costs	80,000
Direct Wages	1,00,000	Other fixed costs	80,000
Fixed factory overheads	1,00,000	Profit	1,15,000
Variable factory overheads	1,00,000	Sales	7,50,000

During the year, the company manufactured two products A and B and the output and costs were:

	A	B
Output (units)	2,00,000	1,00,000
Selling price per unit	₹ 2.00	₹ 3.50
Direct materials per unit	₹ 0.50	₹ 0.75
Direct wages per unit	₹ 0.25	₹ 0.50

Variable factory overhead is absorbed as a percentage of direct wages. Other variable costs have been computed as: Product A ₹0.25 per unit; and B ₹0.30 per unit.

During 20X3, it is expected that the demand for product A will fall by 25 % and ... manufacture a further product C, the cost for which ...



It is anticipated that ... A.

Prepare a budget to present to ... and the position for 20X3. Comment on the comparative results.

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STATEMENT SHOWING CURRENT POSITION

SALES-UNITS	200000	100000	TOTAL
(A) SALES	= 400000 (200000 X 2)	= 350000 (100000 X 3.50)	750000
(B) RELEVANT COST			
(1) DIRECT-MATERIAL	(100000) (200000 X .50)	(75000) (150000 X .75)	(175000)
(2) DIRECT WAGES	(50000) (200000 X .25)	(50000) (100000 X .50)	(100000)
(3) FACTORY OH (WORKS %) VARIABLE ($\frac{100000}{100000} \times 100$) = 100%	(50000)	(50000)	(100000)
(4) OTHER-V.COST	(50000) (200000 X .25)	(30000) (100000 X .30)	(80000)
CONTRIBUTION	150000	145000	295000
FIXED F.O.			(100000)
OTHER F.O.			(80000)
PROFITS			115000

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STATEMENT SHOWING POSITION 20X3

	A	B	C	TOTAL
UNITS	= 150000	= 50000	= 200,000	
	(200000 X 75%)	(100000 X 50%)		
(A) SALES	300000	175000	350000	825000
	(150000 X 2)	(50000 X 3.50)	(200000 X 1.25)	
(B) RELEVANT COST				
(1) DIRECT MAT.	(75000)	(37500)	(80000)	(192500)
	(150,000 X .5)	(50000 X .75)	(200000 X .40)	
(2) DIRECT WAGES	(37500)	(25000)	(50000)	(112500)
	(150,000 X .25)	(50000 X .50)	(200000 X .25)	
(3) FACTORY O/H (VARIABLE) (100% X WAGES)	(37500)	(25000)	(50000)	(112500)
(4) OTHER - VAR.	(37500)	(15000)	(50000)	(102500)
	(150000 X .25)	(50000 X .30)	(200000 X .25)	
CONTRIBUTION	112500	72500	120000	305000
FIXED COST				(100000)
OTHER.				(80000)
				125000

ON 16 491

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3. TQM Ltd. has furnished the following information for the month ending 30th June, 20X4:

	Master Budget	Actual	Variance
Units produced and sold	80,000	72,000	
Sales (₹)	3,20,000	2,80,000	40,000 (A)
Direct material (₹)	80,000	73,600	6,400 (F)
Direct wages (₹)	1,20,000	1,04,800	15,200 (F)
Variable overheads (₹)	40,000	37,600	2,400 (F)
Fixed overhead (₹)	40,000	39,200	800 (F)
Total Cost	2,80,000	2,55,200	

The Standard costs of the products are as follows:

	Per unit (₹)
Direct materials (1 kg. at the rate of ₹1 per kg.)	1.00
Direct wages (1 hour at the rate of ₹ 1.50)	1.50
Variable overheads (1 hour at the rate of ₹ 0.50)	0.50

Actual results for the month showed that 78,400 kg. of material were used and 70,400 labour hours were recorded.

Required:

(i) Prepare Flexible budget for the month and compare with actual results.

(ii) Calculate Material, Labour, Sales Price, Variable Overhead and Fixed Overhead variances and Sales Volume (Profit) variance.

Page No. | Date

STATEMENT SHOWING FLEXIBLE BUDGET AND ITS COMPARISON WITH ACTUAL

		MASTER BUDGET		FLEXIBLE BUDGET	ACTUAL FOR	VARIANCE
		80000 (UNITS)	P.U.	72000 UNITS	72000 UNITS	
	A	Rs	Rs	Rs	Rs	Rs.
(A)	SALES	320000	4.00	288000	280000	8000(A)
(B)	DIR-Mat	80000	1.00	72000	73600	1600(A)
(C)	DIREW.	120000	1.50	108000	104800	3200(F)
(D)	V.O.	40000	.50	36000	37600	1600(A)
(B)	V.COST	240000	3.00	216000	216000	—
A-B	CONT	80000	1.00	72000	64000	—
	FXED(OH)	40000	.50	40000	39200	800(F)
	NET(P-	40000	.50	32000	24800	7200(A)

Page No.
Date

Step No (1)

MATERIAL VARIANCE

ACTUAL PRODUCTION = 72000 UNITS.

