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92 MARKS

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91 MARKS

KIRAN BHUSAL
91 MARKS

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91 MARKS

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RANK HOLDERS

VAIBHAV SINGAL
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NISHANK PUNDIR
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ARPITA TYAGI
AIR 32

DIKSHA BHARDWAJ
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AIR 41

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CHAPTER – 1 MATERIALS COST

ECONOMIC ORDER QUANTITY (EOQ)

1. RE-ORDER QUANTITY (ROQ):

'ORDER SIZE REPEATED BY ANY BUSINESS ORGANISATION'

2. ORDERING COST:

'COST ASSOCIATED WITH PLACEMENT OF ORDERS'

$$= \frac{A}{ROQ} \times O$$

A = ANNUAL REQUIREMENT OF RAW MATERIAL TO BE PURCHASED

O = COST PER ORDER

EXAMPLE 1

CONSUMPTION OF MATERIALS PER ANNUM 10,000 KGS.

ORDER PLACING COST PER ORDER ₹50

ROQ CASE 1: 1,000 KGS CASE 2: 2,000 KGS

ANSWER

ORDERING COST $= \frac{A}{ROQ} \times O$

CASE 1 $= \frac{10,000}{1,000} \times 50 = 500$

CASE 2 $= \frac{10,000}{2,000} \times 50 = 250$

3. CARRYING COST:

'COST ASSOCIATED WITH HOLDING OF AVERAGE RAW MATERAL STOCK'

$$= \frac{1}{2} \times ROQ \times C$$

C = COST PER UNIT PER ANNUM

EXAMPLE 2

COST PER UNIT ₹2.00

STORAGE COST 8% OF AVERAGE INVENTORY

ROQ CASE 1: 1,000 KGS CASE 2: 2,000 KGS

ANSWER

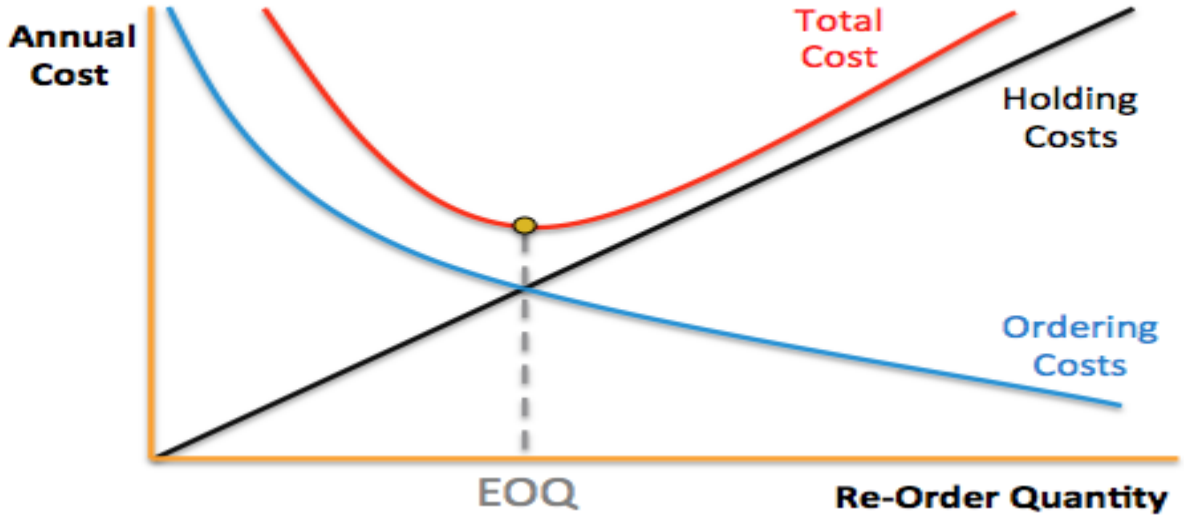
CARRYING COST $= \frac{1}{2} \times ROQ \times C$

CASE 1 $= \frac{1}{2} \times 1,000 \times 0.16 =$ **₹80**

CASE 2 $= \frac{1}{2} \times 2,000 \times 0.16 =$ **₹160**

4. ECONOMIC ORDER QUANTITY (EOQ):

'ORDER SIZE AT WHICH TOTAL OF ORDERING AND CARRYING COST WILL BE LOWEST'



AT EOQ:

$$\text{CARRYING COST} = \text{ORDERING COST}$$

$$\frac{1}{2} \times ROQ \times C = \frac{A}{ROQ} \times O$$

$$\therefore \quad EOQ = \sqrt{\frac{2AO}{C}}$$

EXAMPLE 3

FIND OUT THE ECONOMIC ORDER QUANTITY FROM THE FOLLOWING INFORMATION.

CONSUMPTION OF MATERIALS PER ANNUM	**10,000 KGS.**
ORDER PLACING COST PER ORDER	**₹50**
COST PER KG OF RAW MATERIALS	**₹2**
STORAGE COST	**8% OF AVERAGE INVENTORY**

ANSWER

$$\textbf{EOQ} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 10{,}000 \times 50}{8\%\ \text{OF}\ 2.00}} = \textbf{2,500 KGS}$$

EXAMPLE 4

Annual consumption of raw materials	**:**	**10,500 units**
Opening stock of raw materials	**:**	**1,000 units**
Company wants to maintain closing stock	**:**	**500 units**
Ordering cost per order	**:**	**₹250**
Purchase price per unit	**:**	**₹200**
Carrying cost per unit	**:**	**₹10% per annum**

DETERMINE ECONOMIC ORDER QUANTITY.

ANSWER

$$\text{EOQ} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 10{,}000 \times 250}{10\% \times 200}} = \textbf{500 units}$$

A = Annual purchase
= Annual Consumption + Closing Stock – Opening Stock
= 10,500 + 500 – 1,000
= 10,000 units

EXTRA COST OR SAVING IN COST BY USING EOQ

EXAMPLE 5

Anil & Company buys its annual requirement of 36,000 units in 6 installments. Each unit costs ₹1 and the ordering cost is ₹25. The inventory carrying cost is estimated at 20% of unit value.

How much money can be saved by using Economic Order Quantity?

ANSWER

$$\text{EOQ} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2\times 36{,}000\times 25}{20\%\times 1}} = 3{,}000 \text{ Units}$$

COMPUTATION OF SAVING IN MONEY

PARTICULARS	AT ROQ 6,000	AT EOQ 3,000
Ordering cost ($^{A}/_{ROQ}$ × 25)	150	300
Carrying cost (ROQ × ½ × C) (C = 20% OF ₹1)	600	300
Total cost	750	600
SAVING IN COST	-	150

EVALUATION OF DISCOUNT OFFER

EXAMPLE 6

A Company manufactures a special product which requires a component 'Alpha'. The following particulars are collected for the year 2019:

Annual demand of Alpha	8,000 units
Cost of placing an order	₹200 per order
Cost per unit of Alpha	₹400
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:

1. **Compute the economic order quantity**
2. **Advise whether the quantity discount offer can be accepted.**

ANSWER

1. EOQ = $\sqrt{\frac{2AO}{C}}$ = $\sqrt{\frac{2\times 8{,}000\times 200}{20\%\times 400}}$ = **200 units**

2. Evaluation of 4% discount offer

PARTICULARS	AT EOQ (order size 200 units)	At order size 4,000 units
Purchase cost 8,000 units @ ₹400/384 per unit	32,00,000	30,72,000
Ordering cost ($^{A}/_{ROQ}$ × 200)	8,000	400
Carrying cost (ROQ × ½ × C) (C = 20% of 400/384)	8,000	1,53,600
Total cost	**32,16,000**	**32,26,000**

Reject the discount offer.

MOST ECONOMICAL PURCHASE LEVEL IN CASE OF MULTIPLE DISCOUNT OFFERS

EXAMPLE 7

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

Price per tone	Tonnes number
₹1200	Less than 500
₹1180	500 and less than 1000
₹1160	1000 and less than 2000
₹1140	2000 and less than 3000
₹1120	3000 and above

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

YOU ARE REQUIRED TO CALCULATE THE MOST ECONOMICAL PURCHASE LEVEL.

ANSWER

STATEMENT OF MOST ECONOMICAL PURCHASE LEVEL

Order Size (ROQ)	Total Ordering Cost (A/ROQ × 1,200)	Total Carrying Cost (½ × ROQ × 20% of Price)	Purchase Cost (250 × Price)	Total Cost
400	15,000	48,000 (½ × 400 × 20% × 1,200)	60,00,000 (5,000 × 1,200)	60,63,000
500	12,000	59,000 (½ × 500 × 20% × 1,180)	59,00,000 (5,000 × 1,180)	59,71,000
1,000	6,000	1,16,000 (½ × 1,000 × 20% × 1,160)	58,00,000 (5,000 × 1,160)	59,22,000
2,000	3,000	2,28,000 (½ × 2,000 × 20% × 1,140)	57,00,000 (5,000 × 1,140)	59,31,000
3,000	2,000	3,36,000 (½ × 3,000 × 20% × 1,120)	56,00,000 (5,000 × 1,120)	59,38,000

Optimum order quantity is 1,000 units having minimum total cost of inventory and purchase cost of ₹59,22,000.

VARIOUS STOCK LEVELS

Re-order Stock Level	• When to Order
Re-order Quantiy/ EOQ	• How Much to Order
Maximum Stock Level	• Upto How much to stock
Minimum Stock Level	• Atleast How much to stock
Average Stock Level	• Stock normally kept
Danger Stock Level	• Kept for emergency requirement
Buffer Stock	• To meetigate sudden demand

CONSUMPTION RATE/USAGE RATE OF RAW MATERIALS

DELIVERY PERIOD/LEAD TIME/RE-ORDER PERIOD

5. RE ORDER LEVEL/ ORDERING LEVEL/ RE ORDER POINT:

RE-ORDERING LEVEL

ALTERNATIVE 1 'WHEN THERE IS NO SAFETY/MINIMUM STOCK'

ROL = MAXIMUM USAGE DURING MAXIMUM DELIVERY PERIOD

ALTERNATIVE 2 'WHEN THERE IS SAFETY/MINIMUM STOCK'

ROL = AVERAGE USAGE DURING AVERAGE DELIVERY PERIOD + MINIMUM STOCK/SAFETY STOCK

6. MAXIMUM STOCK LEVEL:

MAXIMUM LEVEL = RE-ORDER LEVEL + RE-ORDER QUANTITY – MINIMUM USAGE DURING MINIMUM PERIOD

7. MINIMUM STOCK LEVEL:

MINIMUM LEVEL = ROL – NORMAL USAGE DURING AVERAGE PERIOD

8. AVERAGE STOCK LEVEL:

ALTERNATIVE 1 = ½ (MINIMUM STOCK LEVEL + MAXIMUM STOCK LEVEL)

ALTERNATIVE 2 = ½ OF ROQ + MINIMUM STOCK LEVEL

9. DANGER STOCK LEVEL

DANGER LEVEL = NORMAL CONSUMPTION DURING EMERGENCY LEAD TIME (PREFERRED)

OR

= MINIMUM CONSUMPTION DURING EMERGENCY LEAD TIME

EXAMPLE 8

Normal usage	50 per week each
Maximum usage	75 per week each
Minimum usage	25 per week each
Re-order quantity	300 units
Re-order period	4 to 6 weeks
Emergency period	3 weeks

ANSWER

1. Re-ordering level = Maximum usage per week × Maximum delivery period

= 75 units × 6 weeks = 450 units

2. Minimum level = Re-order level – (Normal usage × Average period)

= 450 units – (50 units × 5 weeks) = 200 units

3. Maximum level = Re-order level + Re-order quantity – (Min. usage × Minimum period)

= 450 units + 300 units – (25 units × 4 weeks)
= 650 units

4. Average level = ½ (Minimum stock level + Maximum stock level)

= ½ (200 units + 650 units) = 425 units

Or

= ½ of ROQ + Minimum stock level
= ½ of 300 + 200 = **350 units**

5. Danger level = Normal usage × Emergency period

= 50 units × 3 weeks = **150 units**

ABC ANALYSIS

ABC ANALYSIS:

	% VALUE	% QUANTITY	CONTROL
A	70%	10%	HIGH
B	20%	20%	MEDIUM
C	10%	70%	LOW

ISSUE PRICING OF MATERIAL

STATEMENT SHOWING COST PER UNIT

PARTICULARS	₹
Purchase price Less: Trade or Quantity Discount (× Cash Discount) Less: Subsidy/Grant/Incentives from Government Add: Road tax/Toll tax Add: IGST/CGST/SGST/Custom duty (when ITC is not available) Add: Insurance Add: Commission/Brokerage on purchase Add: Freight Inward Add: Net cost of Containers or packing material (when not returnable or returnable at low value)	
TOTAL COST	
÷ Number of Effective units (Total units – Normal shortage – Provision for further shortage)	
COST PER UNIT	

NOTE:

- × CASH DISCOUNT,
- × INDIRECT TAX IF ITC IS AVAILAVLE
- × DEMURRAGE/ DETENTION CHARGES/ PENALTY

EXAMPLE 9

At what price per unit would part A 32 be entered in the stores ledger, if the following invoice was received from the supplier?

Invoice	₹
200 units part A 32 @ ₹5.00 per unit	1,000.00
Less: 20% discount	200.00
	800.00
Add: CGST @ 12%	96.00
	896.00
Add: Packing charges (5 non-returnable boxes)	50.00
	946.00

Notes:

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

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

ANSWER

STATEMENT SHOWING COST PER UNIT

Invoice	₹
Net purchase price (1,000 - 200)	800.00
Add: Packing charges (5 non-returnable boxes)	50.00
Total cost	850.00
÷ Number of units	÷200
COST PER UNIT	**4.25**

NORMAL LOSS, ABNORMAL LOSS

NORMAL LOSS/STANDARD LOSS/UNAVOIDABLE LOSS:

1. AVERAGE/ STANDARD LOSS OF CONCERN INDUSTRY
2. CUSTOMER WILL SUFFER THIS LOSS DUE TO INCREASE IN COST

PARTICULARS	QUANTITY	RATE	VALUE
Purchase Order	100	10.00	1,000
LESS : Normal Loss	(10)	-	-
TOTAL COST	90	11.11	1,000

ABNORMAL LOSS:

1. LOSS OVER AND ABOVE NORMAL LOSS
2. BUSINESSMEN WILL SUFFER THIS LOSS BY DEBITING IT IN COSTING P/L
3. NO IMPACT ON COST PER UNIT

PARTICULARS	QUANTITY	RATE	VALUE
Purchase Order	100	10.00	1,000
LESS : Abnormal Loss	(10)	10.00	(100)
TOTAL COST	90	10.00	900

CASE OF TWO MATERIALS

EXAMPLE 10

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

Invoice	*₹*
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.

ANSWER

EFFECTIVE QUANTITY

Invoice	*Chemical A*	*Chemical B*
Quantity purchased	10,000	8,000
Less: Shortage due to normal breakages	500	320
EFFECTIVE QUANTITY	**9,500**	**7,680**

RATE PER KG. OF EACH CHEMICAL

Invoice	*Chemical A*	*Chemical B*
Purchase price	1,00,000	1,04,000
Add: Basic custom duty @ 10%	10,000	10,400
Add: Railway freight in 5 : 4	2,133	1,707
Total cost	1,12,133	1,16,107
÷ Effective quantity	÷ 9,500	÷ 7,680
RATE PER KG	***11.80***	***15.12***

INVENTORY TURNOVER RATIO

INVENTORY TURNOVER RATIO:

MATERIALS CONSUMED ÷ AVERAGE INVENTORY

INVENTORY TURNOVER IN DAYS:

365 ÷ ITR

STORES LEDGER

STORES LEDGER

Date	Receipts			Issues			Balance		
April	Units	Rate	Value	Units	Rate	Value	Units	Rate	Value

FIFO:

'FIRST IN FIRST OUT'

LIFO:

'LAST IN FIRST OUT'

WEIGHTED AVERAGE:

'MATERIAL VALUED ON THE BASIS OF AVERAGE COST PER UNIT'

AVERAGE COST PER UNIT = TOTAL COST ÷ TOTAL UNITS

EXAMPLE 11

The following are the details of receipt and issue of material 'CXE' in a manufacturing company during the month of April 2019:

Date	*Particulars*	*Quantity (kg)*	*Rate per kg*
April 4	Purchase	3000	₹16
April 8	Issue	1000	
April 15	Purchase	1500	₹18
April 20	Issue	1200	

Opening stock as on 01-04-2019 is 1000 kg @ ₹15 per kg.

On 30th April, 2019 it was found that 50 kg of material 'CXE' was fraudulently misappropriated by the store assistant and never recovered by the company.

ANSWER

Stores Ledger of Material CXE (FIFO Method)

Date April	Receipts			Issues			Balance		
	Units	Rate	Value	Units	Rate	Value	Units	Rate	Value
1	-	-	-	-	-	-	1000	15	15,000
4	3000	16	48,000	-	-	-	1000 3000	15 16	15,000 48,000
8	-	-	-	1000	15	15,000	3000	16	48,000
15	1500	18	27,000	-	-	-	3000 1500	16 18	48,000 27,000
20	-	-	-	1200	16	19,200	1800 1500	16 18	28,800 27,000
30	-	-	**Shortage**	**50**	**16**	**800**	1750 1500	16 18	28,000 27,000

Stores Ledger of Material CXE (LIFO Method)

Date April	Receipts			Issues			Balance		
	Units	Rate	Value	Units	Rate	Value	Units	Rate	Value
1	-	-	-	-	-	-	1000	15	15,000
4	3000	16	48,000	-	-	-	1000 3000	15 16	15,000 48,000
8	-	-	-	1000	16	16,000	1000 2000	15 16	15,000 32,000
15	1500	18	27,000	-	-	-	1000 2000 1500	15 16 18	15,000 32,000 27,000
20	-	-	-	1200	18	21,600	1000 2000 300	15 16 18	15,000 32,000 5,400
30	-	-	**Shortage**	**50**	**18**	**900**	1000 2000 250	15 16 18	15,000 32,000 4,500

Stores Ledger of Material CXE (Weighted Average Method)

Date April	Receipts			Issues			Balance		
	Units	Rate	Value	Units	Rate	Value	Units	Rate	Value
1	-	-	-	-	-	-	1000	15	15,000
4	3000	16	48,000	-	-	-	4000	15.75	63,000
8	-	-	-	1000	15.75	15,750	3000	15.75	47,250
15	1500	18	27,000	-	-	-	4500	16.50	74,250
20	-	-	-	1200	16.50	19,800	3300	16.50	54,450
30	-	-	**Shortage**	**50**	**16.50**	**825**	3250	16.50	53,625

NOTE:

- **✕ TRANSFERRED BETWEEN TWO JOB OR DEPARTMENTS**

- **RETUN TO SUPPLIER:**

  ISSUE SIDE AT THE RATE IT RECEIVED FROM SUPPLIER

- **RETURN TO STORES:**

  RECEIPT SIDE AT THE RATE OF ISSUE/RECENT ISSUE

- **SHORTAGE:**

  ISSUE SIDE AS PER THE METHOD (TRANSFER TO COSTING P/L)

- **MATERIAL CONSUMED:**

  TOTAL VALUE OF ISSUED MATERIAL - MATERIAL RETURN TO STORES - SHORTAGE – RETURN TO SUPPLIER

STORES LEDGER

Date	Receipts			Issues			Balance		
	Q	R	V	Q	R	V	Q	R	V
				RETURN TO SUPPLIER					
	RETURN TO STORES								
				SHORTAGE					

CHAPTER – 2
EMPLOYEE COST OR LABOUR COST

WAGES COST UNDER DIFFERENT PLANS

1. STRAIGHT PIECE RATE SYSTEM:

WAGES = NUMBER OF UNITS PRODUCED × PIECE RATE

2. STRAIGHT TIME RATE SYSTEM:

WAGES = WORKING HOURS × TIME RATE PER HOUR
= AH × R

EXAMPLE 1

Calculate the earnings of the workers A and B under Straight Piece Rate System and Time Rate System from the following particulars:

Normal rate per hour	**₹20**
Piece rate	**₹5**
Working hours per day	**8 hours**

Output per day is as follows:

Worker A	**30 Units**
Worker B	**40 Units**

ANSWER

1. Calculation of earnings under Straight Piece Rate System:

Worker A	**=**	**30 units × ₹5**	**=**	**₹150**
Worker B	**=**	**40 units × ₹5**	**=**	**₹200**

2. Calculation of earnings under Time Rate System:

Worker A	**=**	**8 Hours × ₹20**	**=**	**₹160**
Worker B	**=**	**8 Hours × ₹20**	**=**	**₹160**

TIME RATE TO PIECE RATE

EXAMPLE 2

Normal rate per hour	**₹20**
Standard time per unit	**15 Minutes**

Calculate Piece Rate.

ANSWER

Piece rate	**=**	**₹20 × 15/60**	**=**	**₹5.00**

PIECE RATE TO TIME RATE

EXAMPLE 3

Piece Rate	**₹5.00**
Standard time per unit	**15 Minutes**

Calculate Time Rate.

ANSWER

Time rate	**=**	**₹5 × 60/15**	**=**	**₹20.00**

3. HALSEY SYSTEM:

WAGES = AH × R + 50% (SH - AH) × R

AH = ACTUAL HOURS WORKED FOR ACTUAL PRODUCTION

SH = STANDARD TIME ALLOTED FOR ACTUAL PRODUCTION

SH – AH = TIME SAVED BY THE WORKER

R = TIME RATE

4. ROWAN SYSTEM:

WAGES = AH × R + AH/SH (SH - AH) × R

AH = ACTUAL HOURS WORKED FOR ACTUAL PRODUCTION

SH = STANDARD TIME ALLOTED FOR ACTUAL PRODUCTION

SH – AH = TIME SAVED BY THE WORKER

R = TIME RATE

5. EFFECTIVE RATE:

EFFECTIVE RATE = WAGES ÷ AH

EXAMPLE 4

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

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

ANSWER

Earning under Halsey System:

Earning = (AH × R) + 50% (SH - AH) × R

= (6 hours × ₹60) + 50% (8 hours – 6 hours) × ₹60

= ₹420.00

Earning under Rowan System:

Earning = (AH × R) + AH/SH × (SH – AH) × R

= (6 hours × ₹60) + 6/8 × (8 hours – 6 hours) × ₹60

= ₹450.00

EXAMPLE 5

Two workmen, A and B produce the same product using the same material. A is paid bonus according to Halsey plan, while B is paid bonus according to Rowan plan. The time allowed to manufacture the product is 100 hours. A has taken 60 hours and B has taken 80 hours to complete the product. The normal hourly rate of wages of workman A is ₹24 per hour. The total earnings of both the workers are same.

Calculate normal hourly rate of wages of workman B.

ANSWER

Earning of A (HALSEY PLAN):

Earning	**=**	**(AH × R) + 50% (SH - AH) × R**
	=	**(60 × ₹24) + 50% (100 – 60) × ₹24**
	=	**₹1,920.00**

Earning of A = Earning of B (Given in the question)

Earning of B (ROWAN PLAN):

Earning	**=**	**(AH × R) + AH/SH × (SH – AH) × R**
1,920.00	**=**	**(80 × R) + 80/100 × (100 – 80) × R**
1,920	**=**	**80 R + 16 R**
R	**=**	**₹20.00**

EXAMPLE 6

A skilled worker is paid a guaranteed wage rate of ₹150 per hour. The standard time allowed for a job is 50 hours. He gets an effective rate of wages of ₹180 under Rowan Incentive Plan due to saving in time. For the same saving in time, calculate hourly rate of wages he will get, if he placed under Halsey Premium Scheme (50%).

ANSWER

The following equation can be made:

Effective Earnings	**=**	**Wages ÷ AH**
180	**=**	**[(AH × R) + AH/SH (SH - AH) × R] ÷ AH**
180	**=**	**[150 AH + AH/50 (50 - AH) × 150] ÷ AH**
30 AH	**=**	**AH/50 (50 - AH) × 150**
AH	**=**	**40 hours**

Total earnings and effective hourly rate of skilled worker under Halsey Incentive Scheme:

Total earnings	**=**	**(AH × R) + 50% (SH – AH) × R**
	=	**(40 × 150) + 50% (50 – 40) × 150**
	=	**₹6,750**
Effective hourly rate	**=**	**Total earning ÷ hours worked**
	=	**₹6,750 ÷ 40 hours**
	=	**₹168.75**

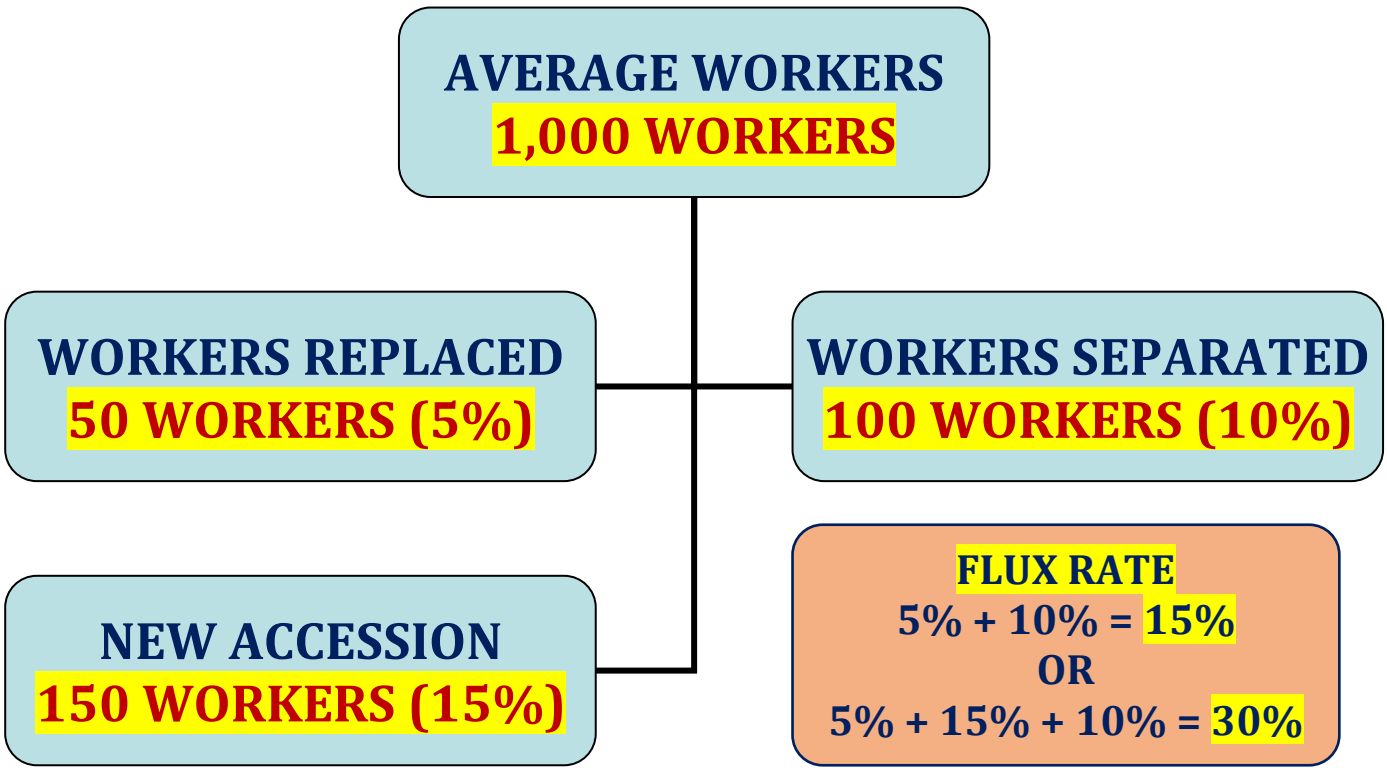
NOTE:

- **BONUS CAN NEVER BE NEGATIVE**

LABOUR TURNOVER

LABOUR TURNVER:

Opening workers		**950 workers**
Separation:		
	Workers Left/Resigned	**75 workers**
	Discharged	**25 workers**
Accessions:		
	Replacements	**50 workers (In place of those leaving)**
	New joined/new accession	**150 workers (Recruitment due to expansion)**
Closing workers		**1,050 workers**
Average workers		**1,000 workers**



SEPARATION METHOD = $\frac{\text{NUMBER OF SEPARATIONS}}{\text{AVERAGE WORKERS}} \times 100$

REPLACEMENT METHOD = $\frac{\text{NUMBER OF REPLACEMENTS}}{\text{AVERAGE WORKERS}} \times 100$

NEW ACCESSION METHOD = $\frac{\text{NUMBER OF NEW JOININGS}}{\text{AVERAGE WORKERS}} \times 100$

ACCESSION METHOD = $\frac{\text{NUMBER OF TOTAL JOININGS}}{\text{AVERAGE WORKERS}} \times 100$

FLUX METHOD (ALT 1) = $\frac{\text{NO. OF SEPARATIONS + REPLACEMENTS}}{\text{AVERAGE WORKERS}} \times 100$

FLUX METHOD (ALT 2) = $\frac{\text{NO. OF SEPARATIONS + ACCESSIONS}}{\text{AVERAGE WORKERS}} \times 100$

AVERAGE WORKERS = $\frac{\text{OPENING WORKERS + CLOSING WORKERS}}{2}$

EQUIVALENT TURNOVER RATE:

$$\frac{\text{EMPLOYEE TURNOVER RATE FOR THE PERIOD}}{\text{NUMBER OF DAYS IN A PERIOD}} \times 365$$

EXAMPLE 7

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

No. of workers as on 01.01.2000	=	7,600 workers
No. of workers as on 31.12.2000	=	8,400 workers

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

ANSWER

SEPARATION METHOD $= \frac{\text{NUMBER OF SEPARATIONS}}{\text{AVERAGE WORKERS}} \times 100$

$= \frac{80 + 320}{8{,}000} \times 100 = 5\%$

REPLACEMENT METHOD $= \frac{\text{NUMBER OF REPLACEMENTS}}{\text{AVERAGE WORKERS}} \times 100$

$= \frac{300}{8{,}000} \times 100 = 3.75\%$

NEW ACCESSION METHOD $= \frac{\text{NUMBER OF NEW JOININGS}}{\text{AVERAGE WORKERS}} \times 100$

$= \frac{1200}{8{,}000} \times 100 = 15\%$

ACCESSION METHOD $= \frac{\text{NUMBER OF TOTAL JOININGS}}{\text{AVERAGE WORKERS}} \times 100$

$= \frac{1500}{8{,}000} \times 100 = 18.75\%$

FLUX METHOD (ALT 1) $= \frac{\text{NO. OF SEPARATIONS + REPLACEMENTS}}{\text{AVERAGE WORKERS}} \times 100$

$= \frac{400 + 300}{8{,}000} \times 100 = 8.75\%$

FLUX METHOD (ALT 2) $= \frac{\text{NO. OF SEPARATIONS + ACCESSIONS}}{\text{AVERAGE WORKERS}} \times 100$

$= \frac{400 + 1500}{8{,}000} \times 100 = 23.75\%$

AVERAGE WORKERS $= \frac{\text{OPENING WORKERS + CLOSING WORKERS}}{2}$

$= \frac{7600 + 8400}{2} = 8{,}000$

EXAMPLE 8

The rate of change of labour force in a company during the year ending 31st march, 2013 was calculated as 13%, 8% and 5% respectively under 'Flux Method', 'Replacement Method', and 'Separation Method'. If the number of workers separated during the year is 40.

You are required to calculate:

(a) Average number of workers on roll.
(b) Number of workers replaced during the year.
(c) Number of new accessions i.e. new recruitment.
(d) Number of workers at the beginning of the year.

Answer

(a) Average number of workers on roll:

Separations	**=**	**5% of average workers**	**=**	**40 workers**
∴ Average workers	**=**	**40 ÷ 5%**	**=**	**800 workers**

(b) Number of workers replaced

	=	**8% of average workers**		
	=	**8% of 800**	**=**	**64 workers**

(c) Number of new accessions:

Flux Rate	**=**	**Separation Rate + Accession Rate**		
13%	**=**	**5% + Accession Rate**		
No. of accessions	**=**	**13% of 800 – 5% of 800**	**=**	**64 workers**
No. of accessions	**=**	**No. of replacement + No. of new accessions**		
No. of new accessions	**=**	**No. of accessions - No. of replacement**		
	=	**64 workers – 64 workers**	=	**Nil**

(d) Number of workers at the beginning:

Let opening workers be x
Now,

Closing workers	**=**	**Opening workers + Replacement + New accessions – Separations**
	=	**x + 64 + Nil – 40 = x + 24**
Average workers	**=**	**½ [Opening workers + Closing workers]**
800	**=**	**[x + x + 24] ÷ 2**
∴ x (opening workers)	**=**	**788 workers**

PROFIT FOREGONE DUE TO LABOUR TURNOVER

Statement Showing Profit Foregone on Account of Labour Turnover

Particulars	Amount
Contribution Foregone due to delay in filling the vacancies Settlement Cost due to leaving Recruitment Costs Selection Costs Training Costs	
Profit Foregone	

EXAMPLE 9

The management of Moonshine Ltd wants to have an idea of the profit foregone as a result of labour turnover last year.

Last year sales accounted to ₹33,00,000 and the P/V ratio was 20%. The total number of actual hours worked by the direct labour force was 2,40,000. As a result of the delays by the personnel department in filling vacancies due to labour turnover 25,000 potentially productive hours were lost. The actual direct labour hours included 40,000 hours attributable to training new recruits out of which half of the hours were unproductive.

