INDEX

THE 04 ANALYSIS (last 15 attempts by PK Sir)

CA INTER COSTING CHAPTER WISE MARKS

	May 18	N18	M19	N19	N20	J21	JL21	D21	M22	N22	M23	N23	M24
INTRO TO CMA	5	5	5	5	5	5	0	10	10	0	5	5	5
MATERIAL	15	10	10	10	10	10	10	5	10	10	15	10	5
Elec Cost (Labour)	15	5	10	10	15	10	10	10	10	6	10	10	14
OH	10	15	15	10	10	10	5	10	10	–	10	10	0
ABC	5	10	5	10	10	10	15	10	10	19	10	15	8
COST SHEET *	10	10	10	10	10	10	10	10	10	10	10	10	0
COST ACCOUNTING SYSTEM	5	10	10	5	5	0	10	5	5	10	5	4	12
UNIT & BATCH COSTING	5	10	0	0	0	0	0	0	0	0	0	0	4
JOB COSTING	10	5	10	5	5	0	5	10	5	10	10	10	0
PROCESS COSTING	10	5	10	10	10	5	10	5	10	10	15	5	8
JOINT & BY PRODUCT	5	5	5	5	10	5	10	5	15	5	5	5	
SERVICE COSTING	10	10	10	15	15	15	10	10	5	10	5	10	6
* STANDARD COSTING	5	5	10	10	10	10	10	10	15	10	10	10	6
* MARGINAL COSTING	5	10	10	5	5	15	15	10	10	10	5	11	11
BUDGETING	15	10	5	15	10	15	10	10	10	5	10	10	4
													88

		Sep 24	JAN 25	MCQ
INTRO TO CMA	C	(5)	-	
MATERIAL	A	- 10(CS) +2	4+4	2
Elec Cost (Labour)	A	6+2	5	2
OH	A	7	6(MC)+(4)8 4	
ABC	A	8	-	10(CS)
COST SHEET **	A	8	9	
Cost ACCOUNTING Systems	A	5	4+5	
UNIT & BATCH Costing	C	5	-	
JOB COSTING	B	(4)	-	
PROCESS COSTING	A	- 10+2	8	
JOINT & By products	C	(4)	-	2
SERVICE COSTING	A	5	8+5	
STANDARD * COSTING	A	9+(2.5)	6	2+2
MARGINAL * Costing	A	4+7+2	5+5(OH) +6	
BUDGETING	B	6+(2.5)	-	10 (CS)

15 Chapters → 100 marks (excluding Choice)

Cost Sheet	10 m
Std Costing	10 m
M. Costing	10 m
ABC	8
OH	10 m
Budgeting & Service	8 m 10
Labour	8

8/15 => 75-80 marks (55% of Syllabus)

(or)

add Material Chapter 10 m

=> 9/15 => 85-90 marks

Bot.

BIRDS EYE VIEW

1. Objective of CMA
2. Scope of CMA
3. Role & function of CMA
4. Users of CMA
5. Use of IT in Costing.

- Cost Object
- Responsibility Centre
- Cost Classification

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B.① Why do we need CMA ?

a) Current business environment

↓

Global & Complex (not just domestic)

↓

Any Company must fit in to 3 Competitive dimensions

- Cost leadership
  - Eg: Thar (US) Wrangler
- Product differentiation
  - Eg: Apple products (US) Others
- Niche Segment
  - Eg: In women shoes
    - Eco friendly shoes
    - orthopedic shoes
  - In Face wash
    - Vegan face wash

PK note

BMW CE 04 CE 02

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Cost leadership can be achieved if an entity has robust CMA.

KEY TERMS

- **COST** → Amt of exp
- **COSTING** → Process of ascertaining Costs
- **COST ACCOUNTING** → Process of accounting for Costs
- **COST ACCOUNTANCY** → Application of Costing, Cost accounting

Objectives of Cost Accounting

- **Ascertainment of Cost** → Accumulated Assigned & ascertained for each Cost object
  Eg unit, Job, Operation, Process dept, Service
- **Finding out S.P & Plt** → Helps in Price fixation & Rate negotiation
- **Cost Control** → Simply put Standard Costing.
- **Cost reduction** → Real & Permanent reduction
  Eg VCA → VA activities, NVA activities
- **Assist in DMaking.**

Cost Control	(vs) Cost Reduction
↓	↓
(1) Compliance with Standards	(1) Challenges the Standards
(2) lowest possible Cost under existing Condition	(2) Change will result in lower Cost
(3) emphasis on Past & present	(3) Present & Future
(4) Preventive function	(4) Corrective function
(5) It ends once target are achieved	(5) No end

Cost Object

* Anything for which Separate measurement of Cost is req

Pk note Simply put ⇒ If you want to find Cost of Something & that Some thing is Cost object.

Eg Product, Activity, Project, Process, dept, Service

- Product: Phone, Tablet, Computer
- Activity: Quality Inspection of Materials; placing of orders
- Project: Metro, Road Projects
- Process: Oil refinement, Sugar Cane manf
- dept: Prod dept, Purchase dept, FLA dept, Safety dept
- Service: Flight Service, Audit Service

COST UNITS

Industry / Product	Cost unit
Automobile	NO:
Cement	Per bag / Tonnes
Chemicals	litre / gallon / kg / Ton
Power	KWH
Steel	Ton
Tranport	P-km
Gas	Cu-feet

COST DRIVER

* An activity which is responsible for Cost incurrence

PK notes: Simply put → The one that drives the Cost is Cost driver.

Eg level of activity, Volume of production (Output)

NO: of purchase orders, NO: of tests

Responsibility Centre (Can be departments (or) persons)

- Cost Centre → Std Cost (vs) Actual Cost
- Revenue Centre → Eg Sales dept
- Profit Centre
- Investment Centre → RoI

① Std Cost Centre
② Discretionary Cost Centre

Eg R&D, Adv

Responsibility of both generation of revenue & incurrence of exp

Have the authority to make Capital investment decisions.

LIMITATIONS OF COST ACCOUNTING

- Expensive
- Req of Reconciliation
- Duplication of Work

PK note * : We will see this in detail in Cost accounting Systems.

* CLASSIFICATION OF COSTS *

- By elements
- By Functions
- By variability
- By Controllability
- By normality
- Based on decision making
- Based on relationship with Cost object
  - Direct Cost
  - Indirect Cost

FG/product

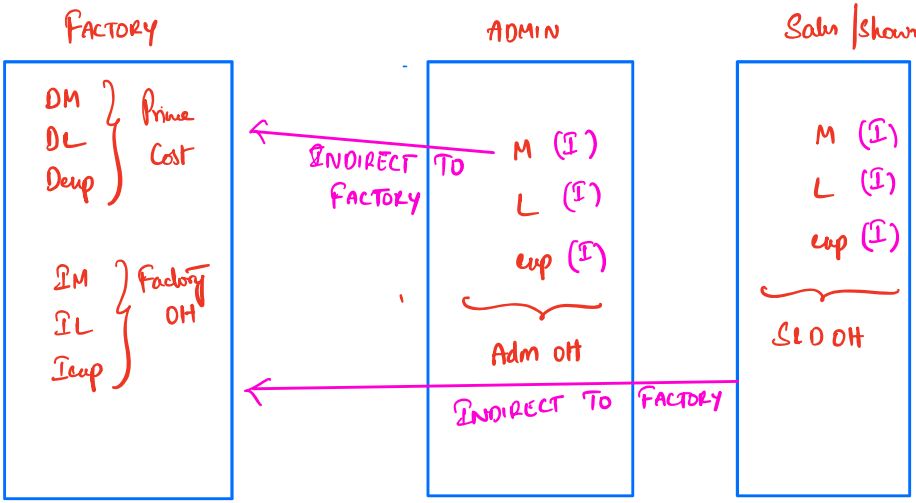
① By Elements

FG = Wooden bench

- Material
  - DM → Wood
  - IM → Sand paper
- Employee / Labour Cost
  - DL → Carpenter
  - IL → Supervisor
- Other expenses
  - Dexp → Hire charges
  - Iexp → electricity

DM + DL + Dexp = PRIME COST | DIRECT COST

IM + IL + Iexp = OH | INDIRECT COST



Total Factory Cost = (DM + DL + Dexp) + (IM + IL + Iexp) + Adm OH / Office OH + SLD OH

= Prime Cost + OH (Factory) (or) Works OH (or) Production OH (or) Manf OH

Total Cost = Prime Cost + FOH + AOH + SLD OH

② By FUNCTION

Manf Cost / Factory Cost | Adm Cost | RLD Cost | SLD Cost

COST SHEET UNDER FUNCTIONAL CLASSIFICATION

DM
DL
Dexp } Prime Cost

\+ Factory OH

Factory Cost

(+) Adm OH

CoGS

(+) S&D OH

Cost of Sales (COS)

③ BY VARIABILITY with Cost Object → product/FG

Variable Cost (Should vary proportionately)

They tend to vary with volume

Eg DM, DL

Fixed Cost

They do not inc (or) dec with Δ in output.

Eg Rent, Insurance on Factory building

Semi variable Cost

They contain both fixed & variable element.

Eg Telephone bill
gas bill
Electricity bill

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PK notes

* VC in total varies, V.C/unit remains Constant
* FC in total is fixed, F.C/unit varies.
* S.V Cost varies but varies disproportionately with Output
* V.C varies proportionately with output.

Segregation of S.V Costs

See ① Pg: 1.30

High & low method

	Sales value	Total cost
	(₹)	(₹)
At the Highest volume	1,40,000	72,000
At the Lowest volume	80,000	60,000
	60,000	12,000

12000

Thus, Variable Cost (₹ 12,000/₹ 60,000)

= 1/5 or 20% of sales value = ₹ 28,000 (at highest volume)

Fixed Cost ₹ 72,000 – ₹ 28,000 i.e., (20% of ₹ 1,40,000) = ₹ 44,000.

Alternatively, ₹ 60,000 – ₹ 16,000 (20% of ₹ 80,000) = ₹ 44,000.

See ② **Analytical Method** (Experienced Cost accountant will judge the proportion.)

Suppose last month the total semi-variable expenses amounted to ₹ 3,000.

If the degree of variability is assumed to be 70%, then variable cost = 70% of ₹ 3,000 = ₹ 2,100.

Fixed cost = ₹ 3,000 – ₹ 2,100 = ₹ 900.

Now in the future months, the fixed cost will remain constant, but the variable cost will vary according to the change in production volume.

Thus, if in the next month production increases by 50%, the total semi-variable expenses will be:

Fixed cost of ₹ 900, plus variable cost viz., ₹ 3,150 i.e., (₹ 2,100 (V.C.) plus 50% increase of V.C. i.e., ₹ 1,050) =, ₹ 4,050.

Iii ③ ★ Comparison by period (or) level of activity method ★

$$= \frac{\Delta \text{ in amount}}{\Delta \text{ in output}}$$

	Production Units	Semi-variable expenses
		(₹)
January	100	260
February	140	300
Difference	40	40

④ By CONTROLLABILITY

Controllable Costs

Can be influenced by the action of the managers heading that responsibility centre

Eg Cost Centre
Profit Centre
Investment centre

Uncontrollable Costs

Costs that cannot be influenced

Eg Price of RM influenced by international market.

Pk note

Mostly Whether a particular Cost is Controllable (or) uncontrollable is decided by individual judgement.

5. BY NORMALITY

Normal Cost (expected loss)

any cost that is incurred under normal conditions.

Pk note: added to the cost of Good units

Eg Branded Garments

Abnormal Cost (unexpected loss)

Incurred under abnormal conditions.

Pk note: Charged to Costing P&L A/c

6. BASED ON DECISION MAKING

Pre-determined Cost

Computed in advance before Production Starts

Eg Budget Costs

Standard Cost

Kind of pre-determined Cost but Calculated from managements expected Standard of efficient operation

Marginal Cost

Additional Cost incurred for additional unit of output

Estimated Cost

Similar to pre-determined Cost.

(also called prospective Cost)

Differential Cost

Inc/Dec in total Cost due to Δ in activity level, technology, process etc.

Imputed Costs / Implicit Costs

Notional Costs

Eg Rent of own premises

Int on own capital

* Same as opp Costs

Capitalised Costs

Initially recorded as assets Subsequently treated as expenses.

Eg Installation of machine

Product Costs

Costs that goes in to product manf inside the factory is called product cost.

* Will discuss in more detail in class

Opportunity Costs

Benefit foregone bcoz of lost opportunity.

* Deeply discussed in class with various examples.

Out of pocket Costs

Simply put

Cash outflow.

Shut down Costs

unavoidable costs due to shutdown of factory.

(The exp incurred to shut down the factory)

Sunk Costs

Historical Costs

Eg: W.Dv of existing machine

Absolute Cost

Costs shown in absolute amount in Cost Sheet

* Not as % of others.

* Discretionary Costs

At your choice

Eg: Adv, PR etc

Period Costs

Charged as exp against the revenue of the period in which they are incurred.