STANDARD			ACTUAL		
Kg	Rate	Amt	Kg	Rate	Amt
72000 X 1 = (72000X1)		72000	78400	193	73600

Labour VAR

Hrs	Rate	Amt	Hrs	Rate	Amt
72000 X 1.50 = (72000X1)		108000	70400	1.48	104880

V.O VAR

Hrs	Rate	Amt	Hrs	Rate	Amt
72000 X .50 = (72000X1)		36000	70400	.53	37600

FIXED O'H

Units	R.R	Exp	Units	Exp
80000	.50	40000	72000	39200

SALES

Units	Rate	Amt	Units	Rate	Amt
80000	4	320000	72000	3.89	280000

SALES MARGIN VAR

Units	Rate	Amt	Units	Rate	Amt
80000	.5	40000	72000	.38	28000

ACTUAL S.P (P.U) = 3.89 (3.50)

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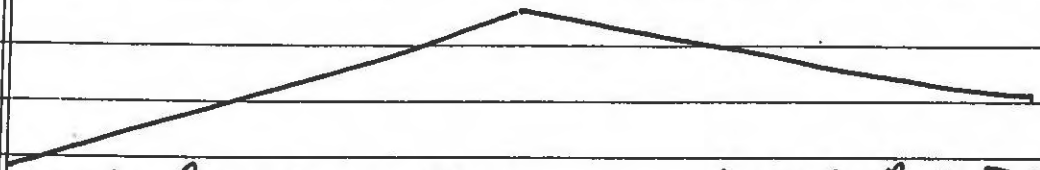
Material Cost VARIANCE

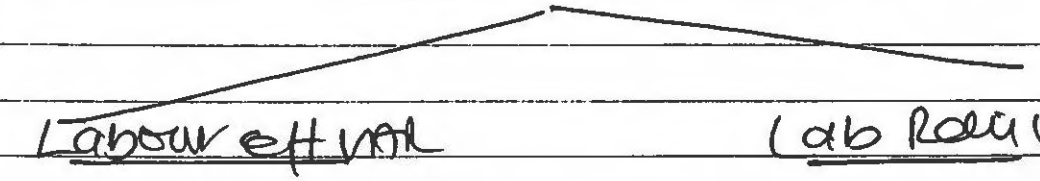
(72000 − 73600) = 1600 (A)



Material Usage VAR	Mat Rate VAR
(72000 − 78400) × 1	(1 − 9.3) × 78400
= 6400 (A)	4800 (F)

Labour cost VAR (108000 − 104800)

= 3200 (F)



Labour eff VAR	Lab Rate VAR
(72000 − 70400) × 1.5	(1.5 − 1.48) × 70400
= 2400 (F)	800 (F)

V.O. cost VAR

(36000 − 37600) = 1600 (A)

V.O. Eff VAR	V.O. Exp/Rate VAR
(72000 − 70400) × .50	(.5 − .53) × 70400
= 800 (F)	= 2400 (A)

F.O.A/C

To Bank	39200	By Purchase (72000 × 50)	36000
		By V/R	3200

F.O. COST VAR

(36000 − 39200) = 3200 (A)

F.O. EXP VAR

(40000 − 39200)

= 800 (F)

F.O. VOLUME VAR

(80000 − 72000) × 5

= 4000 (A)

SALES. VAR.

(320000 − 280000) = 40000 (A)

Sales volume VAR

(80000 − 72000) × 4

= 32000 (A)

Sales price VAR

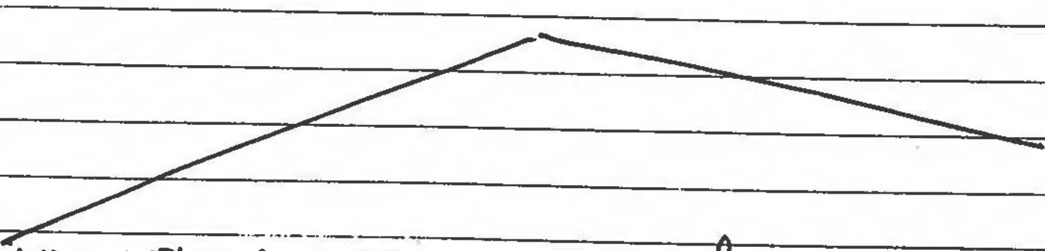
(4 − 3.89) × 72000

= 8000 (A)

Page No. | Date

Sale - MARGIN VAR

(40000 - 28000) = 12000 (A)



Sale M - Volume Var

(80000 - 72000)
X ·5

= 4000 (F)

Sale. M. Ratio Var

(·5 - ·38) X 72000

= 8000 (A)

497

Nov-17

4 [redacted] nd
[redacted] X3-X4. The company's policy is to hold [redacted] st[redacted]ck
[redacted] ng
[redacted]

[redacted]	[redacted]	[redacted]
Budgeted Production units	1,80,000	1,20,000
	(₹)	(₹)
Direct material cost per unit	220	280
Direct labour cost per unit	130	120
Manufacturing overhead	4,00,000	5,00,000

The estimated units to be so[redacted]re as under

	April	May	June	July
Minimax	8,000	10,000	12,000	16,000
Heavyhigh	6,000	8,000	9,000	14,000

Prepare production budget for the first quarter in monthwise.