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

Settlement cost due to leaving	₹25,000
Recruitment costs	₹20,000
Selection costs	₹12,000
Training costs	₹18,000

ANSWER

Statement Showing Profit Foregone on Account of Labour Turnover

Particulars	Amount
Contribution Foregone (25,000 hours × ₹3 per hour)	75,000
Settlement Cost due to leaving	25,000
Recruitment Costs	20,000
Selection Costs	12,000
Training Costs	18,000
Profit Foregone	1,50,000

Working Notes:

1. Calculation of productive hours:

Actual hours worked	2,40,000
Less: Unproductive training hours (½ of 40,000 hours)	(20,000)
Actual productive hours	2,20,000

2. Contribution earned per productive hours:

Sales value	33,00,000
Contribution (20% of 33,00,000)	6,60,000
Contribution per productive hour (6,60,000 ÷ 2,20,000)	₹3.00

Note: Unproductive training hours are considered as normal feature of the company.

IDLE TIME AND OVERTIME

IDLE TIME:

'WORKER IN FACTORY WITHOUT WORK BUT ELIGIBLE FOR WAGES'

NORMAL IDLE TIME:

'IT IS THE TIME WHICH CANNOT BE AVOIDED OR REDUCED IN THE NORMAL COURSE OF BUSINESS'

CAUSES

- **THE TIME LOST BETWEEN FACTORY GATE AND THE PLACE OF WORK,**
- **THE INTERVAL BETWEEN ONE JOB AND ANOTHER,**
- **THE SETTING UP TIME FOR THE MACHINE,**
- **NORMAL REST TIME (FATIGUE), BREAK FOR LUNCH ETC.**

TREATMENT

- **INCRESE LABOUR RATE**
- **CHARGED TO PRODUCTION OVERHEADS**

ABNORMAL IDLE TIME:

'APART FROM NORMAL IDLE TIME, THERE MAY BE FACTORS WHICH GIVE RISE TO ABNORMAL IDLE TIME'

CAUSES

- **IDLE TIME MAY ALSO ARISE DUE TO ABNORMAL FACTORS LIKE LACK OF COORDINATION**
- **POWER FAILURE, BREAKDOWN OF MACHINES**
- **NON-AVAILABILITY OF RAW MATERIALS, STRIKES, LOCKOUTS, POOR SUPERVISION, FIRE, FLOOD ETC.**
- **THE CAUSES FOR ABNORMAL IDLE TIME**

TREATMENT

- **TRANSFER TO COSTING P/L**

OVERTIME:

'WORKING OVER AND ABOVE NORMAL WORKING HOURS'

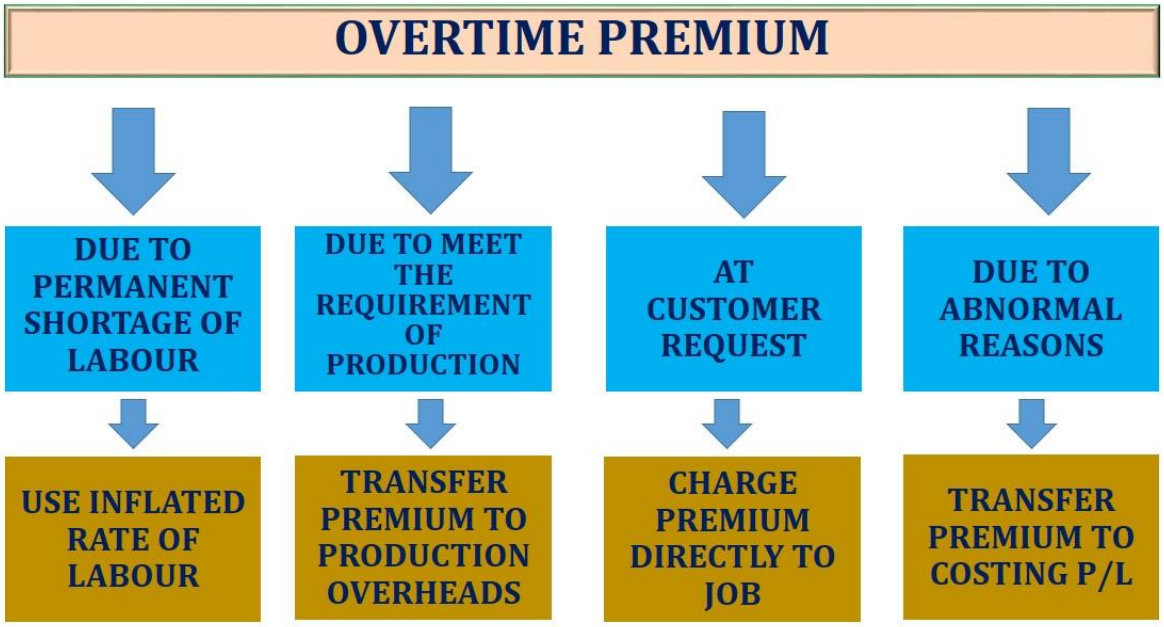
OVERTIME PAYMENT:

= PAYMENT AS PER NORMAL RATE + OVERTIME PREMIUM

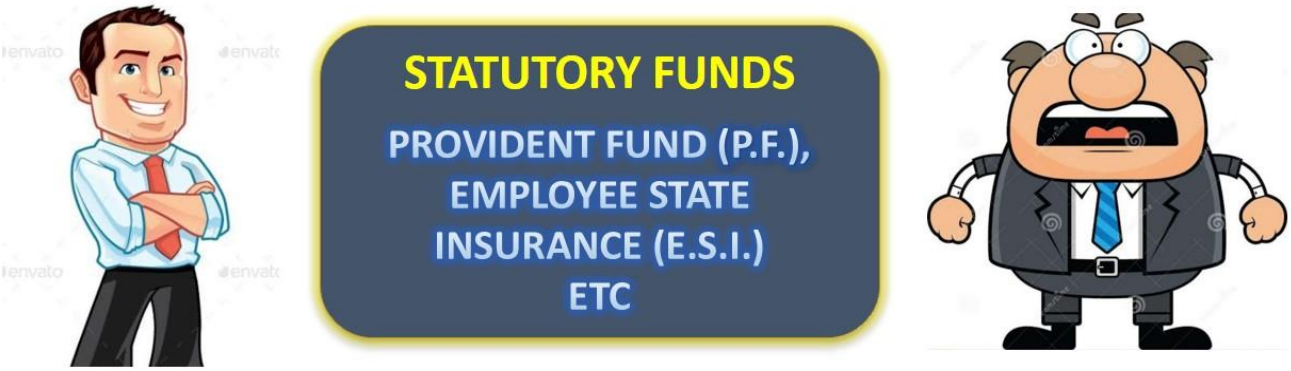
OVERTIME PREMIUM:

'PAYMENT IN EXCESS OF NORMAL WAGE RATE (GENERALLY DOUBLE)'

TREATMENT OF OVERTIME PREMIUM:



GROSS WAGES NET WAGES AND LABOUR COST PER HOUR



STATEMENT SHOWING GROSS AND NET WAGES (CHEQUE)

PARTICULARS	AMOUNT
Basic Wages	XXX
Dearness Allowance	XXX
Basic plus D.A.	XXX
Bonus	XXX
Various Allowances	XXX
Other Cash Payments	XXX
GROSS WAGES PAYABLE	**XXX**
Less: Employee's contribution to P.F.	XXX
Less: Employee's contribution to E.S.I.	XXX
Less: T.D.S.	XXX
Less: Professional Tax	XXX
Less: Loan Deduction	XXX
Less: Any other Deduction	XXX
NET WAGES PAYABLE	**XXX**

STATEMENT SHOWING LABOUR COST PER HOUR

PARTICULARS	AMOUNT
Basic Wages	XXX
Dearness Allowance	XXX
Basic plus D.A.	XXX
Bonus	XXX
Various Allowances	XXX
Other Cash Payments	XXX
Perquisites	XXX
	XXX
Add: Employer's contribution to P.F.	XXX
Add: Employer's contribution to E.S.I.	XXX
LABOUR COST	**XXX**
÷ Effective Labour Hours	**÷XXX**
(Working Hours – Eligible Holidays – Normal Idle Time)	
LABOUR COST PER HOUR	**XXX**

EXAMPLE 10

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

Basic pay	**:**	**₹10,000 p.m.**
Dearness allowance	**:**	**₹2,000 p.m.**
Bonus	**:**	**20% of Salary and D.A.**
Other allowances	**:**	**₹2,500 p.m.**
Employee's contribution to P.F.	**:**	**10% of salary and D.A.**

'X' works for 2,400 hours per annum out of which 400 hours are non-productive and treated as normal idle time.

You are required to find out the effective hourly cost of employee 'X'.

ANSWER

STATEMENT OF EFFECTIVE HOURLY COST OF EMPLOYEE X

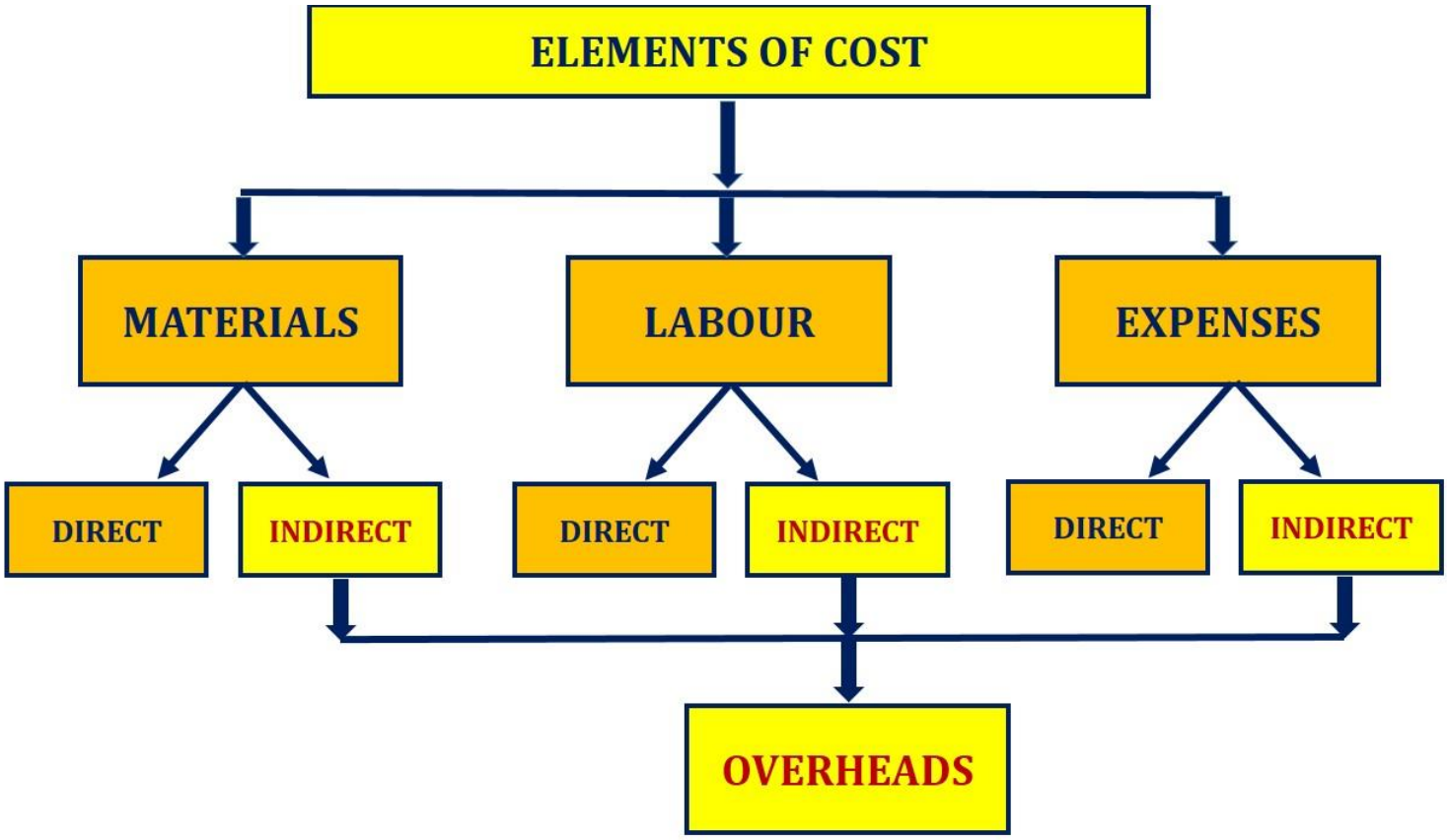
PARTICULARS	AMOUNT
Basic pay (10,000 × 12)	1,20,000
Dearness Allowance (2,000 × 12)	24,000
Bonus @ 20% of 1,44,000 (1,20,000 + 24,000)	28,800
Other allowance (2,500 × 12)	30,000
Employer's contribution to provided fund @ 10% of 1,44,000	14,400
LABOUR COST PER ANNUM	**2,17,200**
÷ Effective labour hours (2,400 - 400)	÷ 2,000
EFFECTIVE HOURLY COST	**108.60**

NOTE:

- **IF NOTHING IS SPECISIED IN THE QUESTION, CONTRIBUTION OF EMPLOYER TOWARDS P.F. AND E.S.I. EQUALS TO EMPLOYEE CONTRIBUTION**

CHAPTER – 3 OVERHEADS

PRODUCTION OVERHEADS



TYPES OF DEPARTMENTS

1. MAIN/PRODUCTION DEPATMENTS:

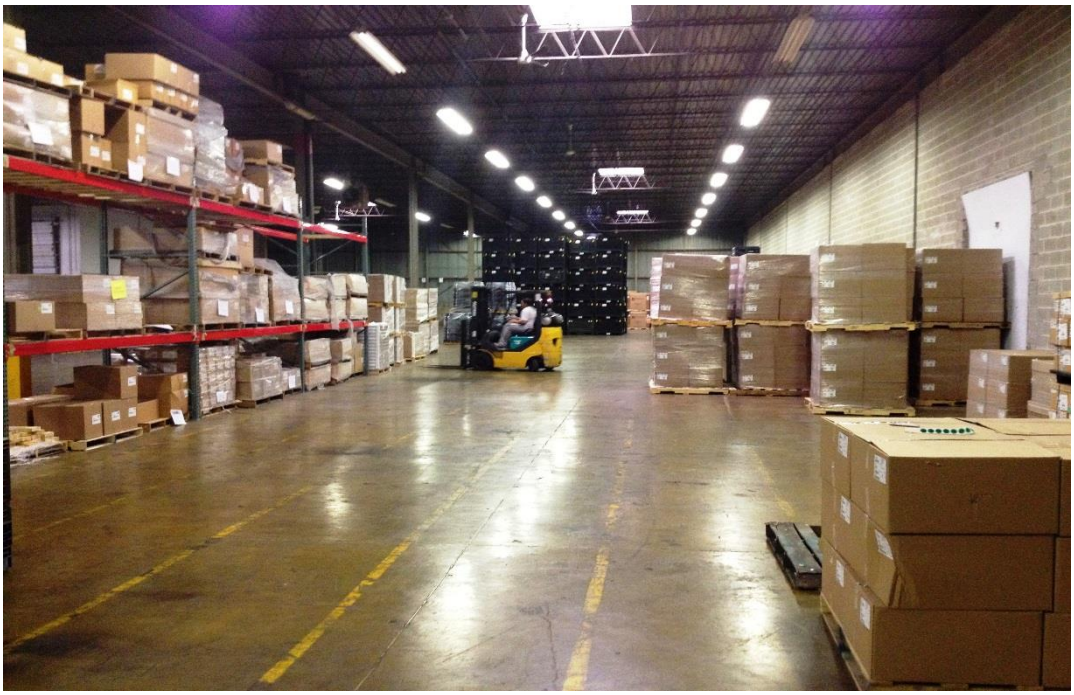
'PRODUCT IS PRODUCED IN THESE DEPARTMENTS'

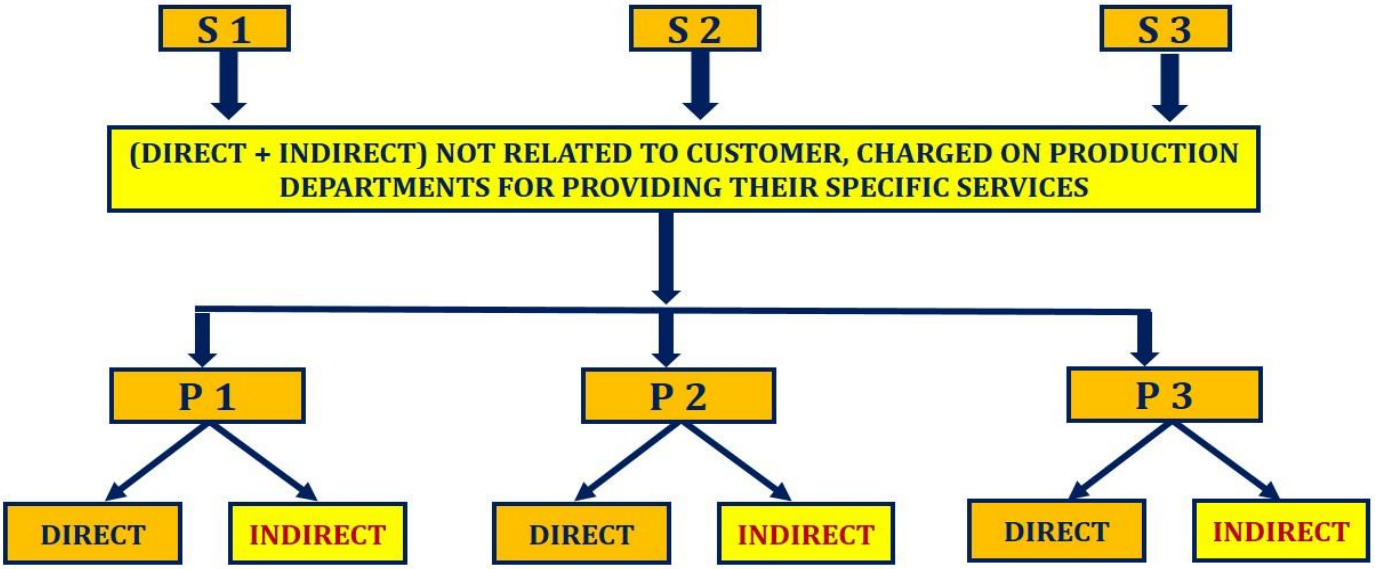
2. SUPPORT/SERVICE DEPARTMENTS:

'PRODUCT IS NOT PRODUCED IN THESE DEPARTMENTS BUT THESE DEPARTMENTS HELP TO MAIN DEPARTMENTS'

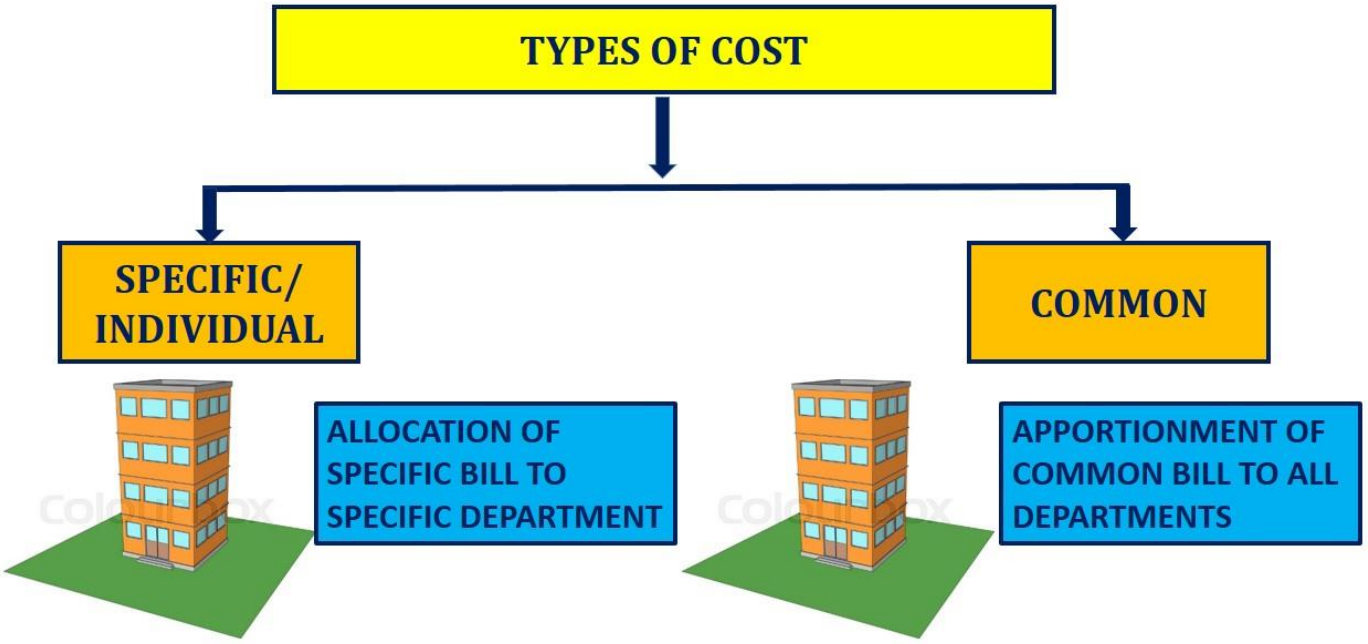
CANTEEN

STORES




S 1
S 2
S 3
(DIRECT + INDIRECT) NOT RELATED TO CUSTOMER, CHARGED ON PRODUCTION DEPARTMENTS FOR PROVIDING THEIR SPECIFIC SERVICES
P 1
P 2
P 3
DIRECT
INDIRECT
DIRECT
INDIRECT
DIRECT
INDIRECT

TYPES OF COST



PRIMARY DISTRIBUTION

STATEMENT SHOWING PRIMARY DISTRIBUTION

PARTICULARS	BASIS	PRODUCTION DEPT.		SERVICE DEPT.	
		P1	P2	S1	S2
ALLOCATION:		NO	NO	YES	YES
DIRECT MATERIAL		NO	NO	YES	YES
DIRECT LABOUR		NO	NO	YES	YES
DIRECT EXPENSES		YES	YES	YES	YES
INDIRECT MATERIAL		YES	YES	YES	YES
INDIRECT LABOUR		YES	YES	YES	YES
INDIRECT EXPENSES		YES	YES	YES	YES
OTHER SPECIFIC COST		YES	YES	YES	YES
APPORTIONMENT:					
RENT	AREA	YES	YES	YES	YES
INSURANCE ETC.	VALUE	YES	YES	YES	YES
TOTAL OH		XXX	XXX	XXX	XXX

EXAMPLE 1

Modern Manufactures Ltd. has three Production Departments P1, P2, P3 and two Service Departments S1 and S2 details pertaining to which are as under:

Items	Production Departments			Service Departments	
	P1	P2	P3	S1	S2
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

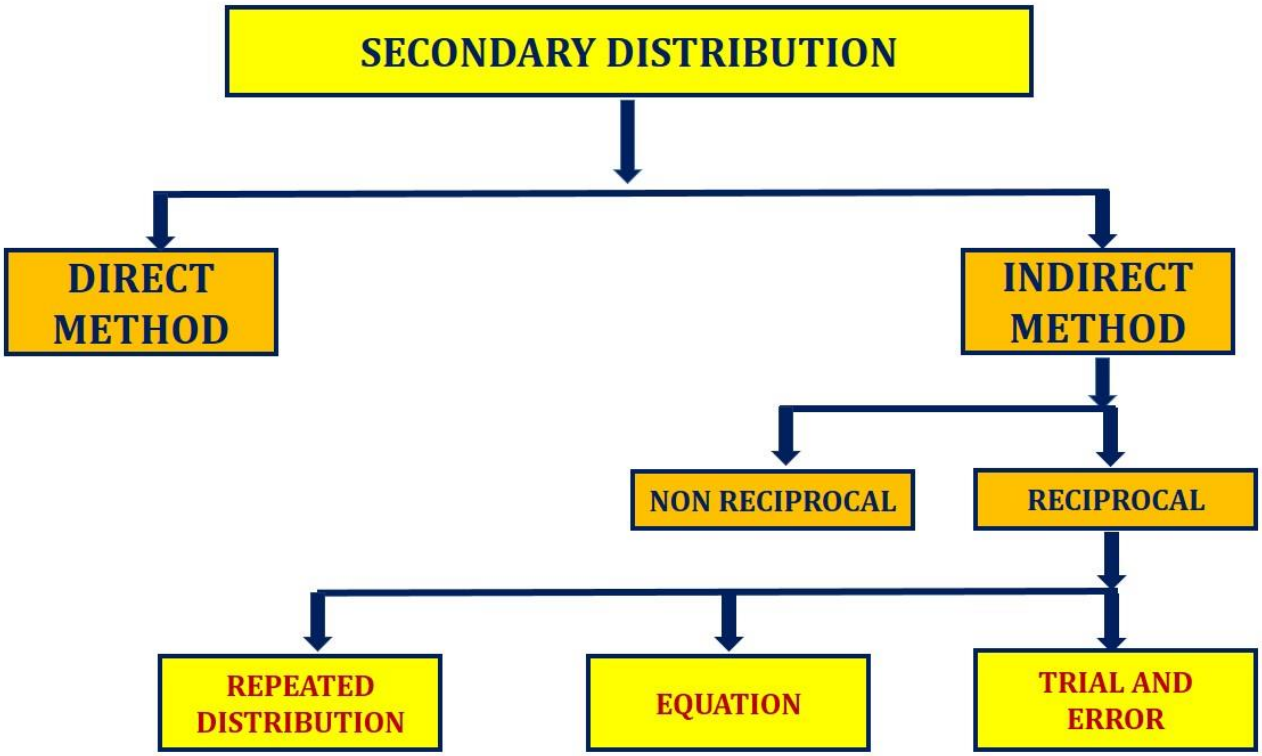
PREPARE OVERHEAD ANALYSISI SHEET (PRIMARY DISTRIBUTION).

ANSWER

OVERHEAD ANALYSISI SHEET (PRIMARY DISTRIBUTION)

Items	Basis of Charge	Production Departments			Service Departments	
		P1	P2	P3	S1	S2
Direct wages	Allocation	-	-	-	1,500	195
Rent and rates	Area	1,000	1,250	1,500	1,000	250
General lighting	Light points	100	150	200	100	50
Indirect wages	Direct wages	600	400	600	300	39
Power	H.P.	600	300	500	100	-
Depreciation on machines	Value of machines	2,400	3,200	4,000	200	200
Sundries	Direct wages	3,000	2,000	3,000	1,500	195
TOTAL OH		**7,700**	**7,300**	**9,800**	**4,700**	**929**

SECONDARY DISTRIBUTION



DIRECT METHOD

EXAMPLE 2

	P1	P2	S1	S2
EXPENSES	**2,00,000**	**5,00,000**	**1,00,000**	**1,50,000**

	P1	P2	S1	S2
SERVICES BY S1	**50%**	**40%**	**-**	**10%**
SERVICES BY S2	**40%**	**40%**	**20%**	**-**

ANSWER

STATEMENT SHOWING SECONDARY DISTRIBUTION
(DIRECT METHOD)

PARTICULARS	BASIS	PRODUCTION DEPARTMENTS		SERVICE DEPARTMENTS	
		P1	P2	S1	S2
Overheads		2,00,000	5,00,000	1,00,000	1,50,000
Apportionment:					
Department S1	50 : 40	55,556	44,444	(1,00,000)	-
Department S2	40 : 40	75,000	75,000	-	(1,50,000)
TOTAL OVERHEADS		**3,30,556**	**6,19,444**	**-**	**-**

INDIRECT METHOD (NON RECIPROCAL)

'THIS METHOD US ALSO KNOWN AS STEP DOWN METHOD AND STEP LADDER METHOD'

EXAMPLE 3

	P1	P2	S1	S2
EXPENSES	**2,00,000**	**5,00,000**	**1,00,000**	**1,50,000**

	P1	P2	S1	S2
SERVICES BY S1	**50%**	**40%**	**-**	**10%**
SERVICES BY S2	**60%**	**40%**	**-**	**-**

ANSWER

STATEMENT SHOWING SECONDARY DISTRIBUTION
(NON RECIPROCAL)

PARTICULARS	BASIS	PRODUCTION DEPARTMENTS		SERVICE DEPARTMENTS	
		P1	P2	S1	S2
Overheads		2,00,000	5,00,000	1,00,000	1,50,000
Apportionment:					
Department S1	50 : 40 : 10	50,000	40,000	(1,00,000)	10,000
Department S2	60 : 40	96,000	64,000	-	(1,60,000)
TOTAL OH		**3,46,000**	**6,04,000**	**-**	**-**

INDIRECT METHOD (RECIPROCAL)

1. **REPEATED DISTRIBUTION**
2. **EQUATION METHOD**
3. **TRIAL AND ERROR METHOD**

REPEATED DISTRIBUTION/CONTINUOUS ALLOTMENT METHOD

EXAMPLE 4

	P1	P2	S1	S2
EXPENSES	**2,00,000**	**5,00,000**	**1,00,000**	**1,50,000**
	P1	**P2**	**S1**	**S2**
SERVICES BY S1	**50%**	**40%**	**-**	**10%**
SERVICES BY S2	**40%**	**40%**	**20%**	**-**

ANSWER

STATEMENT SHOWING SECONDARY DISTRIBUTION
(REPEATED DISTRIBUTION METHOD)

PARTICULARS	BASIS	PRODUCTION DEPARTMENTS		SERVICE DEPARTMENTS	
		P1	P2	S1	S2
Overheads		2,00,000	5,00,000	1,00,000	1,50,000
Apportionment:					
Department S1	50 : 40 : 10	50,000	40,000	(1,00,000)	10,000
Department S2	40 : 40 : 20	64,000	64,000	32,000	(1,60,000)
Department S1	50 : 40 : 10	16,000	12,800	(32,000)	3,200
Department S2	40 : 40 : 20	1,280	1,280	640	(3,200)
Department S1	50 : 40 : 10	320	256	(640)	64
Department S2	40 : 40 : 20	26	26	12	(64)
Department S1	50 : 40	7	5	(12)	-
TOTAL OH		**3,31,633**	**6,18,367**	**-**	**-**

EQUATION METHOD

EXAMPLE 5

	P1	P2	S1	S2
EXPENSES	**2,00,000**	**5,00,000**	**1,00,000**	**1,50,000**
	P1	**P2**	**S1**	**S2**
SERVICES BY S1	**50%**	**40%**	**-**	**10%**
SERVICES BY S2	**40%**	**40%**	**20%**	**-**

ANSWER

STATEMENT SHOWING SECONDARY DISTRIBUTION
(EQUATION METHOD)

PARTICULARS	BASIS	PRODUCTION DEPARTMENTS		SERVICE DEPARTMENTS	
		P1	P2	S1	S2
Overheads		2,00,000	5,00,000	1,00,000	1,50,000
Apportionment:					
Department S1	50 : 40 : 10	66,327	53,061	(1,32,653)	13,265
Department S2	40 : 40 : 20	65,306	65,306	32,653	(1,63,265)
TOTAL OH		**3,31,633**	**6,18,367**	**-**	**-**

EQUATION:

S1 = EXPENSES OF S1 + 20% OF EXPENSES OF S2
S1 = 1,00,000 + 20% S2

S2 = EXPENSES OF S2 + 10% OF EXPENSES OF S1
S2 = 1,50,000 + 10% (1,00,000 + 20% S2)
S2 = 1,50,000 + 10,000 + 2% S2
S2 = 1,63,265

S1 = 1,00,000 + 20% OF 1,63,265
S1 = 1,32,653

TRIAL AND ERROR METHOD

EXAMPLE 6

	P1	P2	S1	S2
EXPENSES	**2,00,000**	**5,00,000**	**1,00,000**	**1,50,000**
	P1	**P2**	**S1**	**S2**
SERVICES BY S1	**50%**	**40%**	**-**	**10%**
SERVICES BY S2	**40%**	**40%**	**20%**	**-**

ANSWER

STATEMENT SHOWING SECONDARY DISTRIBUTION
(TRIAL AND ERROR METHOD)

PARTICULARS	BASIS	PRODUCTION DEPARTMENTS		SERVICE DEPARTMENTS	
		P1	P2	S1	S2
Overheads		2,00,000	5,00,000	1,00,000	1,50,000
Apportionment:					
Department S1	50 : 40 : 10	66,327	53,061	(1,32,653)	13,265
Department S2	40 : 40 : 20	65,306	65,306	32,653	(1,63,265)
TOTAL OH		**3,31,633**	**6,18,367**	**-**	**-**

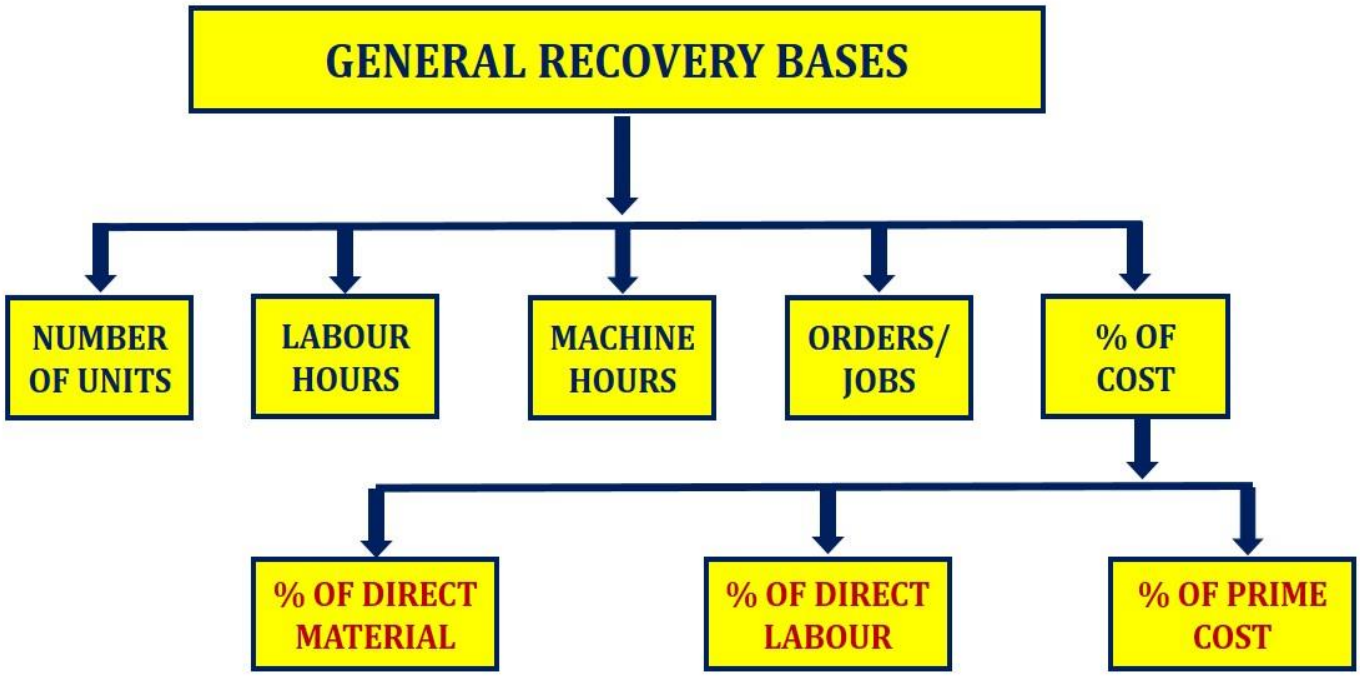
CALCULATION OF EXPENSES

PARTICULARS	RATIO	S1	S2
Overheads		1,00,000	1,50,000
Apportionment:			
Expense of S1	10%	-	10,000
Expense of S2	20%	32,000	-
Expense of S1	10%	-	3,200
Expense of S2	20%	640	-
Expense of S1	10%	-	64
Expense of S2	20%	13	-
Expense of S1	10%	-	1
EXPENSES	**-**	**1,32,653**	**1,63,265**

PREDETERMINED RECOVERY RATE

$$\text{PREDETERMINED RECOVERY RATE} = \frac{\text{BUDGETED OVERHEADS}}{\text{BUDGETED RECOVERY BASE}}$$

'OVERHEADS RECOVERY RATE IS ALSO KNOWN AS OVERHEADS CHARGING RATE, OVERHEADS APPLICATION RATE AND OVERHEADS ABSORPTION RATE'



UNDER OR OVER RECOVERY

UNDER OR OVER RECOVERY:

'DIFFERENCE BETWEEN RECOVERED OVERHEADS AND ACTUAL OVERHEADS'

SITUATIONS:

1. **RECOVERED OH > ACTUAL OH** — **OVER RECOVERY**
2. **RECOVERED OH < ACTUAL OH** — **UNDER RECOVERY**
3. **RECOVERED OH = ACTUAL OH** — **EQUAL RECOVERY**

EXAMPLE 7

Budgeted Overheads	₹2,00,000
Budgeted Labour Hour (Recovery Base)	10,000 Hours
Actual Labour Hours	11,000 Hours
Actual Overheads	₹2,25,000

CALCULATE OVER UNDER RECOVERY IF ANY.