Eg: All non-manf Costs

Engineered Costs

Costs that result from clear cause & effect relationship b/n Input & output.

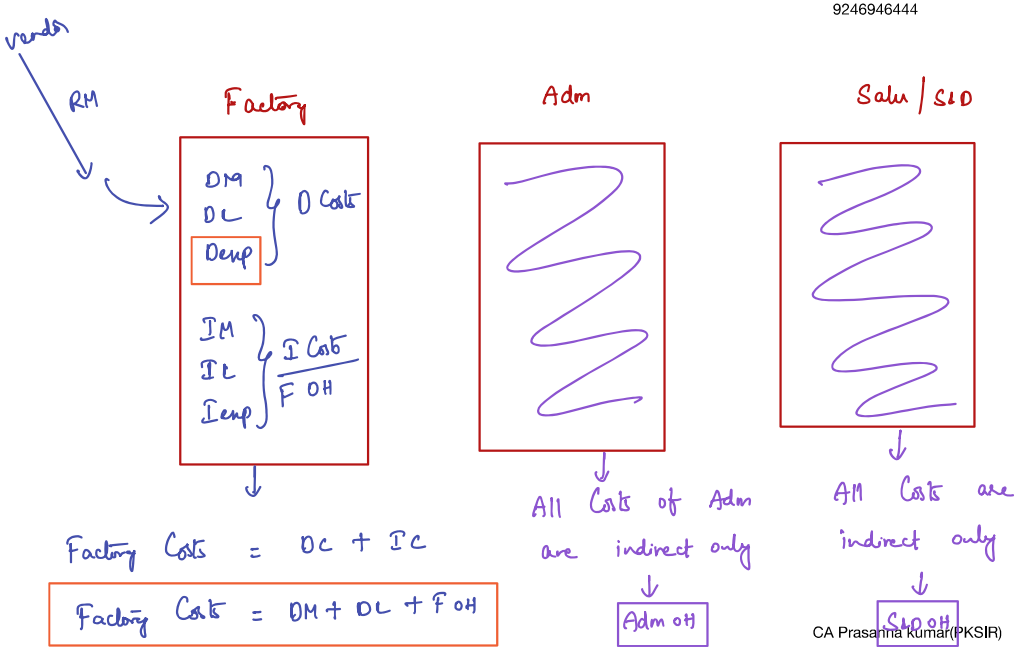
* Explicit Costs
  - Out of pocket Costs
* Implicit Costs
  - Economic Costs | Imputed Costs

METHODS OF COSTING

- Single / output Costing
  - Product being only one
  - Eg Bricks, Coal
- Batch Costing
  - No: of Small orders passed through a factory in batch.
  - Eg Wedding Cards, Business Cards
- Job Costing.
  - Under this Cost of each job is ascertained Separately.
  - Eg Adv, Custom Motorcycles.
- * Contract Costing
  - Big jobs
  - Eg Construction of bridges, roads, rail etc
- Process Costing
  - Multiple process to make output
  - Eg Paper manf, Sugar manf
- Operating Costing
  - Service Costing
  - Eg Transport Services, Supply of Water etc.
- * Multiple Costing
  - Combination of two / more methods of Costing.
  - Eg: Bicycle manf
    - Parts manf → Job / batch Costing
    - Assembling the parts → Single / output Costing

TECHNIQUES OF COSTING

- **Uniform Costing** → No: of firms in an industry follow same system of Costing.
- **Marginal Costing** → Differenciating b/n fixed & variable Cost fo decision making.
- **Standard Costing** → fo Cost Control & Performance evaluation.
- **Absorption Costing** → Charging all Costs (F & V) to operation, process & products.



Factory Costs = DC + IC

Factory Costs = DM + DL + F OH

Basic Concepts

(i) Opportunity Cost (what is)

Benefit foregone from a lost opportunity

↓ is Cost

PUSHPA – 2

Example

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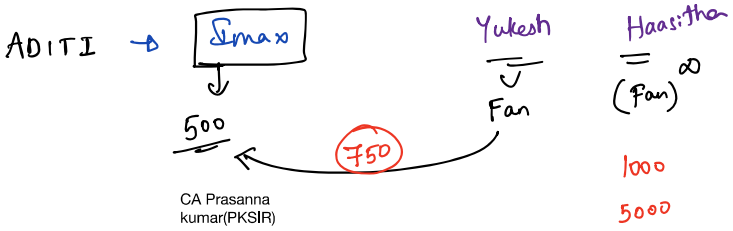

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11.30 am

Q_1 What is the opp Cost of watching the movie ?

Q_2 What is the Total Cost of watching the movie ?

Total Cost = Cost Spent + opportunity Cost

= 750 + 9250

⇒ 10000 /-

CASE 1

Cash = 10,00,000 → House → After 1 year → 10 90 000

MF = 20% (after 1 year)

Bank → Invest → 1 year → 10%

Q2 Total Cost of Investing in MF = Cost Spent + opp Cost

= 1000000 + 100000

⇒ 1100000

Total benefit ⇒ 1800000

Net benefit 100000

9250
750
10000

1000000
1100000

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Q3 opp Cost of Investing in Real estate (House) = Benefit foregone from a lost opp

⇒ 200000

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Decision making on Real estate (House) investment

Total Cost = 1000000 + 200000

= 1200000

Total benefit = 1090000

Net benefit (110000)

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STORY

In 2015 → Company Dumchick → RM = 100 (Non-perishable)

After purchase (RM is of no use)

Stays in Godown for 9 years

In 2024, A Customer asks for a FG → Fortunately to make this FG we need the RM

RM = 100

Additional Costs = 200

Sale price = 250

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Q = Should we accept (or) Reject ?

Common Sense

Accept		Reject	
S.P	250	S.P	XXX
(-) RM	100 ✓	(-) RM	100 ✓
(-) Addl Costs	200	(-) Addl Costs	XXX
	(50)		(100)

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Applying Concept of Sunk Cost

S.P =	250	(Relevant)
(-) Addl Cost =	200	(Relevant)
(-) RM Cost =	~~100~~	(Irrelevant) (Sunk Cost)
Net benefit	50	→ Accept this proposal

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Another example of basics

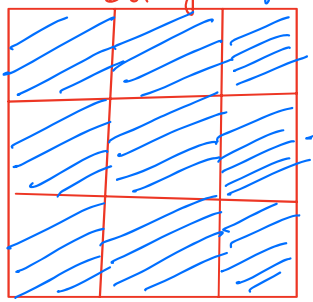
CA Coaching Centre → planning to start 'CS' Coaching

↓

Take new building on rent

Case ①

Building is full



→ 150000

Rent = Fixed Cost

= 25000

Specific / Additional / Incremental Fixed Cost

Discretionary

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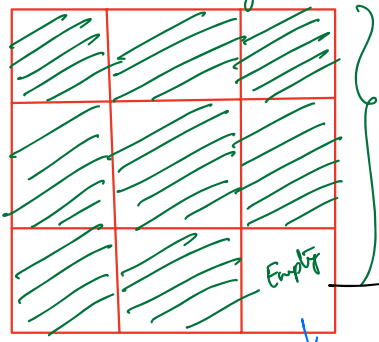
Case ②

Building



150000/- (Rent of existing building = Fixed Cost)

↳ Committed fixed Costs / Absorbed

Empty → You can start CS Coaching here

↓

16667 → proportionate rent

Sunk Cost = Historical Cost	Costs already incurred

MATERIAL COST

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Birds eye view

① Material Procurement
→ BOM
→ MRN
→ PRN
→ GRN
→ MRN etc

→ Valuation of materials

↓

Material Storage & records (Bin Cards, Stores ledger etc)

↓

Inventory Control (Various Stock levels, EOQ etc)

↓

Valuation of Material issues (FIFO, LIFO, weighted avg)

←

Consumption of Materials

* Q1) What is Material ?

a) All Commodities / Physical objects used to make final product. It may be direct (or) Indirect.

DM → Significant part → so req Cost Control.

* Following things must be kept in mind for EEE Cost Control

Economy — Effectiveness — Efficiency.

- Quality of final Product
- Price of Final Product
- Production Continuity
- Cost of Stock holding & Stock out
- Wastage & other losses
- Regular Info on resources.

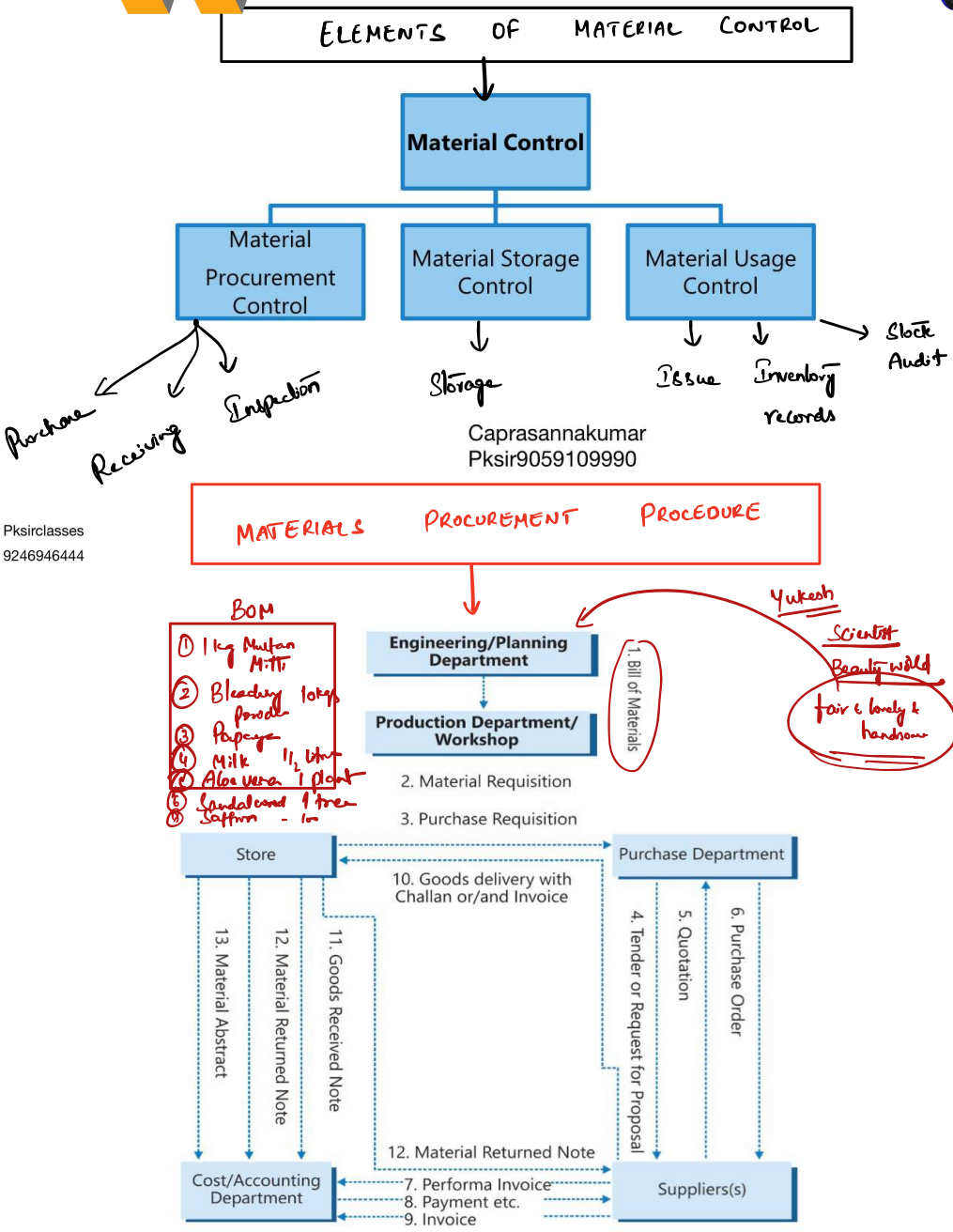


Diagram: Material Procurement Procedure

[The name of the departments and documents shown in the diagram are for illustrative purpose only]

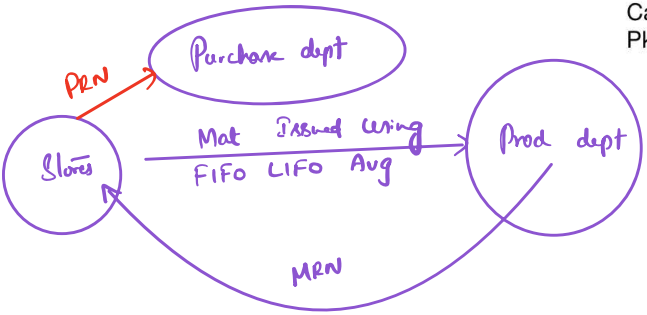
① Bill of Materials

- Detailed list of Materials
- Standard Qty & Quality
- Prepared by (R&D) Product development team
- Also known as → Engineering (or) planning dept