Page No.
Date

STATEMENT SHOWING PRODUCTION BUDGET

(MINIMAX)	APRIL	MAY	JUNE	TOTAL
SALES	8000	10000	12000	30000
CLOSING STOCK (25% of 10000) (25% of 12000) (25% of 16000)	2500	3000	4000	9500
OPSTOCK (25% of 8000)	(2000)	(2500)	(3000)	(7500)
	8500	10500	13000	32000
HEAVY-HRH (H.H)				
SALES	6000	8000	9000	23000
CLOSING = (25% of 8000)	= 2000	= 2250 (25% of 9000)	= 2250 (25% of 9000)	7750
	(1500)	(2000)	(2250)	(5750)
	25% of 6000	6250	10250	25000

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Date

STATEMENT SHOWING PRODUCTION COST BUDGET

	M. M.	H. H.
UNITS	32000 UNITS	25000 UNITS
DIRECT MATERIAL	= 7040000 (32000 × 220)	= 7000000 (25000 × 280)
DIRECT-LABOUR	= 4160000 (32000 × 130)	= 3500000 (25000 × 120)
MAN-OVERHEADS	71,111 (32000 × 400000 / 180000)	104167 (25000 × 500000 / 120000)
	11271,111	10104167

ON-18 500

Page No. Date

5. Concorde Ltd. manufactures two products using two types of materials and one grade of labour. Shown below is an extract from the company's working papers for the next month's budget:

	Product-A	Product-B
Budgeted sales (in units)	2,400	3,600
Budgeted material consumption per unit (in kg):		
Material-X	5	3
Material-Y	4	6
Standard labour hours allowed per unit of product	3	5

Material-X and Material-Y cost ₹ 4 and ₹ 6 per kg and labours are paid ₹ 25 per hour. Overtime premium is 50% and is payable, if a worker works for more than 40 hours a week. There are 180 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 four 5-days weeks in the budgeted period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipated that stock at the beginning of the period will be:

Product-A 400 units

200 units

1,000 kg.

500 kg.

The a

4

5

10

Material-Y

5 days

Required:

Calculate the Material Purchase

workers, showing the quantities

Page No.
Date

NOTENO (1)

STATEMENT SHOWING PRODUCTION BUDGET

	A	B
SALES	2400 UNITS	3600 UNITS
CLOSING STOCK	= 480 " (2400 X 4days / 4X5)	900 " (3600 X 5days / 4X5)
OPENING STOCK	(400)	(200)
	2480	4300

STATEMENT SHOWING PURCHASE BUDGET

MATERIAL	X	Y
CONSUMPTION (NOTENO-1)	25300 kg	35720 kg
	= 12650	= 10716
CLOSING STOCK	(25300 / 4X5 X 10)	(35720 / 4X5 X 6)
OPEN-STOCK	(1000 kg)	(500 kg)
PURCHASES	36950	45936
X RATE	X 4	X 6
PURCHASE COST	= 147800	= 275616

	X	Y
CONSUMPTION		
A	= 12400 kg (2480 X 5)	= 9920 kg (2480 X 4)
B	= 12900 kg (4300 X 3)	= 25800 (4300 X 6)
CONSUMPTION	25300	35720

ANS (ii) STATEMENT SHOWING COSTING BUDGET

GROSS HRS = 43410 hrs

PRODUCTIVE HRS. $\left(\frac{28940 \times 100}{80}\right)$ = 36175

UN-PRODUCTIVE HRS. 20% X 36175 = 7235

80% AGAINST MANF 20% SETUP TIME

A	2480 X 3 = 7440	
B	4300 X 5 = 21500	
	28940	

Page No.
Date

STATEMENT SHOWING Labour BUDGET

NORMAL (40hrs X 180 X 4 Weeks) = 28800hrs
X 25 = 720000

O.T (43410 - 28800)
X 25 X 150% = 14610
547875

(720000 + 547875) = 1267875

CHAPTER – 16

MARGINAL & ABSORPTION COSTING

Question 1

WONDER Ltd. Manufactures a single product, ZEST. The following figures relate to ZEST for a one-year period:

Activity Level	50%	100%
Sales & Production (units)	400	800
	Rs. Lakhs	**Rs. Lakhs**
Sales	8.00	16.00
Production Costs:		
Variable	3.20	6.40
Fixed	1.60	1.60
Selling & Administration Costs:		
Variable	1.60	3.20
Fixed	2.40	2.40

The Normal level of activity for the year is 800 units. Fixed Costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted. There were no stocks of ZEST at the beginning of the year.

In the first quarter 220 units were produced & 160 units were sold.

Requires:

(a) What would be the fixed production costs absorbed by ZEST if absorption costing is used?

(b) What would be the under/over recovery of overheads during the period?

(c) What would be the profit using absorption costing?

(d) What would be the profit using marginal costing?

(e) Why is there a difference between the answers to (c) & (d)?

Question 2:

XYZ Ltd. Has a production capacity of 2,00,000 units per year. Normal capacity utilization is reckoned as 90%. Standard variable production costs are Rs. 11 per unit. The Fixed Costs are Rs. 3,60,000 per year. Variable Selling Costs are Rs. 3 per unit & Fixed Selling Costs are Rs. 2,70,000 per year. The unit selling price is Rs. 20.

In the year just ended on 30 th June, 2016, the production was 1,60,000 units & sales were 1,50,000 units. The closing inventory on 30 th June was 20,000 uits. The actual variable production costs for the year were Rs. 35,000 higher than the standard.

(I) **Calculate the profit for the year**

(a) By absorption costing method &

(b) By Marginal Costing Method

(II) **Explain the Difference**

****

HOMEWORK MARGINAL VS ABSORPTION

Q NO-3

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Date

ILLUSTRATION 1

WONDER LTD. manufactures a single product, ZEST. The following figures relate to ZEST for a one-year period:

Activity Level	50%	100%
Sales and production (units)	400	800
	(₹)	(₹)
Sales	8,00,000	16,00,000
Production costs:		
- Variable	3,20,000	6,40,000
- Fixed	1,60,000	1,60,000
Selling and distribution costs:		
- Variable	1,60,000	3,20,000
- Fixed	2,40,000	2,40,000

The normal level of activity for the year is 800 units. Fixed costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted. There were no stocks of ZEST at the beginning of the year.