ANSWER

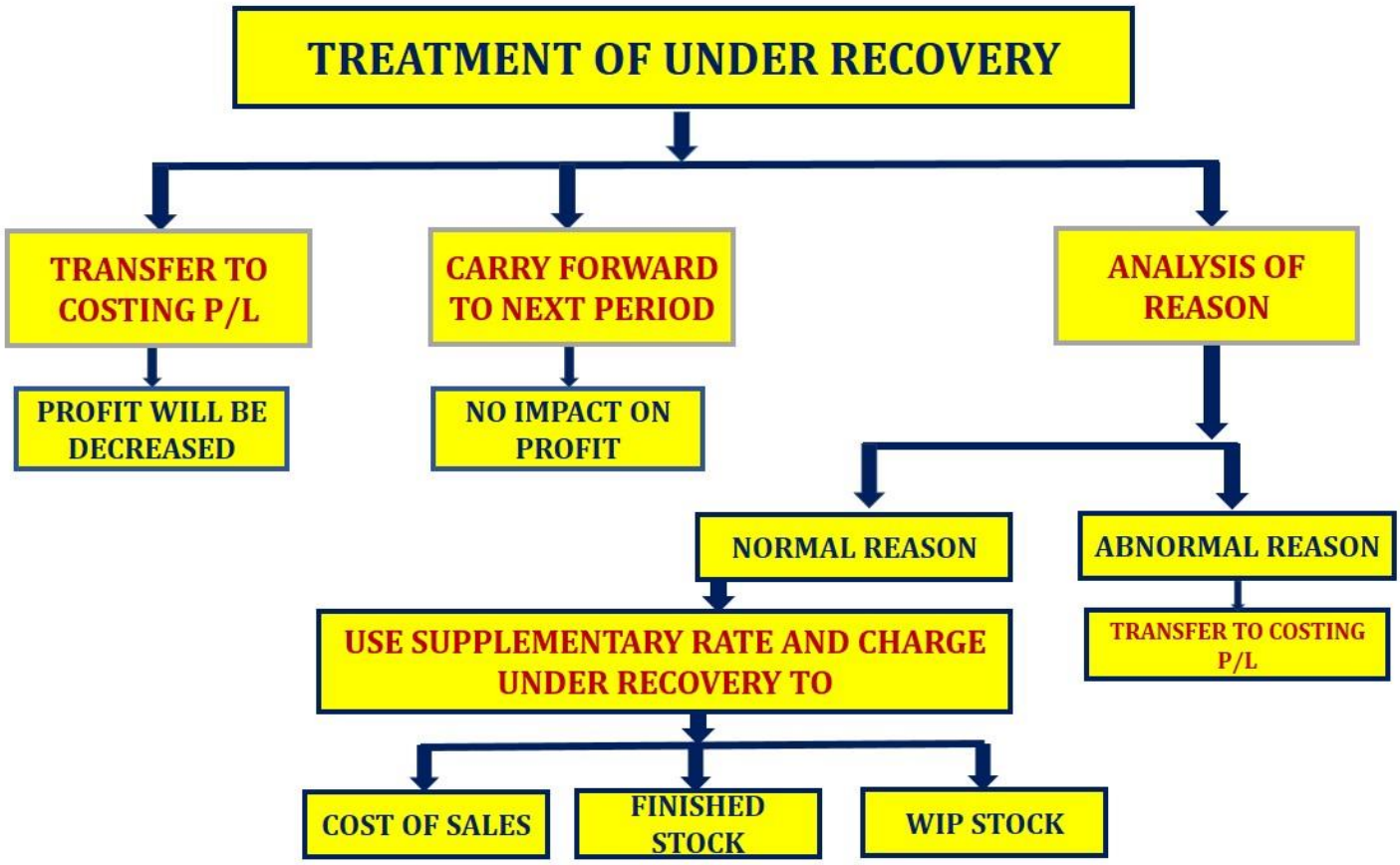
$$\text{Recovery rate} = \frac{\text{BUDGETED OVERHEADS}}{\text{BUDGETED RECOVERY BASE}} = \frac{2,00,000}{10,000}$$

$$= ₹20 \text{ per labour hour}$$

$$\text{Recovered overheads} = 11,000 \text{ hours} \times 20 = ₹2,20,000$$

$$\text{Under Recovery} = ₹2,20,000 - ₹2,25,000 = ₹5,000$$

TREATMENT OF UNDER RECOVERY



EXAMPLE 8

RJS produces a single product and absorbs the production overheads at a pre-determined rate. Information relating to a period is as under:

Production overheads actually incurred	₹4,84,250
Overheads recovery rate at production	₹1.45 per hour
Actual hours worked	2,65,000 hours

Production:

Finished goods	17,500 units
Work-in-progress (50% complete in all respects)	5,000 units

Sales:

Finished goods	12,500 units

At the end of the period, it was discovered that the actual production overheads incurred included ₹40,000 on account of 'written off obsolete stores' and wages paid for the strike period under an award. It was also found that **30% of the under** absorption of production overheads was **due to production inefficiency** and the **rest** was attributable to **normal** increase in costs.

Required to calculate:

(1) The amount of under absorbed production overheads during the period.
(2) Show the accounting treatment of under absorption of production overheads and pass journal entry.

ANSWER

(1) Computation of under absorption of Production Overheads during the period:

Total production overheads actually incurred during the period	4,84,250
Less: Written off obsolete stores and wages paid for strike period	(40,000)
Net production overheads actually incurred	**4,44,250**
Production overheads recovered by 2,65,000 hours @ ₹1.45 per hour	**3,84,250**
Under recovery (recovered - actual)	**60,000**

(2) Accounting treatment of under-absorption of production overheads:

a. **₹18,000 (i.e., 60,000 × 30%)** of under absorbed overheads were due to lack of production planning. This being abnormal should be debited to Costing Profit and Loss Account.

b. The balance of **₹42,000 (i.e., 60,000 × 70%)** of under absorbed overheads should be distributed over work in progress, finished goods and cost of sales by using supplementary rate.

$$\text{Supplementary OH Rate} = \frac{\text{Under recovery}}{\text{Equivalents units}}$$

$$= \frac{42{,}000}{12{,}500 + 5{,}000 + 2{,}500} = ₹2.10 \text{ per unit}$$

Distribution of unabsorbed overheads of ₹42,000 over work-in-progress, finished goods and cost of sales:

Work-in-Progress (2,500 units × ₹2.10)	**₹5,250**
Finished goods (5,000 units × ₹2.10)	**₹10,500**
Cost of sales (12,500 units × ₹2.10)	**₹26,250**

JOURNAL ENTRY

Work in Progress Control A/c	**Dr.**	**5,250**	
Finished Goods Control A/c	**Dr.**	**10,500**	
Cost of Sales A/c	**Dr.**	**26,250**	
Costing Profit & Loss A/c	**Dr.**	**18,000**	
To Overhead Control A/c			**60,000**

(Being under recovery of under absorbed overheads recovered/charged)

TYPES OF RECOVERY RATE

1. **NORMAL RATE/ACTUAL RATE** = $\frac{\text{ACTUAL OVERHEADS}}{\text{ACTUAL RECOVERY BASE}}$

2. **PREDETERMINED OH RATE** = $\frac{\text{BUDGETED OVERHEADS}}{\text{BUDGETED RECOVERY BASE}}$

3. **DEPARTMENTAL OH RATE** = $\frac{\text{OH OF CONCERN DEPARTMENT}}{\text{BASE OF CONCERN DEPARTMENT}}$

4. **BLANKET OH RATE** = $\frac{\text{TOTAL OVERHEADS OF FACTORY}}{\text{RECOVERY BASE FOR FACTORY}}$

BLANKET OH RATE:

- **Blanket overhead rate refers to the computation of one single overhead rate for the whole factory.**
- **The use of blanket rate may be proper in certain factories producing only one major product in a continuous process or where the work performed in every department is fairly uniform or standardised.**

MACHINE HOUR RATE

STATEMENT OF MHR

PARTICULARS	AMOUNT
(A) STANDING CHARGES:	
Rent	XXX
Heat and light	XXX
Forman's salary	XXX
Depreciation	XXX
Wages	XXX
Bonus	XXX
Other fixed cost	XXX
TOTAL STANDING CHARGES (A)	**XXX**
(B) RUNNING EXPENSES:	
Repairs and maintenance	XXX
Consumable stores	XXX
Power	XXX
Other variable cost	XXX
TOTAL RUNNING EXPENSES (B)	**XXX**
TOTAL EXPENSES(A+B)	**XXX**
÷ EFFECTIVE MACHINE HOURS	**÷ XX**
MHR	**XXX**

MACHINE HOURS:

1. **RUNNING HOURS** — **ALWAYS PRODUCTIVE/EFFECTIVE**
2. **SET UP HOURS** — **AS PER QUESTION OR ASSUMPTION**
3. **MAINTENANCE HOURS** — **ALWAYS UNPRODUCTIVE**

EXAMPLE 9

A machine shop cost centre contains three machines of equal capacities. Three operators are employed on each machine, payable ₹20 per hour each. The factory works for forty eight hours in a week which includes 4 hours setup time. The work is jointly done by operators. The operators are paid fully for the forty-eight hours. In addition, they are paid a bonus of 10 percent of productive time. Costs are reported for this company on the basis of four-weekly period.

The company for the purpose of computing machine hour rate includes the direct wages of the operator and also recoups overheads allocated to the machine. The following details of factory overheads applicable to the cost centre are available

- Depreciation 10% per annum on original cost of the machine. Original cost of the each machine is ₹52,000
- Maintenance and repairs per week per machine is ₹60.
- Consumable stores per week per machine are ₹75.
- Power: 20 units per hour per machine at the rate of 80 paise per unit.
- Apportionment to the cost centre: Rent per annum ₹5,400, Heat and Light per annum ₹9,720 and foreman's salary per annum ₹12,960.

REQUIRED

(i) **Calculate the cost of running one machine for a four week period.**
(ii) **Calculate machine hour rate.**

ANSWER

(i) **COST OF RUNNING ONE MACHINE FOR A FOUR WEEK PERIOD**

PARTICULARS		AMOUNT
(A) STANDING CHARGES:		
Rent	(5,400 × ⅓ × $^{4}/_{52}$)	138.46
Heat and light	(9,720 × ⅓ × $^{4}/_{52}$)	249.23
Forman's salary	(12,960 × ⅓ × $^{4}/_{52}$)	332.31
Depreciation	(52,000 × 10% × $^{4}/_{52}$)	400
Wages	(48 × 4 × ₹20 × 3)	11,520
Bonus	(10% × 44 × 4 × ₹20 × 3)	1,056
TOTAL STANDING CHARGES (A)		**13,696**
(B) RUNNING EXPENSES:		
Repairs and maintenance	(₹60 × 4 weeks)	240
Consumable stores	(₹75 × 4 weeks)	300
Power	(44 hours × 4 weeks × 20 units × .80)	2,816
TOTAL RUNNING EXPENSES (B)		**3,356**
TOTAL EXPENSES OF ONE MACHINE (A+B)		**17,052**

(ii) **MACHINE HOUR RATE**

= Total Expenses for 4 weeks ÷ Effective Hours for 4 weeks

= 17,052 ÷ 176 hours (44 hours × 4 weeks)

= **₹96.89 per hour**

CHAPTER – 4 COST SHEET AND UNIT COSTING

COST SHEET

COST SHEET:

'A COST SHEET OR COST STATEMENT IS A DOCUMENT WHICH PROVIDES A DETAILED COST INFORMATION (FUNCTIONAL CLASSIFICATION)'.

FUNCTIONAL CLASSIFICATION OF COST SHEET

FUNCTIONAL CLASSIFICATION:

1. **DIRECT MATERIAL COST**
2. **DIRECT EMPLOYEE/ LABOUR COST**
3. **DIRECT EXPENSES**
4. **PRODUCTION/MANUFACTURING OVERHEADS**
5. **ADMINISTRATION OVERHEADS**
6. **SELLING OVERHEADS**
7. **DISTRIBUTION OVERHEADS**
8. **RESEARCH AND DEVELOPMENT COST ETC.**

SPECIMEN FORMAT OF COST SHEET

PARTICULARS	TOTAL COST
Direct Material Consumed:	
Raw Materials Purchased	
Add: Opening stock of Raw Materials	
Less: Closing stock of Raw Materials	
Add: Carriage Inward	
Less: Recovery From Sale of Scrap of Raw Materials	
Less: Cost of Abnormal Loss of Raw Materials	
Direct Wages or Labour or Employee Cost	
Direct Expenses	
PRIME COST	**XXX**
Factory/Works/Production/Manufacturing Overheads	
GROSS WORKS COST/FACTORY COST	**XXX**
Add: Opening WIP	
Less: Closing WIP	
WORKS/FACTORY COST	**XXX**
Add: Quality Control Cost	
Add: Research and Development Cost	
Add: Administrative Overheads (relating to production activity)	
Less: Credit for recoveries/Scrap/By-Products	
Add: Packing Cost (Primary)	
COST OF PRODUCTION	**XXX**
Add: Opening Finished Goods	
Less: Closing Finished Goods	
COST OF GOODS SOLD	**XXX**
Add: Administrative OH (General/not related to production)	
Add: Selling Overheads	
Add: Distribution Overheads	
Add: Packing Cost (Secondary)	
COST OF SALES	**XXX**
Add: Profit	
SALES	**XXX**

EXAMPLE

Following information relate to a manufacturing concern for the year ended 31st March, 2018:

Raw Materials (opening)	₹2,28,000
Raw Material (closing)	₹3,05,000
Purchase of Raw Material	₹42,25,000
Freight Inwards	₹1,00,000
Direct wages paid	₹12,56,000
Direct wages outstanding at the end of the year	₹1,50,000
Factory Overheads	20% prime cost
Work-in-progress (opening)	₹1,92,500
Work-in-progress (closing)	₹1,40,700
Administrative Overheads (related to production)	₹1,73,000
Distribution expenses	₹16 per unit
Finished Stock (opening: 1,217 Units)	₹6,08,500
Sale of scrap of material	₹8,000

The firm produced 14,000 units of output during the year. The stock of finished goods at the end of the year is valued at cost of production. The firm sold 14,153 units at a price of ₹618 per unit during the year.

PREPARE COST SHEET OF THE FIRM.

ANSWER

COST SHEET

PARTICULARS	TOTAL COST
Raw materials purchased	42,25,000
Add: Opening stock of raw materials	2,28,000
Add: Freight Inward	1,00,000
Less: Sale of scrap	(8,000)
Less: Closing stock of raw materials	(3,05,000)
Materials consumed	42,40,000
Direct wages (12,56,000 + 1,50,000)	14,06,000
PRIME COST	**56,46,000**
Factory Overheads (20% of 56,46,000)	11,29,200
Add: Opening WIP	1,92,500
Less: Closing WIP	(1,40,700)
WORKS COST	**68,27,000**
Administrative Overheads (related to production)	1,73,000
COST OF PRODUCTION	**70,00,000**
Add: Opening Finished goods	6,08,500
Less: Closing Finished Goods [(70,00,000 ÷ 14,000) × 1,064 units]	(5,32,000)
COST OF GOODS SOLD	**70,76,500**
Selling expenses (₹16 × 14,153)	2,26,448
COST OF SALES	**73,02,948**
Profit (b.f.)	14,43,606
SALES (14,153 × 618)	**87,46,554**

NOTE: SCRAP OF MATERIAL IS ABNORMAL ITEM.

WORKING NOTE:

Units in closing finished goods= Opening units + Units produced – Units sold

= 1,217 + 14,000 – 14,153 = **1,064 units**

EXAMPLE 2

Following details are provided by M/s ZIA Private Limited for the quarter ended 30th September, 2018:

Direct Expenses	₹1,80,000
Direct Wages being 175% of Factory Overheads	₹2,57,250
Cost of Goods Sold	₹18,75,000
Selling and Distribution Overheads	₹60,000
Sales	₹22,10,000

Administration Overheads are 10% of Factory Overheads

Stock details as per Stock register:

	30.06.2018	30.09.2018
Raw Materials	₹2,45,600	₹2,08,000
Work-in-progress	₹1,70,800	₹1,90,000
Finished Goods	₹3,10,000	₹2,75,000

YOU ARE REQUIRED TO PREPARE A COST SHEET SHOWING:

(1) Raw Material Consumed
(2) Prime Cost
(3) Factory Cost
(4) Cost of Goods Sold
(5) Cost of Sales and Profit

ANSWER

COST SHEET

PARTICULARS	TOTAL COST
Raw Materials Purchased (W.N.)	12,22,650
Add: Opening stock of Raw Materials	2,45,600
Less: Closing stock of Raw Materials	(2,08,000)
MATERIALS CONSUMED	**12,60,250**
Direct Wages	2,57,250
Direct Expenses	1,80,000
PRIME COST	**16,97,500**
Factory Overheads (2,57,250 ÷ 175%)	1,47,000
Add: Opening WIP	1,70,800
Less: Closing WIP	(1,90,000)
FACTORY COST	**18,25,300**
Administrative Overheads (10% of 1,47,000)	14,700
Add: Opening Finished Goods	3,10,000
Less: Closing Finished Goods	(2,75,000)
COST OF GOODS SOLD	**18,75,000**
Selling and Distribution Overheads	60,000
COST OF SALES	**19,35,000**
Profit (b.f.)	2,75,000
SALES	**22,10,000**

WORKING NOTE:

Materials Purchased = COGS + Closing Finished Goods – Opening Finished Goods – Administrative Overheads + Closing WIP – Opening WIP – Factory Overheads – Direct Wages – Direct Expenses + Closing Raw Materials – Opening Raw Materials

= 18,75,000 + 2,75,000 – 3,10,000 - 14,700 + 1,90,00 – 1,70,800 – 1,47,000 – 1,80,000 – 2,57,250 + 2,08,000 – 2,45,600

= **12,22,650**

CHAPTER – 5 JOB AND BATCH COSTING

JOB COSTING

JOB COSTING:

- **IN THIS METHOD COSTS ARE COLLECTED AND ACCUMULATED FOR SPECIFIC JOBS/WORK ORDER**
- **EACH JOB IS TREATED AS A SEPARATE ENTITY FOR THE PURPOSE OF COSTING**
- **THIS METHOD IS USED TO ASCERTAIN COST AND PROFIT OF EACH JOB AND TAKES INTO ACCOUNT THE COST OF MATERIALS, EMPLOYEES AND OVERHEAD ETC.**

EXAMPLE 1

From the following particulars, prepare the Cost Sheet for Job No.75 and find out the value of the job:

Materials issued for the job	**₹6,000**
Productive Wages	**₹4,600**
Direct Expenses	**₹500**

Provide 60% on wages for works overheads and 12½% on works cost for office overheads. Profit to be realised on the selling price 15%.

ANSWER

COST SHEET FOR JOB NO.75

PARTICULARS	AMOUNT
Materials	6,000.00
Productive Wages	4,600.00
Direct Expenses	500.00
PRIME COST	**11,100.00**
Works overheads (60% of productive wages)	2,760.00
WORKS COST	**13,860.00**
Office overheads (12½ % on works cost)	1,732.50
COST OF PRODUCTION	**15,592.50**
Profit (15% on sales)	2,751.62
SALES (15,592.50 ÷ 85%)	**18,344.12**

EXAMPLE 2

In the current quarter, a company has undertaken two jobs. The data relating to these jobs are as under:

	Job 1102	**Job 1108**
Selling price	₹1,07,325	₹1,57,920
Profit as percentage on cost	8%	12%
Direct Materials	₹37,500	₹54,000
Direct Wages	₹30,000	₹42,000

It is the policy of the company to charge factory overheads as percentage on direct wages and selling and administration overheads as percentage on factory cost.

The company has received a new order for manufacturing of a similar job. The estimate of direct materials and direct wages relating to the new order is ₹64,000 and ₹50,000 respectively. A profit of 20% on sales is required.

YOU ARE REQUIRED TO COMPUTE:

(i) The rates of Factory overheads and Selling and Administration overheads to be charged;

(ii) The Selling price of the new order.

ANSWER

(i) Computation of rates of factory overheads and selling and administration overheads to be charged:

Let % of factory overheads to direct wages be **F** and % of selling and administrative overheads to factory cost be **A**

JOBS COST SHEET

PARTICULARS	JOB 1102	JOB 1108
Direct materials	37,500	54,000
Direct wages	30,000	42,000
PRIME COST	**67,500**	**96,000**
Factory overheads	30,000F	42,000F
FACTORY COST	**67,500+30,000F**	**96,000+42,000F**
Selling and Admin OH	(67,500+30,000F)A	(96,000+42,000F)A
TOTAL COST	**(67,500+30,000F)(1+A)**	**(96,000+42,000F)(1+A)**

*** Computation of total cost of jobs:**

Total cost of Job 1102 when 8% is the profit on cost = $\frac{1,07,325}{108\%}$ = **₹99,375**

Total cost of Job 1108 when 12% is the profit on cost = $\frac{1,57,920}{112\%}$ = **₹1,41,000**

(67,500 + 30,000F) (1 + A) = **₹99,375** **(1)**
(96,000 + 42,000F) (1 + A) = **₹1,41,000** **(2)**

Or

67,500 + 30,000F + 67,500 A + 30,000FA = **₹99,375**
96,000 + 42,000F + 96,000 A + 42,000FA = **₹1,41,000**

Or

30,000F + 67,500A + 30,000FA = **₹31,875** **(3)**
42,000F + 96,000A + 42,000FA = **₹45,000** **(4)**

On solving (3) and (4) we get:

A	=	**0.25 or 25% on factory cost**
F	=	**0.40 or 40% on direct wages**

(ii) SELLING PRICE OF THE NEW ORDER:

PARTICULARS	AMOUNT
Materials	64,000
Productive Wages	50,000
PRIME COST	**1,14,000**
Factory overheads (40% of 50,000)	20,000
FACTORY COST	**1,34,000**
Selling and Admin overheads (25% of 1,34,000)	33,500
TOTAL COST	**1,67,500**
Profit (20% on sales or 25% on cost)	41,875
SALE PRICE	**2,09,375**

BATCH COSTING

BATCH COSTING:

- **BATCH COSTING IS A TYPE OF SPECIFIC ORDER COSTING WHERE ARTICLES ARE MANUFACTURED IN PREDETERMINED LOTS, KNOWN AS BATCH**
- **THIS METHOD IS USED TO ASCERTAIN COST AND PROFIT OF SPECIFIC BATCH OR UNITS IN SPECIFIC BATCH**

ECONOMIC BATCH QUANTITY (EBQ)

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

Where,

D	**=**	**ANNUAL DEMAND FOR THE PRODUCT**
S	**=**	**SETTING UP COST PER BATCH**
C	**=**	**CARRYING COST PER UNIT OF PRODUCTION**

EXAMPLE 3

XYZ has obtained an order to supply 48,000 bearings per year from a concern on a steady basis. It is estimated that it costs ₹.20 as inventory holding cost per bearing per month and that the set up cost per run of bearing manufacture is ₹384.

YOU ARE REQUIRED TO:

(1) Compute optimum run size and number of runs for bearing manufacture.

(2) Compute the interval between two consecutive runs.

(3) Find out the extra cost incurred, if company adopts a policy to manufacture 8,000 bearings per run as compared to optimum run size.

(4) Give your opinion regarding run size of bearing manufacture.

Assume 365 days in a year.

ANSWER

(1) EBQ/Optimum Run size $= \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2\times48{,}000\times384}{12\times0.20}}$

$=$ **3,919.18 BEARINGS**

(2) Interval between two runs $= \frac{365}{\text{Number of runs}} = \frac{365}{12.247}$

$=$ **29.80 DAYS**

Number of runs $= \frac{\text{Annual Demand}}{\text{EBQ}} = \frac{48{,}000}{3{,}319.18}$

$=$ **12.247 RUNS**

(3) Calculation of extra cost at run size 8,000 bearings:

COMPUTATION OF EXTRA COST

PARTICULARS	AT RBQ 8,000	AT EBQ 3,919.18
Set up Cost ($^{D}/_{RBQ}$ × S)	2,304	4,703
Carrying cost (RBQ × ½ × C)	9,600	4,703
TOTAL COST	11,904	9,406
EXTRA COST	-	2,498

(4) OPINION:

'Company should go with the EBQ (i.e. 3,919.18 bearings) having lower cost than RBQ 8,000 units'

CHAPTER - 06
CONTRACT COSTING

NORMAL CONTRACT ACCOUNT

PROFORMA CONTRACT A/C

PARTICULARS	₹	PARTICULARS	₹
To Material:		By Work-in-progress:	
Opening stock	XXX	Work certified	On Sale
Purchased	XXX		Value
Recd. from stores	XXX	Work uncertified	On Cost
Trf. from other site	XXX		
To Wages	XXX	By Material:	
To Depreciation on plant	XXX	Closing stock	XXX
To Other expenses	XXX	Cost of material sold	XXX
To Administrative OH	XXX	Cost of material lost	XXX
To Establishment charges	XXX	By Escalation claim (cr.)	XXX
To Sub contactor	XXX		
To Chargeable expenses	XXX		
To NOTIONAL PROFIT	**XXX**		
	XXX		**XXX**

- **DON'T SHOW LOSS OF PLANT IN CONTRACT ACCOUNT (LOSS OF PLANT IS TRANSFERRED TO COSTING P/L), JUST CALCULATE DEPRECIATION ON PLANT ACTUALLY USED**
- **ACTUAL SALE VALUE OF MATERIAL IS IR RELEVANT, COST OF MATERIAL SOLD IS RELEVANT**
- **PROFIT OR LOSS ON SALE OF PLANT AND MATERIAL IS TRANSFERRED TO COSTING P/L AND NOT IN CONTRACT A/C**
- **PANELTY AND INCENTIVES ARE DIRECTLY TRANSFEERED TO COSTING P/L**

EXAMPLE

THE FOLLOWING EXPENSES WERE INCURRED ON A CONTRACT:

Material 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, 2016. The value of the work completed and certified upto 30th November, 2016 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, 2016 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, 2016 was ₹30,000.

PREPARE THE CONTRACT ACCOUNT, SHOWING THE NOTIONAL PROFIT FOR THE YEAR.

ANSWER

CONTRACT A/C

PARTICULARS	₹	PARTICULARS	₹
To Material Purchased	6,00,000	By Work-in-progress:	
To Materials Drawn from Stores	1,00,000	Work Certified	13,00,000
		Work Uncertified	60,000
To Wages	2,25,000	By Material at Site	40,000
To Depreciation on plant (75,000 – 30,000)	45,000		
To Chargeable Expenses	75,000		
To Apportioned Indirect Expenses	25,000		
TO NOTIONAL PROFIT	**3,30,000**		
	14,00,000		**14,00,000**

COST OF WORK UNCERTIFIED

EXAMPLE

A contractor, who prepares his account on 31st December each year, commenced a contract on 1st April 2016. The costing records concerning the said contract reveal the following information on 31st December, 2016:

Material issued	₹2,51,000
Wages	₹5,65,600
Foremen's salary	₹81,300

Plant costing ₹2,60,000 had been on site for 146 days, working life is estimated at 7 years and final scrap value at ₹15,000. A supervisor, who is paid ₹8,000 p.m., has devoted approximately one half of his time to this contract. The administrative and all other expenses amount to ₹1,36,500. Materials in hand at site on 31st December 2016 cost ₹35,400.

The contract price was ₹22,00,000 but it was accepted by the contractor for ₹20,00,000. **On 31st December, 2016 two third of the contract was completed. The architect issued certificate covering 50% of the contract price and contractor had been paid ₹7,50,000 on account.**

PREPARE CONTRACT ACCOUNT.

ANSWER

CONTRACT ACCOUNT

PARTICULARS	₹	PARTICULARS	₹
To Materials Issued	2,51,000	By Materials in Hand	35,400
To Wages	5,65,600	By Works Cost c/d (b.f.)	10,49,000
To Foremen's Salary	81,300		
To Supervisor's Salary (8,000 × 9 month × $^1/_2$)	36,000		
To Administrative and Other Expenses	1,36,500		
To Depreciation (WN. 2)	14,000		
	10,84,400		**10,84,400**
To Works Cost b/d	10,49,000	By Work-in-progress: Work Certified (50% of 20,00,000)	10,00,000
TO NOTIONAL PROFIT	**2,13,250**	Work uncertified (WN. 1)	2,62,250
	12,62,250		**12,62,250**

WORKING NOTES:

(1) CALCULATION OF COST OF WORK UNCERTIFIED:

Contract Completed = **⅔ or 16-⅔%**

Cost of ⅔ Contract = **10,49,000**

Cost of Work Uncertified = **10,49,000 × $\frac{3}{2}$ × 16-⅔%**

= **2,62,250**

(2) DEPRECIATION = $\frac{2,60,000-15,000}{7 \text{ Years}} \times \frac{146}{365}$

= **14,000**

VALUE OF WIP AND BALANCE SHEET (RELEVANT EXTRACTS)

VALUE OF WIP IN BALANCE SHEET:

ASSETS SIDE	AMOUNT
WORK-IN-PROGRESS:	
WORK CERTIFIED	**XXX**
WORK UNCERTIFIED	**XXX**
LESS: CASH RECD. FROM CONTRACTEE	**(XXX)**
VALUE OF WIP IN BALANCE SHEET	**XXX**

BALANCE SHEET (RELEVANT EXTRACTS ONLY)

LIABILITIES	AMOUNT	ASSETS	AMOUNT
NET PROFIT	XXX	PLANT	
		LESS: DEPRECIATION	XXX
OUTSTANDING WAGES	XXX		
		BUILDING	
CREDITORS	XXX	LESS: DEPRECIATION	XXX
OTHER LIABILITIES	XXX	MATERIALS AT SITE	XXX
		PREPAID EXPENSES	XXX
		OTHER ASSETS	XXX
		WORK-IN-PROGRESS:	
		WORK CERTIFIED	
		WORK UNCERTIFIED	
		LESS: CASH RECD. FROM CONTRACTEE	**XXX**
	-		**-**

ESTIMATED PROFIT

ESTIMATED PROFIT = CONTRACT PRICE – COST TO DATE – FURTHER ESTIMATED COST

EXAMPLE

Brock Construction Ltd. commenced a contract on November 1, 2003. The total contract was for ₹39,37,500.

Actual expenditure for the period November 1, 2003 to October 31, 2004 and estimated expenditure for November 1, 2004 to March 31, 2005 are given below:

	01.11.03 to 31.10.04 (Actuals)	01.11.04 to 31.03.05 (Estimated)
Materials issued	6,75,000	12,37,500
Labour:		
Paid	4,50,000	5,62,500
Prepaid	25,000	Nil
Outstanding	Nil	2,500
Plant purchased	3,75,000	Nil
Expenses:		
Paid	2,00,000	3,50,000
Outstanding	50,000	25,000
Plant returns to store (Historical cost)	75,000 (on 31.03.04)	3,00,000 (on 31.03.05)
Work Certified	20,00,000	Full
Work Uncertified	75,000	Nil
Cash received	17,50,000	Full
Material at site	75,000	37,500

The plant is subject to annual depreciation @33-⅓% on written down value method. The contract is likely to be completed on March 31, 2005.