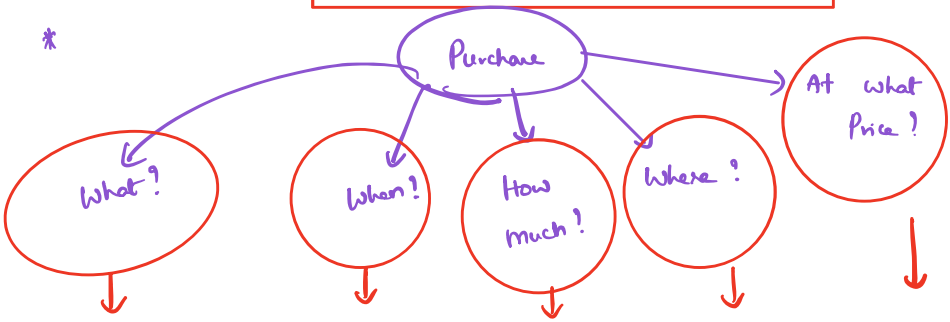
USES OF BOM

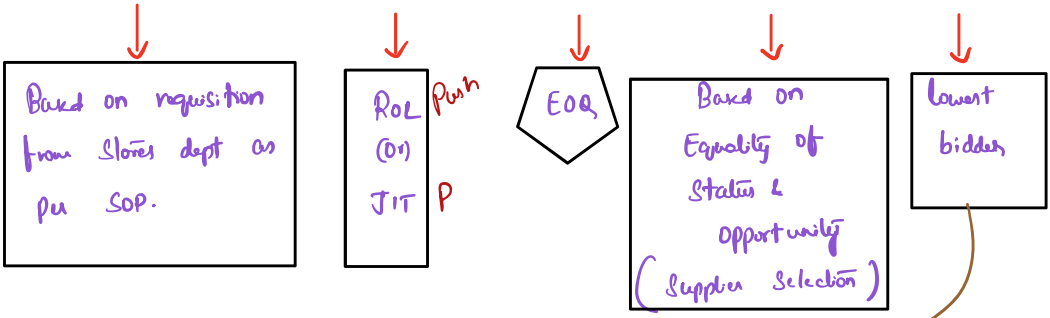
- Materials are procured based on BOM by Purchasing dept.
- Production is Planned based on BOM.
- Stores dept uses BOM as reference doc
- Cost | Acc dept uses it to estimate profit

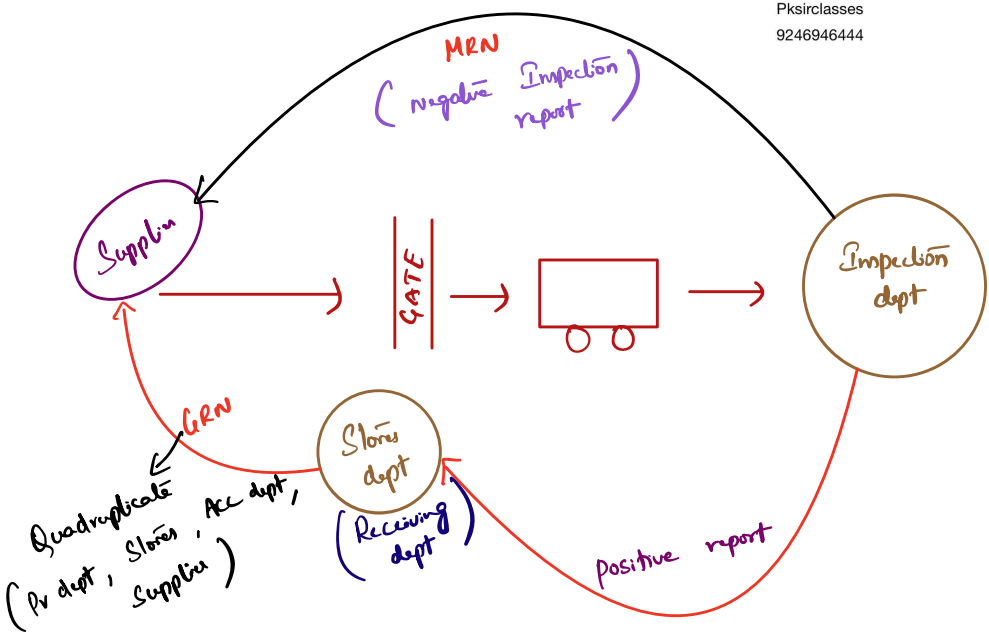
② MRN & PRN



③ INVITING QUOTATION by Purchase dept





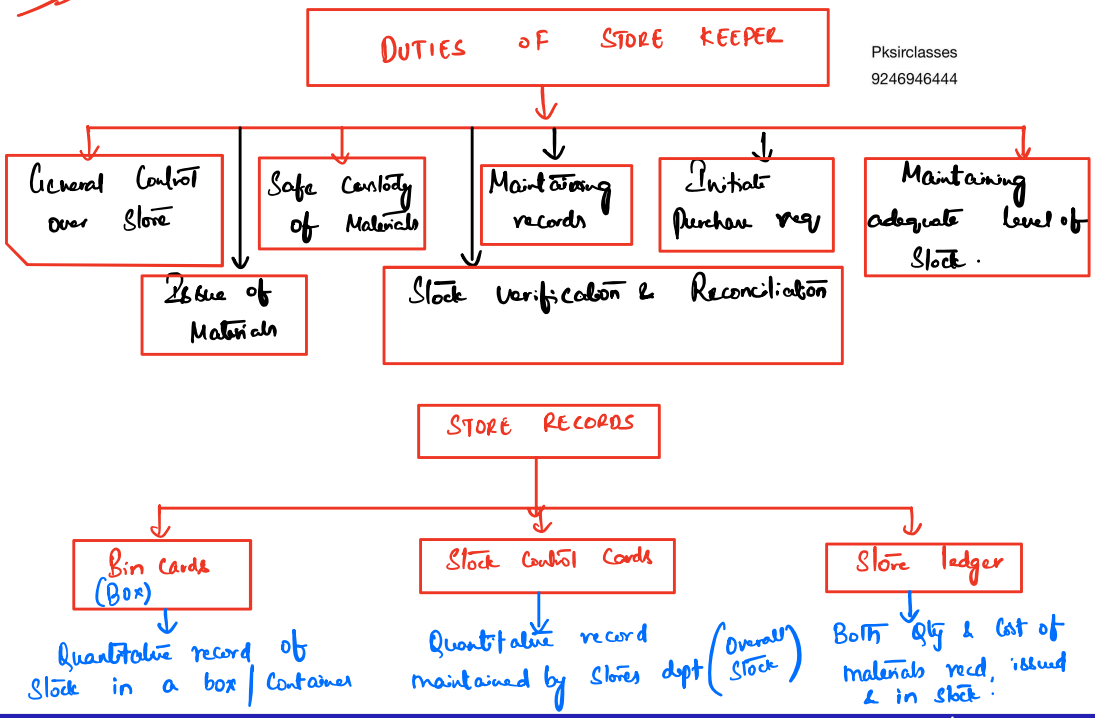


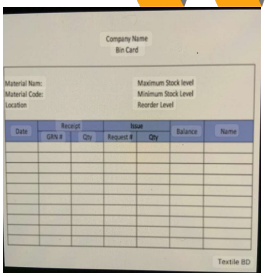
Discounts and Subsidy		
(i)	**Trade Discount**	Trade discount **is deducted** from the purchase price if it is not shown as deduction in the invoice.
(ii)	**Quantity Discount**	Like trade discount quantity discount is also shown as deduction from the invoice. It **is deducted** from the purchase price if not shown as deduction.
(iii)	**Cash Discount**	Cash discount **is not deducted** from the purchase price. It is treated as interest and finance item. It is ignored.
(iv)	**Subsidy/ Grant/ Incentives**	Any subsidy/ grant/ incentive received from the Government or from other sources **deducted** from the cost of purchase.

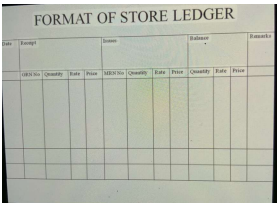
Duties and Taxes		
(v)	**Road Tax/ Toll Tax**	Road tax/ Toll tax, if paid by the buyer, **is included** with the cost of purchase.
(vi)	**Goods and Service Tax (GST)**	Goods and Service Tax (GST) is paid on supply of goods and provision of services and collected from the buyers. It **is excluded** from the cost of purchase if credit for the same is available. Unless mentioned specifically it should not form part of cost of purchase.
(vii)	**Custom Duty**	Custom duty is paid on import of goods from outside India. It **is added** with the purchase cost.
Penalty and Charges		
(viii)	**Demurrage**	Demurrage is a penalty imposed by the transporter for delay in uploading or offloading of materials. It is an abnormal cost and **not included** with cost of purchase
(ix)	**Detention charges/ Fine**	Detention charges/ fines imposed for non-compliance of rule or law by any statutory authority. It is an abnormal cost and **not included** with cost of purchase
(x)	**Penalty**	Penalty of any type is **not included** with the cost of purchase
Other expenditures		
(xi)	**Insurance charges**	Insurance charges are paid for protecting goods during transit. It **is added** with the cost of purchase.
(xii)	**Commission or brokerage paid.**	Commission or brokerage paid **is added** with the cost of purchase.
(xiii)	**Freight inwards**	It **is added** with the cost of purchase as it is directly attributable to procurement of material.

(xiv)	**Cost of containers**	Treatment of cost of containers are as follows: • Non-returnable containers: The cost of containers **is added** with the cost of purchase of materials. • Returnable Containers: If the containers are returned and their costs are refunded, then cost of containers should not be considered in the cost of purchase. • If the amount of refund on returning the container is less than the amount paid, then, only the short fall is added with the cost of purchase.
(xv)	**Shortage**	Shortage in materials is treated as follows: **Shortage due to normal reasons:** Good units absorb the cost of shortage due to normal reasons. Losses due to breaking of bulk, evaporation, or due to any unavoidable conditions etc. are the reasons of normal loss. **Shortage due to abnormal reasons:** Shortage arises due to abnormal reasons such as material mishandling, pilferage, or due to any avoidable reasons are not absorbed by the good units. Losses due to abnormal reasons are debited to costing profit and loss account.

Illu ① & ② Pg no: 2.16, 2.17 in ICAI → Solved in class







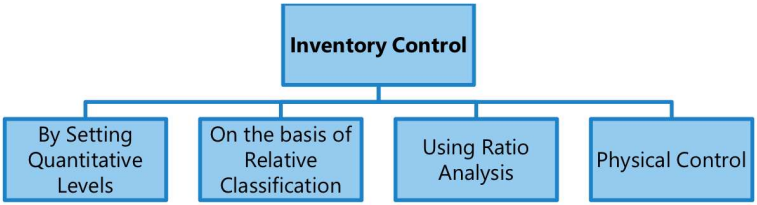
INVENTORY CONTROL

CIMA → Control as *"The function of ensuring that sufficient goods are retained in stock to meet all requirements without carrying unnecessarily large stocks."*

To put it Simple → finding balance between Sufficient Stock & Over Stock.

Less Stock → Stock out Costs

Over Stock → Holding Costs



(1) 6.1 Inventory Control- By Setting Quantitative Levels

Re-order Stock Level	•When to Order
Re-order Quantity/ 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 meet sudden demand

(A) Re-order level (ROL)

Re-order Stock Level (ROL): *This level lies between minimum and the maximum levels* in such a way that before the material ordered is received into the stores, there is sufficient quantity in hand to cover both normal and abnormal consumption situations. In other words, it is the level at which fresh order should be placed for replenishment of stock.

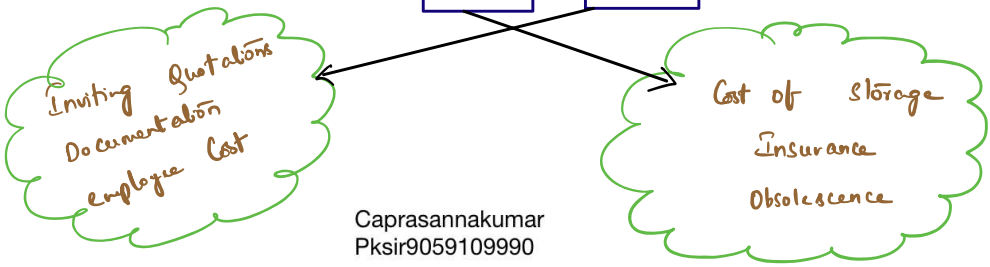
* ROL = Max C × Max lead time

(Or)

* ROL = Min level + (Avg C × Avg lead time)

(B) ROQ (EOQ)

* Qty Where Total of C. cost & O. Cost is at its minimum



$$EOQ = \sqrt{\frac{2AB}{C}}$$

Based on concept, at EOQ OC = C.C

PK Sir logic & derivation for EOQ

No: of orders × B.Cost order = $\frac{1}{2}$ × OQ × C.C.