In the first quarter, 220 units were produced and 160 units were sold.

Required:

(a) What would be the fixed production costs absorbed by ZEST if absorption costing is used?

(b) What would be the under/over-recovery of overheads during the period?

(c) What would be the profit using absorption costing?

(d) What would be the profit using marginal costing?

Q NO-4

Practical Questions

1. XYZ Ltd. has a production capacity of 2,00,000 units per year. Normal capacity utilisation is reckoned as 90%. Standard variable production costs are ₹11 per unit. The fixed costs are ₹3,60,000 per year. Variable selling costs are ₹3 per unit and fixed selling costs are ₹2,70,000 per year. The unit selling price is ₹20.

In the year just ended on 30th June, 20X4, the production was 1,60,000 units and sales were 1,50,000 units. The closing inventory on 30th June was 20,000 units. The actual variable production costs for the year were ₹ 35,000 higher than the standard.

(i) Calculate the profit for the year

(a) by absorption costing method and

(b) by marginal costing method.

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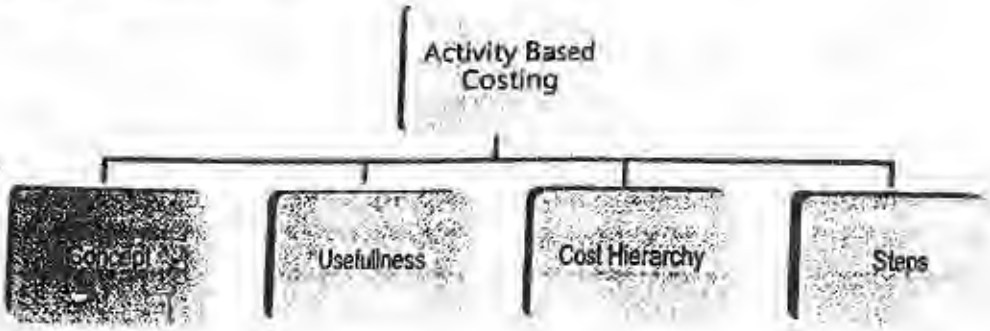
CHAPTER 5

COSTING

LEARNING OUTCOMES

- Discuss problem of traditional costing system.
- Discuss usefulness of Activity Based Costing(ABC).
- Discuss Cost Allocation under ABC.
- Discuss Different level of activities under ABC.
- Understand stages, advantages, and limitations of ABC.
- Discuss various requirements in ABC implementation.
- Explain the concept of Activity Based Management(ABM).
- Explain the concept of Activity Based Budgeting(ABB).

CHAPTEROVERVIEW



17 ACTIVITY BASED COST MANAGEMENT

Question 1

Traditional Ltd. is a manufacturer of a range of goods.The cost structure of its different products is as follows:

Particulars	Product A	Product B	Product C
Direct Materials	50	40	40 Rs/u
Direct labour @10 Rs./ hour	30	40	50 Rs/u
Production overheads	30	40	50 Rs/u
Total Cost	110	120	140 Rs/u
Quantity produced	10,000	20,000	30,000 Units

Traditional Ltd. was absorbing overheads on the basis of direct labour hours .A newly appointed management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows :

Activity cost pool	Cost driver	Associated Cost
Stores Receiving	Purchase requisition	2,96,000
Inspection	Number of production runs	8,94,000
Despatch	Orders executed	2,10,000
Machine Setup	Number of Setups	12,00,000

The following information is also supplied:

Details	Product A	Product B	Product C
No. of Setups	360	390	450
No. of orders executed	180	270	300
No. of production runs	750	1050	1200
No. of Purchase requisition	300	450	500

You are required to calculate activity based production cost of all the three products.

Question 2

A company product four products viz. P, Q, R and S. The data relating to production activity are as under :-

Product	Quantity of Production	Materials cost/unit Rs.	Direct Labour hours/unit	Machine hours/unit	Direct Labour Cost /unit Rs.
P	1,000	10	1	0.50	6
Q	10,000	10	1	0.50	6
R	1,200	32	4	2.00	4
S	14,000	34	3	3.00	18

Production overhead are as under :-

		Rs.
1)	Overhead applicable to machine oriented activity	1,49,700
2)	Overhead relating to ordering materials	7,680
3)	Set up costs	17,400
4)	Administration overheads for spare parts	34,380
5)	Material handling costs	30,294

The following further information have been compiled :-

Product	Number of Set up	Number of materials orders	Number of times materials handled	Number of spare parts
P	3	3	6	6
Q	18	12	30	15
R	5	3	9	3
S	24	12	36	12

Required :

i. Select a suitable cost driver for each item of overhead expense and calculate the cost per unit of cost driver.

ii. Using the concept of Activity Based Costing, compute the factory cost per unit of each product.

Question 3

A company products three products, the standard costs of which are shown below :

	A	B	C
	Rs.	Rs.	Rs.
Direct Material	50	40	30
Direct Labour (@ Rs. 10 / hour)	30	40	50
Production overhead	30	40	50
	110	120	130
Quantity produced/ sold (units)	10,000	20,000	30,000

Absorbed on basis of direct labour hours.

The company wishes to introduce. ABC, and has indentified two major cost pools for production overhead and their association cost drivers.