PREPARE THE CONTRACT A/C. DETERMINE THE NOTIONAL PROFIT ON THE CONTRACT FOR THE YEAR NOVEMBER, 2003 TO OCTOBER, 2004 AND ESTIMATED PROFIT.

ANSWER

CONTRACT A/C
(01.11.03 TO 31.03.04)

PARTICULARS		AMOUNT	PARTICULARS	AMOUNT
To Materials issued		6,75,000	By WIP:	
			Value of work certified	20,00,000
To Labour	4,50,000		Cost of work uncertified	75,000
Less: Prepaid	(25,000)	4,25,000		
			By Materials at site	75,000
To Plant depreciation (3,00,000 + 75,000 × $^{5}/_{12}$) × 33-⅓%		1,10,417		
To Expenses paid	2,00,000	2,50,000		
Add: Outstanding	50,000			
TO NOTIONAL PROFIT		**6,89,583**		
		21,50,000		**21,50,000**

CALCULATION OF ESTIMATED PROFIT:

ESTIMATED PROFIT = Contract price – Cost to date + Further estimated cost

= 39,37,500 – (13,85,417 + 22,17,778)

= **3,34,305**

FURTHER ESTIMATED COST:

= Materials + Labour + Expenses + Depreciation

= (75,000 + 12,37,500 – 37,500) + (5,62,500 + 25,000 + 2,500) + (3,50,000 - 50,000 + 25,000) + [(3,00,000 – 33-⅓%) × $^{5}/_{12}$ × 33-⅓%]

= **22,17,778**

ESCALATION CLAIM

ESCALATION CLAIM:

'CLAIM TO COMPENSATE INCREASE IN PRICE OF STANDARD QUANTITY OF RAW MATERIALS AND INCREASE IN WAGE RATE OF STANDARD LABOUR HOURS'

- **CLAIM IS ONLY FOR STANDARD QUANTITY OF MATERIAL AN LABOUR HOURS**

ESCALATION CLAIM:

= SQ OF MATERIALS (AP - SP) + SH OF LABOUR (AR - SR)

EXAMPLE

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 :

MATERIAL	STANDARD		ACTUAL	
	QUANTITY (TONS)	RATE (₹)	QUANTITY (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
LABOUR	**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.

ANSWER

STATEMENT SHOWING ESCALATION CLAIM

PARTICULARS		₹
(A) MATERIALS:		
A	[5,000 tons × (48 - 50)]	(10,000)
B	[3,500 tons × (79 - 80)]	(3,500)
C	[2,500 tons × (66 - 60)]	15,000
	TOTAL (A)	**1,500**
(B) LABOUR:		
X	[2,000 hours × (72 - 70)]	4,000
Y	[2,500 hours × (75 - 75)]	-
Z	[3,000 hours × (66 - 65)]	3,000
	TOTAL (B)	**7,000**
	TOTAL ESCALATION CLAIM (A + B)	**8,500**

FINAL PRICE PAYABLE = ₹17,50,000 + ₹8,500 = **₹17,58,500**

MORE THAN ONE YEAR

'CLOSING BALANCE OF CURRENT PERIOD=OPENING BALANCE OF NEXT PERIOD'

EXAMPLE

Mr. Astle undertook a contract for ₹15,00,000 on an arrangement that 80% of the value of the work done as certified by the architect of the contractee, should be paid immediately and that remaining 20% be retained until the contract as completed.

In 2013:

The amount expended were: Materials ₹1,80,000; Wages ₹1,70,000; Carriage ₹6,000; Cartage ₹1,000; Sundry Expenses ₹3,000. The work was certified for ₹3,75,000 and 80% of this was paid as agreed.

In 2014:

The amounts expended were: Materials ₹2,20,000; Wages ₹2,30,000; Carriage ₹23,000; Cartage ₹2,000; Sundry Expenses ₹4,000. Three-fourth of the contract was certified as done by 31st December and 80% of this was received accordingly. The value of unused stock and work-in-progress uncertified was ascertained at ₹20,000.

In 2015:

The amounts expended were: Materials ₹1,26,000; Wages ₹1,70,000; Cartage ₹6,000; Sundry Expenses ₹3,000 and on 30th June, the whole contract was completed.

SHOW HOW THE CONTRACT ACCOUNT AND ALSO CONTRACTEE'S ACCOUNT WOULD APPEAR EACH OF THESE YEARS IN THE BOOKS OF THE CONTRACTOR ASSUMING THAT THE BALANCE DUE TO HIM WAS PAID ON COMPLETION OF THE CONTRACT.

ANSWER

CONTRACT ACCOUNT (2013)

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
To Materials	1,80,000	By Work in progress:	
To Wages	1,70,000	Work certified	3,75,000
To Carriage	6,000		
To Cartage	1,000		
To Sundry Expenses	3,000		
TO NOTIONAL PROFIT	**15,000**		
	3,75,000		**3,75,000**

CONTRACT ACCOUNT (2014)

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
To Opening WIP	3,75,000	By Work in progress:	
To Materials	2,20,000	Work certified	11,25,000
To Wages	2,30,000	Work uncertified	20,000
To Carriage	23,000		
To Cartage	2,000		
To Sundry Expenses	4,000		
TO NOTIONAL PROFIT	**2,91,000**		
	11,45,000		**11,45,000**

CONTRACT ACCOUNT (2015)

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
To Opening WIP	11,45,000	**BY CONTRACTEE'S A/C**	**15,00,000**
To Materials	1,26,000		
To Wages	1,70,000		
To Cartage	6,000		
To Sundry Expenses	3,000		
TO NOTIONAL PROFIT	**50,000**		
	15,00,000		**15,00,000**

RETENTION MONEY:

'CONTRACTEE DOESN'T PAY FULL AMOUNT OF WORK CERTIFIED TO CONTRACTOR. SMALL PORTION IS RETAINED BY CONTRACTEE AND SUCH PORTION IS KNOWN AS RETENTION MONEY'

- **AT THE TIME OF COMPLETION OF CONTRACT CONTRACTEE HAS TO PAY FULL AMOUNT TO CONTACTOR**

CONTRACTEE'S ACCOUNT (2013 TO 2015)

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
2013		**2013**	
To Balance c/d	3,00,000	By Bank	3,00,000
	3,00,000		**3,00,000**
2014		**2014**	
To Balance c/d	9,00,000	By Balance b/d	3,00,000
		By Bank	6,00,000
	9,00,000		**9,00,000**
2015		**2015**	
To Contract A/c	15,00,000	By Balance b/d	9,00,000
		By Bank	6,00,000
	15,00,000		**15,00,000**

CHAPTER - 07
OPERATING COSTING OR SERVICE COSTING

OPERATING COSTING OR SERVICE COSTING

OPERATING COSTING:

'THIS METHOD IS USED TO CALCULATE COST AND DETERMINE PRICE OF ONE SERVICE UNIT'

IN CA INTERMEDIATE ICAI COVERS FOLLOWING SERVICES:

- **TRANSPORT SERVICE**
- **HOTEL AND LODGES SERVICE**
- **RESTAURANT SERVICE**
- **HOSPITAL SERVICE**
- **EDUCATIONAL INSTITUTE**
- **INFORMATION TECHNOLOGY (IT) AND IT ENABLED SERVICES (ITES)**
- **TOLL PLAZA**
- **FINANCIAL INSTITUTES**
- **INSURANCE AND**
- **POWER GENERATION SERVICE.**

TRANSPORT SERVICE

PROFORMA OPERATING COST SHEET FOR TRANSPORT SERVICE

PARTICULARS	AMOUNT
(A) STANDING CHARGES OR FIXED COST:	
DEPRECIATION (REALTED TO PERIOD)	XXX
INSURANCE	XXX
LICENSE	XXX
SALARY OF MANAGER, DRIVER, CONDUCTOR ETC	XXX
ROAD TAX	XXX
PERMIT FEE	XXX
GARAGE RENT	XXX
ANY OTHER FIXED COST	XXX
TOTAL (A)	**XXX**
(B) RUNNING CHARGES OR VARIABLE COST:	
DIESEL/PETROL	XXX
LUBRICANTS, OIL ETC	XXX
DEPRECIATION (RELATED TO ACTIVITY)	XXX
COMMISSION	XXX
ANY OTHER VARIABLE COST	XXX
TOTAL (B)	**XXX**
(C) MAINTENANCE CHARGES OR SEMI VARIABLE COST:	
REPAIRS AND MAINTENANCE	XXX
TYRES	XXX
SPARES ETC.	XXX
TOTAL (C)	**XXX**
TOTAL OPERATING COST (A + B + C)	**XXX**
ADD: PROFIT	XXX
NET COLLECTIONS OR TAKING	**XXX**
ADD: INDIRECT TAXES (PASSENGER TAX, GST ETC)	XXX
GROSS COLLECTIONS OR TAKING	**XXX**
÷ TOTAL PASSENGER-KMS OR TON-KMS	XXX
FARE/CHARGES FOR PER PASSENGER-KM OR TON-KMS	**XXX**

EXAMPLE

M/s XY Travels has been given a 25 km long route to run an air-conditioned Mini Bus. The cost of bus is ₹20,00,000. It has been insured at 3% p.a. while annual road tax amounts to ₹36,000. Annual repairs will be ₹50,000 and the bus is likely to last for 5 years. The driver's salary will be ₹2,40,000 per annum and the conductor's salary will be ₹1,80,000 per annum in addition to 10% of takings as commission (to be shared by the driver and the conductor equally). Office and administration overheads will be ₹3,18,000 per annum. Diesel and oil will be ₹1,500 per 100 km. The bus will make 4 round trips carrying on an average 40 passengers on each trip. Assuming 25% profit on takings, and the bus will run on an average 25 days in a month.

YOU ARE REQUIRED TO:

(a) PREPARE OPERATING COST SHEET (FOR THE MONTH).
(b) CALCULATE FARE TO BE CHARGED PER PASSENGER KM.

ANSWER

(a) OPERATING COST SHEET (FOR THE MONTH)

PARTICULARS		AMOUNT
(A) STANDING CHARGES:		
Depreciation	(20,00,000 ÷ 5 Years × $^{1}/_{12}$)	33,333
Insurance	[(20,00,000 × 3%) ÷ 12]	5,000
Annual Tax	(36,000 ÷ 12)	3,000
Driver's salary	(2,40,000 ÷ 12)	20,000
Conductor's salary	(1,80,000 ÷ 12)	15,000
Office and administration OH	(3,18,000 ÷ 12)	26,500
TOTAL (A)		**1,02,833**
(B) RUNNING CHARGES:		
Diesel and oil	($^{1,500}/_{100}$ × 5,000 kms)	75,000
Commission @ 10% of collections 'WN'		28,000
TOTAL (B)		**1,03,000**
(C) MAINTENANCE CHARGES:		
Repairs	(50,000 × $^{1}/_{12}$)	4,167
TOTAL (C)		**4,167**
TOTAL OPERATING COST (A + B + C)		**2,10,000**
Add: Profit @ 25% of collections		70,000
TOTAL TAKINGS (WN 3)		**2,80,000**

(b) CALCULATION OF FARE TO BE CHARGED PER PASSENGER-KM:

Fare per passenger km	=	Total Takings ÷ Total Passenger-kms
	=	2,80,000 ÷ 2,00,000
	=	**₹ 1.40**

WN 1: CALCULATION OF TOTAL TRAVELLING OF BUS IN ONE MONTH:

=	2 × No of round trips daily × Distance one way × No of days
=	2 × 4 × 25 × 25
=	**5,000 kms**

WN 2: CALCULATION OF PASSENGER-KMS PER MONTH:

=	No of kms travelled per month × No of passengers
=	5,000 × 40
=	**2,00,000 PASSENGER-KMS**

WN 3: CALCULATION OF TAKINGS:

Total takings	=	Operating cost (excluding commission on takings) + 10% for commission + 25% for profit
	=	1,82,000 + 35% of takings
Total Takings	=	**₹2,80,000**

ABSOLUTE TONNE KMS AND COMMERCIAL TONNE KMS

ABSOLUTE TONN-KMS = D1 × W1 + D2 × W2 + D3 × W3……..

COMMERCIAL TONNE-KMS = TOTAL DISTANCE × AVERAGE WEIGHT

EXAMPLE

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'.

ANSWER

ABSOLUTE TONNE KMS:

This is the sum total of tonnes – kms, arrived at by multiplying various distances by respective load quantities carried as calculated below:

= 20 tonnes × 80 kms + 12 tonnes × 120 kms + 16 tonnes × 160 kms

= **5,600 TONNES KMS.**

COMMERCIAL TONNE KMS:

This is computed by average load being multiplied by total distance travelled as calculated below:

= Average load × Total kms travelled

= $\frac{20+12+16}{3}$ tonnes × 360 kms

= **5,760 TONNES KMS**.

SERVICE COST UNIT

OPERATING COST PER UNIT = TOTAL COST ÷ SERVICE UNITS

SERVICE UNITS CANBE CLASSIFIED AS:

- **SINGLE SERVICE UNIT**
- **COMPOSITE SERVICE UNIT**

NAME OF SERVICE	SINGLE SERVICE UNIT	COMPOSITE SERVICE UNIT
TAXI	COST PER KM	-
AUTO (SHARING)	COST PER KM	COST PER PASSENGER-KM
ROADWAYS BUS	COST PER KM	COST PER PASSENGER-KM
TRUCK	COST PER KM	COST PER TON-KM
HOTEL	COST PER ROOM-DAY	-
COACHING	COST PER BATCH	COST PER BATCH-STUDENT

HOTEL SERVICE WITH UNDERSTANDING OF DIFFERENCIAL FARE

EXAMPLE

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 room and triple room. Following information is given:

TYPE OF SUITES	NUMBER OF ROOMS	OCCUPANCY PERCENTAGE
Single room	100	100%
Double room	50	80%
Triple room	30	60%

The rent of double room suite is to be fixed at 2.5 times of the single room suite and that of triple room suite as twice of the double room suite.

THE OTHER EXPENSES FOR THE YEAR ARE AS FOLLOWS:

EXPENSES	₹
Staff salaries	14,25,000
Room attendant's 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.

ANSWER

STATEMENT SHOWING RENT TO BE CHARGED

PARTICULARS	₹
Staff salaries	14,25,000
Room attendant's 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
Building rent:	
Fixed	1,20,000
Variable @ 5% on taking	1,76,067
TOTAL COST	**28,17,067**
Add: Profit @ 20% on taking	7,04,266
***TOTAL TAKING**	**35,21,333**
÷ Equivalent single room days	÷ 1,04,400
RENT FOR SINGLE ROOM DAY	**₹33.73**
RENT FOR DOUBLE ROOM DAY (33.73 × 2.5)	**₹84.32**
RENT FOR TRIPLE ROOM DAY (33.73 × 2.5 × 2)	**₹168.65**

WORKING NOTES:

CALCULATION OF TAKING:

***TOTAL TAKING**	=	Operating cost (excluding rent on taking) + 5% for rent + 20% for profit
	=	₹26,41,000 + 25% of total takings
75% of Taking	=	₹26,41,000
TOTAL TAKING	=	**₹35,21,333**

CALCULATION OF EQUIVALENT SINGLE ROOM SUITES:

TYPE OF SUITES	ROOM DAYS	EQUIVALENT SINGLE ROOM
Single room suite	100 × 360 ×100% = 36,000	36,000 × 1 = 36,000
Double room suite	50 × 360 × 80% = 14,400	14,400 × 2.5 = 36,000
Triple room suite	30 × 360 × 60% = 6,480	6,480 × 5 = 32,400
TOTAL EQUIVALENT SINGLE ROOM DAYS		**1,04,400**

CHAPTER - 08
PROCESS & OPERATION COSTING

NORMAL PROCESS ACCOUNT

STEP 1: **PREPARE SEPARATE PROCESS ACCOUNT BY DEBITING ALL DIRECT COST AND APPORTIONABLE AND RECOVERBLE EXPENSES**

STEP 2: **CREDITED PROCESS ACCOUNT WITH NORMAL LOSS UNITS AND THEIR SCRAP VALUE**

STEP3: **CALCULATE NORMAL COST PER UNIT (NCPU):**

$$\text{NCPU} = \frac{\text{TOTAL COST} - \text{SALE VALE OF NORMAL LOSS UNITS}}{\text{TOTAL UNITS} - \text{NORMAL LOSS UNITS}}$$

STEP4: **VALUED ACTUAL OUTPUT AND ABNORMAL GAIN OR LOSS AS PER NCPU**

STEP 5: **PREPARE NOMAL LOSS, ABNORMAL LOSS, ABNORMAL GAIN AND PROFIT AND LOSS A/C**

EXAMPLE

A product passes through three processes A, B, and C. The normal wastage and actual output of each process is as follows:

PROCESS	ACTUAL OUTPUT	NORMAL LOSS
Process A	9,500 units	3%
Process B	9,100 units	5%
Process C	8,100 units	8%

Wastage of Process A was sold 25 Paise per unit, that of Process B at 50 Paise per unit and that of Process C at ₹1 per unit. 10,000 units were issued to Process A in the beginning of October 2016 at a cost of ₹1 per unit the other expenses were as follows:

NAME OF EXPENSES	PROCESS A (₹)	PROCESS B (₹)	PROCESS C (₹)
Sundry Materials	1,000	1,500	500
Labour	5,000	8,000	6,500
Direct expenses	1,050	1,188	2,009

Selling and distribution expenses are ₹850 and sale value per unit is ₹6.00

PREPARE ALL ACCOUNTS.

PROCESS A ACCOUNT

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Units Introduced	10,000	10,000	By Normal Loss A/c (3% @ ₹0.25/unit)	300	75
To Sundry Materials		1,000			
To Labour		5,000			
To Direct expenses		1,050	By Process B A/c @ ₹1.75 per unit	9,500	16,625
			By Abnormal Loss A/c @ ₹1.75 per unit	200	350
	10,000	**17,050**		**10,000**	**17,050**

$$\text{NCPU} = \frac{17{,}050 - 75}{10{,}000 - 300} = ₹1.75 \text{ per unit}$$

PROCESS B ACCOUNT

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Process A A/c	9,500	16,625	By Normal Loss A/c (5% @ ₹0.50/unit)	475	238
To Sundry Materials		1,500			
To Labour		8,000			
To Direct expenses		1,188	By Process C A/c @ ₹3 per unit	9,100	27,300
To Abnormal Gain A/c @ ₹3 per unit	75	225			
	9,575	**27,538**		**9,575**	**27,538**

NCPU = $\frac{27{,}313 - 238}{9{,}500 - 475}$ = ₹3 per unit

PROCESS C ACCOUNT

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Process B A/c	9,100	27,300	By Normal Loss A/c (8% @ ₹1.00/unit)	728	728
To Sundry Materials		500			
To Labour		6,500			
To Direct expenses		2,009	By Profit & Loss A/c @ ₹4.25 per unit	8,100	34,425
			By Abnormal Loss A/c @ ₹4.25 per unit	272	1,156
	9,100	**36,309**		**9,100**	**36,309**

NCPU = $\frac{36{,}309 - 728}{9{,}100 - 728}$ = ₹4.25 per unit

NORMAL LOSS ACCOUNT
(KABADI WALE BHAIYA KA ACCOUNT)

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Process A A/c	300	75	By Cash A/c:		
To Process B A/c	475	238	Process A	300	75
To Process C A/c	728	728	Process B	**400**	**200**
			Process C	728	728
			By Abnormal Gain A/c **(Opportunity cost)**	**75**	**38**
	1,503	**1,041**		**1,503**	**1,041**

ABNORMAL LOSS ACCOUNT
(ACHI UNIT BAN GAYI KABAD)

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Process A A/c	200	350	By Cash A/c:		
To Process C A/c	272	1,156	Process A	200	50
			Process C	272	272
			By Costing P/L A/c		**1,184**
	472	**1,506**		**472**	**1,506**

ABNORMAL GAIN ACCOUNT
(KABAD SE NIKLI ACHI UNITS)

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Normal Loss A/c **(opportunity cost)**	75	38	By Process B A/c	75	225
To Costing P/L A/c		**187**			
	75	**225**		**75**	**225**

COSTING PROFIT AND LOSS ACCOUNT

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Process C A/c	8,100	34,425	By Sales A/c (8,100 × 6.00)	8,100	48,600
To Selling Expenses		850			
To Abnormal Loss A/c		1,184	By Abnormal Gain A/c		187
To Profit (b.f.)		**12,328**			
	8,100	**48,787**		**8,100**	**48,787**

EQUIVALENT PRODUCTION (CLOSING WIP ONLY)

EQUIVALENT PRODUCTION:

'THIS CONCEPT IS USED IN CASE OF WIP UNITS IN PROCESS'

STEP 1: **PREPARE PROCESS ACCOUNT AS USUAL**

STEP2: **PREPARE STATEMENT OF EQUIVALENT PRODUCTION**

STEP 3: **PREPARE STATEMENT OF COST**

STEP 4: **PREPARE STATEMENT OF APPORTIONMENT OF COST OR STATEMENT OF EVALUATION (IN CASE OF ABNORMAL GAIN OR LOSS)**

STEP 5: **DO COMPLETE PROCESS ACCOUNT**

EXAMPLE

AB Ltd. is engaged in the process engineering industry. During the month of April 2017, 2,000 units were introduced in Process X. The normal loss is estimated at 5% of input.

At the end of the month 1,400 units had been produced and transferred to Process Y; 460 were incomplete units and 140 units had to be scrapped at the end of the process.

THE INCOMPLETE UNITS REACHED THE FOLLOWING DEGREE OF COMPLETION:

Materials: 75% **Labour: 50%** **Overheads: 50%**

FOLLOWING ARE THE FURTHER DETAILS REGARDING PROCESS X:

Cost of 2,000 units introduced	**₹58,000**
Additional materials consumed	**₹14,400**
Direct labour	**₹33,400**
Allocated overheads	**₹16,700**

Note: The scrapped units fetched ₹10 each

ANSWER

PROCESS X ACCOUNT

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Units Introduced	2,000	58,000	By Normal wastage (5% @ ₹10 per unit)	100	1,000
To Materials		14,400	By Process Y Account	1,400	
To Labour		33,400	By Closing WIP	460	
To Overheads		16,700	By Abnormal Loss A/c	40	
	2,000	**1,22,500**		**2,000**	**1,22,500**

STATEMENT OF EQUIVALENT PRODUCTION

PARTICULARS	UNITS	MATERIALS		LABOUR		OVERHEAD	
		%	E.U.	%	E.U.	%	E.U.
Units introduced:							
Normal Loss	100	-	-	-	-	-	-
Transferred to Y	1,400	100	1,400	100	1,400	100	1,400
Closing WIP	460	75	345	50	230	50	230
Abnormal Loss	40	100	40	100	40	100	40
Total	**2,000**	**-**	**1,785**	**-**	**1,670**	**-**	**1,670**

IF NOTHING IS SPECIFIED IN THE QUESTION:

- **% OF COMPLETION OF ABNORMAL LOSS UNITS** **100%**
- **% OF COMPLETION OF WIP UNITS:**

MATERIALS	**100%**
LABOUR	**50%**
OVERHEADS	**50%**

- **% OF MATERIAL COMPONENTS** **100%**

ALWAYS:

- **% OF COMPLETION OF FINISHED GOODS** **100%**
- **% OF COMPLETION OF ABNORMAL GAIN** **100%**
- **% OF COMPLETION OF NORMAL LOSS** **0%**
- **SALE VALUE OF SCRAP IS DEDUCTED FROM THE COST OF MATERIALS**

STATEMENT OF COST

ELEMENTS	COST	EQ. UNITS	COST PER UNIT
Materials	58,000 + 14,400 – 1,000 = 71,400	1,785	₹40.00
Labour	33,400	1,670	₹20.00
Overheads	16,700	1,670	₹10.00
TOTAL COST PER UNIT			**₹70.00**

STATEMENT OF EVALUATION

PARTICULARS	ELEMENTS	EQUIVALENT UNITS	COST PER UNIT	TOTAL (₹)
1. Transfer to Y	Materials	1,400	40	56,000
	Labour	1,400	20	28,000
	Overhead	1,400	10	14,000
				98,000
2. Closing WIP	Materials	345	40	13,800
	Labour	230	20	4,600
	Overhead	230	10	2,300
				20,700
3. Abnormal Loss	Materials	40	40	1,600
	Labour	40	20	800
	Overheads	40	10	400
				2,800

PROCESS X ACCOUNT

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹

To Units Introduced	2,000	58,000	By Normal wastage (5% @ ₹10 per unit)	100	1,000
To Materials		14,400	By Process Y Account	1,400	98,000
To Labour		33,400	By Closing WIP	460	20,700
To Overheads		16,700	By Abnormal Loss A/c	40	2,800
	2,000	**1,22,500**		**2,000**	**1,22,500**

EQUIVALENT PRODUCTION (OPENING AND CLOSING WIP)

IN CASE OF OPENING WIP WE CAN SOLVE TH EPROBLEM BY USING:

- **FIFO METHOD**
- **AVERAGE METHOD**

OPENING WIP WITH FIFO METHOD

IN FIFO METHOD:

- **ONLY CURRENT PERIOD WORK IS CONSIDERED IN STATEMENT OF EQUIVALENT PRODUCTION**
- **COST OF OPENING WIP IS DIRECTLY ADDED TO VALUE OF UNITS COMPLETED**

EXAMPLE

THE FOLLOWING DATA ARE AVAILABLE IN RESPECT OF PROCESS 1:

1. **Opening stock of work in process 800 units at a total cost of ₹4,000.**

2. **Degree of completion of opening work in progress:**

Materials	**100%**
Labour	**60%**
Overheads	**60%**

3. **Input of materials at a total cost of ₹36,800 for 9,200 units.**

4. **Direct wages incurred ₹16,740**

5. **Production overhead ₹8,370**

6. **Unit scrapped 1,200 units. The state of completion of these units was:**

Materials	**100%**
Labour	**80%**
Overheads	**80%**

7. **Closing work in progress 900 units and stage of completion was:**

Materials	**100%**
Labour	**70%**
Overheads	**70%**

8. **7,900 units were completed and transferred to the process 2.**

9. **Normal loss is 8% of the total input and scrap value is ₹4 per unit.**

PREPARE ALL ACCOUNT USING FIFO METHOD

ANSWER

PROCESS 1 ACCOUNT

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹

To Opening WIP	800	4,000	By Normal loss	800	3,200
To Materials	9,200	36,800	By Process 2 A/c	7,900	
To Labour		16,740	By Closing WIP	900	
To Overhead		8,370	By Abnormal Loss	400	
	10,000	**65,910**		**10,000**	**65,910**

STATEMENT OF EQUIVALENT PRODUCTION
(ONLY CURRENT PERIOD WORK IS CONSIDERED)

PARTICULARS	UNITS	MATERIALS		LABOUR		OVERHEAD	
		%	E.U.	%	E.U.	%	E.U.
Opening units: Transferred to 2	800	-	-	40	320	40	320
Units introduced: Transferred to 2	7,100	100	7,100	100	7,100	100	7,100
Normal Loss	800	-	-	-	-	-	-
Closing WIP	900	100	900	70	630	70	630
Abnormal Loss	400	100	400	80	320	80	320
Total	**10,000**	**-**	**8,400**	**-**	**8,370**	**-**	**8,370**

- **NORMAL AND ABNORMAL LOSS UNITS ALWAYS FROM CURRENT UNITS**

STATEMENT OF COST
(CURRENT PERIOD COST ONLY)

ELEMENTS	COST	EQ. UNITS	COST PER UNIT

Materials	36,800 – 3,200 = 33,600	8,400	₹4.00
Labour	16,740	8,370	₹2.00
Overheads	8,370	8,370	₹1.00
TOTAL COST PER UNIT			**₹7.00**

STATEMENT OF EVALUATION

PARTICULARS	ELEMENTS	EQUIVALENT UNITS	COST PER UNIT	TOTAL (₹)
1. Transfer to 2	Materials	7,100	4	28,400
	Labour	7,420	2	14,840
	Overhead	7,420	1	7,420
Add: Cost of opening WIP				**4,000**
				54,660
2. Closing WIP	Materials	900	4	3,600
	Labour	630	2	1,260
	Overhead	630	1	630
				5,490
3. Abnormal Loss	Materials	400	4	1,600
	Labour	320	2	640
	Overheads	320	1	320
				2,560

PROCESS 1 ACCOUNT

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Opening WIP	800	4,000	By Normal loss	800	3,200

To Materials	9,200	36,800	By Process 2 A/c	7,900	54,660
To Labour		16,740	By Closing WIP	900	5,490
To Overhead		8,370	By Abnormal Loss	400	2,560
	10,000	**65,910**		**10,000**	**65,910**

OPENING WIP WITH AVERAGE METHOD

IN AVERAGE METHOD:

- **TOTAL WORK IS CONSIDERED IN STATEMENT OF EQUIVALENT PRODUCTION**

- **COST OF OPENING WIP IS ADDED TO CURRENT PERIOD COST ELEMENTWISE**

- **NO NEED TO ADD COST OF OPENING WIP TO FINISHED GOODS**

EXAMPLE

THE FOLLOWING DATA ARE AVAILABLE IN RESPECT OF PROCESS 1:

1. **Opening stock of work in process 800 units at a total cost of ₹4,000:**

Materials	**2,000**
Labour	**1,000**
Overheads	**1,000**

2. **Degree of completion of opening work in progress:**

Materials	**100%**
Labour	**60%**
Overheads	**60%**

3. **Input of materials at a total cost of ₹36,800 for 9,200 units.**

4. **Direct wages incurred** **₹16,740**

5. **Production overhead** **₹8,370**

6. **Unit scrapped 1,200 units. The state of completion of these units was:**

Materials	**100%**
Labour	**80%**
Overheads	**80%**

7. **Closing work in progress 900 units and stage of completion was:**

Materials	**100%**
Labour	**70%**
Overheads	**70%**

8. **7,900 units were completed and transferred to the process 2.**

9. **Normal loss is 8% of the total input and scrap value is ₹4 per unit.**

PREPARE ALL ACCOUNT USING AVERAGE METHOD

ANSWER

PROCESS 1 ACCOUNT

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Opening WIP	800	4,000	By Normal loss	800	3,200

To Materials	9,200	36,800	By Process 2 A/c	7,900	
To Labour		16,740	By Closing WIP	900	
To Overhead		8,370	By Abnormal Loss	400	
	10,000	**65,910**		**10,000**	**65,910**

STATEMENT OF EQUIVALENT PRODUCTION
(TOTAL WORK IS CONSIDERED)

PARTICULARS	UNITS	MATERIALS		LABOUR		OVERHEAD	
		%	E.U.	%	E.U.	%	E.U.
Transferred to 2	7,900	100	7,900	100	7,900	100	7,900
Normal Loss	800	-	-	-	-	-	-
Closing WIP	900	100	900	70	630	70	630
Abnormal Loss	400	100	400	80	320	80	320
Total	**10,000**	**-**	**9,200**	**-**	**8,850**	**-**	**8,850**

STATEMENT OF COST
(TOTAL COST)

ELEMENTS	COST (OPENING WIP + CURRENT)	EQ. UNITS	COST P.U.
Materials	2,000 + 36,800 – 3,200 = 35,600	9,200	₹3.8696

Labour	1,000 + 16,740 = 17,740	8,850	₹2.0045
Overheads	1,000 + 8,370 = 9,370	8,850	₹1.0588
TOTAL COST PER UNIT			**₹6.9329**

STATEMENT OF EVALUATION

PARTICULARS	ELEMENTS	EQUIVALENT UNITS	COST PER UNIT	TOTAL (₹)
1. Transfer to 2	Materials	7,900	3.8696	30,570
	Labour	7,900	2.0045	15,836
	Overhead	7,900	1.0588	8,365
				54,771
2. Closing WIP	Materials	900	3.8696	3,483
	Labour	630	2.0045	1,263
	Overhead	630	1.0588	666
				5,412
3. Abnormal Loss	Materials	400	3.8696	1,548
	Labour	320	2.0045	641
	Overheads	320	1.0588	338
				2,527

PROCESS 1 ACCOUNT

PARTICULARS	UNITS	₹	PARTICULARS	UNITS	₹
To Opening WIP	800	4,000	By Normal loss	800	3,200
To Materials	9,200	36,800	By Process 2 A/c	7,900	54,771

To Labour		16,740	By Closing WIP	900	5,412
To Overhead		8,370	By Abnormal Loss	400	2,527
	10,000	**65,910**		**10,000**	**65,910**

INTER PROCESS PROFIT

INTER PROCESS PROFIT:

- **ONE PROCESS TRANSFER IT'S OUTPUT TO OTHER PROCESS ON COST PLUS PROFIT BASIS**

- **PRFIT EARNED BY EACH PROCESS DEPARTMENT IS USED TO EVALUATE PERFORMANCE OF CONCERN PROCESS DEPARTMENT**

EXAMPLE

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 2017.