$\frac{A}{OQ} \times B = \frac{1}{2} \times OQ \times C$

$2AB = OQ^2 \times C$

$OQ^2 = \frac{2AB}{C}$

$OQ = \sqrt{\frac{2AB}{C}}$

logic explained in class for both O.cost & C.cost

Assumptions under EOQ :-

① Qty discount is not available.

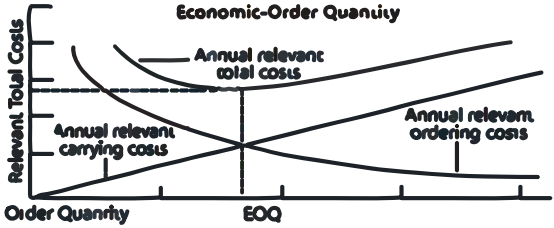
(i) Ordering cost per order and carrying cost per unit per annum are known and they are fixed.

(ii) Anticipated usage of material in units is known.

(iii) Cost per unit of the material is constant and is known as well.

(iv) The quantity of material ordered is received immediately *i.e.* the lead time is zero.

(v) Heavy Buffer Stock is maintained by mgmt. ↓ No stock out



* Ill ③ & Ill ④ Pg: No: 2.24, 2.25 will be Solved

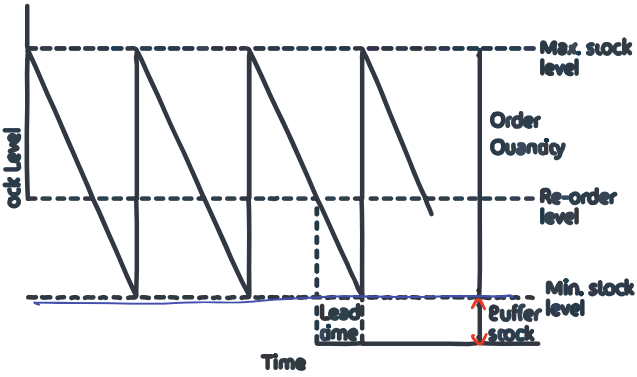
ⓒ Min level :- ROL − (Avg c × Avg lead time) (or) Re-order period.
(Max c × Max lead)

ⓓ Max level :- ROL + ROQ − (Min c × Min lead time)
(Max × Max)

ⓔ Avg level :- (Max + Min) / 2

ⓕ Danger level :- Avg / Min Consumption × lead time for emergency purchase

ⓖ Buffer Stock :- Contingency Stock.



* Ill ⑤ ⑥ Pg: No: 2.29, 2.30

Stock out Cost
↓
loss of Contribution + Good will
(financial loss) (Non-financial loss)
↓
future financial loss.

FC + profit

Sales 1000 units
SP = 100
VC = 60
C = 40
FC = 1000
PFT

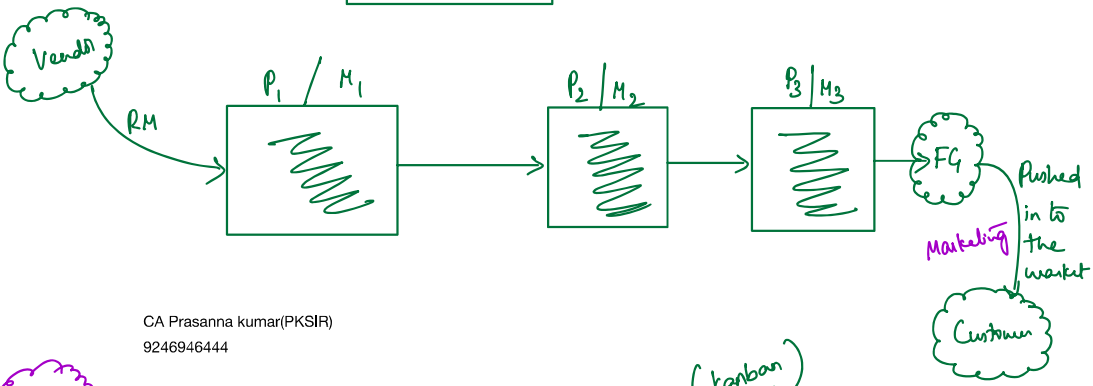
* Ill ⑦ 2.31 (very imp problem)

JIT Inventory MGMT

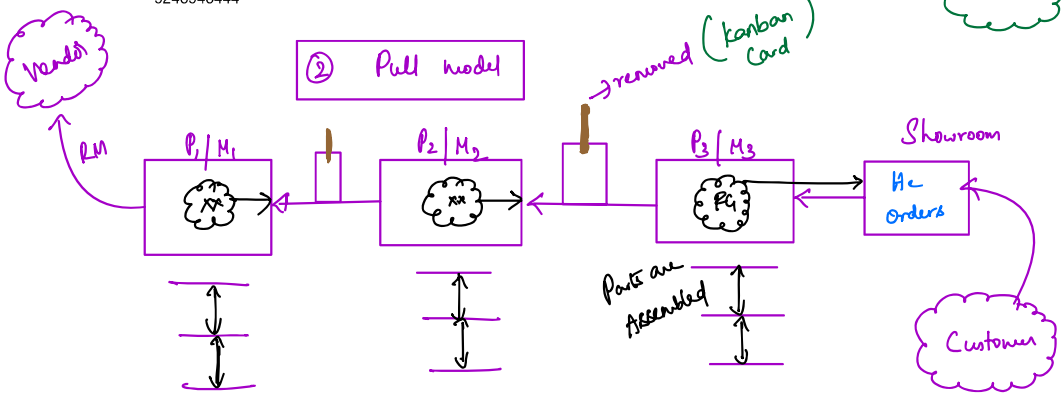
Two ways of producing goods / Products

- Push model — Old one
- Pull model — New one

① Push model



② Pull model



JIT is based on two principles

(i) Produce goods only when it is required and

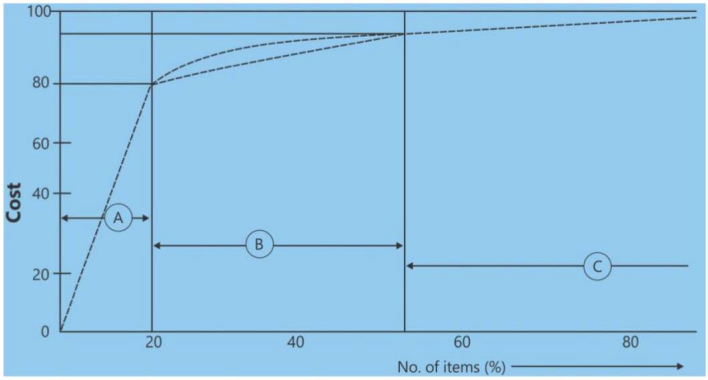
(ii) the products should be delivered to customers at the time only when they want.

(2) 6.4 Inventory Control- On the basis of Relative Classification

ABC Analysis	•On the basis of value and frequency of inventory
Fast, Slow and Non Moving (FSN)	•On the basis of inventory turnover
Vital, Essential and Desirable (VED)	•On the basis of importance of inventory
High, Medium and Low (HML)	•On the basis of price of an item of inventory

① ABC ANALYSIS

- A → 10% Qty, 70% Value
- B → 20% Qty, 20% Value
- C → 70% Qty, 10% Value



* ICL (8) Pg: 2.37 ICL (9) Pg 2.40

Advantages of ABC analysis

- Continuity in Production
- lower Cost
- less attention required
- Systematic Working.

② FNS

Fast

* placed nearer to store issue point
* Reviewed frequently for making fresh orders

NON

* kept for disposal
* Provision for loss is created

Slow

* placed little far
* May be shifted to Non-moving.

③ VED

* Based on Criticality for the production function & final Product.

Vital

Can Cause Production loss

Eg Hospital

life saving, rare Critical drugs.

Essential

Can Cause Sub-standardisation & loss of efficiency in Production Process.

Alternate brands

Desirable

Does not Cause any loss.

Vitamin tablets etc

RATIO ANALYSIS

① Input - output ratio :- Similar to Standard Costing.

② Inventory T/o ratio :-

* = Cost of materials Consumed / Cost of avg Stock

* Avg Stock = (Opg + Clg) / 2

* Inventory holding days = 365 | 12 / Inv T/o ratio

* High Inv T/o ratio = Fast moving Stock.
* low Inv T/o ratio = Slow moving Stock
* RM Consumed = opg + Pur - Clg

Ill ⑩, ⑪ pg: 2.43, 2.44

VALUATION OF MATERIAL ISSUES

COST PRICE METHODS

- **Specific Price method** → Useful when Materials are Specifically purchased for a specific job.
- **FIFO METHOD** → Issued in the Order in which they are purchased
- **LIFO** → Reverse of FIFO
- **Base Stock method** → Min qty of Stock always held at Fixed price. as reserve in Stock.

* See (12), (13), 2.54 - 256

AVERAGE PRICE METHODS

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Simple average

By dividing the total of rate at which different lot of materials are purchased

Weighted average

This method gives weightage to quantities also.

Eg:

1st April, 200 units @ ₹10 each;
5th April, 150 units @ ₹12 each;
14th April, 210 units @ ₹12 each;
21st April, 50 units @ ₹15 each and
28th April, 140 units @ ₹ 11 each.

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

$$= \frac{\{(₹10\times200 \text{ units})+(₹12\times150 \text{ units})+(₹12\times210 \text{ units})+(₹15\times50 \text{ units})+(₹11\times140 \text{ units})\}}{(200+150+210+50+140) \text{ units}}$$

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

MARKET PRICE METHODS

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Replacement price method

Valued at CMP

Useful to determine true cost of production

Realisable price method

Price at which material can be sold in the market.

NOTIONAL PRICE METHODS

- **Standard price method** → Materials are priced at pre-determined rate (or) Standard price
- **Inflated price method** → Material suffers loss in weight due to Natural (or) climatic factors. Eg Evaporation.
- **Re-use price method** → Material is actually used in the price of some other material. other than its intended purpose.

Standard prices are fixed for each material and the requisitions are priced at the standard price. This method is useful for controlling material cost and determining the efficiency of purchase department. In the case of highly fluctuating prices of materials, it is difficult to fix their standard cost on long-term basis.

VALUATION OF RETURNS & SHORTAGES

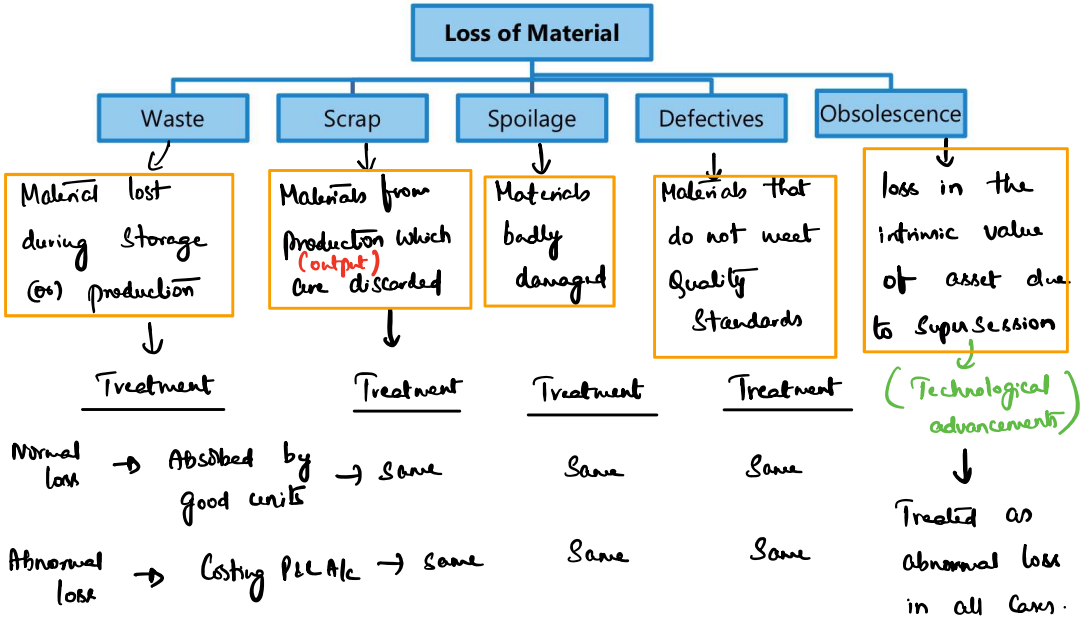
* ① Valuation of materials returned to vendor :-

The price of the materials to be returned to the vendor should include its invoice price plus freight, receiving and handling charges etc. *Strictly speaking, the materials returned to the vendor should be returned at the stores ledger price and not at invoice price.* But in practice, only invoice price is considered and the gap between the invoice price and stores ledger price is charged as overhead. In stores

* ② Valuation of Materials returned to Stores :-

- Include materials in stock as if they are fresh purchases
- (or) Materials are kept in Suspense account and issued at Rate price against next requisition.