Information on these activities - cost pools and their drivers is given below :

Activity cost pool	Cost driver	Cost associated with Activity cost pool
Receiving/Inspecting/quality assurance	purchase	Rs. 14,00,000
Production scheduling/machine set ups.	Number of	Rs. 12,00,000

Further relevant information on the three products are given below :

	A	B	C
Number of purchase requisitions	1,200	1,800	2,000
Number of set ups	240	260	300

Required :

From the information given, calculate the activity - based production cost of products A, B and C also.

5 - ABC

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Page No. 1
Date

ILLUSTRATION 1

ABC Ltd. is a multiproduct company, manufacturing three products A,B and C. The budgeted costs and production for the year ending 31st March, 20X8 are as follows:

	A	B	C
Production quantity (Units)	4,000	3,000	1,600
Resources per Unit:			
- Direct Materials (Kg.)	4	6	3
- Direct Labour (Minutes)	30	45	60

The budgeted direct labour rate was ₹10 per hour, and the budgeted material cost was ₹ 2 per kg. Production overheads were budgeted at ₹ 99,450 and were absorbed to products using the direct labour hour rate. ABC Ltd. followed an Absorption Costing System.

ABC Ltd. is now considering to adopt an Activity Based Costing system. The following additional information is made available for this purpose.

1. ***Budgeted overheads were analysed into the following:***

	(₹)
Material handling	29,100
Storage costs	31,200
Electricity	39,150

2. ***The cost drivers identified were as follows:***

Material handling	Weight of material handled
Storage costs	Number of batches of material
Electricity	Number of Machine operations

3. ***Data on Cost Drivers was as follows:***

	A	B	C
For complete production:			
Batches of material	10	5	15
Per unit of production:			
Number of Machine operators	6	3	2

You are requested to:

1. *Prepare a statement for management showing the unit costs and total costs of each product using the absorption costing method.*
2. *Prepare a statement for management showing the product costs of each product using the ABC approach.*
3. *What are the reasons for the different product costs under the two approaches?*

(5.10) (I11:1) 5/2

Page No.
Date

ANSNO-(1) TRADITIONAL METHOD

PRODUTS.	UNITS	X	HRS P.U.	=	TOTAL HRS.
A	4000	X	$\frac{30}{60}$	=	2000
B	3000	X	$\frac{45}{60}$	=	2250
C	1600	X	$\frac{60}{60}$	=	1600
					5850

STATEMENT SHOWING REQ RATE AS PER TRADITIONAL METHOD

$$\text{REC RATE} = \left(\frac{\text{TOTAL OVERHEADS}}{\text{TOTAL-LABOUR-HRS.}}\right)$$

$$17.00 = \left(\frac{99450}{5850}\right)$$

ANSNO(1)

STATEMENT SHOWING COST SHEET - AS PER TRAD METHOD

PRODUTS	A	B	C
UNITS	4000	3000	1600
	P.U	P.U	P.U.
DIRECT COST			
$ Mat	(4X2)=8.00	(6X2)=12	(3X2)=6
$ Lab	= 5.00	= 7.50	= 10
	$\left(\frac{30\text{MIN}X\ 10}{60\text{MIN}}\right)$	$\left(\frac{45X\ 10}{60}\right)$	$\left(\frac{60X\ 10}{60}\right)$
PRIME COST	13	19.50	16
INDIRECT COST	= 8.50	= 12.75	= 17
PRODUCTION O/H	$\left(\frac{30\text{MIN}X\ 17}{60}\right)$	$\left(\frac{45\text{MIN}X\ 17}{60}\right)$	$\left(\frac{60\text{MIN}X\ 17}{60}\right)$
	21.50	32.25	33.00
TOTAL COST PER UNIT			

ANS NO-(2) SUB NO(i)

STATEMENT SHOWING COST DRIVER RATE

ACTIVITY	COST DRIVER	(ACTIVITY COST / COST DRIVER) = COST DRIVER RATE
(1) MATERIAL HANDLING	WEIGHT OF MAT-HAND (NOTE NO 1)	(29100 / 38800) = 175 kg
(2) STORAGE COST	NO OF BATCHES OF MATERIAL	(31200 / 30) = 1040
(3) EL-COST	NO OF MACHINE OPERATION	(39150 / 36200) = 1.082

NOTE NO(i)

PRODUCTS	UNITS		
A	4000	X 4kg =	16000 kg
B	3000	X 6kg =	18000 "
C	1600	X 3kg =	4800 "
			38800

NOTE NO(ii) NO OF BATCHES

A	10
B	5
C	15
	30

NOTE NO(iii) NO OF MACHINE OF OPERATION

A	4000 Units	X 6	=	24000
B	3000 "	X 3	=	9000
C	1600 "	X 2	=	3200
				36200

SOLNO(2) STATEMENT SHOWING COST DRIVER RATE PER UNIT / PER PRODUCT.