	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)	Nil	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.**

ANSWER

PROCESS I A/C

PARTICULARS	TOTAL	COST	PROFIT	PARTICULARS	TOTAL	COST	PROFIT
To Balance b/d	7,500	7,500	-	By Process II A/c	54,000	40,500	13,500
To Materials	15,000	15,000	-				
To Wages	11,200	11,200	-				
Prime Cost	33,700	33,700	-				
- Closing Stock	(3,700)	(3,700)	-				
	30,000	30,000	-				
To Factory OH	10,500	10,500	-				
COGS	40,500	40,500	-				

To Profit	13,500	-	13,500				
	54,000	**40,500**	**13,500**		**54,000**	**40,500**	**13,500**

PROCESS II A/C

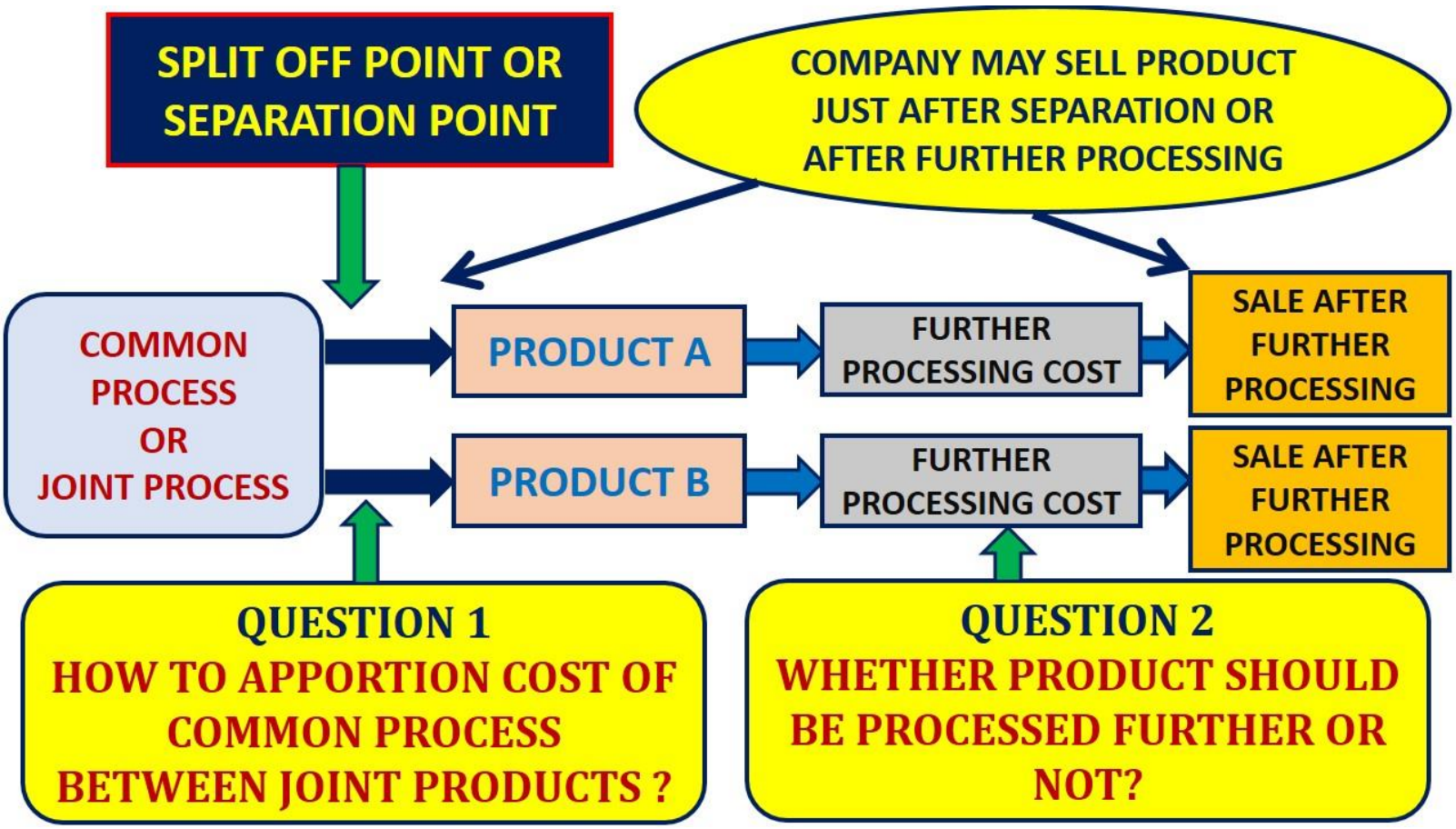
PARTICULARS	TOTAL	COST	PROFIT	PARTICULARS	TOTAL	COST	PROFIT
To Balance b/d	9,000	7,500	1,500	By Finished	1,12,500	75,750	36,750
To Process I A/c	54,000	40,500	13,500	Stock A/c			
To Materials	15,750	15,750	-				
To Wages	11,250	11,250	-				
Prime Cost	90,000	75,000	15,000				
- Closing Stock	(4,500)	(3,750)	*(750)				
	85,500	71,250	14,250				
To Factory OH	4,500	4,500	-				
COGS	90,000	75,750	14,250				
To Profit	22,500	-	22,500				
	1,12,500	**75,750**	**36,750**		**1,12,500**	**75,750**	**36,750**

FINISHED STOCK A/C

PARTICULARS	TOTAL	COST	PROFIT	PARTICULARS	TOTAL	COST	PROFIT
To Balance b/d	22,500	14,250	8,250	By Sales A/c	1,40,000	82,425	57,575
To Process II A/c	1,12,500	75,750	36,750				
- Closing Stock	(11,250)	(7,575)	*(3,675)				
COGS	1,23,750	82,425	41,325				
To Profit	16,250	-	16,250				
	1,40,000	**82,425**	**57,575**		**1,40,000**	**82,425**	**57,575**

CHAPTER - 09
JOINT PRODUCTS & BY PRODUCTS

UNDERSTANDING OF CHAPTER



METHODS OF APPORTIONMENT OF JOINT COST

1. MARKET VALUE AT SEPARATION POINT METHOD:

'APPORTIONMENT OF JOINT COST ON THE BASIS OF MARKET VALUE AT SEPARATION POINT OF TOTAL OUTPUT OF PRODUCTS'

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 at separation point.

APPORTION THE JOINT COST ON THE BASIS OF MARKET VALUE AT THE POINT OF SEPARATION.

ANSWER

STATEMENT SHOWING APPORTIONMENT OF JOINT COST

PARTICULARS	PRODUCT A	PRODUCT B
Number of units	200	200
Market value at separation point per unit	₹170	₹260
Total market value at separation point	₹34,000	₹52,000
APPORTIONMENT OF JOINT COST	**₹25,500**	**₹39,000**
(₹64,500 in 34 : 52)		

2. MARKET VALUE AFTER FURTHER PROCESSING METHOD:

'APPORTIONMENT OF JOINT COST ON THE BASIS OF MARKET VALUE AFTER FURTHER PROCESSING OF TOTAL OUTPUT OF PRODUCTS'

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 ₹1,00,000 by selling @ ₹200 per unit of product A and product B @ ₹300 per unit after further processing.

APPORTION THE JOINT COST ON THE BASIS OF MARKET VALUE AFTER FURTHER PROCESSING.

ANSWER

STATEMENT SHOWING APPORTIONMENT OF JOINT COST

PARTICULARS	PRODUCT A	PRODUCT B
Number of units	200	200
Market value after further processing per unit	₹200	₹300
Total market value after further processing	₹40,000	₹60,000
APPORTIONMENT OF JOINT COST (₹64,500 in 40 : 60)	**₹25,800**	**₹38,700**

3. NET REALISABLE VALUE (NRV) METHOD:

'APPORTIONMENT OF JOINT COST ON THE BASIS OF NET REALISABLE VALUE AT SPLIT OFF POINT OF TOTAL OUTPUT OF PRODUCTS'

NRV = SALE VALUE AFTER FURTHER PROCESSING – FURTHER PROCESSING COST – SELLING EXPENSES ETC.

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 ₹1,00,000 by selling @ ₹200 per unit of product A and product B @ ₹300 per unit after further processing. Further processing costs for products A and B are ₹4,000 and ₹32,000 respectively.

APPORTION THE JOINT COST ON THE BASIS OF NRV METHOD.

ANSWER

STATEMENT SHOWING APPORTIONMENT OF JOINT COST

PARTICULARS	PRODUCT A	PRODUCT B
Number of units	200	200
Market value after further processing	₹40,000	₹60,000
Less: Further processing cost	₹4,000	₹32,000
NET REALISABLE VALUE (NRV)	**₹36,000**	**₹28,000**
APPORTIONMENT OF JOINT COST (₹64,500 in 36 : 28)	**₹36,281**	**₹28,219**

4. PHYSICAL UNIT METHOD:

'APPORTIONMENT OF JOINT COST ON THE BASIS OF PHYSICAL UNITS AT SPLIT OFF POINT'

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 ₹1,00,000 by selling @ ₹200 per unit of product A and product B @ ₹300 per unit after further processing.

APPORTION THE JOINT COST ON THE BASIS OF PHYSICAL UNIT METHOD.

ANSWER

STATEMENT SHOWING APPORTIONMENT OF JOINT COST

PARTICULARS	PRODUCT A	PRODUCT B
Number of units	200	200
APPORTIONMENT OF JOINT COST (₹64,500 in 20 : 20)	**₹32,250**	**₹32,250**

5. AVERAGE UNIT COST METHOD:

'APPORTIONMENT OF JOINT COST ON THE BASIS OF AVERAGE COST PER UNIT'

$$\text{AVERAGE UNIT COST} = \frac{\text{TOTAL JOINT COST}}{\text{TOTAL UNITS AT SEPARATION POINT}}$$

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 ₹1,00,000 by selling @ ₹200 per unit of product A and product B @ ₹300 per unit after further processing.

APPORTION THE JOINT COST ON THE BASIS OF AVERAGE UNIT COST METHOD.

ANSWER

$$\text{AVERAGE UNIT COST} = \frac{64{,}500}{400 \text{ UNITS}} = ₹161.25 \text{ per unit}$$

JOINT COST:

PRODUCT A = 200 units × ₹161.25 = ₹32,250

PRODUCT B = 200 units × ₹161.25 = ₹32,250

6. CONTRIBUTION MARGIN METHOD:

- **APPORTIONMENT OF VARIABLE JOINT COST ON THE BASIS OF PHYSICAL UNITS**

- **APPORTIONMENT OF FIXED JOINT COST ON THE BASIS OF CONTRIBUTION**

EXAMPLE:

Sales:

Product A	**100 kg @ ₹60 per kg.**
Product B	**120 kg @ ₹40 per kg.**

Joint costs:

Variable cost	**₹4,400**
Fixed cost	**₹3,900**

APPORTION THE JOINT COST ON THE BASIS OF CONTRIBUTION MARGIN METHOD.

ANSWER

STATEMENT SHOWING APPORTIONMENT OF JOINT COST

PARTICULARS	PRODUCT A	PRODUCT B
Number of units	100	120
VARIABLE JOINT COST ₹4,400 IN (100 : 120)	**₹2,000**	**₹2,400**
Sales	₹6,000	₹4,800
Less: Variable joint cost	₹2,000	₹2,400
Contribution	₹4,000	₹2,400
FIXED JOINT COST ₹3,900 IN (40 : 24)	**₹2,438**	**₹1,462**
TOTAL JOINT COST	**₹4,438**	**₹3,862**

7. REVERSE COST METHOD:

STATEMENT SHOWING APPORTIONMENT OF JOINT COST

PARTICULARS	PRODUCT A	PRODUCT B
Sale value after further processing	XXX	XXX
Less: Profit	XXX	XXX
Less: Selling expenses	XXX	XXX
Less: Further cost	XXX	XXX
JOINT COST	**XXX**	**XXX**

EXAMPLE

FROM THE FOLLOWING DETAILS APPORTION ₹37,500 JOINT COST.

PARTICULARS	PRODUCT A	PRODUCT B
Sale value after further processing	50,000	80,000
Profit	10%	20%
Selling expenses	5%	5%
Further cost	25,000	40,000

ANSWER

STATEMENT SHOWING APPORTIONMENT OF JOINT COST

PARTICULARS	PRODUCT A	PRODUCT B
Sale value after further processing	50,000	80,000
Less: Profit	(5,000)	(16,000)
Less: Selling expenses	(2,500)	(4,000)
Less: Further cost	(25,000)	(40,000)
JOINT COST	**₹17,500**	**₹20,000**

EXAMPLE

A company manufactures one main product (M1) and two by-products B1 and B2 for the month of January 2013, following details are available:

TOTAL COST UPTO SEPARATION POINT ₹2,12,400

PARTICULARS	M1	B1	B2
Cost after separation	-	₹35,000	₹24,000
No. of units produced	4,000	1,800	3,000
Selling price per units	₹100	₹40	₹30
Estimated net profit as percentage to sales	-	20%	30%
Estimated selling expenses as % to sales	20%	15%	15%

PREPARE STATEMENT SHOWING:

I. Allocation of joint cost; and
II. Product-wise and overall profitability of the company for January 2013.

ANSWER

I. STATEMENT OF ALLOCATION OF JOINT COST

PARTICULARS	B1	B2
Sales @ ₹40/₹30 per unit	72,000	90,000
Less: Estimated profit @ 20%/30%	14,400	27,000
Less: Estimated selling expenses @ 15% on sales	10,800	13,500
Less: Further estimated cost	35,000	24,000
JOINT COST	**11,800**	**25,500**
Total Joint Cost		2,12,400
Less: Joint cost allocable to B1		11,800
Less: Joint cost allocable to B2		25,500
JOINT COST ALLOCABLE TO M1		**1,75,100**

II. PRODUCT-WISE & OVERALL PROFITABILITY STATEMENT

PARTICULARS	M1	B1	B2	TOTAL
Sales	4,00,000	72,000	90,000	5,62,000
Less: Selling expenses	80,000	10,800	13,500	1,04,300
Less: Cost after separation	Nil	35,000	24,000	59,000
Less: Joint cost	1,75,100	11,800	25,500	2,12,400
PROFIT	**1,44,900**	**14,400**	**27,000**	**1,86,300**

8. CONSTANT GROSS MARGIN METHOD:

- **FIRST CALCULATE CONSTANT PERCENTAGE OF PROFIT**
- **USE REVERSE COST METHOD**

EXAMPLE

FROM THE FOLLOWING DETAILS APPORTION ₹37,500 JOINT COST USING GROSS CONSTANT MARGIN METHOD.

PARTICULARS	PRODUCT A	PRODUCT B
Sale value after further processing	50,000	80,000
Selling expenses	5%	5%
Further cost	25,000	40,000

ANSWER

CALCULATION OF CONSTANT % OF PROFIT/MARGIN:

PARTICULARS		TOTAL
Total Sale value	(50,000 + 80,000)	1,30,000
Less: Total Selling expenses	(2,500 + 4,000)	(6,500)
Less: Total Further cost	(25,000 + 40,000)	(65,000)
Less: Total Joint cost		(37,500)
TOTAL PROFIT		**₹21,000**
% OF PROFIT (21,000 ÷ 1,30,000)		**16.1538%**

STATEMENT SHOWING APPORTIONMENT OF JOINT COST

PARTICULARS	PRODUCT A	PRODUCT B
Sale value after further processing	50,000	80,000
Less: Profit @ 16.1538%	(8,077)	(12,923)
Less: Selling expenses	(2,500)	(4,000)
Less: Further cost	(25,000)	(40,000)
JOINT COST	**₹14,423**	**₹23,077**

FURTHER PROCESSING DECISION

INCREMENTAL REVENUE (IR) = **SALE VALUE AFTER FURTHER PROCESSING – SALE VALUE AT SEPARATION POINT**

INCREMENTAL COST (IC) = **FURTHER PROCESSING COST + SELLING EXPENSES IN CASE OF FURTHER PROCESSING – SELLING EXPENSES AT SPLIT OFF POINT**

SITUATION	FURTHER PROCESSING DECISION
1. IR > IC	YES
2. IR = IC	INDIFFERENT
3. IR < IC	NO

EXAMPLE

PARTICULARS	PRODUCT A	PRODUCT B	PRODUCT C

Sale value:			
After further processing	1,50,000	2,40,000	70,000
At separation point	80,000	1,50,000	50,000
Selling expenses:			
After further processing	20,000	30,000	12,000
At separation point	15,000	20,000	7,000
Further cost	30,000	80,000	35,000

ANSWER

STATEMENT SHOWING FURTHER PROCESSING DECISION

PRODUCT	CALCULATION IR AND IC	STATUS	DECISION
A	IR = 1,50,000 – 80,000 = 70,000 IC = 30,000 + (20,000 – 15,000)= 35,000	IR > IC	YES
B	IR = 2,40,000 – 1,50,000 = 90,000 IC = 80,000 + (30,000 – 20,000)= 90,000	IR = IC	INDIFF.
C	IR = 70,000 – 50,000 = 20,000 IC = 35,000 + (12,000 – 7,000)= 40,000	IR < IC	NO

TREATMENT OF BY PRODUCT

1. WHEN BY PRODUCT HAS COMMERCIAL USE:

'TREAT IT AS JOINT PRODUCT'

HOW TO TRACE:

- **IF QUESTION SAYS TO APPORTION COST TO BY PRODUCT ALSO**
- **IF QUESTION SAYS TO CALCULATE PROFIT ON BY PRODUCT ALSO**
- **IF QUESTION SAYS BY PRODUCT HAS COMMERCIAL USE**

2. WHEN BY PRODUCT DON'T HAVE COMMERCIAL USE:

'TREAT IT AS SCRAP'

STEP 1: **DEDUCT SALE VALUE OF BY PRODUCT FROM THE JOINT COST**

STEP 2: **APPORTION NET JOINT COST AMONG REMAINING MAIN PRODUCTS**

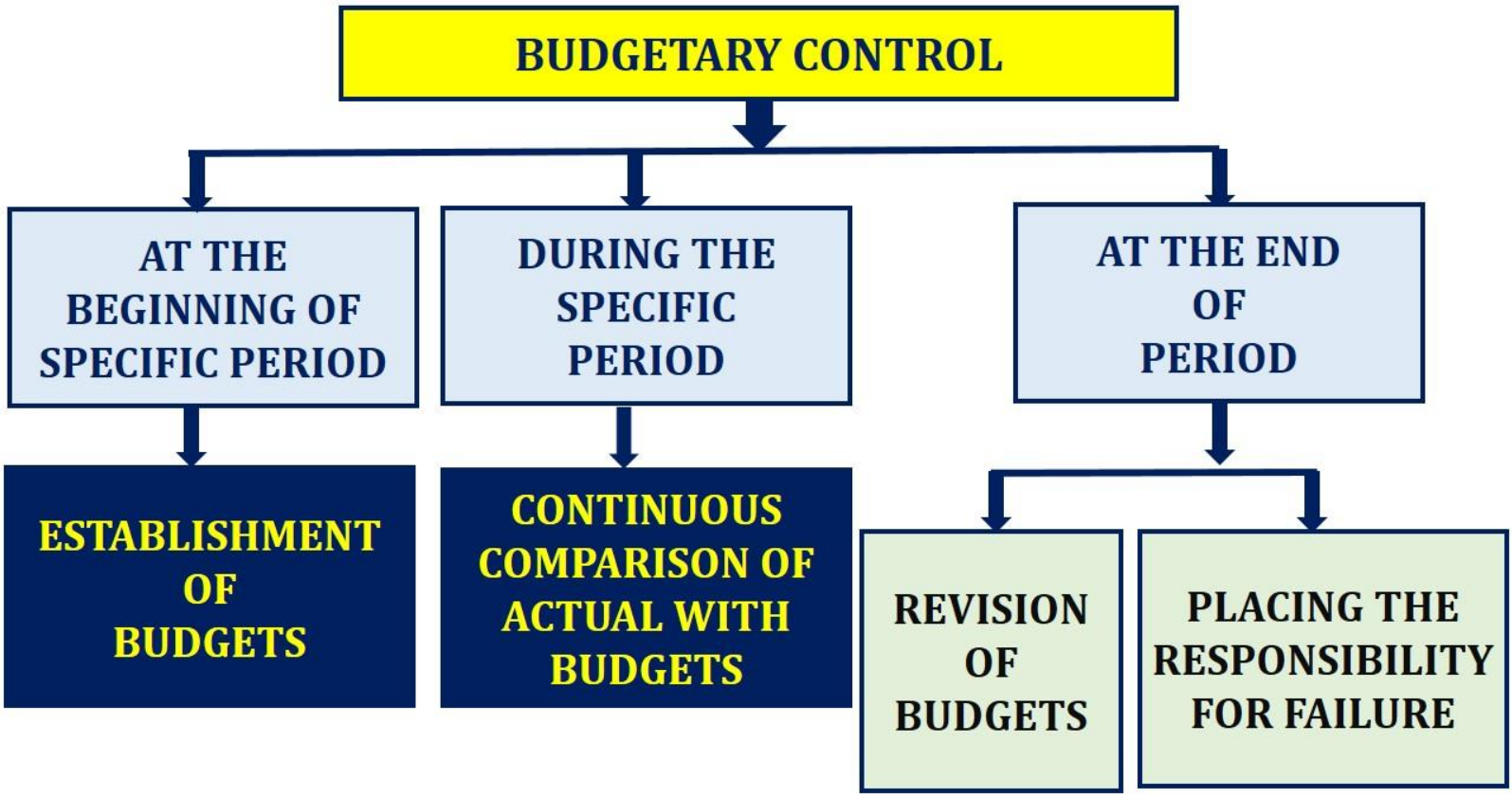
CHAPTER - 10
BUDGET AND BUDGETARY CONTROL

MEANING OF BUDGET AND BUDGETARY CONTROL

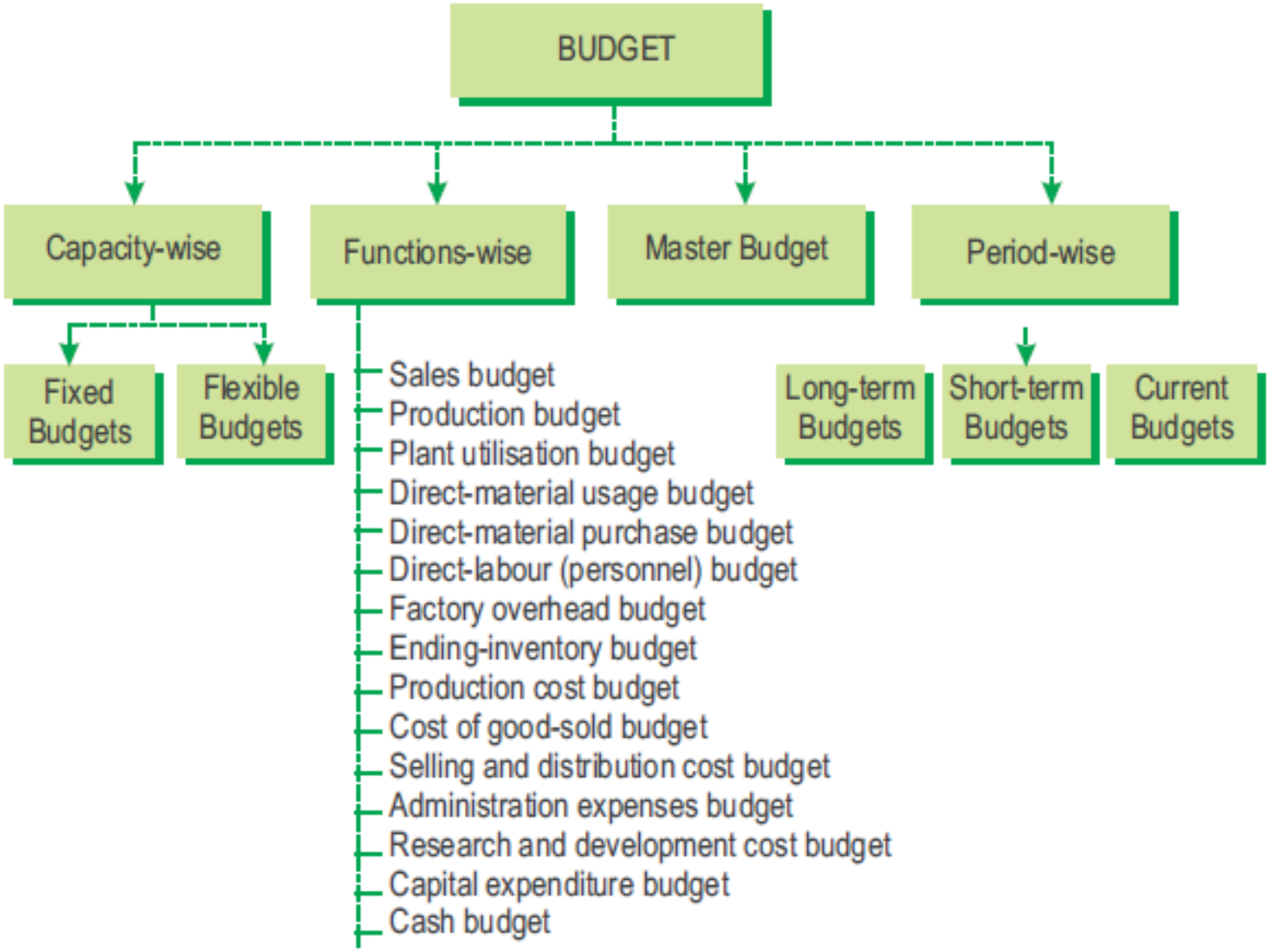
BUDGET:

'QUANTITATIVE EXPRESSION OF APLAN FOR A DEFINED PERIOD OF TIME'

BUDGETARY CONTROL:



TYPES OF BUDGET



FIXED AND FLEXIBLE BUDGET

S.N	FIXED BUDGET	FLEXIBLE BUDGET
1	It does not change with actual volume of activity achieved. Thus it is rigid.	It can be re-casted on the basis of activity level to be achieved. Thus it is not rigid.
2	It operates on one level of activity and under one set of conditions.	It consists of various budgets for different level of activity.
3	If the budgeted and actual activity levels differ significantly, then cost ascertainment and price fixation do not give a correct picture.	It facilitates the cost ascertainment and price fixation at different levels of activity.
4	Comparisons of actual and budgeted targets are meaningless particularly when there is difference between two levels.	It provided meaningful basis of comparison of actual and budgeted targets.

ZERO BASED BUDGETING (ZBB)

ZERO-BASED BUDGETING (ZBB):

- ZERO BASED BUDGETING (ZBB) IS A METHOD OF BUDGETING IN WHICH ALL EXPENSES MUST BE JUSTIFIED FOR EACH NEW PERIOD
- THE PROCESS OF ZERO BASED BUDGETING STARTS FROM A "ZERO BASE"

- **EVERY FUNCTION WITHIN AN ORGANIZATION IS ANALYZED FOR ITS NEEDS AND COSTS**

EXAMPLE

Pentax Limited has prepared its expense budget for 20,000 units in its factory for the year 2013 as detailed below:

	₹ PER UNIT
Direct Material	50
Direct Labour	20
Variable Overhead	15
Direct Expenses	6
Selling Expenses (20% Fixed)	15
Factory Expenses (100% Fixed)	7
Administration Expenses (100% Fixed)	4
Distribution Expenses (85% Variable)	12
TOTAL	129

PREPARE AN EXPENSE BUDGET FOR THE PRODUCTION OF 15,000 UNITS AND 18,000 UNITS.

ANSWER

EXPENSES BUDGET

PARTICULARS	20,000 UNIT	15,000 UNIT	18,000 UNIT
(A) VARIABLE COST:			
Direct Materials @ ₹50 per unit	10,00,000	7,50,000	9,00,000
Direct Labour @ ₹20 per unit	4,00,000	3,00,000	3,60,000
Variable Overhead @ ₹15 per unit	3,00,000	2,25,000	2,70,000
Direct Expenses @ ₹6 per unit	1,20,000	90,000	1,08,000
TOTAL (A)	**18,20,000**	**13,65,000**	**16,38,000**
(B) FIXED COST:			
Factory Expenses (₹7 × 20,000 units)	1,40,000	1,40,000	1,40,000
Admin Expenses (₹4 × 20,000 units)	80,000	80,000	80,000
TOTAL (B)	**2,20,000**	**2,20,000**	**2,20,000**
(C) SEMI VARIABLE COST:			
Selling Expenses:			
Variable @ ₹12 per unit	2,40,000	1,80,000	2,16,000
Fixed (₹3 × 20,000)	60,000	60,000	60,000
Distribution Expenses:			
Variable @ ₹10.20 per unit	2,04,000	1,53,000	1,83,600
Fixed (₹1.80 × 20,000 units)	36,000	36,000	36,000

TOTAL (C)	**5,40,000**	**4,29,000**	**4,95,600**
TOTAL EXPENSES (A + B + C)	**25,80,000**	**20,14,000**	**23,53,600**

EXAMPLE

XYZ company is drawing a production plan for its two products XML and YML for the year 2015-16. The company's policy is to maintain a closing stock of finished goods at 25% of the anticipated volume of the sales of the succeeding month.

THE FOLLOWING ARE THE ESTIMATED DATA FOR TWO PRODUCTS:

	XML	YML
Budgeted production in units	2,00,000	1,50,000
Direct material per unit	₹220.00	₹280.00
Direct labour per unit	₹130.00	₹120.00
Other manufacturing expenses	₹4,00,000	₹5,00,000

THE ESTIMATED UNITS TO BE SOLD IN THE FIRST 4 MONTHS OF THE YEAR 2015-16 ARE AS UNDER:

	April	May	June	July
XML	8,000	10,000	12,000	16,000
YML	6,000	8,000	9,000	14,000

PREPARE:

(i) Production Budget (Month wise)

(ii) Production Cost Budget (for first quarter of the year)

ANSWER

(i) PRODUCTION BUDGET

PRODUCT XML			
PARTICULARS	**APRIL**	**MAY**	**JUNE**
Budgeted Sales (in units)	8,000	10,000	12,000
Add: Expected Closing Stock (25% of sales of next month)	2,500	3,000	4,000
Less: Opening Stock	(2,000)	(2,500)	(3,000)
TOTAL PRODUCTION	**8,500**	**10,500**	**13,000**
PRODUCT YML			
PARTICULARS	**APRIL**	**MAY**	**JUNE**
Budgeted Sales (in units)	6,000	8,000	9,000
Add: Expected Closing Stock (25% of sales of next month)	2,000	2,250	3,500
Less: Opening Stock	(1,500)	(2,000)	(2,250)
TOTAL PRODUCTION	**6,500**	**8,250**	**10,250**

(ii) PRODUCTION COST BUDGET

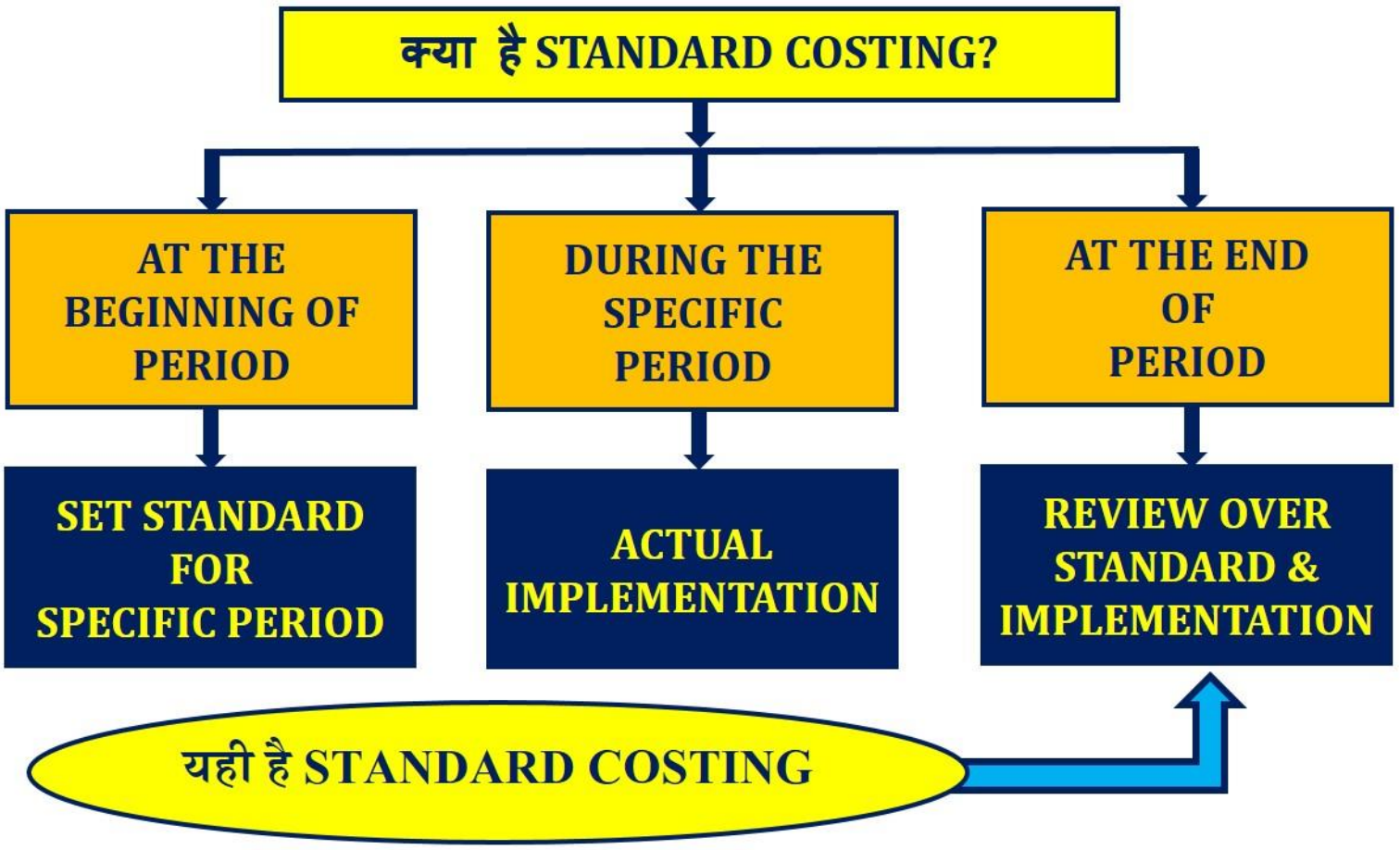
PARTICULARS	XML	YML
No of units expected to be produced	32,000	25,000
Direct material @ ₹220/ ₹280 per unit	70,40,000	70,00,000
Direct labour @ ₹130/ ₹120 per unit	41,60,000	30,00,000

Other manufacturing expenses @ ₹2 / ₹3.33 p.u.	**64,000**	**83,333**
TOTAL PRODUCTION COST	**1,12,64,000**	**1,00,83,333**