TREATMENT OF NORMAL & ABNORMAL LOSS



* ILL (14) — 2:68

CHAPTER - 3 | 10m

EMPLOYEE COST & DIRECT EXPENSES

Birds eye view

- Meaning of E'ee Costs
- Attendance & payroll procedures
- Idle time & Over time Cost
- labour T/o
- Various methods of remuneration
- Efficiency rating procedures
- Measurement & Treatment of Direct expenses

* employee cost is wider term which includes wages, salary, bonus, incentives etc. paid to an employee and charged to a cost object as labour cost.

Employee Cost

Output

- Wages & Salary
- Allowances & Incentives
- Overtime Payment
- Employers Contribution to provident fund
- Other benefits
  - free / subsidised food

- Direct labour
  - * Can be directly attributed to a Cost object
    - Process
    - Product
    - Customer
    - activity
    - Contract
    - Cost Centre
  - * These e'ees are directly engaged in production process
- Indirect labour
  - * Cannot be .....
  - * Indirectly engaged.

* Direct employee Cost Varies with Volume of production.

* May not vary with Volume of production.

Employee Cost Control

* **The aim should be to keep the wages per unit of output as low as possible.**

Department	Functions
1. Personnel Department	(i) On receipt of employee requisition from the various departments it searches for the required skills and qualification. (ii) It ensures that the persons recruited possess the requisite qualification and skills required for the job. (iii) Arranges proper training for the newly recruited employees and workshops for existing employees.
	(iv) Maintains all personal and job related records of the employees. (v) Evaluation of performance from time to time

2. Engineering and Work Study Department	(i) Prepares plans and specifications for each job. (ii) Providing training and guidance to the employees. (iii) Supervises production activities. (iv) Conducts time and motion studies. (v) Undertakes job analysis. (vi) Conducts job evaluation.

3. Time-keeping Department	(i) Concerned with the maintenance of attendance records i.e. time keeping and (ii) Time spent by an employee on various jobs i.e. time booking etc.
4. Payroll Department	(i) The preparation of payroll of the employees. (ii) It disburses salary and wage payments.
5. Cost Accounting Department	(i) Accumulation and classification of employee costs. (ii) Analysis and allocation of costs to various cost centres or cost objects

Task of Collecting employee Costs

Time keeping (VS) Time booking

Record of total time spent by elees.

Break up of time on various jobs.

METHODS OF TIME KEEPING

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MANUAL

- Attendance register method
  - record the arrival & departure time of elee
  - (Small org)
  - (possibility of time manipulation)
- Metal Disc / Token method
  - Metal disc / token is given to Time keeper
  - (Proxy problem)

MECHANICAL | AUTOMATED

- Punch Card attendance
  - Punch Card Contains details of elee in digital form.
- Bio-metric
  - finger print
  - face
  - Retina image
  - (not Suitable for Small Org)

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Pksir9059109990

TIME BOOKING

* To understand why we need Time booking, we need to understand the drawbacks (or) limitations of time keeping

↓

* Time keeping shows time spent by an elee in the premises, but does not show how much time a person spent on a particular job.

↓

* In Time booking each activity of employee is recorded.

This further helps in Calculation of Costing for a job measuring efficiency → fixation of responsibility

further explained in class in detail.

Time @ Job Card can be of two types

- Analysis of time for each job
  - Job Card
    - Operation ① → elee ①
    - operation ② → elee ②
    - operation ③ → elee ③

  Now elee Cost of Job is Calculated easily

- Analysis of time for each employee

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Separate Card for Idle (for a day (or) week)

This Card will have Complete history of all jobs

PAYROLL PROCEDURE

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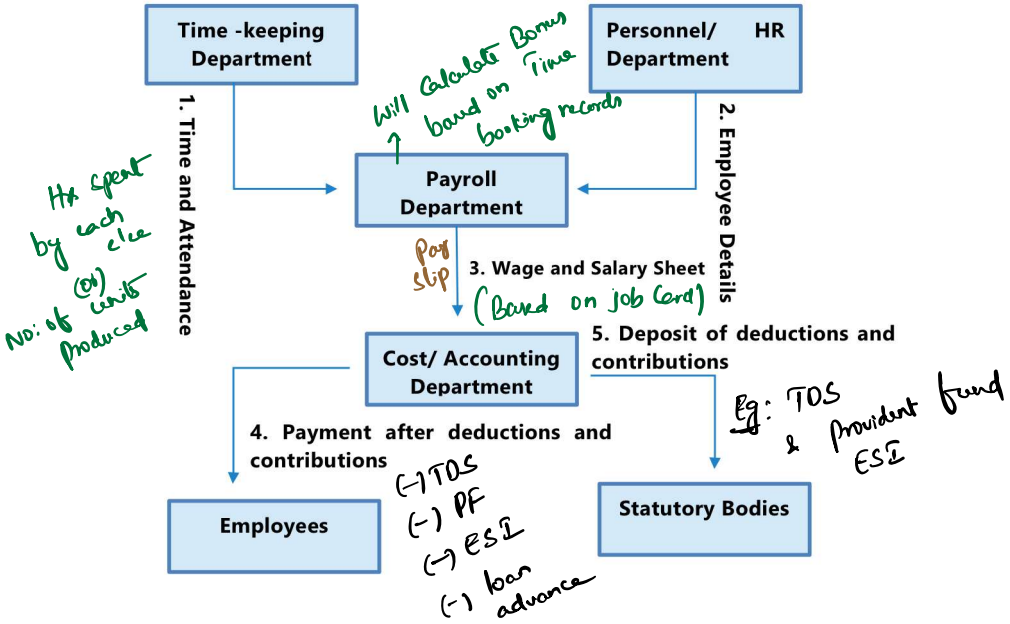


IDLE TIME

* No production is carried out bcoz the workers remains Idle but are paid.
* Idle time = Time paid − Time booked
* Time paid = Time booked + holidays + paid leaves + rest time

ⓐ Normal Idle time

- Cannot be avoided / reduced
- Time lost b/n Factory gate & place of work & b/n one job & another
- Setting up time of machine
- Normal rest time lunch break.

ⓑ Abnormal Idle time

CAUSES

- Lack of Co-ordination
- Power failure
- Breakdown of machines
- Non-availability of RM
- Strikes lock outs
- Poor Supervision
- Fire Flood

- Controllable abnormal time
- Un Controllable abnormal time

* Detailed analysis should be done by the management & responsibility should be fixed.

* ILL ①, ② – 3.15 – 3.16

OVER TIME

* Work done beyond normal working hours.

* Overtime = Wages paid for Overtime @ Normal rate + Premium for overtime hours

Overtime premium

* As per Factories act 1948 → limit = 9 hrs / day & Twice the normal rate
48 hrs / week.

Causes of Overtime and Treatment of Overtime premium in cost accounting

Causes	*Treatment*
(1) The customer may agree to bear the entire charge of overtime because urgency of work.	(1) If overtime is resorted to at the desire of the customer, then overtime premium may be charged to the job directly.
(2) Overtime may be called for to make up any shortfall in production due to some unexpected development. ↓ Irregular	(2) If overtime is required to cope with general production programmes or for meeting urgent orders, the overtime premium should be treated as overhead cost of the particular department or cost centre which works overtime.
(3) Overtime work may be necessary to make up a shortfall in production due to some fault of management.	(3) If overtime is worked in a department due to the fault of another department, the overtime premium should be charged to the latter department.
(4) Overtime work may be resorted to, to secure an out-turn in excess of the normal output to take advantage of an expanding market or of rising demand	(4) Overtime worked on account of abnormal conditions such as flood, earthquake etc., should not be charged to cost, but to Costing Profit and Loss Account.

* Ill ③, ④, ⑤ – 3.19 - 3.26

SYSTEM OF WAGE PAYMENT & INCENTIVES

- Time based
  - Time hrs × Rate
  - (Suitable for those whose Services cannot be tangibly measured)
  - Eg: General helpers, Supervisor, Clerical staff
- Output based
  - No: of units × Rate/unit
- Combo of Time & output
- Premium Bonus method
  - * Halsey Premium *
  - * Rowan premium *
  - Imp
  - * Ill (8), (9), (10), (11), (12), (13)
- Group bonus Scheme
- Incentives for Indirect workers

HALSEY PREMIUM PLAN

* Wages = $(TT \times TR)_{BW} + (50\% \text{ of } TS \times TR)_{Bonus}$

* $(TS = ST - TT)$

* Negative point :- Incentive is not as strong as piece rate system. In fact the harder the worker works, the lesser he gets per piece

ROWAN PREMIUM PLAN

* WAGES = $(TT \times TR)_{BW} + \left(\frac{TS}{TA} \times TT \times TR\right)_{Bonus}$

Explained with ILL ⑥ & ⑦

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

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

HALSEY

$= (TT \times TR) + (50\% \text{ of } \underset{\times TR}{TS})$

$= (6\text{hrs} \times 60) + 50\% (2 \times 60)$

$= 360 + 60$

$= 420$

ROWAN

$= TT \times TR + \frac{TS}{TA} \times TT \times TR$

$= (6 \times 60) + \left(\frac{2}{8}\right) \times 6 \times 60$

$= 360 + (25\% \times 360)$

$= 360 + 90$

$= 450$

LABOUR / EMPLOYEE TURNOVER

* Rate of Change of Composition of labour during a period

Methods to Calculate ele T/o

- Replacement method
- Separation method
- Flux method

$\frac{R}{Avg} \times 100$ $\frac{S}{Avg} \times 100$ $\frac{S+R}{Avg} \times 100$

* R = Replacements
* S = Separations
* N = New recruitments due to expansion
* Acc = Accessions = R + N
* Avg c'less = $\frac{opg + clg}{2}$

If there are new c'less due to expansion, then

$= \frac{S + R + New}{Avg} \times 100$

$= \frac{S + Acc}{Avg} \times 100$

* ILL (14), pg. 3.47

Causes of E'ee T/o

Personal Causes

* Jobs change for betterment
* ill health / old age
* family problems
* Discontent over jobs

Unavoidable Causes

* Seasonal cause
* Shortage of RM, Pow
* Δ in plant location
* Disability
* Disciplinary measures

Avoidable Causes

* Dissatisfaction with job, remuneration
* Strained relationship
* lack of promotions
* No medical facilities
* low wages
* low allowances.

Effects of Employee T/o

* High employee T/o ↑ Cost of production

- Production is disturbed
- Productivity of new workers is low
- ↑ Cost of training & recruitment
- New workers cause ↑ breakage of tools, wastage of materials

Cost of elec T/o

Preventive Costs (to prevent elec T/o)

* Cost of Medical benefit
* Cost of elecs welfare (Pension) etc
* Any other benefits with an objective to retain elecs.

Replacement Costs

* Arises due to elec leaving
* * Same as above

* Ill (15), 3.51

DIRECT EXPENSES

* Cost incurred directly attributable to Cost object. (Other than DM & DL)

- Royalty paid
- Hire charges
- Cost of product / Servia Specific design, drawing, software

* Ill (16)

OVERHEADS - ABSORPTION COSTING METHOD

↳ To find out OH/unit

Birds eye view

- Prod OH
- Adm OH
- SID OH

Accounting & Control of OH

- Distribution of OH
- OH Rates
- Concepts related with Capacity

* INTRO

Expenses incurred for output in general and not for a particular work order.

Eg :- Supervision exp, Heating & lighting exp of factory.

* CLASSIFICATION OF OVERHEADS

By function

- Factory / Manf / Prod OH
  - Includes all exp incurred from procurement of materials to the completion of finished product
- Office & Admin OH
- SID OH
  - anything related to sales & distribution

By Nature

Fixed OH

Remains Constant with in a range & No limit.

Eg: Salary paid to permanent employees, Depreciation of building and plant and equipment, Interest on capital, Insurance.

V OH

Vary with volume activity ↑ VOH ↑

Eg Indirect materials, Power and fuel, lubricants, tools and spares etc.

S. V. OH

Both V & F elements

Eg Electricity cost, water cost, telephone and internet expenses etc.

By ELEMENT

IM

Materials which do not form part of Cost object (Output)

Eg Stores used for maintaining machines and buildings (lubricants, cotton waste, bricks etc.) Stores used by service departments like power house, boiler house, canteen etc.

IL

Labour which do not form part of Cost object

Eg Salary paid to foreman and supervisor. Salary paid to administration staff etc.

I Exp

Exp that cannot be directly allocated to Cost Centre.

Eg Rates & taxes, insurance, depreciation, advertisement expenses etc.

By Control

Controllable Costs

OH that can be controlled by Managerial influence & proper policies.

Eg: Materials cost, wages and salary, power and fuel etc.

Uncontrollable Costs

OH that cannot be controlled .....