AGIVITY	PRODUCT	COST DRIVER USED	×	COST DRIVER RATE	÷	PRODUCTION	=	COST DRIVER RATE PU/PP
		WEIGHT						
(1) MAT HAND	A	16000	×	·175	÷	4000	=	3·00
	B	18000	×	·175	÷	3000	=	4·50
	C	4800	×	·175	÷	1600	=	2·25
		NO OF BATCH						
(2) STOR COST	A	10	×	1040	÷	4000	=	2·60
	B	5	×	1040	÷	3000	=	1·73
	C	15	×	1040	÷	1600	=	9·75
(3) EL COST	A	24000	×	1·082	÷	4000	=	6·492
	B	9000	×	1·082	÷	3000	=	3·246
	C	3200	×	1·082	÷	1600	=	2·164

STATEMENT SHOWING COST SHEET (A·B·C)

PRODUCTS	A	B	C
UNITS	4000	3000	1600
	P·U·	P·U·	P·U
DIRECT COST			
DM	8·00	12·00	6·00
DL	5·00	7·50	10·00
PRIME COST	13·00	19·50	16·00
IND COST			
AGIVITY (1)	3·00	4·50	2·25
" (2)	2·60	1·73	9·75
" (3)	6·49	3·25	2·16
F·COST	25·09	28·98	30·16
	X4000	X 3000	X1600
T·COST =	= 100360	= 86940	= 48256

5- ABC

Page No. 2
Date

ILLUSTRATION 2

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

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

The company makes three products M, S and T. For the year ended March 31, 20X4, the following consumption of cost drivers was reported:

Product	Kilowatt hours	Quality Inspections
M	10,000	3,500
S	20,000	2,500
T	15,000	3,000

Required:

(i) *Compute the costs allocated to each product from each activity.*

(ii) *Calculate the cost of unused capacity for each activity.*

(iii) *Discuss the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate.*

SOL/NO (1)

STATEMENT SHOWING COST DRIVER RATE

ACTIVITY	COST DRIVER	(ACTIVITY COST / COST DRIVER)
(i) POWER	K/W hrs	(200000 / 50000) = 4.00
(ii) QLTY INSP	NO OF INSP.	(300000 / 10000) = 30.00

SOL/NO (2)

STATEMENT SHOWING COST DRIVER [crossed out]

ACTIVITY	PRODUCT	COST DRIVER Used × DRIVER Rate = ALLOCATED COST	
(i) Power		K/W hrs.	
	M	10000 × 4 =	40000
	S	20000 × 4 =	80000
	T	15000 × 4 =	60000
			180000
(ii) QLTY CON		NO OF INSP	
	M	3500 × 3 ÷	10500
	S	2500 × 3 ÷	7500
	T	3000 × 3 ÷	9000
			27000

~~POWER~~

STATEMENT SHOWING COST OF UNUSED CAPACITY

	POWER	QLY INSP
USED	180000	270000
UNUSED	20000	30000
	200000	300000

ILLUSTRATION 3

ABC Ltd. Manufactures two types of machinery equipment Y and Z and applies/absorbs overheads on the basis of direct-labour hours. The budgeted overheads and direct-labour hours for the month of December, 20X6 are ₹ 12,42,500 and 20,000 hours respectively. The information about Company's products is as follows:

	Equipment Y	Equipment Z
Budgeted Production volume	2,500 units	3,125 units
Direct material cost	₹ 300 per unit	₹ 450 per unit
Direct labour cost		
Y : 3 hours @ ₹ 150 per hour		
X : 4 hours @ ₹ 150 per hour	₹ 450	₹ 600

ABC Ltd.'s overheads of ₹ 12,42,500 can be identified with three major activities:

Order Processing (₹ 2,10,000), machine processing (₹ 8,75,000), and product inspection (₹ 1,57,500). These activities are driven by number of orders processed, machine hours worked, and inspection hours, respectively. The data relevant to these activities is as follows:

	Orders processed	Machine hours worked	Inspection hours
Y	350	23,000	4,000
Z	250	27,000	11,000
Total	600	50,000	15,000

Required:

(i) Assuming use of direct-labour hours to absorb/apply overheads to production, compute the unit manufacturing cost of the equipment Y and Z, if the budgeted manufacturing volume is attained.

(ii) Assuming use of activity-based costing, compute the unit manufacturing costs of the equipment Y and Z, if the budgeted manufacturing volume is achieved.

(iii) ABC Ltd.'s selling prices are based heavily on cost. By using direct-labour hours as an application base, calculate the amount of cost distortion (under-costed or over-costed) for each equipment.

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ANS NO (1)   NOGN (?)

TRAD-METHOD

PRODUCTS		UNITS		MH P.U.		TOTAL
Y	X	2500	X	3	=	7500
Z	X	3125	X	4	=	12500
						20000

REC RATE = $\frac{\text{BUD O'H}}{\text{BUD MH}}$

$= \frac{1242500}{20000}$

= 62.125 (P.H)

STATEMENT SHOWING COST-SHEET (TRAD-)

PRODUCTS	2500 Units P.U	3125 UNITS P.U.
DIRECT COST		
D Mat	300	450
D Lab	450	600
PRIME COST	750	1050
IND COST		
F.O.	= 186.375 (62.125 X 3)	= 248.50 (62.125 X 4)
F cost	936.375	1298.50

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MODERN METHOD:-

SOLN NO(1) STATEMENT SHOWING COST DRIVER RATE

ACTIVITY	COST DRIVER	(ACTIVITY COST / COST DRIVER) = C.D.R.
(1) ORDER PROCESSING	NO OF ORDER PROCESS (350 + 250)	(210000 / 600) = 350
(2) MACHINE PROCESSING	NO OF MACHINE HR. (23000 + 27000)	(875000 / 50000) = 17.50
(3) PRODUCT INSPECTION	NO OF INSP/HR (4000 + 11000)	(157500 / 15000) = 10.50

NOTE NO(1)

STATEMENT SHOWING COST D. RATE P.U.