CHAPTER – 11

STANDARD COSTING OR VARIANCE ANALYSIS

UNDERSTANDING OF CHAPTER

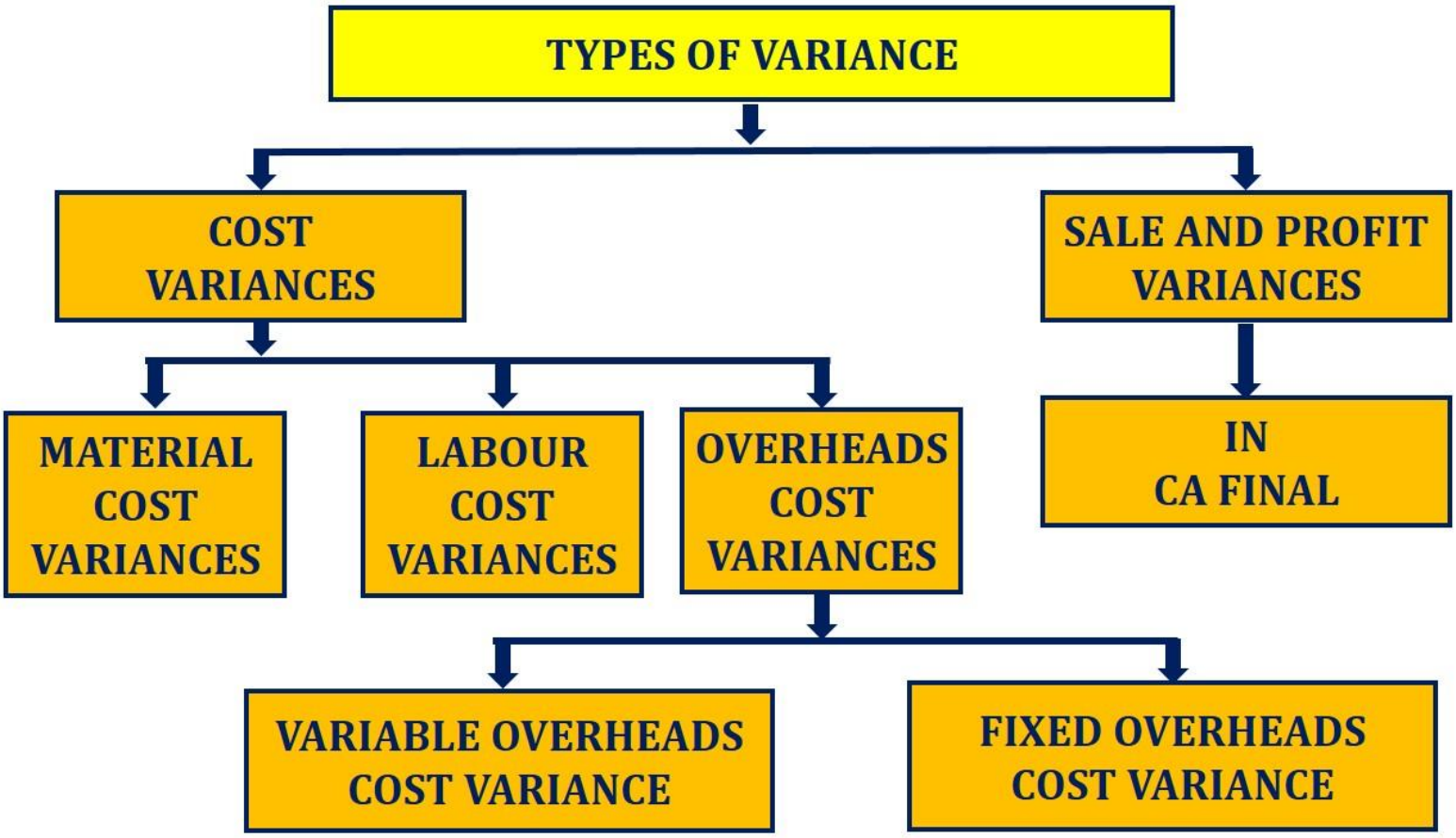


COST VARIANCE

COST VARIANCE:

'DIFFERENCE BETWEEN ACTUAL COST AND STANDARD COST TO PRODUCE ACTUAL OUTPUT'

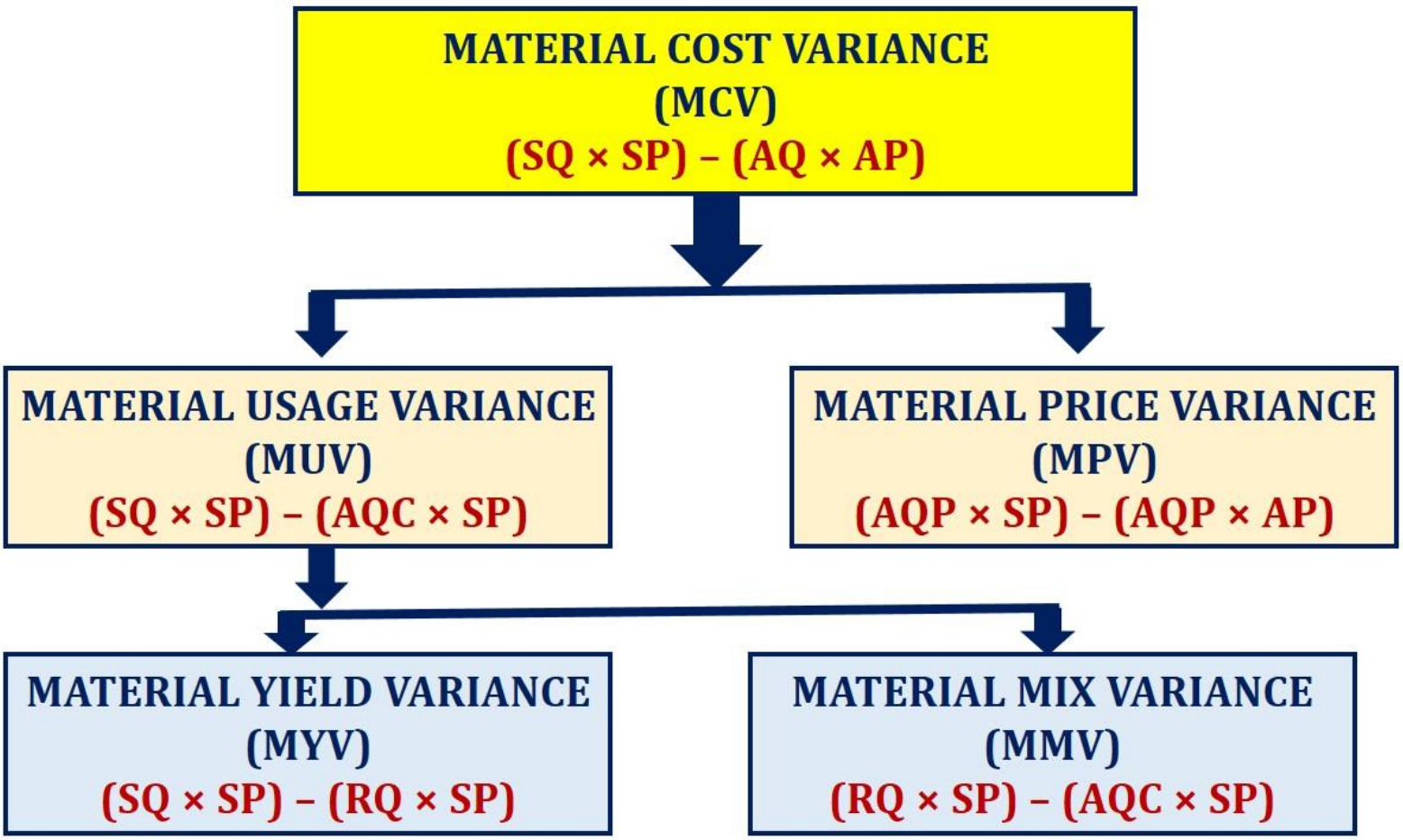
TYPES OF VARIANCE



MATERIAL COST VARIANCE

REASONS OF DIFFERENCE IN MATERIAL COST:

- **DUE TO DIFFERENCE IN CONSUMPTION QUANTITY (INPUT-OUTPUT RATIO)**
- **DUE TO DIFFERENCE IN RATIO OF MIXTURE OF MATERIALS USED**
- **DUE TO DIFFERENCE IN PURCHASE PRICE OF RAW MATERIALS**



SQ (STANDARD QUANTITY):

'STANDARD QUANTITY OF RAW MATERIAL CONSUMPTION TO PRODUCE ACTUAL OUTPUT'

AQP (ACTUAL QUANTITY PURCHASED):

'ACTUAL QUANTITY OF RAW MATERIALS PURCHASED'

AQC (ACTUAL QUANTITY CONSUMED):

'ACTUAL QUANTITY OF RAW MATERIALS CONSUMED TO PRODUCE ACTUAL OUTPUT'

RQ (REVISED QUANTITY):

'ACTUAL QUANTITY OF RAW MATERIALS CONSUMED IN STANDARD PROPORTION'

SP (STANDARD PRICE):

'STANDARD PURCHASE PRICE OF RAW MATERIALS'

AP (ACTUAL PRICE):

'ACTUAL PURCHASE PRICE OF RAW MATERIALS'

EXAMPLE

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.

ANSWER

WORKING NOTE:

(a) ANALYSIS TABLE

MATERIALS	SQ × SP	RQ × SP	AQ × SP	AQ × AP
A	80.88 kg × ₹20	80 kg × ₹20	90 kg × ₹20	90 kg × ₹18
B	121.33 kg × ₹30	120 kg × ₹30	110 kg × ₹30	110 kg × ₹34
Total	₹5,258	₹5,200	₹5,100	₹5,360

(b) RQ (Revised Quantity):

Actual input	**=**	**90 kg + 110 kg**	**=**	**200 kgs**
Materials A	**=**	**200 kgs × 60%**	**=**	**120 kgs**
Materials B	**=**	**200 kgs × 40%**	**=**	**80 kgs**

(c) SQ (Standard Quantity):

Actual output	**=**	**182 kg**		
Standard input	**=**	**182 kg ÷ 90%**	**=**	**202.22 kgs**
Materials A	**=**	**202.22 kgs × 40%**	**=**	**80.88 kgs**
Materials B	**=**	**202.22 kgs × 60%**	**=**	**121.33 kgs**

MAIN ANSWER:

1.	**MATERIAL PRICE VARIANCE**	**=**	**(AQP × SP) – (AQP × AP)**		
		=	**₹5,100 - ₹5,360**	**=**	**₹260A**
2.	**MATERIAL MIX VARIANCE**	**=**	**(RQ × SP) – (AQC × SP)**		
		=	**₹5,200 - ₹5,100**	**=**	**₹100 F**
3.	**MATERIAL YIELD VARIANCE**	**=**	**(SQ × SP) – (RQ × SP)**		
		=	**₹5,258 - ₹5,200**	**=**	**₹58 F**
4.	**MATERIAL USAGE VARIANCE**	**=**	**(SQ × SP) – (AQC × SP)**		
		=	**₹5,258 – ₹5,100**	**=**	**₹158 F**
5.	**MATERIAL COST VARIANCE**	**=**	**(SQ × SP) – (AQ × AP)**		
		=	**₹5,258 – ₹5,360**	**=**	**₹102 F**

NOTE:

- **IF NOTHING IS SPECIFIED IN THE QUESTION:**

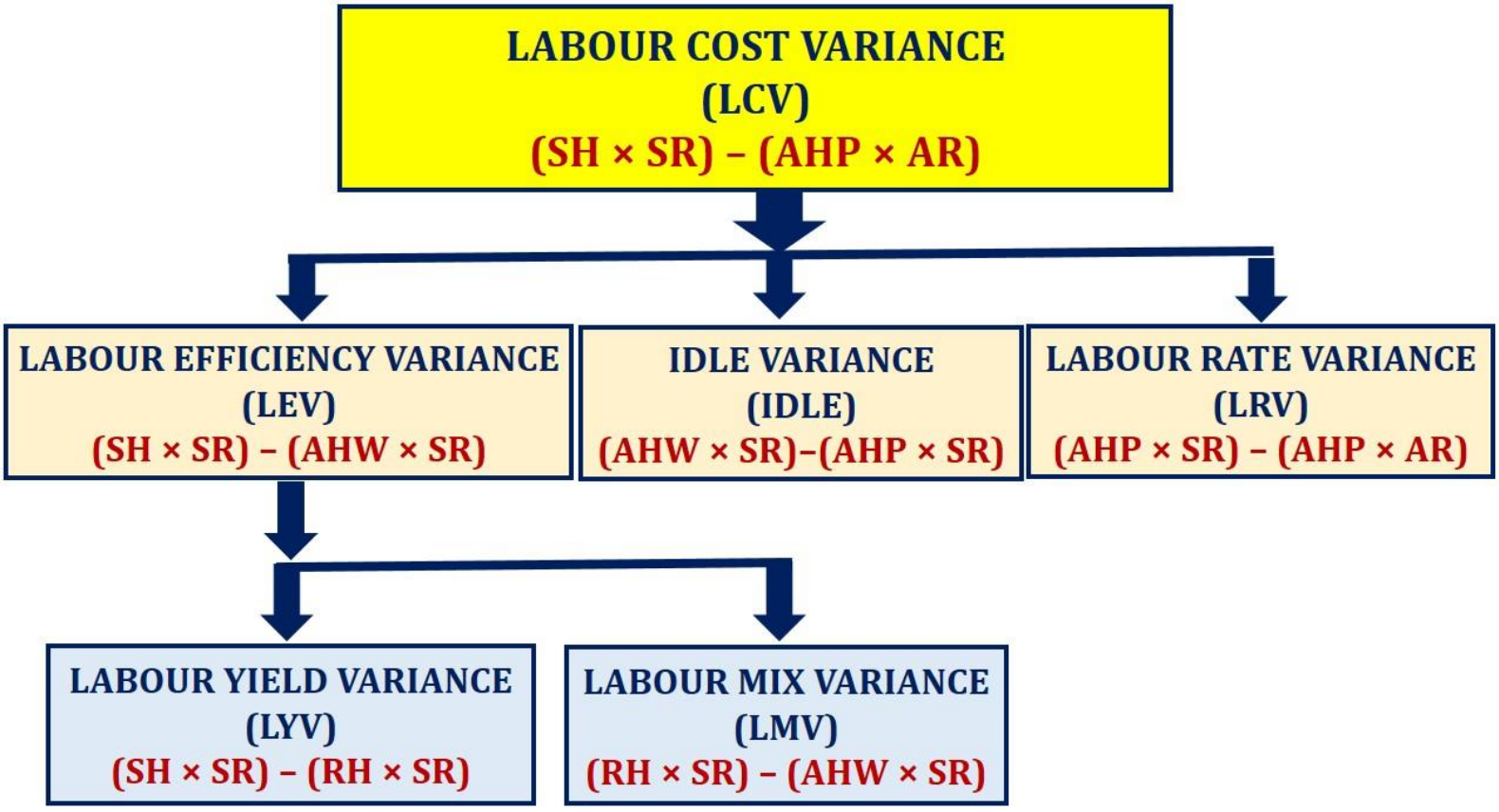
RAW MATERIAL PURCHASE (AQP) = RAW MATERIAL CONSUMED (AQC)

- **MATERIAL PRICE VARIANCE IS BASED ON PURCHASE QUANTITY (AQP) AND ALL OTHER VARIANCES ON MATERIAL CONSUMPTION (AQC)**

LABOUR COST VARIANCE

REASONS OF DIFFERENCE IN LABOUR COST:

- **DUE TO DIFFERENCE IN HOURS TAKEN AND ALLOWED**
- **DUE TO DIFFERENCE IN RATIO OF MIXTURE OF WORKERS**
- **DUE TO ABNORMAL IDLE TIME**
- **DUE TO DIFFERENCE IN WAGE RATE**



SH (STANDARD HOURS):

'STANDARD HOURS TO PRODUCE ACTUAL OUTPUT'

AHP (ACTUAL HOUR PAID):

'ACTUAL LABOUR HOURS PAID'

AHW (ACTUAL HOURS WORKED):

'ACTUAL LABOUR HOURS WORKED TO PRODUCE ACTUAL OUTPUT'

AHW (ACTUAL HOURS WORKED):

AHP (ACTUAL HOURS PAID) - ABNORMAL IDLE TIME

RH (REVISED HOURS):

'ACTUAL LABOUR HOURS WORKED IN STANDARD PROPORTION'

SR (STANDARD RATE):

'STANDARD WAGE RATE'

AR (ACTUAL RATE):

'ACTUAL WAGE RATE'

LABOUR VARIANCES

EXAMPLE

The standard labour employment and the actual labour engaged in a 40 hours week for a job are as under:

CATEGORY OF WORKERS	STANDARD		ACTUAL	
	NO. OF WORKERS	WAGE RATE PER HOUR ₹	NO. OF WORKERS	WAGE RATE PER HOUR ₹
Skilled	65	45	50	50
Semi- skilled	20	30	30	35
Unskilled	15	15	20	10

Standard output	:	2,000 units
Actual output	:	1,800 units
Abnormal Idle Time	:	2 hours in the week

CALCULATE ALL LABOUR VARIANCES.

ANSWER

WORKING NOTES:

(a) ANALYSIS TABLE

CATEGORY	SH × SR	RH × SR	AHW × SR	AHP × SR	AHP × AR
Skilled	2,340 × 45	65×38×45	50×38×45	50×40×45	50×40×50
Semi Skilled	720 × 30	20×38×30	30×38×30	30×40×30	30×40×35
Unskilled	540 × 15	15×38×15	20×38×15	20×40×15	20×40×10
Total	1,35,000	1,42,500	1,31,100	1,38,000	1,50,000

(b) SH (Standard Hours) to produce 1,800 units:

SH for 2,000 units	**=**	**(65 + 20 + 15) 100 workers × 40 hours**		
	=	**4,000 hours**		
SH for 1 unit	**=**	**4,000 hours ÷ 2,000 units**	**=**	**2 hours**
SH for 1,800 units	**=**	**1,800 hours × 2 hours**		
	=	**3,600 hours**		
Skilled	**=**	**3,600 hours × 65/100**	**=**	**2,340 hours**
Semi Skilled	**=**	**3,600 hours × 20/100**	**=**	**720 hours**
Un Skilled	**=**	**3,600 hours × 15/100**	**=**	**540 hours**

MAIN ANSWER:

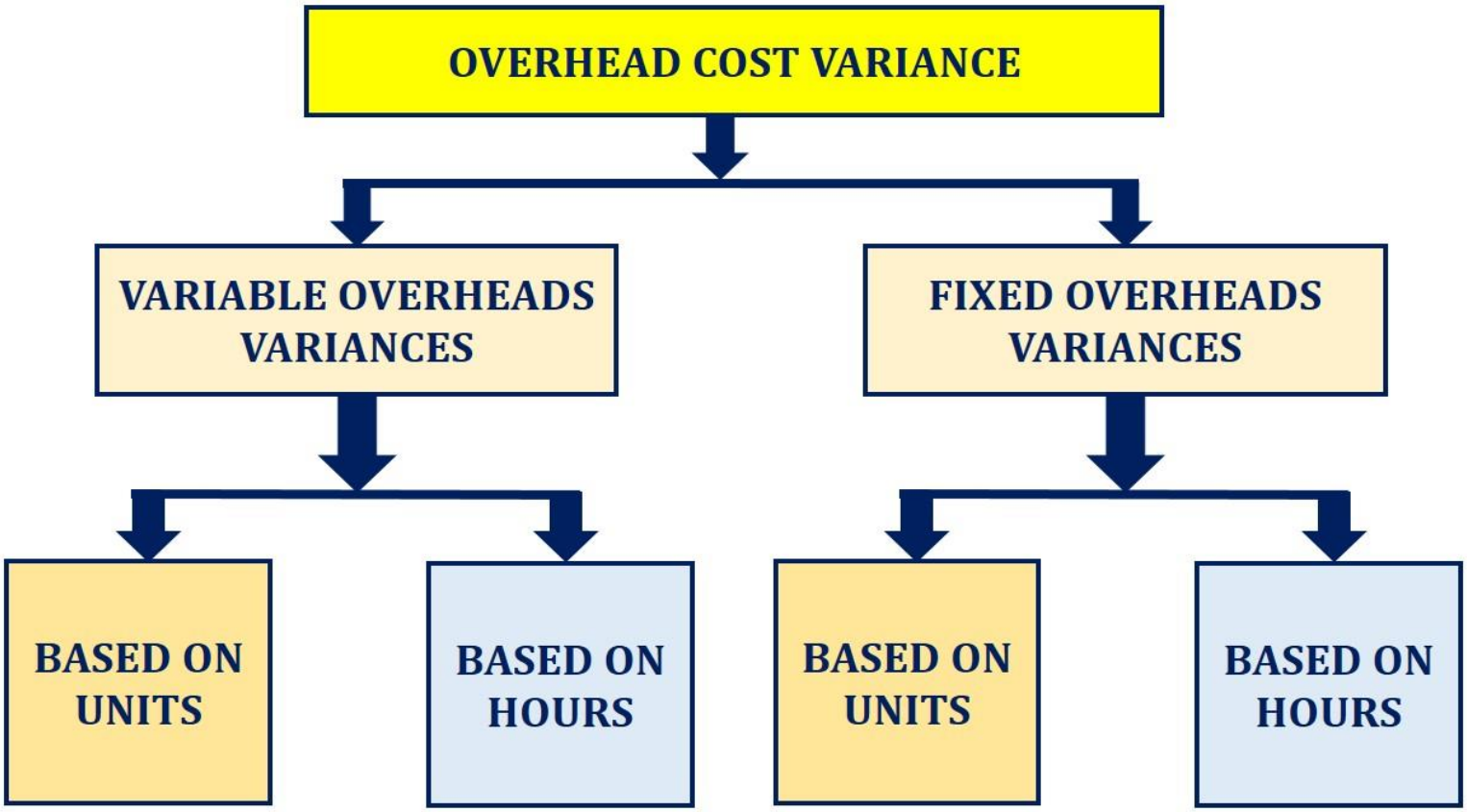
(1) LABOUR RATE VARIANCE	**=**	**(AHP × SR) – (AHP × AR)**		
	=	**1,38,000 – 1,50,000**	**=**	**12,000 A**
(2) LABOUR IDLE VARIANCE	**=**	**(AHW × SR) – (AHP × SR)**		
	=	**1,31,100 – 1,38,000**	**=**	**6,900 A**
(3) LABOUR MIX VARIANCE	**=**	**(RH × SR) – (AHW × SR)**		
	=	**1,42,500 – 1,31,100**	**=**	**11,400 F**
(4) LABOUR YIELD VARIANCE	**=**	**(SH × SR) – (RH × SR)**		
	=	**1,35,000 – 1,42,500**	**=**	**7,500 A**
(5) LABOUR EFF. VARIANCE	**=**	**(SH × SR) – (AHW × SR)**		
	=	**1,35,000 – 1,31,100**	**=**	**3,900 F**
(6) LABOUR COST VARIANCE	**=**	**(SH × SR) – (AH × AR)**		
	=	**1,35,000 – 1,50,000**	**=**	**15,000 A**

NOTE:

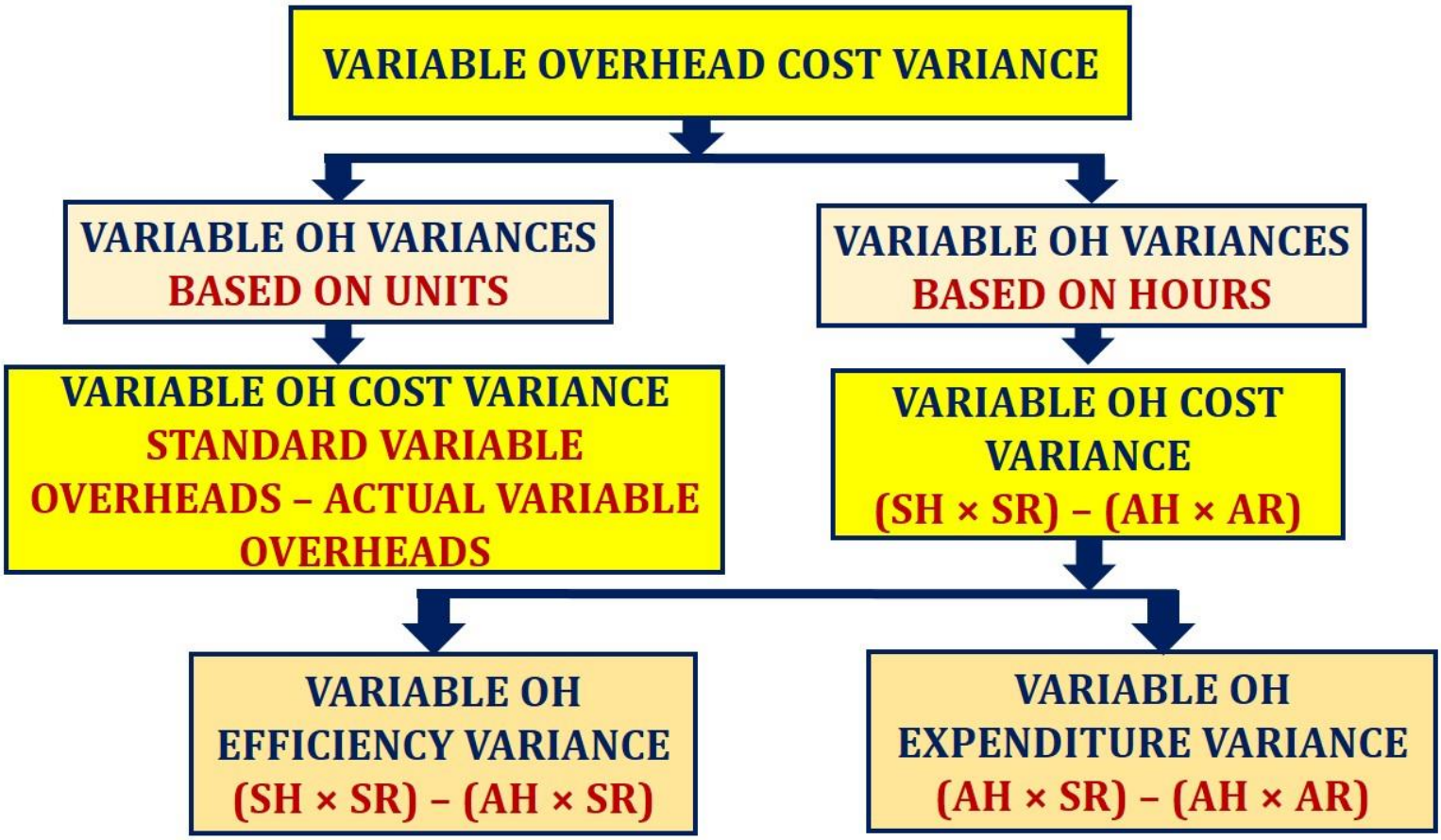
- **WHEN THERE IS NO ABNORMAL IDLE TIME:**

ACTUAL HOURS WORKED (AHW) = ACTUAL HOURS PAID (AHP)

OVERHEAD VARIANCES (IN SHORT)



VARIABLE OVERHEAD VARIANCES



NOTE:

- **IN CASE OF VARIABLE OH VARIANCE BASED ON UNITS WE CAN'T CLASSIFY VARIABLE OH VARIANCES INTO:**

  (1) VARIABLE OH EFFICIENCY VARIANCE AND

  (2) VARIABLE OH EXPENDITURE VARIANCE

VARIABLE OVERHEAD VARIANCES (UNITS BASED)

EXAMPLE

AB Company Ltd. is having standard costing system in operation for quite some time. The following data relating to the month of April, 2017 is available from the cost records:

PARTICULARS	BUDGET	ACTUAL
Output (in units)	30,000	32,500
Variable Overheads (₹)	60,000	68,000

CALCULATE VARIABLE OVERHEADS VARIANCE.

ANSWER

VARIABLE OH COST VARIANCE = STANDARD VARIABLE OH – ACTUAL VARIABLE OH

$$= \frac{60{,}000}{30{,}000} \times 32{,}500 - 68{,}000$$

$$= 65{,}000 - 68\,000 = 3{,}000\ A$$

VARIABLE OVERHEAD VARIANCES (HOURS BASED)

EXAMPLE

AB Company Ltd. is having standard costing system in operation for quite some time. The following data relating to the month of April, 2017 is available from the cost records:

PARTICULARS	BUDGET	ACTUAL
Output (in units)	30,000	32,500
Operating hours	6,000	6,400
Variable Overheads (₹)	60,000	68,000

CALCULATE ALL VARIABLE OVERHEADS VARIANCES.

ANSWER

WORKING NOTES:

(a) ANALYSIS TABLE

SH × SR STANDARD VARIABLE OH	AH × SR	AH × AR ACTUAL VARIABLE OH
6,500 × 10	6,400 × 10	64,000 × ?
65,000	64,000	68,000

(b) Standard hours to produce 32,500 units:

$$= \frac{6,000}{30,000} \times 32,500 = 6,500 \text{ hours}$$

(c) Standard rate:

$$= \frac{60,000}{6,000} = ₹10 \text{ per hours}$$

MAIN ANSWER

(1) VARIABLE OH EXPENDITURE VARIANCE

=	(AH × SR) – (AH × AR)		
=	64,000 – 68,000	=	4,000 A

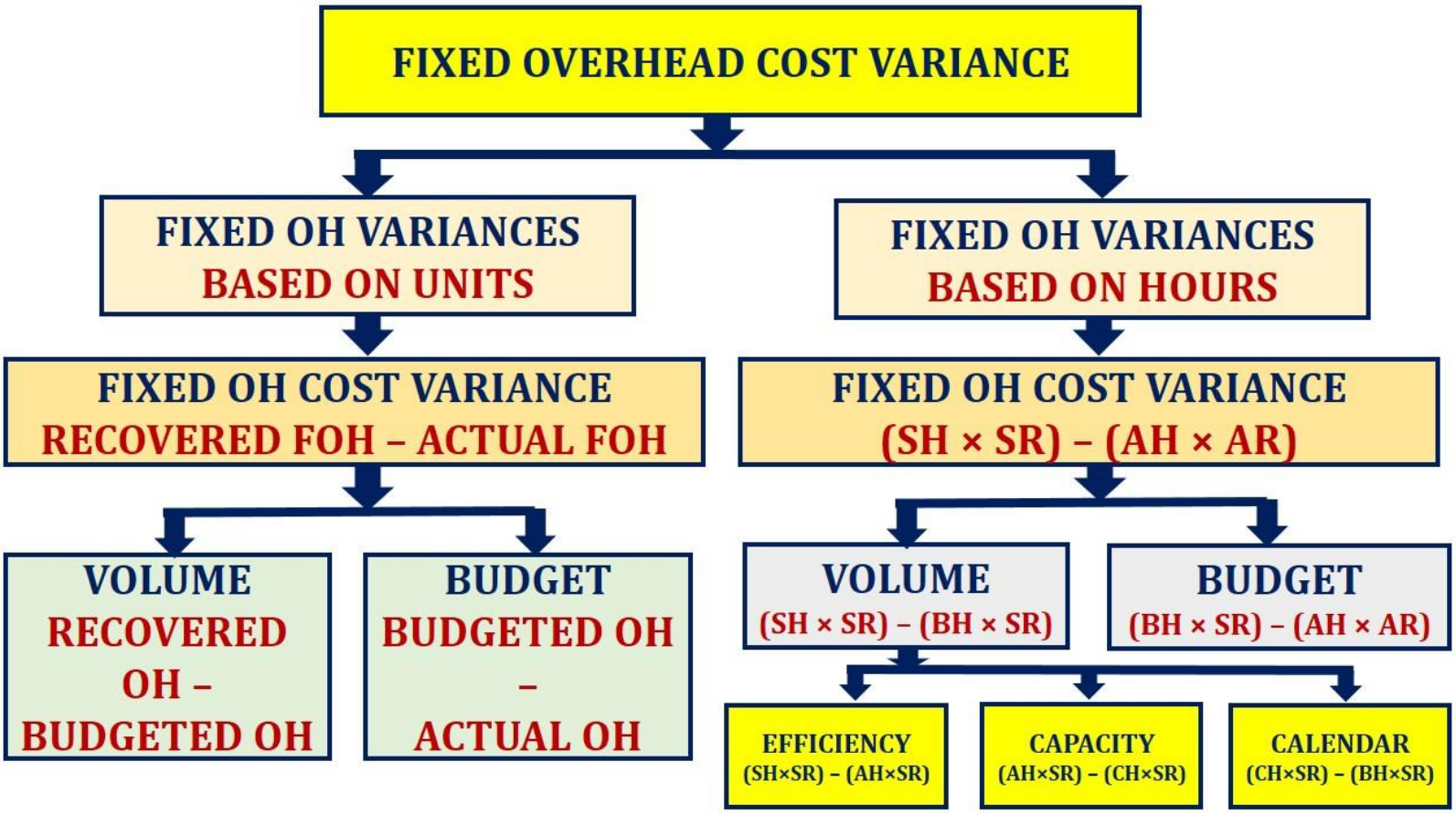
(2) VARIABLE OH EFFICIENCY VARIANCE

=	(SH × SR) – (AH × SR)		
=	65,000 – 64,000	=	1,000 F

(3) VARIABLE OH COST VARIANCE

=	(SH × SR) – (AH × AR)		
=	65,000 – 68,000	=	3,000 A

FIXED OVERHEAD VARIANCES



NOTE:

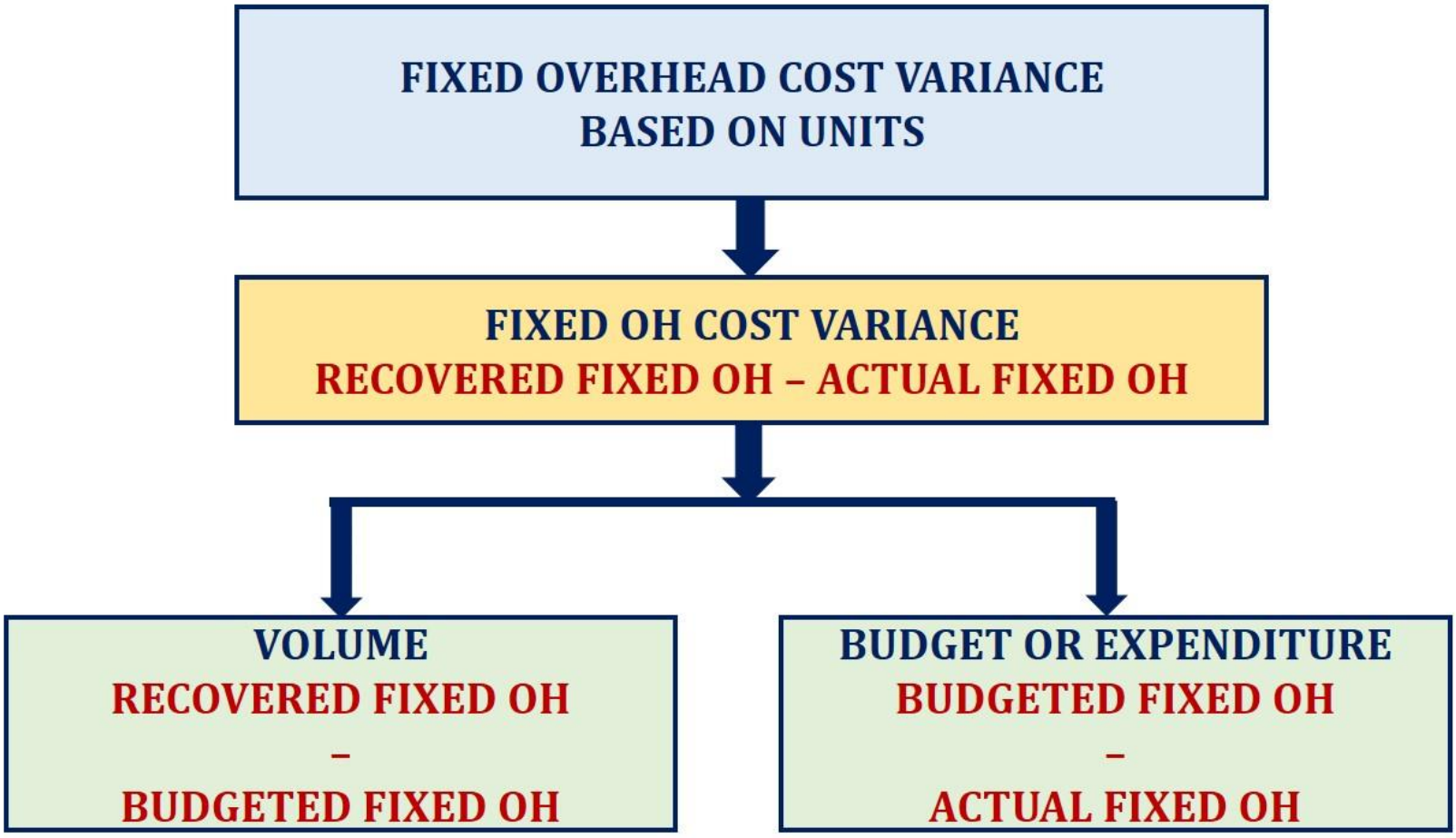
- **IN CASE OF FIXED OH VARIANCE BASED ON UNITS WE CAN'T CLASSIFY FIXED OH VARIANCES INTO:**

  (1) FIXED OH CALENDAR VARIANCE

  (2) FIXED OH CAPACITY VARIANCE AND

  (3) FIXED OH EFFICIENCY VARIANCE

FIXED OVERHEAD VARIANCES (UNITS BASED)



EXAMPLE

AB Company Ltd. is having standard costing system in operation for quite some time. The following data relating to the month of April, 2017 is available from the cost records:

PARTICULARS	BUDGET	ACTUAL
Output (in units)	30,000	32,500
Fixed Overheads (₹)	45,000	50,000

CALCULATE FIXED OVERHEADS VARIANCES BASED ON UNITS.