Eg:- Rates and taxes, Depreciation, Interest on borrowings

Advantages of Classification of OH in to F & V

- Controlling exp
- Preparation of Budget estimates
- Decision making.

ACCOUNTING & CONTROL OF MANF OH

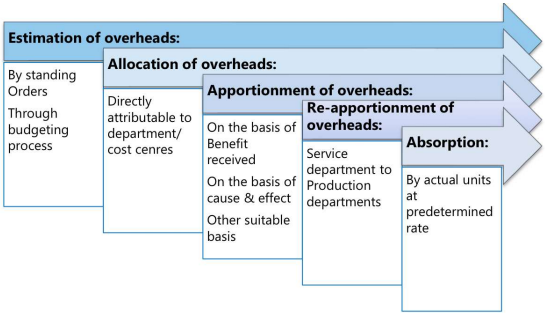
* Target / objective : T.C/unit
  - DC/unit — Easily available
  - I.C/unit (OH/unit) — Not available

*

One method is to work out pre-determined rates for absorbing overheads. These rates are worked out before an accounting period begins by estimating the amount of overheads and the level of activity in the ensuing period. Thus, as soon as the prime cost of a product or a job is available, the various overheads are charged by these rates. Of course, this implies that the overheads are charged on an estimated basis. Later, when the actual overheads are known, the difference between the overheads charged to the products and actual overheads is worked out and adjusted.

Target / objective = T.C / unit

- DC / unit — Easily available
- I.C / unit (OH / unit) — Not available
  - Pre-determined rate
    - Cost allocation → OH to dept / Cost Centres
    - Cost apportionment → allotment of proportion of items to dept / Cost centre
    - Re-apportionment → S.D OH to P.Depts
    - Absorption → P.Depts to output
      - Treatment of under / over absorption.
        - Costing P&L A/c



OH apportionment to various dept (P&S) → P.D

Overhead Cost		Bases of Apportionment (Benefit received by depts)
1.	(i) Rent and other building expenses (ii) Lighting and heating (conditioning) (iii) Fire precaution service (iv) Air- conditioning	Floor area, or volume of department
2.	(i) Perquisites (ii) Labour welfare expenses (iii) Time keeping (iv) Personnel office (v) Supervision	Number of workers
3.	(i) Compensation to workers (ii) Holiday pay (iii) ESI and PF contribution (iv) Perquisites	Direct wages
4.	General overhead	Direct labour hour, or Direct wages, or Machine hours.
5.	(i) Depreciation of plant and machinery (ii) Repairs and maintenance of plant and machinery (iii) Insurance of stock	Capital values
6.	(i) Power/steam consumption (ii) Internal transport (iii) Managerial salaries	Technical estimates
7.	Lighting expenses (light)	No. of light points, or Area or Metered units
8.	Electric power (machine operation)	Horse power of machines, or Number of machine hour, or value of machines or units consumed.
9.	(i) Material handling (ii) Stores overhead	Weight of materials, or volume of materials, or value of materials or unit of materials.

* In few rare cases, basis of apportionment can be

- Analysis (or) Survey of existing Conditions
  - Eg lighting exp based on light points
- Ability to pay (nothing but taxation logic applies here)
  - Eg Sales of diff products in a territory
    - ↓
    - Selling related exp is apportioned based on ability (amt of Sales)
- Efficiency / incentive
  - ↓
  - Appor based on Pre-determined levels of Production / Sales.
  - ↓
  - So if Act P/s > Pre-det P/s
  - Then less OH Cost app
  - ↓
  - less OH / unit
  - ↓
  - Greater Profit
  - (explained in class in detail)

Allocation (vs) Apportionment

- Allocation
  - Whole item to one dept
  - ↓
  - Eg Indirect wages of diff dept
- Apportionment
  - Proportion of item to one dept
  - ↓
  - Eg already discussed above

* Re-appo of S.D OH to P.D

↓

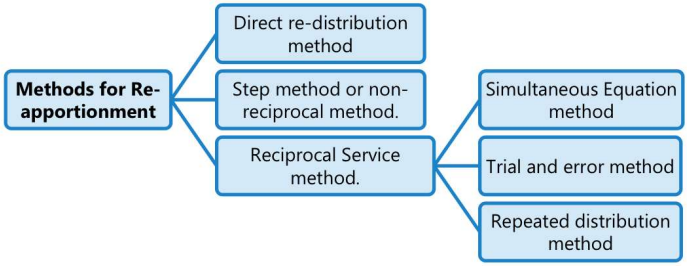
Cost of the Service Departments:	Basis
1. Maintenance and Repair shop 2. Planning and progress 3. Tool room	Direct labour hours, Machine hours, Direct labour wages, Asset value x Hours worked
4. Canteen and Welfare 5. Hospital and Dispensary 6. Personnel Department	No of direct workers No. of employees etc.
7. Time-keeping	No. of card punched, No. of employees
8. Computer Section	Computer hours, Specific allocation to departments
9. Power House (electric lighting cost)	Floor area, Cubic content, No. of electric Points, Wattage.
10. Power House (electric power cost)	Horse power, Kwh, Horse power × Machine hours, Kwh × Machine hours
11. Stores Department	No. of requisitions, Weight or value of Materials issued.
12. Transport Department	Crane hours, Truck hours, Truck mileage, Truck tonnage, Truck ton-hours, Tonnage handled. No. of packages of Standard size
13. Fire Protection	Capital values
14. Inspection	Inspection hours

Notes:

(1) Repairs included in repairs shop cost, building maintenance cost included in maintenance shop cost etc. should be apportioned on the basis of capital values.

(2) Economy, practicability, equitability and reliability are the matters of consideration for selection of the base.

METHODS FOR Re-apportionment (S.D)



① Direct - re-distribution method (S.D to P.D)

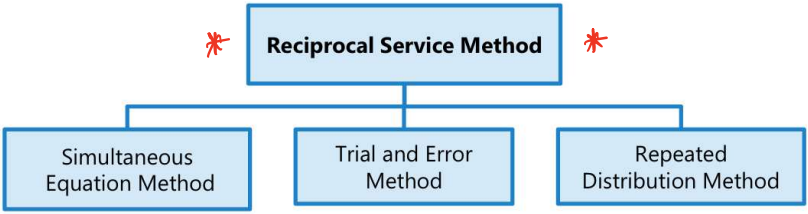
* This ignores services from one S.D to another S.D

* Ill ① – 4.19

② Step method (or) Non - Reciprocal method

* Considers one S.D service to another S.D
* Seq determined by max no: of services.
  * If details are not available in Q then go with large amount of Cost. *

* Ill ② – 4.20



① SIMULTANEOUS EQUATION METHOD

* Ill ③ – 4.22

② TRIAL & ERROR METHOD

* Ill ④ – 4.24

③ REPEATED DISTRIBUTION METHOD

* Ill ⑤ – 4.27

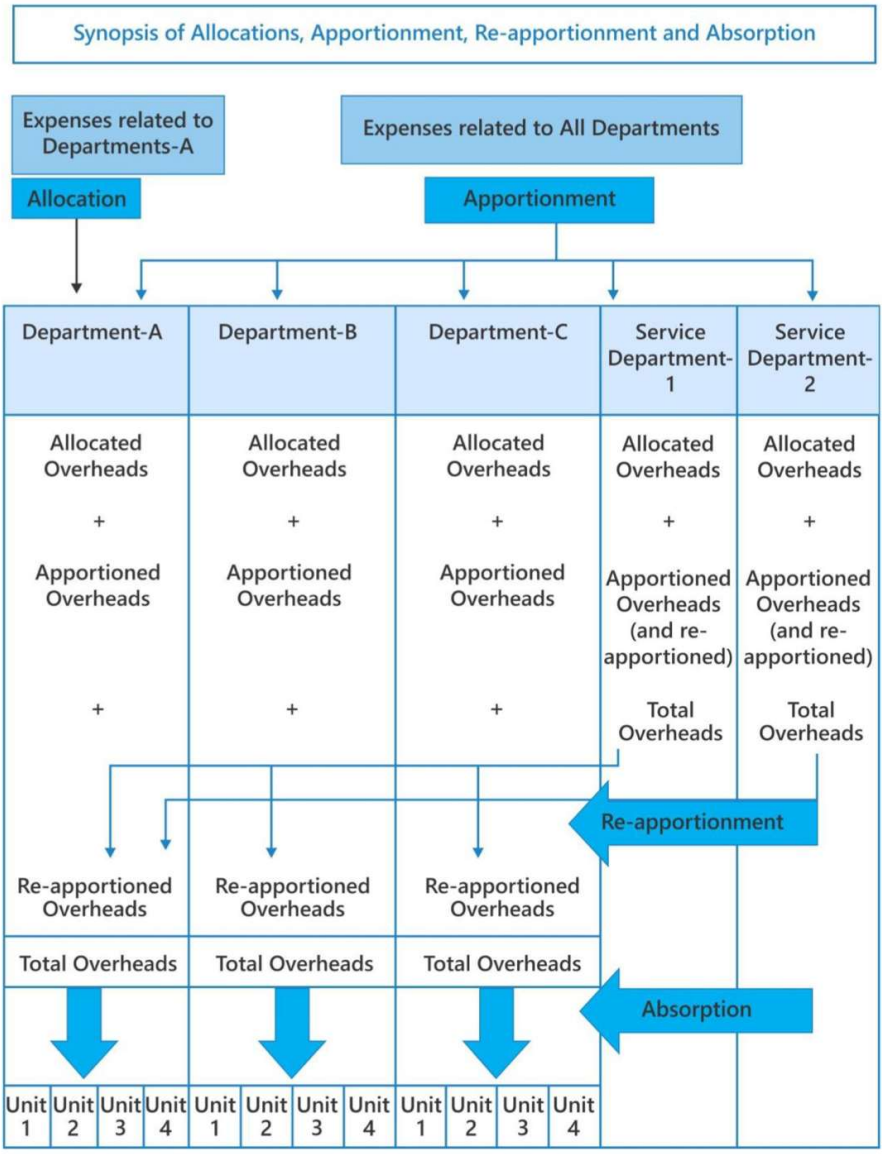
ABSORPTION OF OH TO UNITS / PRODUCTS

↓

METHODS OF ABSORPTION (6)

↓

Percentage of direct materials	Percentage of prime cost	Percentage of direct labour cost	Labour hour rate	Machine hour rate	Rate per unit of output
↓	↓	↓	↓	↓	↓
OH Rate = Total POH of Dept / BOM Cost of all Prod	= Total POH of Dept / Prime Cost	= Total POH of Dept / D.L Cost	= Total POH of Dept / DL Hrs	= Total POH / Mhrs	= Total OH / Units



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(1) Percentage of DM & Percentage of Prime Cost method

Suppose for a given period, actual figures are estimated as follows:

	₹
Direct materials	2,00,000
Direct labour	1,00,000
Factory overheads	90,000

→ % of POH to DM = $\frac{POH}{DM}$ = $\frac{90000}{200000}$ = 45%

So If Suppose Job 'A' = Mat Cost = 10000, DL = 7000,
then POH absorbed = 10000 × 45% = 4500

T. Cost = DM + DL + POH
= 10000 + 7000 + 4500
= 21500

→ % of POH to Prime Cost = $\frac{POH}{Prime\ Cost}$ = $\frac{90000}{300000}$
= 30%

So for Same Job A = POH absorbed = 17000 × 30%
= 5100

T. Cost = DM + DL + POH
= 10000 + 7000 + 5100
= 22100

PK Sir Comments on the above

* POH are mostly function of time

↓ Means

Time is the determining factor

↓

What is POH = ? → exp incurred for providing necessary facilities & Services to workers

↓

This is dependant on time

↓

So More time spent on job

↓

More POH

↓

This logic is ignored by above two methods.

% of DL method

↓

PK Sir Comments → * Again Time factor ignored

* If Machine is used, then that is also ignored.

* Does not Consider Skills of workers.

L Hr Rate Method

- Better than DL Cost method as it recognises TIME
- Most suitable if huge machines are not involved.

Machine hour rate method

↳ Cost of running a machine for an hour.

Direct M hr rate

Only the expenses directly (or) immediately connected with the operation of machine are taken in to account

Eg Power, Dep, Repairs & Maint, Insurance

Comprehensive M hr rate

Other exp like Supervision charges, Shop cleaning, lighting, Consumable stores, Shop supplies, Shop general labour etc

These are incurred for whole dept not for machine

But these exp should not be left out of prod Costs.

Some times wages paid to machine operator is also added in CMhrate.

Steps for Determining Mhr rate

The steps involved in determining of Machine hour rate are as follows:

Step1: Calculate total of overheads apportioned to a production department (as discussed earlier in this chapter)

Step 2: Apportion further these overheads to machines or group of machines in the department.