ACTIVITY	PRODUCT	COST DRIVER USED	×	COST DRIVER RATE	÷	PRODUCTION	= C.D. P.U.
(1) ORDER PROCESS	X	350	×	350	÷	2500	= 49
	Y	250	×	350	÷	3125	= 28
(2) MACHINE PROCESS	X	23000	×	17.50	÷	2500	= 161.00
	Y	27000	×	17.50	÷	3125	= 151.20
(3) PRODUCT INS	X	4000	×	10.50	÷	2500	= 16.80
	Y	11000	×	10.50	÷	3125	= 36.96

STATEMENT SHOWING COST SHEET A.B.C

PRODUCT	X	Y
UNITS	2500	3125
	P.U	P.U
	Rs	Rs
DIRECT COST		
D MAT	300	450
D LAB	450	600
PRIME COST	750	1050
IND COST		
F.O		
ACTIVITY (1)	~~[illegible]~~ 549	~~[illegible]~~ 28
" (2)	161.00	151.20
" (3)	16.80	36.96
F COST	~~[illegible]~~ 976.80	1266.16

ANS NO (iii) STATEMENT SHOWING COMPARATIVE COST-SHEET

	X	Y
TRAD- METHOD	936.38	1298.50
MOD- METHOD	976.80	1266.16

LOW-VOLUME PRODUCT 'Y' IS UNDER COSTED AND HIGH VOLUME PRODUCT 'X' IS OVER COSTED USING DIRECT LABOUR HOURS FOR OVERHEAD ABSORPTION.

V.

Practical Problems

1. RST Limited specializes in the distribution of pharmaceutical products. It buys from the pharmaceutical companies and resells to each of the three different markets.

(I) General Supermarket Chains

(II) Drugstore Chains

(III) Chemist Shops

The following data for the month of April, 20X7 in respect of RST Limited has been reported:

	General Supermarket Chains (₹)	Drugstore Chains (₹)	Chemist Shops (₹)
Average revenue per delivery	84,975	28,875	5,445
Average cost of goods sold per delivery	82,500	27,500	4,950
Number of deliveries	330	825	2,750

In the past, RST Limited has used gross margin percentage to evaluate the relative profitability of its distribution channels.

The company plans to use activity –based costing for analysing the profitability of its distribution channels.

The Activity analysis of RST Limited is as under:

Activity Area	Cost Driver
Customer purchase order processing	Purchase orders by customers
Line-item ordering	Line-items per purchase order
Store delivery	Store deliveries
Cartons dispatched to stores	Cartons dispatched to a store per delivery
Shelf-stocking at customer store	Hours of shelf-stocking

The April, 20X7 operating costs (other than cost of goods sold) of RST Limited are ₹ 8,27,970. These operating costs are assigned to five activity areas. The cost in each area and the quantity of the cost allocation basis used in that area for April, 20X7 are as follows:

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Activity Area	Total costs in April, 20X7 (₹)	Total Units of Cost Allocation Base used in April, 20X7
Customer purchase order processing	2,20,000	5,500 orders
Line-item ordering	1,75,560	58,520 line items
Store delivery	1,95,250	3,905 store deliveries
Cartons dispatched to store	2,09,000	2,09,000 cartons
Shelf-stocking at customer store	28,160	1,760 hours

Other data for April, 20X7 include the following:

	General Supermarket Chains	Drugstore Chains	Chemist Shops
Total number of orders	385	990	4,125
Average number of line items per order	14	12	10
Total number of store deliveries	330	825	2,750
Average number of cartons shipped per store delivery	300	80	16
Average number of hours of shelf-stocking per store delivery	3	0.6	0.1

Required:

(i) Compute for April, 20X7 gross-margin percentage for each of its three distribution channels and compute RST Limited's operating income.

(ii) Compute the April, 20X7 rate per unit of the cost-allocation base for each of the five activity areas.

(iii) Compute the operating income of each distribution channel in April, 20X7 using the activity-based costing information. Comment on the results. What new insights are available with the activity-based cost information?

(iv) Describe four challenges one would face in assigning the total April, 20X7 operating costs of ₹ 8,27,970 to five activity areas.

-Cont....→

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ANS NO(i)

STATEMENT SHOWING OPERATING INCOME & GROSS-MARGIN (%)

	GEN-SUPER MKT-CHAIN	DRUGSTORE CHAINS	CHEMIST SHOP	TOTAL
(A) REVENUE =	28041750 (84-975X330)	238 21875 (28875X825)	14973750 (2750X5445)	66837375
(B) C.O.G.S	(27225000) (330X82500)	(22687500) (825X27500)	(13612500) (2750X4950)	(635,25,000)
GROSS MARGIN	816750	1134375	1361250	3312375
OPERATING COST				827970
OPERATING INCOME				2484405
G.P. RATIO	$\left(\frac{816750}{28041750}\right)\times 100$ = 2.91%	$\left(\frac{1134375}{23821875}\right)\times 100$ 4.76%	$\left(\frac{1361250}{14973750}\right)\times 100$ 9.09%	$\left(\frac{3312375}{66837375}\right)\times 100$ = 4.96%

OPERATING INCOM(%) = $\left(\frac{2484405}{66837375}\right)\times 100$

= 3.72%

ANS NO (i)