ANSWER

(1) FIXED OH EXPENDITURE VARIANCE

= BUDGETED FIXED OH – ACTUAL FIXED OH

= 50,000 – 45 000 = 5,000 A

(2) FIXED OH VOLUME VARIANCE

= RECOVERED FIXED OH – BUDGETED FIXED OH

$= \frac{45,000}{30,000} \times 32,500 - 45,000$

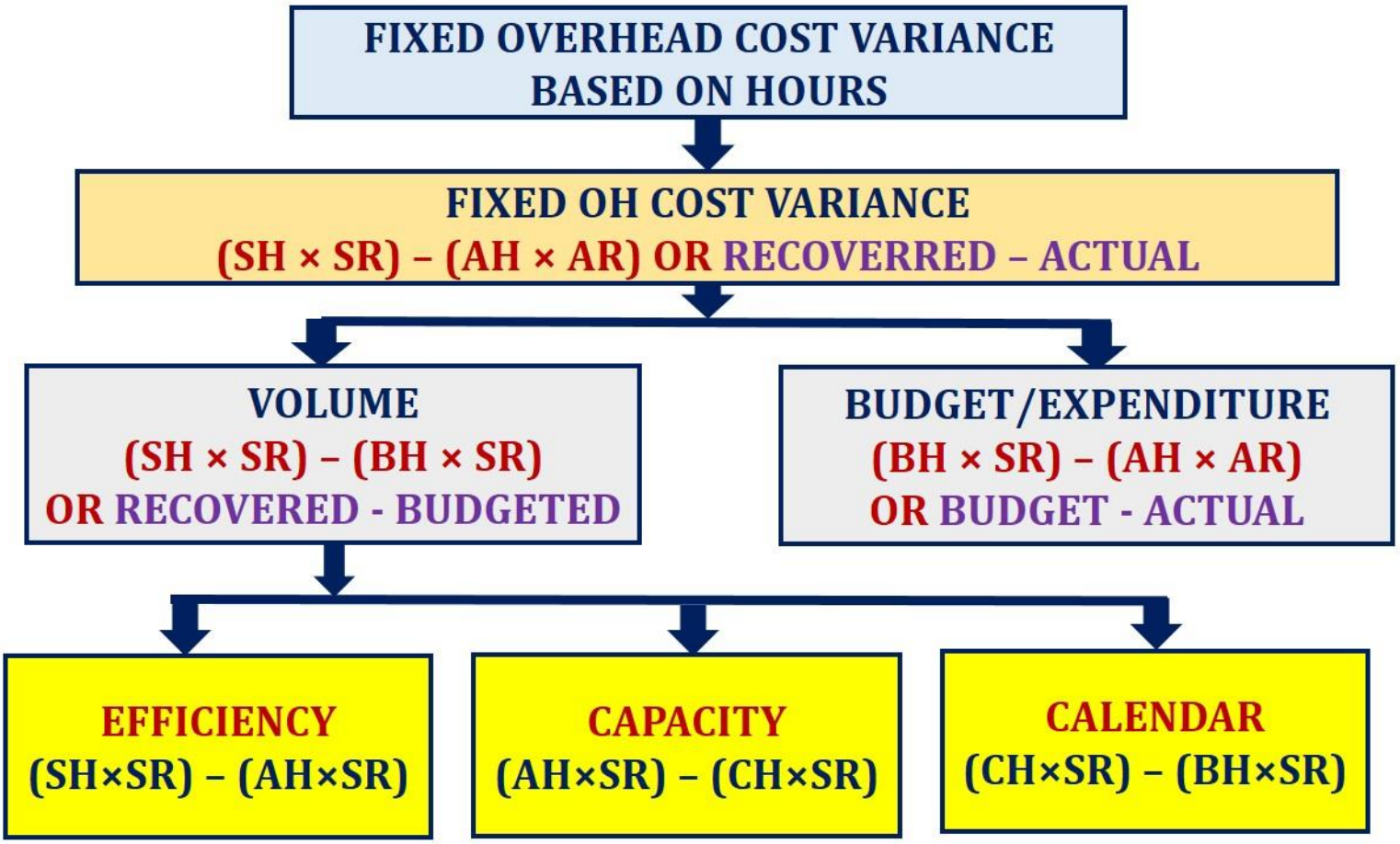
= 48,750 - 45,000 = 3,750 F

(3) FIXED OH COST VARIANCE

= RECOVERRED FIXED OH – ACTUAL FIXED OH

= 48,750 – 50,000 = 1,250 A

FIXED OVERHEAD VARIANCES (HOURS BASED)



EXAMPLE

AB Company Ltd. is having standard costing system in operation for quite some time. The following data relating to the month of April, 2017 is available from the cost records:

PARTICULARS	BUDGET	ACTUAL
Output (in units)	30,000	32,500
Operating Hours	6,000	6,400
Fixed Overheads (₹)	45,000	50,000
Working Days	25	24

CALCULATE FIXED OVERHEADS VARIANCES BASED ON HOURS.

ANSWER

WORKING NOTES:

(a) ANALYSIS TABLE

SH × SR	AH × SR	CH × SR	BH × SR	AH × AR
6,500 × 7.5	6,400 × 7.5	5,760 × 7.5	6,000 × 7.5	6,400 × ?
48,750	48,000	43,200	45,000	50,000

(b) SR (Standard Rate) = ₹45,000 ÷ 6,000 hours = ₹7.50

(c) CH (Calendar Hours) = $\frac{6,000}{25}$ × 24 days = 5,760 Hours

(d) Standard hours to produce 30,000 units:

= $\frac{6,000}{30,000}$ × 32,500 = 6,500 hours

MAIN ANSWER:

(1) FIXED OH EXPENDITURE VARIANCE = (BH × SR) – (AH × AR)
= 45,000 – 50,000
= 5,000 A

(2) FIXED OH CALENDAR VARIANCE = (CH × SR) – (BH × SR)
= 43,200 - 45,000
= 1,800 A

(3) FIXED OH CAPACITY VARIANCE = (AH × SR) – (CH × SR)
= 48,000 – 43,200
= 4,800 F

(4) FIXED OH EFFICIENCY VARIANCE = (SH × SR) – (AH × SR)
= 48,750 – 48,000
= 750 F

(5) FIXED OH VOLUME VARIANCE = (SH × SR) – (BH × SR)
= 48,750 – 45,000
= 3,750 F

(6) FIXED OH VOLUME VARIANCE = (SH × SR) – (AH × AR)
= 48,750 – 50,000
= 1,250 A

CHAPTER - 12
MARGINAL COSTING

MARGINAL COST EQUATION

MARGINAL COST EQUATION:

SALES	**=**	**VARIABLE COST + FIXED COST + PROFIT**
SALES – VARIABLE COST	**=**	**FIXED COST + PROFIT**
CONTRIBUTION	**=**	**FIXED COST + PROFIT**

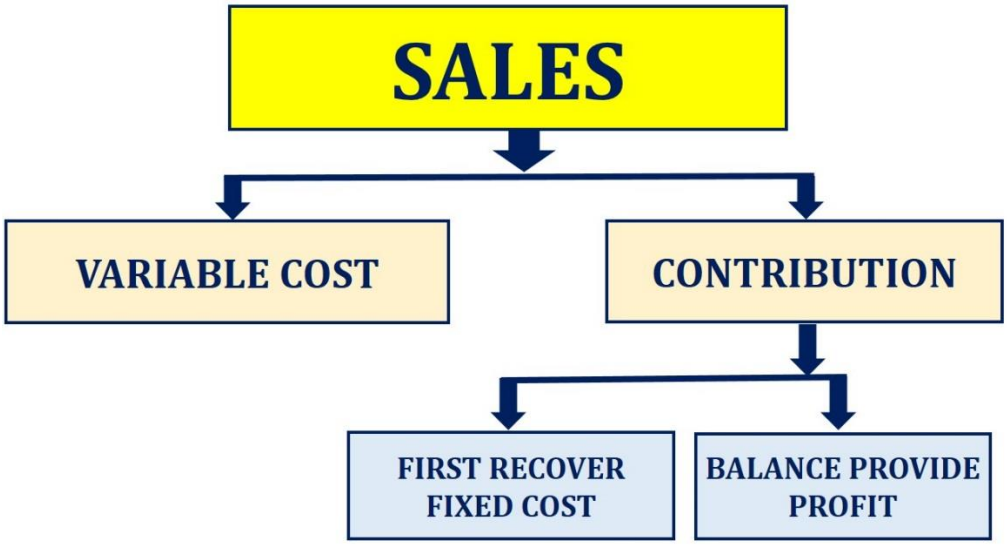
C = F + P

CONTRIBUTION

CONTRIBUTION:

'IT IS THE BALANCE AMOUNT OF SALES AFTER DEDUCTION OF VARIABLE COST WHICH IS USED TO RECOVER FIXED COST AND PROVIDE PROFIT'

CONTRIBUTION = SALES – VARIABLE COST



CONTRIBUTION RATIO OR PROFIT VOLUME RATIO (PV RATIO)

PROFIT VOLUME RATIO:

'RELATIONSHIP OF CONTRIBUTION WITH SALES'

$$\text{PROFIT VOLUME RATIO} = \frac{\text{CONTRIBUTION}}{\text{SALES}} \times 100$$

$$\text{PROFIT VOLUME RATIO} = 100 - \text{VARIBLE COST RATIO}$$

VARIABLE COST RATIO (VC RATIO)

VARIABLE COST RATIO:

'RELATIONSHIP OF VARIABLE COST WITH SALES'

$$\text{VARIABLE COST RATIO} = \frac{\text{VARIABLE COST}}{\text{SALES}} \times 100$$

$$\text{VARIABLE COST RATIO} = 100 - \text{PV RATIO}$$

BREAK EVEN POINT (BEP)

BREAK EVEN POINT:

- **LEVEL OF SALES AT WHICH COMPANY IS IN SITUATION OF NO PROFIT AND NO LOSS**
- **LEVEL OF SALES AT WHICH CONTRIBUTION AND FIXED COST ARE SAME**

BEP SALES = VARIABLE COST + FIXED COST + ~~PROFIT~~

CONTRIBUTION (BEP) = FIXED COST + ~~PROFIT~~

EXAMPLE:

SALE PRICE PER UNIT	=	**₹150**
VARIABLE COST PER UNIT	=	**₹60**
FIXED COST	=	**₹45,000**
CONTRIBUTION PER UNIT	=	**₹90**
PROFIT VOLUME RATIO	=	**60%**

CALCULATE BREAK EVEN POINT IN UNITS AND IN AMOUNT.

ANSWER

$$\text{BREAK EVEN POINT (IN UNITS)} = \frac{\text{FIXED COST}}{\text{CONTRIBUTION PER UNIT}}$$

$$= \frac{45{,}000}{90} = 500 \text{ UNITS}$$

$$\text{BREAK EVEN POINT (IN AMOUNT)} = \frac{\text{FIXED COST}}{\text{PV RATIO}}$$

$$= \frac{45{,}000}{60\%} = ₹75{,}000$$

$$\text{BEP IN UNITS} = \frac{\text{FIXED COST}}{\text{CONTRIBUTION PER UNIT}}$$

$$\text{BEP IN UNITS} = \text{BEP IN AMOUNT} \div \text{SALE PRICE PER UNIT}$$

$$\text{BEP (IN AMOUNT)} = \frac{\text{FIXED COST}}{\text{PV RATIO}}$$

$$\text{BEP (IN AMOUNT)} = \text{BEP IN UNITS} \times \text{SALE PRICE PER UNIT}$$

MARGIN OF SAFETY (MOS)

MARGIN OF SAFETY:

- **LEVEL OF SALES OVER AND ABOVE BEP SALES**
- **LEVEL OF SALES AT WHICH CONTRIBUTION AND PROFIT ARE SAME**

MOS SALES = VARIABLE COST + ~~FIXED COST~~ + PROFIT

CONTRIBUTION (MOS) = ~~FIXED COST~~ + PROFIT

EXAMPLE:

SALE PRICE PER UNIT	**=**	**₹150**
VARIABLE COST PER UNIT	**=**	**₹60**
PROFIT	**=**	**₹22,500**
CONTRIBUTION PER UNIT	**=**	**₹90**
PROFIT VOLUME RATIO	**=**	**60%**

CALCULATE MARGIN OF SAFETY IN UNITS AND IN AMOUNT.

ANSWER

MARGIN OF SAFETY (IN UNITS) $= \dfrac{\text{PROFIT}}{\text{CONTRIBUTION PER UNIT}}$

$= \dfrac{22{,}500}{90} =$ **250 UNITS**

MARGIN OF SAFETY (IN AMOUNT) $= \dfrac{\text{PROFIT}}{\text{PV RATIO}}$

$= \dfrac{22{,}500}{60\%} =$ **₹37,500**

$$\text{MOS IN UNITS} = \frac{\text{PROFIT}}{\text{CONTRIBUTION PER UNIT}}$$

$$\text{MOS IN UNITS} = \text{MOS IN AMOUNT} \div \text{SALE PRICE PER UNIT}$$

$$\text{MOS (IN AMOUNT)} = \frac{\text{PROFIT}}{\text{PV RATIO}}$$

$$\text{MOS (IN AMOUNT)} = \text{MOS IN UNITS} \times \text{SALE PRICE PER UNIT}$$

EXAMPLE:

SALE PRICE PER UNIT	**=**	**₹150**
VARIABLE COST PER UNIT	**=**	**₹60**
FIXED COST	**=**	**₹45,000**
PROFIT	**=**	**₹22,500**
CONTRIBUTION PER UNIT	**=**	**₹90**

CALCULATE BEP, MOS AND TOTAL SALES IN UNITS.

ANSWER

BREAK EVEN POINT (IN UNITS) $= \dfrac{\text{FIXED COST}}{\text{CONTRIBUTION PER UNIT}}$

$= \dfrac{45{,}000}{90} =$ **500 UNITS**

MARGIN OF SAFETY (IN UNITS) $= \dfrac{\text{PROFIT}}{\text{CONTRIBUTION PER UNIT}}$

$= \dfrac{22{,}500}{90} =$ **250 UNITS**

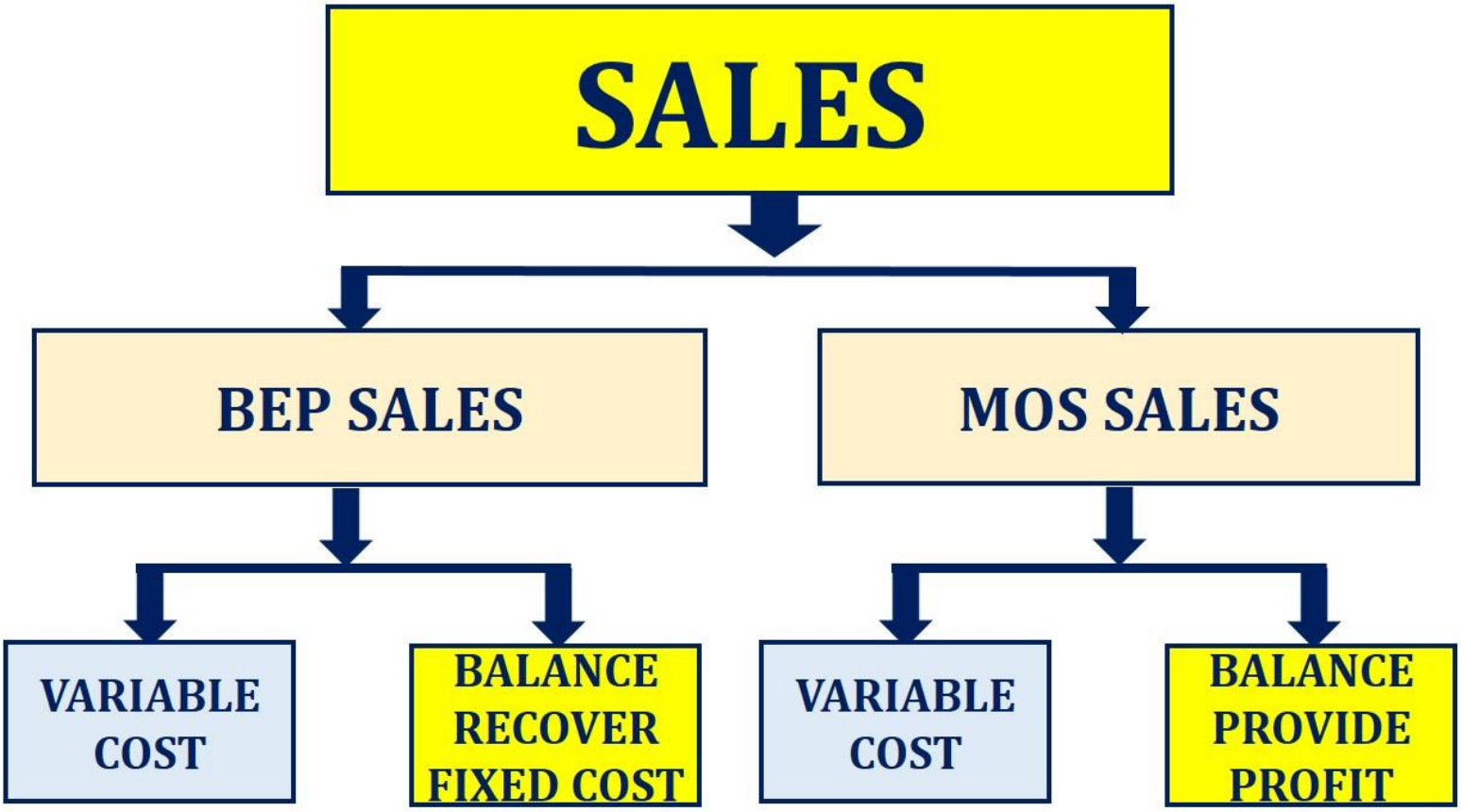
TOTAL SALES (IN UNITS) $= \dfrac{\text{FIXED COST} + \text{PROFIT}}{\text{CONTRIBUTION PER UNIT}}$

$= \dfrac{45{,}000+22{,}500}{90} =$ **750 UNITS**

TOTAL SALES = BEP SALES + MOS SALES

BEP SALES = TOTAL SALES – MOS SALES

MOS SALES = TOTAL SALES – BEP SALES


SALES
BEP SALES
MOS SALES
VARIABLE COST
BALANCE RECOVER FIXED COST
VARIABLE COST
BALANCE PROVIDE PROFIT

PROFIT PLANNING

EXAMPLE:

SALE PRICE PER UNIT	**=**	**₹500**
VARIABLE COST PER UNIT	**=**	**₹400**
FIXED COST	**=**	**₹2,00,000**
DESIRED OR TARGET PROFIT	**=**	**₹10,00,000**

CALCULATE TARGET SALES IN TERMS OF UNITS AND IN AMOUNT.

ANSWER

$$\textbf{TARGET SALES IN UNITS} = \frac{\textbf{FIXED COST+PROFIT}}{\textbf{CONTRIBUTION PER UNIT}}$$

$$= \frac{2,00,000+10,00,000}{500-400} = \textbf{12,000 UNITS}$$

$$\textbf{TARGET SALES IN AMOUNT} = \frac{\textbf{FIXED COST+PROFIT}}{\textbf{PV RATIO}}$$

$$= \frac{2,00,000+10,00,000}{20\%} = ₹60,00,000$$

EXAMPLE:

SALE PRICE PER UNIT	**=**	**₹800**
VARIABLE COST PER UNIT	**=**	**₹600**
FIXED COST	**=**	**₹2,00,000**
DESIRED OR TARGET PROFIT	**=**	**20% ON SALES OR ₹160 PER UNIT**

CALCULATE TARGET SALES IN TERMS OF UNITS AND IN AMOUNT.

ANSWER

$$\textbf{TARGET SALES IN UNITS} = \frac{\textbf{FIXED COST}}{\textbf{CONTRIBUTION PER UNIT} - \textbf{PROFIT PER UNIT}}$$

$$= \frac{2,00,000}{200-160}$$

$$= \textbf{5,000 UNITS}$$

$$\textbf{TARGET SALES IN AMOUNT} = \frac{\textbf{FIXED COST}}{\textbf{PV RATIO} - \%\ \textbf{OF PROFIT TO SALES}}$$

$$= \frac{2,00,000}{25\%-20\%} = \textbf{₹40,00,000}$$

TWO PERIODS DATA

PARTICLULARS	YEAR 2018	YEAR 2019	CHANGE
NUMBER OF UNITS	20,000	30,000	5,000
SALES	10,00,000	15,00,000	5,00,000
LESS : VARIABLE COST	6,00,000	9,00,000	3,00,000
CONTRIBUTION	4,00,000	6,00,000	2,00,000
LESS : FIXED COST	2,50,000	2,50,000	-
PROFIT	1,50,000	3,50,000	2,00,000

UNDERSTANDING:

$$\text{VARIABLE COST RATIO} = \frac{\text{CHANGE IN TOTAL COST}}{\text{CHANGE IN SALES}} \times 100$$

$$= \frac{11,50,000-8,50,000}{15,00,000-10,00,000} \times 100 = 60\%$$

$$\text{PROFIT VOLUME RATIO} = \frac{\text{CHANGE IN PROFIT}}{\text{CHANGE IN SALES}} \times 100$$

$$= \frac{3,50,000-1,50,000}{15,00,000-10,00,000} \times 100 = 40\%$$

$$\text{VARIABLE COST PER UNIT} = \frac{\text{CHANGE IN TOTAL COST}}{\text{CHANGE IN SALES UNITS}}$$

$$= \frac{11,50,000-8,50,000}{30,000-20,000} = ₹30 \text{ PER UNIT}$$

$$\text{CONTRIBUTION PER UNIT} = \frac{\text{CHANGE IN PROFIT}}{\text{CHANGE IN SALES UNITS}}$$

$$= \frac{3,50,000-1,50,000}{30,000-20,000} = ₹20 \text{ PER UNIT}$$

EXAMPLE

Following figures have been extracted from the books of M/s. RST Private Limited:

YEAR	SALES	PROFIT
2016-17	₹4,00,000	15,000 (loss)
2017-18	₹5,00,000	15,000 (profit)

YOU ARE REQUIRED TO CALCULATE:

(1) Profit Volume Ratio
(2) Fixed Costs
(3) Break Even Point
(4) Sales required to earn a profit of ₹45,000
(5) Margin of Safety in financial year 2017-2018.

ANSWER

(1) CALCULATION OF PV RATIO:

$$\text{PROFIT VOLUME RATIO} = \frac{15{,}000-(-15{,}000)}{5{,}00{,}000-4{,}00{,}000} \times 100$$

$$= 30\%$$

(2) CALCULATION OF FIXED COST (BY USING DATA OF YEAR 2017-18):

$$\text{FIXED COST} = \text{Contribution} - \text{profit}$$

$$= 5{,}00{,}000 \times 30\% - 15{,}000$$

$$= ₹1{,}35{,}000$$

(3) CALCULATION OF BREAK EVEN POINT:

$$\text{BREAK EVEN POINT} = \frac{\text{FIXED COST}}{\text{PV RATIO}}$$

$$= \frac{1{,}35{,}000}{30\%} = ₹4{,}50{,}000$$

(4) SALES REQUIRED TO EARN ₹45,000:

$$\text{SALES} = \frac{\text{FIXED COST}+\text{PROFIT}}{\text{PV RATIO}}$$

$$= \frac{1{,}35{,}000+45{,}000}{30\%} = ₹6{,}00{,}000$$

(5) MARGIN OF SAFETY IN FINANCIAL YEAR 2017-2018:

$$\text{MARGIN OF SAFETY} = \frac{\text{PROFIT}}{\text{PV RATIO}}$$

$$= \frac{15{,}000}{30\%} = ₹50{,}000$$

SALES MIX OR CONCEPT OF MULTIPLE PRODUCTS

IN CASE OF MULTIPLE PRODUCTS:

- **USE COMPOSITE OR AVERAGE CONTRIBUTION PER UNIT**
- **USE COMPOSITE OR AVERAGE PV RATIO**

EXAMPLE

A Company sells two products, A and B. The sales mix is 5 units of A and 3 units of B. The sale price of A and B are ₹80 and ₹60 per unit respectively and variable cost ₹50 and ₹45 respectively. Fixed costs are ₹4,87,500 per month.

COMPUTE THE BREAK-EVEN POINT.

ANSWER

$$\text{BREAK EVEN POINT} = \frac{\text{FIXED COST}}{\text{COMPOSITE CONTRIBUTION PER UNIT}}$$

$$= \frac{4,87,500}{24.375}$$

$$= 20,000 \text{ UNITS}$$

COMPOSITE CONTRIBUTION:

$$= [(30 \times 5 \text{ units of A}) + (15 \times 3 \text{ units of B})] \div 8 \text{ units}$$

$$= 24.375 \text{ per unit}$$

KEY FACTOR OR LIMITING FACTOR

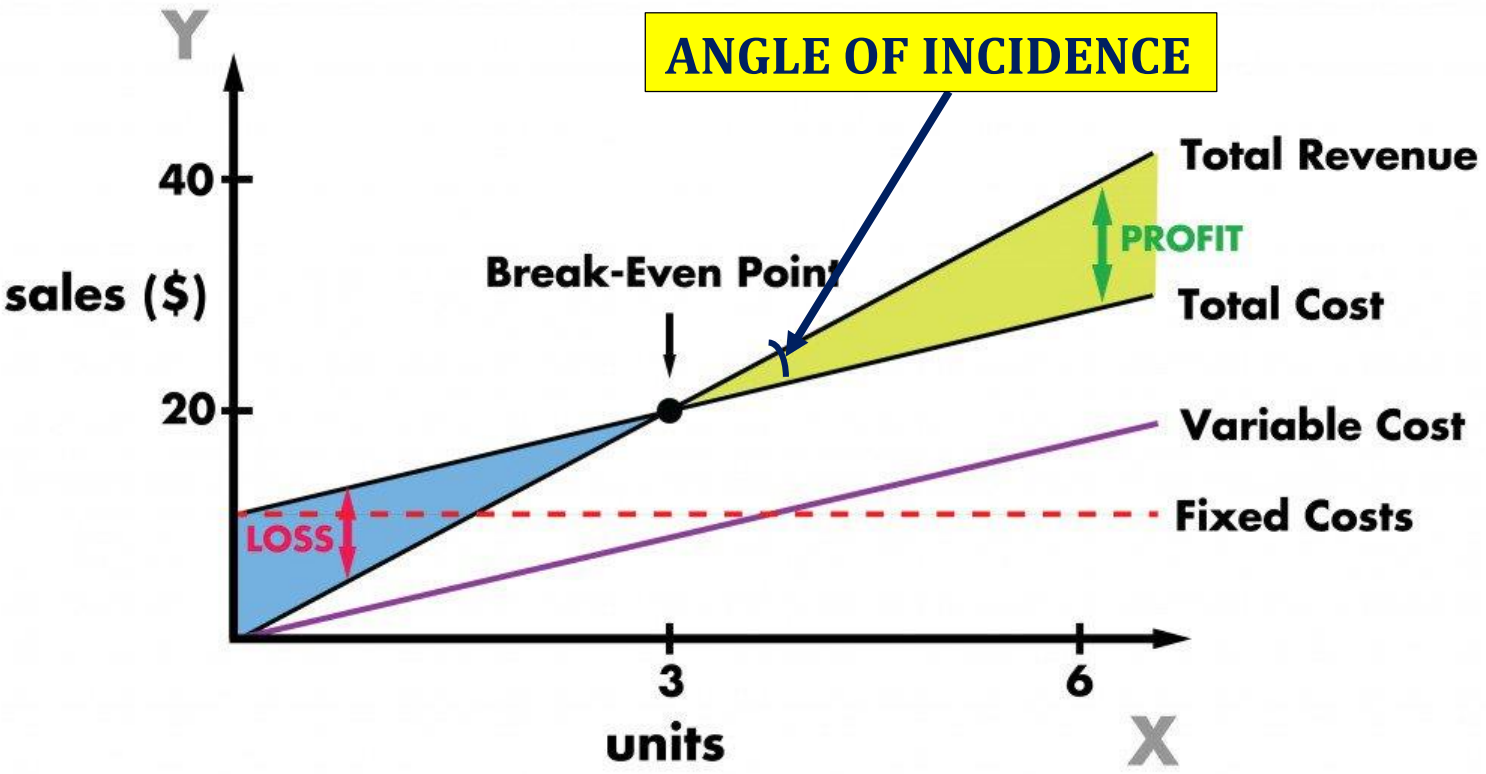
KEY FACTOR OR LIMITING FACTOR:

- **ANYTHING WHICH LIMITS THE ACTIVITY OF AN ENTITY**
- **THE FACTOR IS A KEY TO DETERMINE THE LEVEL OF SALE AND PRODUCTION, THUS ITIS ALSO KNOWN AS KEY FACTOR.**

EXAMPLE OF KEY FACTOR OR LIMITING FACTOR:

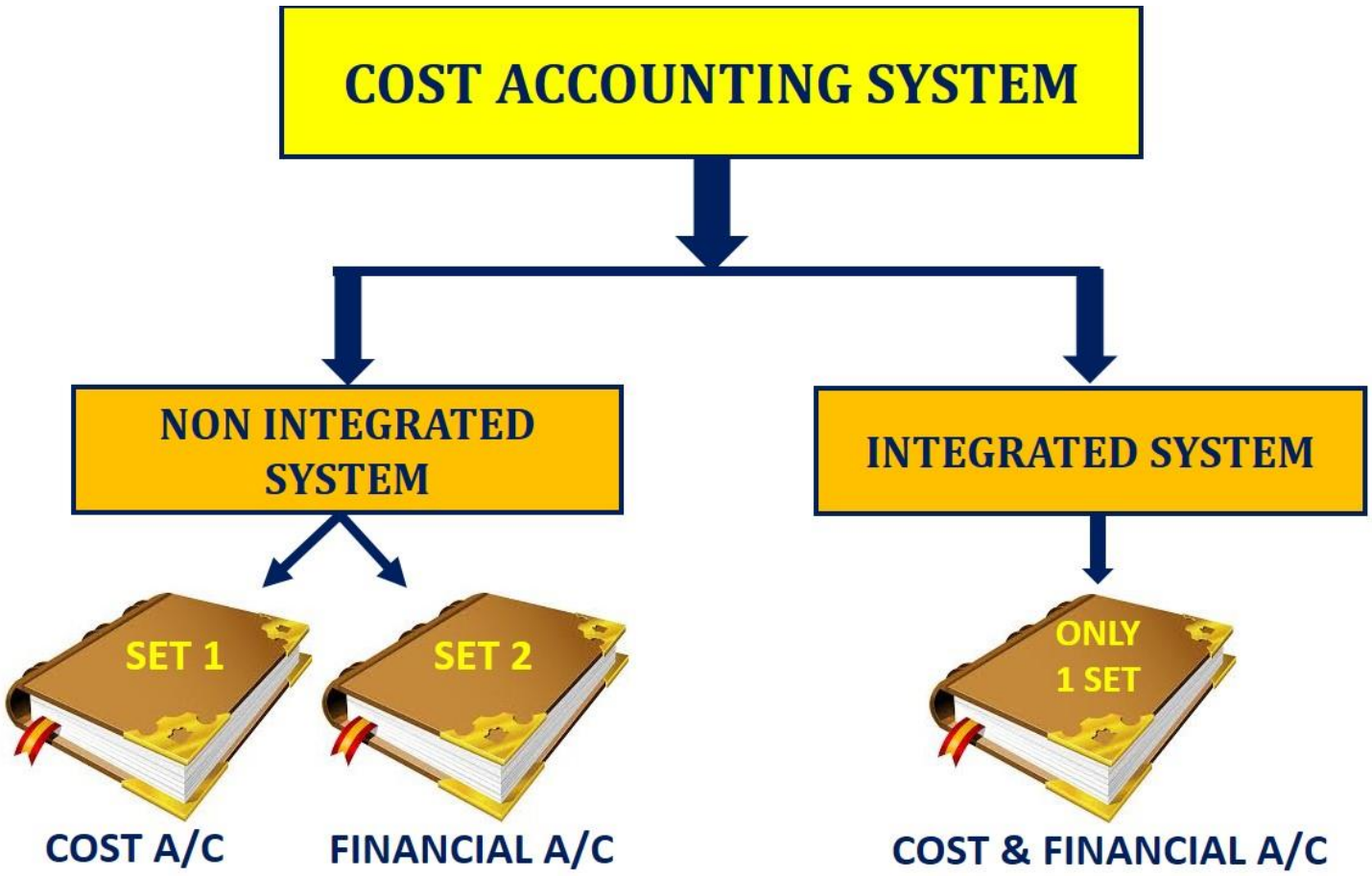
- **MEN (EMPLOYEES),**
- **MATERIALS (RAW MATERIAL OR SUPPLIES),**
- **MACHINE (CAPACITY),**
- **MONEY (AVAILABILITY OF FUND OR BUDGET)**
- **DEMAND FOR THE PRODUCT,**

BEP AND ANGLE OF INCIDENCE GRAPH



CHAPTER - 13
COST ACCOUNTING SYSTEM

COST ACCOUNTING SYSTEM



INTEGRATED ACCOUNTING SYSTEM

INTEGRATED ACCOUNTING SYSTEM:

'IN THIS SYSYTEM ONLY ONE SET OF BOOKS OF ACCOUNT IS MAINTAINED TO RECORDS TRANSACTIONS RELATED TO COST ACCOUNT AND FINANCIAL ACCOUNT'

ACCOUNTING IN INTEGRATED SYSTEM

STORE LEDGER CONTROL A/C

PARTICULARS	₹	PARTICULARS	₹
To Balance b/d	Op. Stock	By Purchase Return A/c	Return
To Purchases/Supplier A/c	Purchase	By WIP A/c	Direct Mat.
To WIP A/c	Return	By Production OH A/c	Indirect Mat.
		By Production OH A/c	Normal Loss
		By Costing P/L A/c	Ab. Loss
		By Balance c/d	Cl. Stock
	-		-

WAGES CONTROL A/C

PARTICULARS	₹	PARTICULARS	₹
To Bank A/c	Wages Paid	By WIP A/c	Direct Lab.
		By Production OH A/c	Indirect Lab.
		By Production OH A/c	Normal Idle
		By Costing P/L A/c	Ab. Idle
	-		-

PRODUCTION OVERHEAD CONTROL A/C

PARTICULARS	₹	PARTICULARS	₹
To Bank A/c	OH Incurred	By WIP A/c	Recovered
To Depreciation A/c	Dep.		
To Store A/c	Ind. M + NL	By Costing P/L A/c	Under
To Wages A/c	Ind. L + NL	or	Recovery
		By Balance c/d	
	-		-

WORK-IN-PROGRESS A/C

PARTICULARS	₹	PARTICULARS	₹
To Balance b/d	Op. WIP	By Finished Goods A/c	Completed
To Stores A/c	Direct Mat.	By Balance c/d	Cl. WIP
To Wages A/c	Direct Lab.		
To Production OH A/c	Recovered		
	-		-

ADMINISTRATION OVERHEAD A/C

PARTICULARS	₹	PARTICULARS	₹
To Bank A/c	OH Incurred	By Finished Goods A/c By Cost of Sales A/c By Costing P/L A/c	Prod. Related General Under Recov.
	-		-

FINISHED GOODS CONTROL A/C

PARTICULARS	₹	PARTICULARS	₹
To Balance c/d To Work-in-process A/c To Administration OH A/c	Op. FG Completed Prod Related	By Cost of sales A/c By Balance c/d	COGS Cl. FG
	-		-

SELLING AND DISTRIBUTION OVERHEAD A/C

PARTICULARS	₹	PARTICULARS	₹
To Bank A/c	OH Incurred	By Cost of Sales A/c By Costing P/L A/c	Recovered Under Rec.
	-		-

COST OF SALES A/C

PARTICULARS	₹	PARTICULARS	₹
To Finished Good A/c To Administration OH A/c To Selling OH A/c To Costing P/L A/c	COGS General S & D Profit	By Sales A/c	Sales
	-		-

COSTING PROFIT & LOSS A/C

PARTICULARS	₹	PARTICULARS	₹
To Stores A/c To Wages A/c To Production OH A/c To Administration OH A/c To Selling OH A/c To Net Profit	Ab. Loss Ab. Loss Under Rec. Under Rec. Under rec. Net Profit	By Cost of Sales A/c By Abnormal Gain and Over Recovery	Profit Ab. Gain
	-		-

NON INTEGRATED ACCOUNTING SYSTEM

INTEGRATED ACCOUNTING SYSTEM:

'IN THIS SYSYTEM TWO SETS OF BOOKS OF ACCOUNTS ARE MAINTAINED TO RECORDS TRANSACTIONS RELATED TO COST ACCOUNT AND FINANCIAL ACCOUNT'

ACCOUNTING IN INTEGRATED SYSTEM

- **IN CASE OF NON INTEGRATED ACCOUNTING SYSYTEM COST RECORDS ONLY RECOGNISE NOMINAL ACCOUNT (MATERIAL, LABOUR, OVERHEADS ETC.)**

- **FOR ALL TRANSACTIONS RELATED TO REAL ACCOUNT (BANK, CASH, ASSETS ETC) AND PERSONAL ACCOUNT (DEBTORS, CREDITORS, CAPITAL ETC.) COST RECORD USE A REPRESENTATIVE ACCOUNT VIZ. :**

  - **COST LEDGET CONTROL A/C (CLC) OR**
  - **NOMINAL LEDGER CONTROL A/C (NLC) OR**
  - **GENERAL LEDGER ADJUSTMENT A/C (GLA)**

STORE LEDGER CONTROL A/C

PARTICULARS	₹	PARTICULARS	₹
To Balance b/d	Op. Stock	By CLC	Return
To CLC A/c	Purchase	By WIP A/c	Direct Mat.
To WIP A/c	Return	By Production OH A/c	Indirect Mat.
		By Production OH A/c	Normal Loss
		By Costing P/L A/c	Ab. Loss
		By Balance c/d	Cl. Stock
	-		-

WAGES CONTROL A/C

PARTICULARS	₹	PARTICULARS	₹
To CLC A/c	Wages Paid	By WIP A/c	Direct Lab.
		By Production OH A/c	Indirect Lab.
		By Production OH A/c	Normal Idle
		By Costing P/L A/c	Ab. Idle
	-		-

PRODUCTION OVERHEAD CONTROL A/C

PARTICULARS	₹	PARTICULARS	₹
To CLC A/c	OH Incurred	By WIP A/c	Recovered
To Store A/c	Ind. M + NL		
To Wages A/c	Ind. L + NL	By Costing P/L A/c	Under Recovery
		or	
		By Balance c/d	
	-		-

WORK-IN-PROGRESS A/C

PARTICULARS	₹	PARTICULARS	₹
To Balance b/d	Op. WIP	By Finished Goods A/c	Completed
To Stores A/c	Direct Mat.	By Balance c/d	Cl. WIP
To Wages A/c	Direct Lab.		
To Production OH A/c	Recovered		
	-		-

ADMINISTRATION OVERHEAD A/C

PARTICULARS	₹	PARTICULARS	₹
To CLC A/c	OH Incurred	By Finished Goods A/c By Cost of Sales A/c By Costing P/L A/c	Prod. Related General Under Recov.
	-		-

FINISHED GOODS CONTROL A/C

PARTICULARS	₹	PARTICULARS	₹
To Balance c/d To Work-in-process A/c To Administration OH A/c	Op. FG Completed Prod Related	By Cost of sales A/c By Balance c/d	COGS Cl. FG
	-		-

SELLING AND DISTRIBUTION OVERHEAD A/C

PARTICULARS	₹	PARTICULARS	₹
To CLC A/c	OH Incurred	By Cost of Sales A/c By Costing P/L A/c	Recovered Under Rec.
	-		-

COST OF SALES A/C

PARTICULARS	₹	PARTICULARS	₹
To Finished Good A/c To Administration OH A/c To Selling OH A/c To Costing P/L A/c	COGS General S & D Profit	By CLC A/c	Sales
	-		-

COSTING PROFIT & LOSS A/C

PARTICULARS	₹	PARTICULARS	₹
To Stores A/c To Wages A/c To Production OH A/c To Administration OH A/c To Selling OH A/c To CLC A/c	Ab. Loss Ab. Loss Under Rec. Under Rec. Under rec. Net Profit	By Cost of Sales A/c By Abnormal Gain and Over Recovery	Profit Ab. Gain
	-		-

COST LEDGER CONTROL A/C

PARTICULARS	₹	PARTICULARS	₹
To Stores A/c	Return	By Balance b/d	Op. Balance
To Cost of Sales A/c	Sales	By Stores A/c	Purchase
To Balance c/d	Cl. Balance	By Wages A/c	Wages Paid
		By Production OH A/c	OH Incurred
		By Admin OH A/c	OH Incurred
		By Selling OH A/c	OH Incurred
		By Costing P/L A/c	Net Profit
	-		-

PYQ 4

THE FOLLOWING FIGURES HAVE BEEN EXTRACTED FROM THE COST RECORDS OF A MANUFACTURING UNIT:

STORES:

Opening balance	**32,000**
Purchases of materials	**1,58,000**
Transfer from work-in-progress	**80,000**
Issues to work-in-progress	**1,60,000**
Issues to repairs	**20,000**
Deficiencies found in stock-taking	**6,000**

WORK-IN-PROGRESS:

Opening balance	**60,000**
Direct wages applied	**65,000**
Overheads applied	**2,40,000**
Closing balance of WIP	**45,000**

ENTIRE OUTPUT IS SOLD AT A PROFIT OF 10% ON ACTUAL COST FROM WORK-IN-PROGRESS.

Wages incurred	**70,000**
Overhead incurred	**2,50,000**

ITEMS NOT INCLUDED IN COST RECORDS:

Income from investment	**10,000**
Loss on sale of capital assets	**20,000**

DRAW UP STORE CONTROL ACCOUNT, WORK-IN-PROGRESS CONTROL ACCOUNT, COSTING PROFIT AND LOSS ACCOUNT, PROFIT AND LOSS ACCOUNT AND RECONCILIATION STATEMENT.

ANSWER

STORES LEDGER CONTROL ACCOUNT

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
To Balance b/d	32,000	By WIP A/c	1,60,000
To CLC A/c	1,58,000	By Work OH A/c	20,000
To WIP A/c	80,000	By Costing P/L A/c (assumed abnormal)	6,000
		By Balance c/d	84,000
	2,70,000		**2,70,000**

WORK IN PROGRESS LEDGER CONTROL ACCOUNT

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
To Balance b/d	60,000	By Stores A/c	80,000
To Stores A/c	1,60,000	By Costing P/L A/c	4,00,000
To Wages A/c	65,000	(i.e., cost of sales)	
To Works OH A/c	2,40,000	By Balance c/d	45,000
	5,25,000		**5,25,000**

WORKS OVERHEAD CONTROL ACCOUNT

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
To CLC A/c	2,50,000	By WIP A/c	2,40,000
To Stores A/c	20,000	By Costing P/L A/c	35,000
To Wages A/c	5,000	(under recovery)	
	2,75,000		**2,75,000**

COSTING PROFIT & LOSS ACCOUNT

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
To WIP A/c	4,00,000	By CLC A/c	4,40,000
To Works OH A/c	35,000	(4,00,000 + 10%)	
To Stores A/c	6,000	**By Loss**	**1,000**
	4,41,000		**4,41,000**

RECORDING OF TRANSACTION IN FINANCIAL BOOKS:

PROFIT & LOSS ACCOUNT

PARTICULARS		AMOUNT	PARTICULARS		AMOUNT
To Opening stock:			By Sales		4,40,000
Stores	32,000		By Closing stock:		
WIP	60,000	92,000	Stores	84,000	
To Purchases		1,58,000	WIP	45,000	1,29,000
To Wages incurred		70,000	By Income from investment		10,000
To Overheads incurred		2,50,000	**By Loss**		**11,000**
To Loss on sale of asset		20,000			
		5,90,000			**5,90,000**

RECONCILIATION STATEMENT

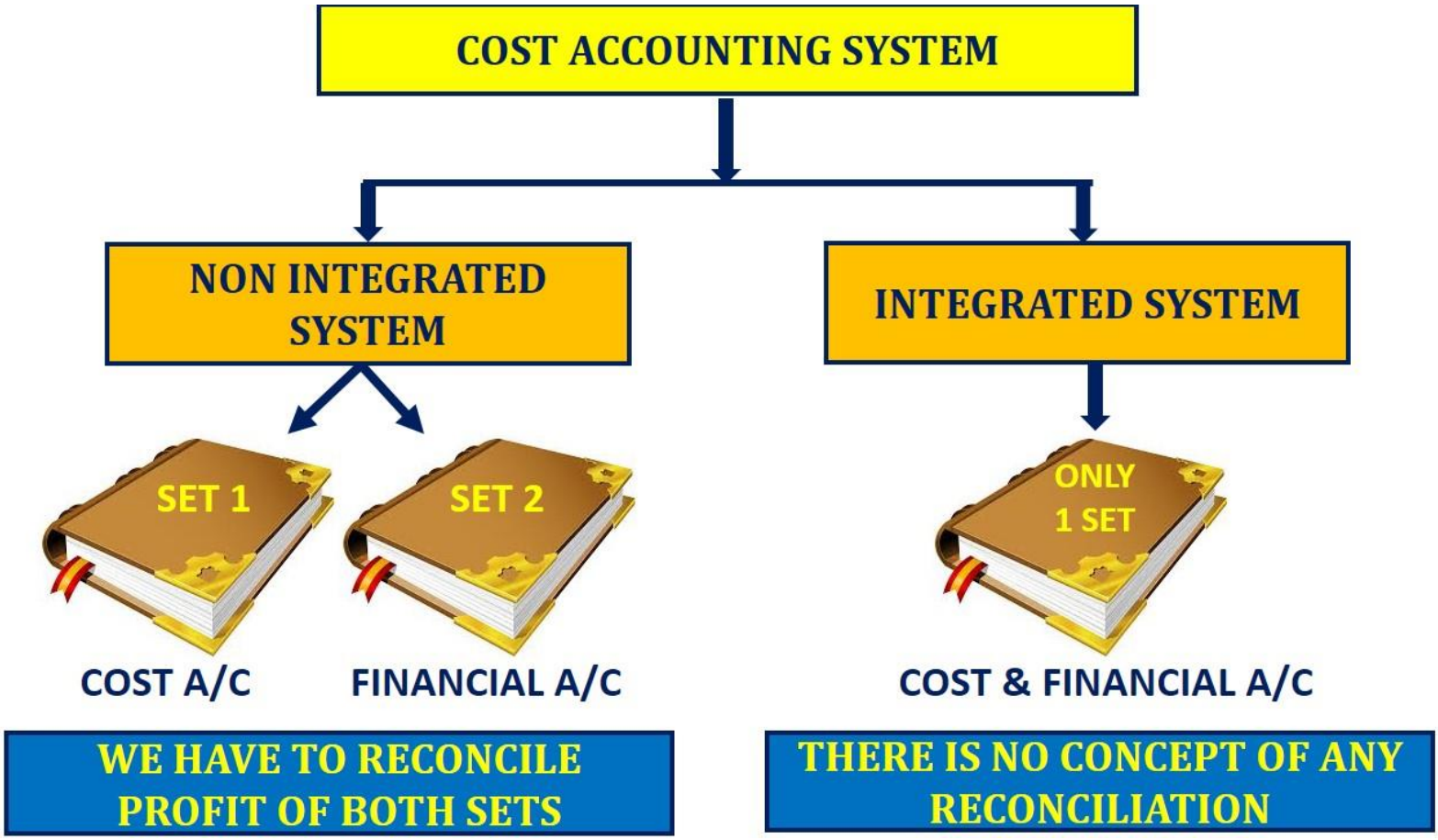
PARTICULARS	₹
LOSS AS PER COST ACCOUNTS	**(1,000)**
Add: Income from investment recorded in financial accounts	10,000
Less: Loss on sale of capital assets only	(20,000)
LOSS AS PER FINANCIAL ACCOUNTS	**(11,000)**

CHAPTER – 14
RECONCILIATION

COST ACCOUNTING SYSTEMS

COST ACCOUNTING SYSTEMS

'METHODS TO MAINTAIN BOOKS OF ACCOUNT IN COST'



RECONCILIATION

RECONCILIATION:

IN CASE OF NON INTEGRATED ACCOUNTING SYSTEM, WE HAVE TO RECONCILE PROFIT BETWEEN TWO SETS OF BOOKS OF ACCOUNT

DIFFERENCE IN THE COST AND FINANCIAL ACCOUNTS

1. ITEMS INCLUDED IN THE FINANCIAL ACCOUNTS BUT NOT IN COST ACCOUNTS (PURELY FINANCIAL ITEMS):

- INTEREST ON LOANS OR BANK MORTGAGES.
- EXPENSES AND DISCOUNTS ON ISSUE OF SHARES, DEBENTURES ETC
- OTHER CAPITAL LOSSES I.E., LOSS BY FIRE NOT COVERED BY INSURANCE ETC
- LOSSES ON THE SALES OF FIXED ASSETS AND INVESTMENTS
- GOODWILL WRITTEN OFF
- PRELIMINARY EXPENSES WRITTEN OFF
- INCOME TAX, DONATIONS, SUBSCRIPTIONS
- EXPENSES OF THE COMPANY'S SHARE TRANSFER OFFICE, IF ANY
- INTEREST RECEIVED ON BANK DEPOSITS, LOANS AND INVESTMENTS
- DIVIDENDS RECEIVED
- PROFITS ON THE SALE OF FIXED ASSETS AND INVESTMENTS
- TRANSFER FEE RECEIVED
- RENT RECEIVABLES

2. ITEMS INCLUDED IN COST ACCOUNTS ONLY (NOTIONAL EXPENSES):

- CHARGES IN LIEU OF RENT WHERE PREMISES ARE OWNED
- INTEREST ON CAPITAL AT NOTIONAL FIGURE THOUGH NOT INCURRED
- SALARY FOR THE PROPRIETOR AT NOTIONAL FIGURE THOUGH NOT INCURRED
- NOTIONAL DEPRECIATION ON THE ASSETS FULLY DEPRECIATED FOR WHICH BOOK VALUE IS NIL

3. ITEMS WHOSE TREATMENT IS DIFFERENT IN THE TWO SETS OF ACCOUNTS:

- DIFFERENCE IN METHODS OF VALUATION OF STOCK
- DIFFERENCE IN METHODS OF DEPRECIATION ETC

EXAMPLE

A manufacturing company has disclosed net loss of ₹48,700 as per their cost accounting records for the year ended 31st March, 2014. However their financial accounting records disclosed net profit of ₹35,400 for the same period.

A scrutiny of data of both the sets of books of accounts revealed the following information:

Factory overheads under absorbed	₹30,500
Administrative overheads over absorbed	₹65,000
Depreciation charged in financial accounts	₹2,25,000
Depreciation charged in cost accounts	₹2,70,000
Income tax provision	₹52,400
Transfer fee (credited in financial accounts)	₹10,200
Obsolescence loss charged in financial accounts	₹20,700
Notional rent of own premises charged in cost accounts	₹54,000
Value of opening stock:	
(a) In cost accounts	₹1,38,000
(b) In financial accounts	₹1,15,000
Value of closing stock:	
(a) In cost accounts	₹1,22,000
(b) In financial accounts	₹1,12,500

Prepare:

(1) MEMORANDUM RECONCILIATION ACCOUNT

(2) RECONCILIATION STATEMENT

ANSWER

MEMORANDUM RECONCILIATION ACCOUNT

PARTICULARS	₹	PARTICULARS	₹
To Net loss as per Costing books	48,700	By Admin OH over absorbed	65,000
To Factory OH under absorbed	30,500	By Depreciation over charged (2,70,000 - 2,25,000)	45,000
To Income tax provision	52,400	By Transfer fee	10,200
To Obsolescence loss	20,700	By Notional rent	54,000
To Closing stock over valued	9,500	By Opening stock over valued	23,000
To Net profit as per Financial books	**35,400**		
	1,97,200		**1,97,200**

RECONCILIATION STATEMENT

PARTICULARS	AMOUNT	AMOUNT
PROFIT/LOSS AS PER COST ACCOUNTS		**(48,700)**
ADD: Admin OH over absorbed	65,000	
Depreciation over charged (2,70,000 - 2,25,000)	45,000	
Transfer fee	10,200	
Notional rent	54,000	
Opening stock over valued (1,38,000 – 1,15,000)	23,000	**1,97,200**
LESS: Factory OH under absorbed	30,500	
Income tax provision	52,400	
Obsolescence loss	20,700	
Closing stock over valued (1,22,000 – 1,12,500)	9,500	**(1,13,100)**
PROFIT/LOSS AS PER FINANCIAL ACCOUNTS		**35,400**

EXAMPLE

The Trading and Profit and Loss Account of a company for the year ended 31.03.2016 is as under:

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
To Materials	26,80,000	By Sales (50,000 units)	62,00,000
To Wages	17,80,000	By Closing stock	1,50,000
To Factory expenses	9,50,000	(2,000 units)	
To Administrative expenses	4,80,200	By Dividend received	20,000
To Selling expenses	2,50,000		
To Preliminary exps w/o	50,000		
To Net Profit	1,79,800		
	63,70,000		**63,70,000**

In the Cost Accounts:

(i) Factory expenses have been allocated to production at 20% of Prime Cost.
(ii) Administrative expenses absorbed at 10% of factory cost.
(iii) Selling expenses charged at ₹10 per unit sold.

Prepare the Costing Profit and Loss Account of the company and reconcile the Profit/Loss with the profit as shown in the Financial Accounts.

ANSWER

COSTING PROFIT & LOSS A/C

Particulars	Amount	Particulars	Amount
To Materials	26,80,000	By Sales (50,000 units)	62,00,000
To Wages	17,80,000	By Closing stock	2,26,431
To Factory overheads	8,92,000	(2,000 units)	
To Administration overheads	5,35,200		
To S & D Expenses (50,000 × 10)	5,00,000		
To Net profit	39,231		
	64,26,431		**64,26,431**

RECONCILIATION STATEMENT

PARTICULARS	AMOUNT	AMOUNT
PROFIT/LOSS AS PER COST ACCOUNTS		**39,231**
ADD: Administrative expenses over recovered (5,35,200 – 4,80,200)	55,000	
Selling expenses over recovered (5,00,000 – 2,50,000)	2,50,000	
Dividend received	20,000	**3,25,000**
LESS: Factory expenses under recovered (9,50,000 – 8,92,000)	58,000	
Closing stock over valued in costs (2,26,431 – 1,50,000)	76431	
Preliminary expenses written off	50,000	**(1,84,431)**
PROFIT/LOSS AS PER FINANCIAL ACCOUNTS		**1,79,800**

Working notes:

1. Factory overheads in costs = 20% of Prime cost
= 20% of (26,80,000 + 17,80,000)
= **8,92,000**

2. Administrative overheads = 10% of Factory cost
= 10% of (26,80,000 + 17,80,000 + 8,92,000)
= **5,35,200**

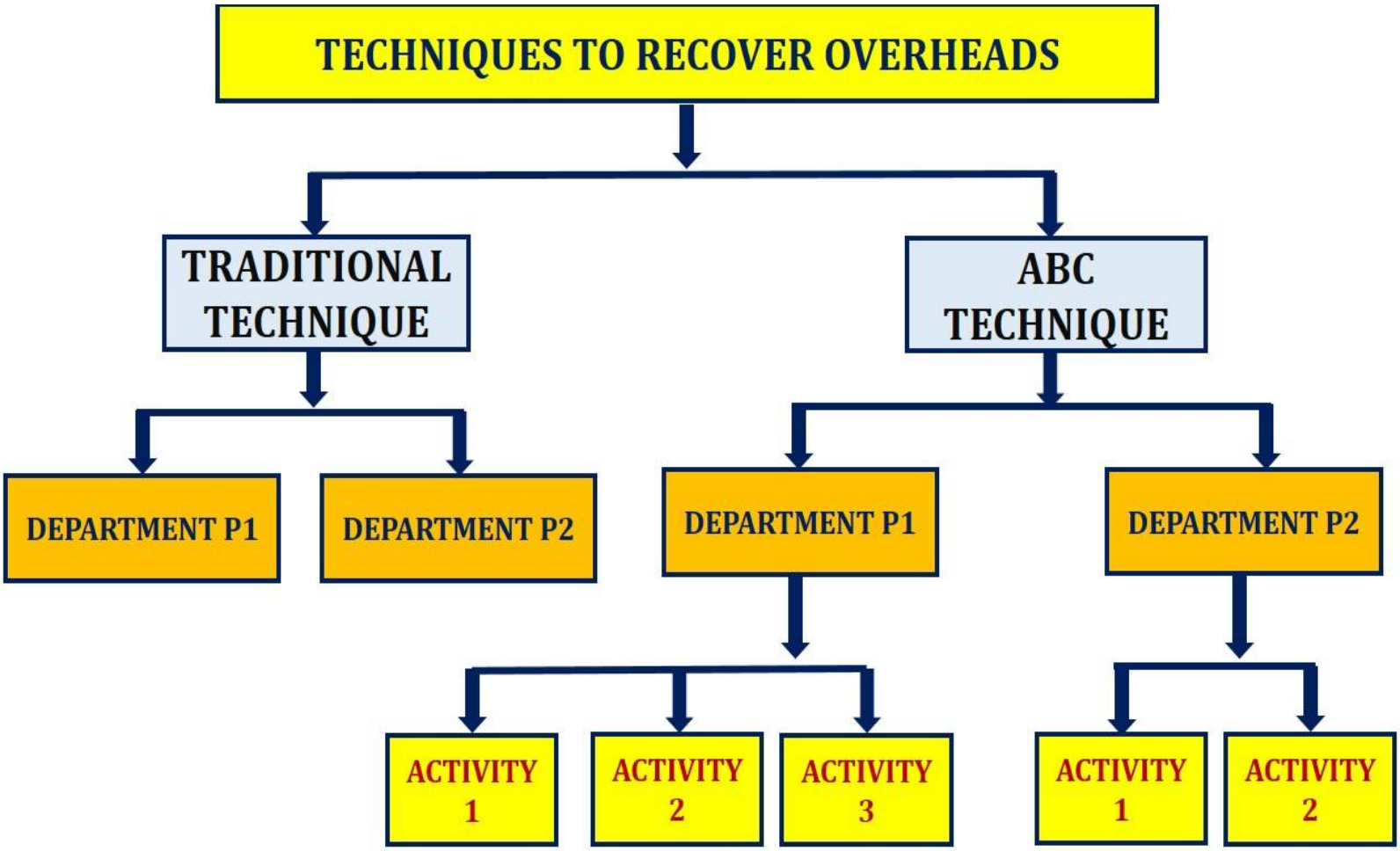
3. Valuation of Closing stock = $\frac{\text{Cost of production}}{\text{Units produced}} \times \text{Units in Closing stock}$

= $\frac{26,80,000+17,80,000+8,92,000+5,35,200}{52,000} \times 2,000$

= **2,26,431**

CHAPTER – 15
ACTIVITY BASED COSTING

TRADITIONAL ABSORPTION COSTING V/S ACTIVITY BASED COSTING



TRADITIONAL ABSORPTION COSTING METHOD

TRADITIONAL ABSORPTION COSTING:

'SINGLE/BLANKET RECOVERY RATE OF OVERHEADS OR DEPARTMENTAL RECOVERY RATE OF OVERHEADS'

ACTIVITY BASED COSTING

ACTIVITY BASED COSTING:

'SEPARATE RECOVERY RATE OF OVERHEADS FOR SEPARATE ACTIVITY'

- **ABC IS ALSO KNOWN AS MODERN ABSORPTION COSTING METHOD**

ACTIVITY

ACTIVITY:

'AN EVENT THAT INCURS COST'

LIKE:

PACKING AND FORWARDING, INSPECTION AND TESTING ETC.

COST POOL

COST POOL:

'GROUP OF VARIOUS INDIVIDUAL COST ITEMS RELATED TO ANY SPECIFIC ACTIVITY'

LIKE:

GROUP OF VARIOUS COST ITEMS RELATED TO PACKING AND FORWARDING

COST DRIVER

COST DRIVER:

'BASIS OF APPORTIONMENT OF COST RELATED TO ANY ACTIVITY'

LIKE:

NUMBER OF PARCELS AS APPORTIONMENT BASE FOR PACKING AND FORWARDING ACTIVITY

QUESTION 1

M/s HMB Limited is producing a product in 10 batches each of 15,000 units in a year incurring the following overheads their on:

PARTICULARS	(₹)
Material procurement	22,50,000
Maintenance	17,30,000
Set-up	6,84,500
Quality control	5,14,800

The prime cost for the year amounted to ₹3,01,39,000. The company is using currently the method of absorbing overheads on the basis of prime cost. Now it wants to shift to activity based costing.

INFORMATION RELEVANT TO ACTIVITY DRIVERS FOR A YEAR ARE AS UNDER:

ACTIVITY DRIVER	ACTIVITY VOLUME
No. of purchase orders	1,500
Maintenance hours	9,080
No. of set-ups	2,250
No. of inspections	2,710

The company has produced a batch of 15,000 units and has incurred ₹26,38,700 and ₹3,75,200 on materials and wages respectively.

THE USAGE OF ACTIVITIES OF THE SAID BATCH ARE AS FOLLOWS:

ACTIVITY DRIVER	ACTIVITY VOLUME
Material orders	48
Maintenance hours	810
No. of set-ups	40
No. of inspections	25

YOU ARE REQUIRED TO:

(1) Find out cost of product per unit on absorption costing basis for the said batch.
(2) Determine cost driver rate, total cost and cost per unit of output of the said batch on the basis of activity based costing.

ANSWER

(1) STATEMENT SHOWING UNIT COST USING ABSORPTION COSTING METHOD

Particulars	(₹)
Direct Material	26,38,700
Direct Labour	3,75,200
PRIME COST	**30,13,900**
Production Overhead @ 17.1847% of Prime Cost	5,17,930
TOTAL COST	**35,31,830**
Number of units	15,000
COST PER UNIT	**₹235.46**

CALCULATION OF OVERHEAD RATE:

Overheads Recovery Rate = (Total Overheads ÷ Total Prime Cost) × 100

$$= \frac{22,50,000 + 17,30,000 + 6,84,500 + 5,14,800}{3,01,39,000} \times 100$$

= **17.1847 % OF PRIME COST**

(2) STATEMENT SHOWING UNIT COST AND TOTAL COST USING ABC METHOD

PARTICULARS	(₹)
Direct Material	26,38,700
Direct Labour	3,75,200
PRIME COST	**30,13,900**
Production Overhead:	
Material procurement (₹1,500 × 48 orders)	72,000
Maintenance (₹190.53 × 810 hours)	1,54,329
Set-up (₹304.22 × 40 set-ups)	12,169
Quality control (₹189.96 × 25 inspections)	4,749
TOTAL COST	**32,57,147**
Number of units	15,000
COST PER UNIT	**₹217.14**

STATEMENT SHOWING DETERMINATION OF COST DRIVER RATE

ACTIVITY COST POOL	COST DRIVER	AMOUNT	VOLUME	COST DRIVER RATE
Material procurement	Material orders	22,50,000	1,500	₹1,500 per order
Maintenance	Maintenance hours	17,30,000	9,080	₹190.53 per hour
Set-up	No. of set-ups	6,84,500	2,250	₹304.22 per set-up
Quality control	No. of inspections	5,14,800	2,710	₹189.96 per inspection