Step 3: Allocate machine specific costs (directly identifiable with the machine)

Step 4: Estimate total productive hours for the machine

Step 5: Aggregate overheads as apportioned in step-2 and allocated in step-3 and divide it by Estimated total productive hours

Step 6: The resultant figure is machine hour rate

Total OH Costs

Fixed Cost / Standing charges

Eg Insurance premium for Machine
Rent
Sup Salary
Dep (effluxion of time)

Variable Costs

Eg Power
lubricants
Oils
R&M
Dep (wage)

Rate per unit Method

$$\text{OH Rate} = \frac{\text{OH Cost}}{\text{units}}$$

Types of OH rate

- **Normal rate** → $\frac{\text{Actual OH}}{\text{Actual base}}$
- **Pre-determined rate** → $\frac{\text{Budgeted OH}}{\text{Budgeted Base}}$
- **Blanket rate** → Single rate for entire factory → $\frac{\text{Total OH of factory}}{\text{Total units}}$
- **Departmental rate** → $\frac{\text{OH of dept}}{\text{Corresponding base}}$

* Ill ⑥, ⑦ solved here (4.40 – 4.42)

Concept of Absorption (PK notes)

Unlike your financial accounts which is prepared at the end of the year, Costing is a Continuous process which starts from Day 1 itself.

↓

From Day 1 → you need to manf & sell goods

↓

You need S.P / unit from Day ①

↓

S.P = T.Cost / unit + PH mark up → Based on your KO

↓

Total Cost / unit

↓

D.C / unit / Prime Cost

↓

Easy to Calculate
No Complications
No issue

I.C / unit / Overheads

↓

Two problems

↓

Problem ①

↓

You do not know OH / unit (or) IC / unit

↓

This is why in CA Inter you have a Chapter called OH i.e find OH / unit.

Problem ②

↓

You do not know what your actual OH are ?

↓

You will know it only at the end of the year

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Which means, basically you do not know what your actual OH are at the beginning of the year

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Means No Actual OH/unit

So no T. Cost/unit

No SP/unit

No business

Solution

Go with expected OH

Budgeted OH

BOH/unit + DC/unit

T.C/unit + profit

S.P/unit

Budgeted OH	Absorbed OH / Standard OH	Actual OH

Predominant influencing factor

BOH = 120 000

BOP = 12000 units

Six methods

① M. Cost
② L Cost
③ Prime Cost
④ M hrs
⑤ L hrs
⑥ Units

BR/unit = 10/unit

SR/unit

Absorption rate

pre-determined rate

Recovery rate

April 1st → 40 units x 10 = 400

2nd → 80 units x 10 = 800

3rd → 100 units x10 = 1000

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365 days

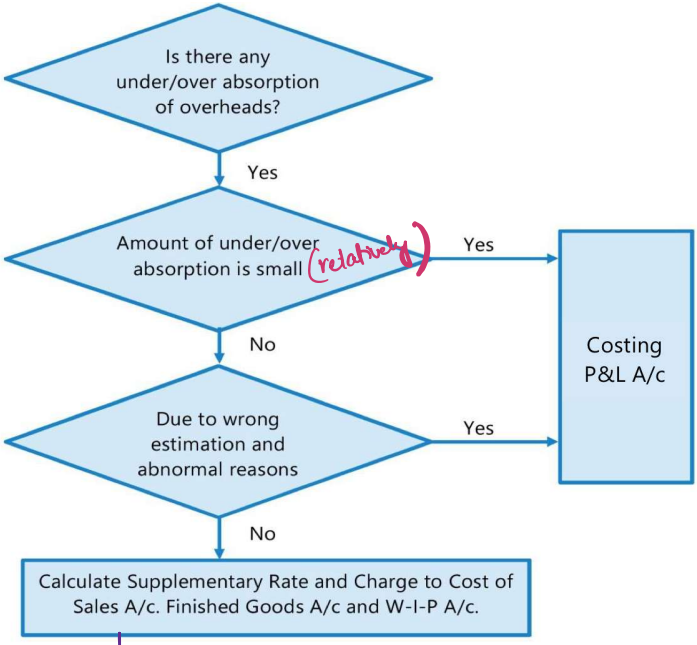
13000 units x 10 = 130 000

Year end = 140000

under absorption = 10000/-

Units/volume

Treatment of over / under absorption in Cost accounting



Supplementary rate / unit = under / over absorbed OH / units produced.

The accounting is done as follows:

In case of Under-absorption:

	Accounts	Dr/Cr	Calculation of amount
1.	Stock of Finished goods A/c	Debit	Units of Finished stock × Supplementary rate per unit
2.	Stock of Semi-finished goods (WIP) A/c	Debit	Equivalent completed units × Supplementary rate per unit
3.	Cost of Sales A/c	Debit	Units sold × Supplementary rate per unit

In case of Over-absorption:

	Accounts	Dr/Cr	Calculation of amount
1.	Stock of Finished goods A/c	Credit	Units of Finished stock × Supplementary rate per unit
2.	Stock of Semi-finished goods (WIP) A/c	Credit	Equivalent completed units × Supplementary rate per unit
3.	Cost of Sales A/c	Credit	Units sold × Supplementary rate per unit

over / under capacity utilisation

* However if there is any abnormal reason → transfer to Costing P&L A/c

* Ill (8) Solved

Accounting & Control of Adm OH → is all about formulation of policies.

- Apportioned to Prod & Sales dept — logic in class
- Charging to P&L A/c (costing) → logic explained in class
- Added to Cost of production and Sales

PK Notes

* Adm OH are mostly fixed bcoz they are mgmt policies.
  - So they are non-Controllable
    - But still some degree of control is necessary.

How to Control?

- Through Budgets
- Through Standards

* Ill (9) Solved here (4:50 - 4:53)

Accounting & Control of SLD OH

Usually SLD OH are absorbed based on

- Sales value of goods → mostly used
- Cost of goods sold → Not Satisfactory
- Gross profit on Sales
- No: of orders / units sold

* If there is no suitable basis → then it is apportioned based on Sales.

Expenses	Basis
Salaries in the Sales Department and of the sales men.	Estimated time devoted to the sale of various products.
Advertisement	Actual amount incurred for each product since these days it is usual to advertise each product separately; common expenses, such as in an exhibition, should be apportioned on the basis of advertisement expenditure on each product.
Show Room expenses	Average space occupied by each product.
Rent of finished goods godowns and Expenses on own delivery vans	Average quantities delivered during a period.

Eg of S&D OH :- Packaging, freight outwards, Insurance in transit
Comm payable to Salesman, rebate allowed to Customers

Control of S&D OH

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It is difficult because

S&D depends mainly on external factors which are beyond Control.

S&D are dependant on Customers behaviour → Their liking & disliking, tastes etc.

Despite above following methods are used

- Comparison with Past performance
- Budgetary Control
- Standard Costing.

* ILL @ Solved.

1	2	3	4	5	6	Avg
10000	12000	11000	10000	13000	9500	109/6

CONCEPTS RELATED TO CAPACITY

This month 10000 units

- **Installed / Rated Capacity** → Max Capacity (or) Theoretical Capacity
- **Practical Capacity** → Operating Capacity (Net Capacity) (Available Capacity)
- **Normal** → Production achievable (Reality)
- **Actual** → Production achieved
- **Idle** → No production

30 kms/litre Active

40 kms/litre Normal

Abnormal Idle Capacity

Idle Capacity

- **Unavoidable reason** → Costs are charged to Production Capacity utilised
- **Avoidable reason** → Costing P&L A/c

TREATMENT OF CERTAIN ITEMS IN COSTING

① Interest & Financing Charges

It includes any payment in the nature of interest for use of non-equity funds.

Eg Int on borrowings
Cash disc allowed to Customers
Financial charges in Financial lease

② Depreciation

Depreciation "is the diminution in the intrinsic value of an asset due to use and/or the lapse of time."

→ Should be traced to Cost object.

③ Packing exp

- Primary packing former part of Production Cost
- Packing facilitating transportation should form part of distribution Cost
- Special pack at the request of Customer should be charged to specific job

④ FRINGE BENEFITS

↳ Treated as POH

- Additional payments provided to workers apart from their Salary
- Eg Overtime, holiday pay, Pension facilites.
- They improve e'ee morale & loyalty towards Org.

Exp on Removal & Re-erection of Machines

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Treated as POH

Why do you remove →
- Δ in method of production
- Δ in flow of production

* If the above is due to faulty planning } Then charged to Costing P&L A/c.

Bad debts

- View ① → finance Cost
- View ② → Part of SLD OH

(Extra-ordinary bad debts Should not be included)

Training exp

- Treated as part of Cost of production
- In case of High labour TIo
  - Training exp will be very high
    - Trsfd to Costing P&L A/c
- Includes
  - * Wages
  - * Cost of running training dept
  - * loss of initial lower prod
  - * Extra Spoilage

Canteen exp

- Subsidy (or) Running exp Should be treated as Prod OH
- Who are using Canteen ?
  - Only Factory Workers
    - Then allocate to dept based on no: of Workers
      - Only to Factory OH
  - Factory & Admin Workers
    - Then a portion as Factory OH & a portion as Admin OH

* Expenses on welfare activities → General OH

Night Shift allowance

- Treated as Prod OH
- If it is due to Specific Customer Order
  - Charged directly to the order
- If night shift is run due to abnormal situations
  - Charged to Costing P&L A/c

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R&D exp

- Development Cost of a Product → Charged directly to Product
- General research exp → General OH
- If R&D amount is Substantial → Treated as Deferred Revenue exp.

ACTIVITY BASED COSTING

↓

Activity based Costing (ABC) (SAOI)

↓ Syllabus

↓

Purpose ⇒ OH/unit

↓

logic ?

1960 - 1990

↓

Sellers market

↓

No MNC's

↓

T.C = 100/unit

↓

DC ≥ 90%. IC ≤ 10%. (OH)

↓

OH are not Significant

↓

1990 Afterwards

↓

Buyers market

↓

S.P is fixed by market forces

↓

Seller has become price taker

↓

Bcoz he doesn't decide S.P/unit unless his T.C/unit of the product is precise, he will end up taking wrong decisions which will adversely affect his business.

affect his business.

↓

T.C/unit → X exact

↓

Under - Costed

↓

Product gives more profit

↓

You may decide to inc your production

X

Over - Costed

↓

Product gives less profit

↓

You may decide to stop production

X

Both the decisions will damage the Company and its business.

Even adhoc absorption of OH Cost is Sufficient

CMA Inter / IPCC OH Chapter (OH/unit)

↓

T.cost/unit

+ Profit

S.P/unit

Price Setter

↓

But now this does it work

↓ 2 reasons

R ①

Buyers market

↓

T.C = 100/unit

Dc ≥ 60%. Ic = ≤ 40%.

R ②

Price Takers

↓

S.P/unit X

↓

No Control over S.P

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Due to MNC's & Service Sects

So, the only way to Control profit is to Control Costs.

Solution

ABC

helps you to find precise OH/unit

Dc/unit + OH/unit (exact)

T.C/unit (precise)

(+) profit

S.P/unit

WHAT IS ABC ?

Recollect your IPCC/CMA Inter OH Chapter ?

$$OH/unit = \frac{\text{Total OH Cost}}{\text{No: of units}}$$ (units method)

$$OH/Mhr = \frac{\text{Total OH Cost}}{\text{Total M hrs}}$$ (M hrs method)

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$$= \frac{120\,000}{10000 \text{ Mhrs}}$$

Mhr rate = 12 / Mhr

	A	B	C
Mhrs	2 Mhrs	3 M hrs	1 Mhr
	x	x	x
Mhr rate	12	12	12
OH Cost	24	36	12
DC / unit	xx	xx	xx
T. cost / unit	xx	xx	xx

$$\text{Mhr rate} = \frac{\text{Total OH Cost}}{\text{Total M hrs}} = \frac{120000}{10000 \text{ Mhrs}}$$

Wrong

logic behind this ?

↓

The entire 120000 OH's is influenced by M hrs

↓

But this logic is wrong

↓

Bcoz 120000 OH is not a single expense

↓

It is a pool of so many expenses

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Further analysis

120000

Machining Cost	Set up Cost	Inspection Cost	Mat req Cost
40000	30000	20000	30000
↓	↓	↓	↓
M hrs	No: of set ups	No: of Inspections	No: of req
40000 / M hrs	30000 / No: of set ups	20000 / No: of Insp	30000 / No: of req
↓	↓	↓	↓
rate	rate	rate	rate

Multiple absorption rates / Multiple rates of recovery

↓

ABC

Other reasons on why we need ABC

↓

- Inc in OH Costs due to automation
- Inc in Competition which pushed the need for accurate product Costs
- Inc in product diversity
- Inc in I.T

Where ABC is most useful

- High amount of OH
- Wide range of products
- Presence of Non-Volume related activities → Explained further
- Stiff Competition

Activity based cvp analysis

$$BEP = \frac{\text{Fixed Cost}}{\text{C/unit}}$$ → How did you decide?

Based on variability with output

V. Cost

F Cost

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This classification of F Cost is wrong

↓

Why ?