STATEMENT SHOWING COST DRIVER RATE

ACTIVITY	COST DRIVER	(ACTIVITY COST / COST DRIVER) = COST DRIVER RATE
(1) CUSTOMER PURCHASE ORDER PROCESSING	NO OF ORDERS	220000 / 5500 = 40.00
LINE-ITEM ORDERING	LINE ITEM ORDER	175560 / 58250 = 3.00
STORE DELIVERY	STORES DELIVERY	195250 / 3905 = 50
CARTOON DISPATCH TO STORE	DISPATCH CARTONS	209000 / 209000 = 1.00
SHELF STOCKING TO CUSTOMER	16 hr	28160 / 1760 = 16

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	GEN-SUPER MKT	DRUG STORE CHAIN	CHEMIST CHAIN
(1) CUSTOMER PURCHASE ORDER-PROCESS.	(15400)	(39600)	(165000)
	(385 X R40)	(990 X R40)	(4125 X R40)
(2) LINE-ITEM ORDERING	(16170)	(35640)	(123750)
	(3 X 14 X 385)	(3 X 12 X 990)	(3 X 10 X 4125)
(3) STORE-DELIVERY	(16500)	(41250)	(137500)
	(50 X 330)	(50 X 825)	(50 X 2750)
(4) CARTOON/DIS STORES	(99000)	(66000)	(44000)
	(1 X 330 X 300)	(1 X 80 X 825)	(1 X 16 X 2750)
(5) SHELF STOCKING	(15840)	(7920)	(4400)
	(16 X 330 X 3)	(16 X 825 X .60)	(16 X 2750 X .10)
	162910	190410	474650

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STATEMENT SHOWING ANALYSIS OF PROFIT AS PER A·B·C

	GEN-SUPER MKT CHAIN	DRUG STORE CHAIN	CHEMIST SHOPT
GROSS-MARGIN	816750	1134,375	1361260
OPERATING COST	(162910)	(190410)	(474650)
OPERATING PROFIT	653840	943965	886600
OPERATING PROFIT /			
	$\left(\frac{653840}{28041750} \times 100\right)$	$\left(\frac{943965}{23821875} \times 100\right)$	$\left(\frac{886600}{14973200} \times 100\right)$
	= 2.33%	= 3.96%	= 5.96%

(iv) Challenges faced in assigning [illegible] costing [illegible]

- choosing an appropriate cost [illegible]
- Developing a reliable data base for the chosen cost drivers
- Deciding how to handle costs that may be common across several activities
- Choice of the time period to compute cost rates per cost driver
- Behavioural factors

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(2)

2. Alpha Limited has decided to analyse the profitability of its five new customers. It buys bottled water at ₹ 90 per case and sells to retail customers at a list price of ₹ 108 per case. The data pertaining to five customers are:

	Customers				
	A	B	C	D	E
Cases sold	4,680	19,688	1,36,800	71,550	8,775
List Selling Price	₹ 108	₹ 108	₹. 108	₹ 108	₹ 108
Actual Selling Price	₹ 108	₹ 106.20	₹ 99	₹. 104.40	₹ 97.20
Number of Purchase orders	15	25	30	25	30
Number of Customer visits	2	3	6	2	3
Number of deliveries	10	30	60	40	20
Kilometers travelled per delivery	20	6	5	10	30
Number of expedited deliveries	0	0	0	0	1

Its five activities and their cost drivers are:

Activity	Cost Driver Rate
Order taking	₹750 per purchase order
Customer visits	₹ 600 per customer visit
Deliveries	₹ 5.75 per delivery Km travelled
Product handling	₹ 3.75 per case sold
Expedited deliveries	₹ 2,250 per expedited delivery

Required:

(i) Compute the customer-level operating income of each of five retail customers now being examined (A, B, C, D and E). Comment on the results.

(ii) What insights are gained by reporting both the list selling price and the actual selling price for each customer?

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STATEMENT SHOWING ANALYSIS OF PROFIT LOSS AS PER- A·B·C

	A	B	C	D	E
NET-REVENUES:-					
	=505440	=212304	=14774400	=77274400	=947700
	(4680X108)	(19688X108)	(136800X108)	(71550X108)	(8775X108)
DISCOUNT	(-)	(35438)	(123200)	(257580)	(94770)
		(108-106.20) X19688	(108-99) X136800	(108-104.40) X71550	(108-97.20) X8775
NET-REV	505440	2090866	13543200	74-69820	852930
DIRECT COST					
C·O·G·S	(421200)	(1771920)	(12312000)	(643500)	(789750)
	(4680X90)	(19688X90)	(136800X90)	(71550X90)	(8775X90)
GROSS-PT	84240	318946	~~1028~~ 1231200	1030320	63180
OPERATING COST					
(1) ORD-TAK	(11250)	(18750)	(82500)	(18750)	(22500)
	(750X15)	(750X25)	(750X30)	(750X25)	(750X31)
(2) CUST VIS	(1200)	(1800)	(3600)	(1200)	(1800)
	(600X2)	(600X3)	(600X6)	(600X2)	(600X3)
(3) DEL	(1150)	(1035)	(~~3000~~ 1725)	(~~4600~~ 2300)	(3450)
	(5·75X10X20)	(5·75X30X6)	(5·75X5X60)	(5·75X10X40)	(5·75X30X20)
(4) PUDHAN	(17550)	(73830)	(513000)	(268313)	(32906)
	(3·75X4680)	(3·75X19688)	(3·75X136800)	(3·75X71550)	(3·75X8775)
(5) EXP-D					(2250)
	(250X-)	(250X-)	(250X-)	(250X-)	(250X1)
	53090	223531	690375	739757	274