↓

Just because a particular Cost doesn't vary with output doesn't make it a fixed Cost

In reality what happens is

There are so many fixed Costs which vary with Some thing else other than output.

Eg

Setup Cost	→	No: of	Set ups
Engineering Cost	→	No: of	engineering hrs
Mat req Cost	→	No: of	Mat requisitions
Inspection Cost	→	No: of	Inspections.

} Cost drivers

These are officially referred as

Non-unit band fixed Costs

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Def of ABC

ABC is a technique which involves identification of cost with each cost driving activity and making it as the basis for apportionment of costs over different cost objects/ jobs/ products/customers or *services*.

SOME IMP TERMS IN ABC

(i) **Activity:** Activity, here, refers to an *event that incurs cost*.

(ii) **Cost Object:** It is *an item for which cost measurement is required* e.g. a product or a customer. You want to find Cost of Something. (Cost object)

(iii) **Cost Driver:** It is a *factor that causes a change in the cost of an activity.* There are two categories of cost driver.

- **Resource Cost Driver:** It is a measure of the *quantity of resources* consumed by an activity. It is used to assign the cost of a resource to an activity or cost pool.
- **Activity Cost Driver:** It is a measure of the *frequency and intensity of demand*, placed on activities by cost objects. It is used to assign activity costs to cost objects.

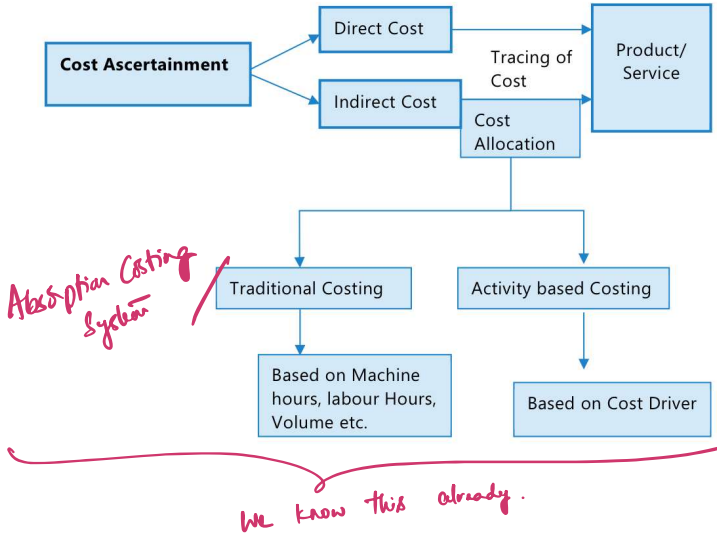
(iv) **Cost Pool:** It represents a group of various individual cost items. It consists of costs that have same cause and effect relationship. Example machine set-up. (Amount)

Examples of Cost Drivers:

Business Functions	Cost Driver
Research and Development	• Number of research projects • Personnel hours on a project
Design of products, services and procedures	• Number of products in design • Number of parts per product • Number of engineering hours
Customer Service	• Number of service calls
	• Number of products serviced • Hours spent on servicing products

Marketing	• Number of advertisements • Number of sales personnel • Sales revenue
Distribution	• Number of units distributed • Number of customers

Cost Allocation under Traditional and Activity Based Costing system



Cost allocation under ABC

Let us take a small example to understand the steps stated above:

Assume that a company makes widgets and the management decides to install an ABC system. The management decides that all overhead costs will have only three cost drivers viz. direct labour hours, machine hours and number of purchase orders. The general ledger of the company shows the following overhead costs –

General Ledger	(₹)
Perquisite taxes	1,000
Machine maintenance	500
Purchasing Dept. labour	4,000
Fringe benefits	2,000
Purchasing Dept. Supplies	250
Equipment depreciation	750
Electricity	1,250
Employees' group insurance	1,500
Total	11,250

So, which overheads do you think are driven by direct labour hours?

The answer is

Perquisite taxes	₹ 1,000
Fringe benefits	₹ 2,000
Employees' group insurance	₹ 1,500
Total	₹ 4,500

Similarly, overheads driven by machine hours include Machine maintenance, depreciation and electricity, totaling ₹ 2,500 and finally overheads driven by number of purchase orders include purchasing department labour and purchasing department supplies, totaling ₹ 4,250.

Now, overhead rate is calculated by the formula

Total cost in the activity pool ÷ Base,

base being the total number of labour hours, machine hours and total number of purchase orders in the given case.

Assume that the total number of labour hours be 1,000 hours, machine hours be 250 hours and total purchase orders be 100 orders.

So, Cost driver rate would be

Cost Driver Rate	(₹)
₹ 4,500/ 1,000 → CDR	₹ 4.50 per labour hour
₹ 2,500/ 250 → CDR	₹ 10 per machine hour
₹ 4,250/ 100	₹ 42.50 per purchase order

Now, let's allocate the overheads between two widgets A and B the details of which are given below:

Particulars	Widget A	Widget B
Labour hours	400	600
Machine Hours	100	150
Purchase Orders	50	50

So, total overhead costs applied to widget A = (400 × ₹ 4.50) + (100 × ₹ 10) + (50 × ₹ 42.50) = ₹ 4,925

And total overheads applied to widget B = (600 × ₹ 4.50) + (150 × ₹ 10) + (50 × ₹ 42.50) = ₹ 6,325

So total overheads = ₹ 4,925 + ₹ 6,325 = ₹ 11,250.

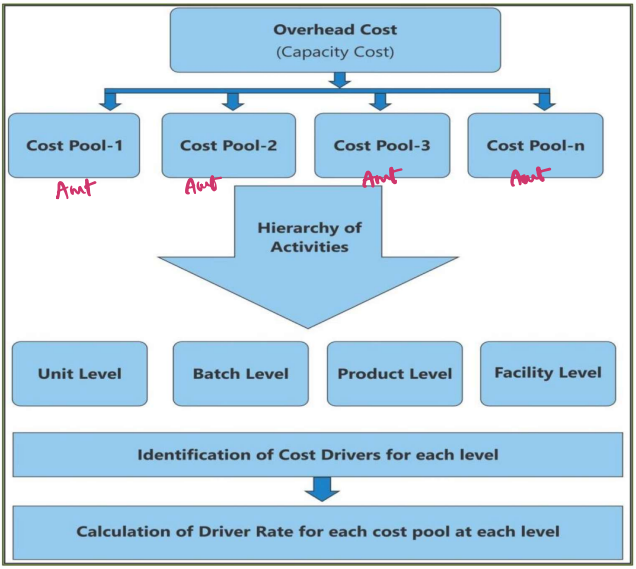
Generally, in the traditional costing method, overheads are applied on the basis of direct labour hours (total 1,000 labour hours in the given case). So, in that case the overhead absorption rate would be – ₹ 11,250/1000 = ₹ 11.25 per hour and the total overheads applied to Widget A would have been = 400 × 11.25 = ₹ 4,500 and to Widget B = 600 × ₹ 11.25 = ₹ 6,750.

Hence Widget A would have been under-valued and Widget B over-valued by ₹ 425.

Examples of Cost Drivers

Some of the examples of cost drivers for different activity pools in a production department are stated below:

Activity Cost Pools	Related Cost Drivers
Ordering and Receiving Materials cost	Number of purchase orders
Setting up machines costs	Number of set-ups
Machining costs	Machine hours
Assembling costs	Number of parts
Inspecting and testing costs	Number of tests
Painting costs	Number of parts
Supervising Costs	Direct labour hours



* Ice ① Solved here

ABM - ACTIVITY BASED MANAGEMENT (ABCM)

* The use of ABC as a Costing tool to manage Costs at activity level is known as ABM.

↓

i.e Efficient & Effective management of activities (Set up activity)

Various types of analysis in ABM

- Cost driver Analysis
- Activity analysis
  - V.A — Polishing furniture
  - NVA — Inspection, Moving materials, Machine Set up time
- Performance Analysis

Uses of ABM

- **Cost reduction** → By eliminating NVA
- **BPR** → Examining existing business process & making substantial changes
- **Benchmarking** → With in (&) outside the company.
- **Performance measurement**

Area	Measure
Quality of purchased component	Zero defects
Quality of output	% yield
Customer awareness	Orders; number of complaints

Activity Based Budgeting (ABB)

Activity based budgeting **analyse the resource input or cost for each activity**.

* the objectives of continuous improvement. It means planning and controlling the expected activities of the organization to derive a cost-effective budget that meet forecast workload and agreed strategic goals. *ABB is the reversing of the ABC process to produce financial plans and budgets.* *

Key elements of ABB

- Type of work to be done
- Qty of work to be done
- Cost of work to be done

Benefits of ABB

- Inc accuracy of Forecasting numbers
- ABB Suits automation especially Flexible budgets
- Eliminates needless work.

Ill ②, ③, ④ Solved here

MARGINAL COSTING → Decision making

Birds eye view

- CVP analysis
- BEP
  - MOS
  - Angle of Incidence
- MC (vs) AC
- P/V ratio
  - Decision making

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① P/V ratio (C/S)

Profit volume ratio (or) Contribution Sales ratio

It is basic indicator of profitability of any business

Contribution %

$$P/V\ ratio = \frac{C/unit}{S.P/unit} \times 100 \quad (or) \quad \frac{C}{S} \times 100$$

$$\frac{\Delta C}{\Delta S} \times 100 \quad \left(\frac{\Delta Profit}{\Delta Sales} \times 100\right) \quad (or) \quad \frac{100 - V/C\ ratio}{1 - V/C\ ratio}$$

Residual One

$$V/C\ ratio = V.Cost\ \% = \frac{VC}{Sales} \times 100$$

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S.P = 100
(-) V.C = 60
C = 40

→ P/V ratio = $\frac{40}{100} \times 100$ = 40%.

P/V ⇒ 100 - V/C ratio
⇒ 100 - 60%.
⇒ 40%.

Concept of MC (vs) AC

MC	AC
① Decision making	External reporting / Cost records
② Technique → Marginal Costing, Standard Costing, Budgeting	Method → unit Costing, process Costing, Joint & by products, Job Costing, Batch Costing

③ Income statement with out stock

M.C

DM, DL	Sales	xxx
(-) V.C		xxx
VFOH, VAOH, VSLOOH	Contribution	xxx
(-) F Cost		xxx
FFOH, FAOH, FSLOOH	Profit	xxx

8

Consider → variability
Ignore → Functionality

AC

Sales	xxx	
(-) Factory Cost	xxx	DM, DL, VFOH, FFOH
Gross profit	xxx	
(-) Adm OH	xxx	VAOH, FAOH
(-) SLD OH	xxx	VSLOOH, FSLOOH
net profit	xxx	

8

Consider → Functionality
Ignore → variability

* Profit under M.C = profit under A.C System
Provided when there is no stock.

* Profit under M.C ≠ Profit under A.C System if there is Stock.

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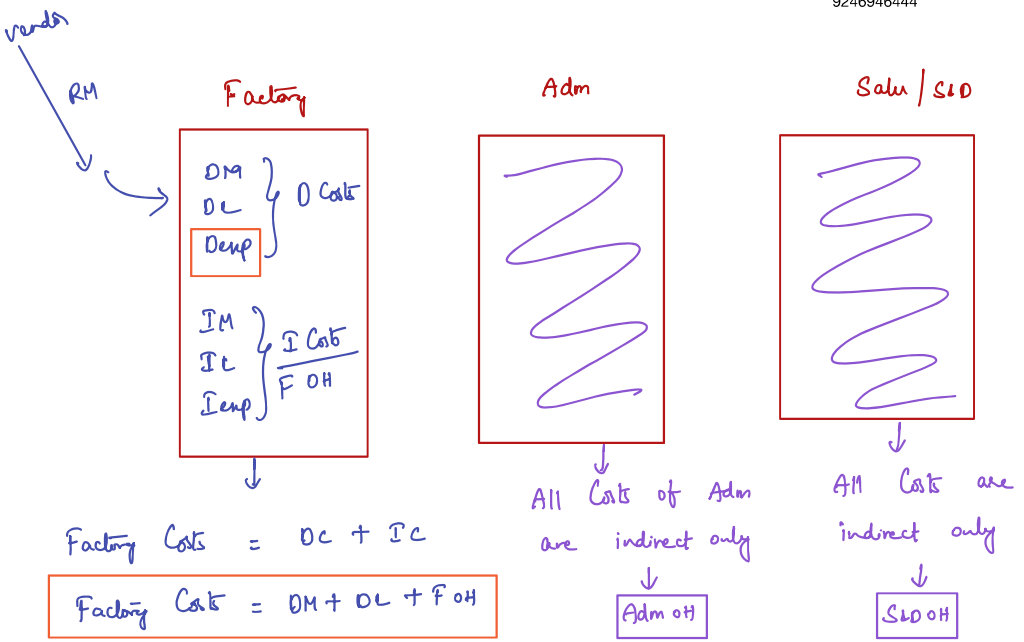

Factory Costs = DC + IC

Factory Cost = DM + DL + F OH

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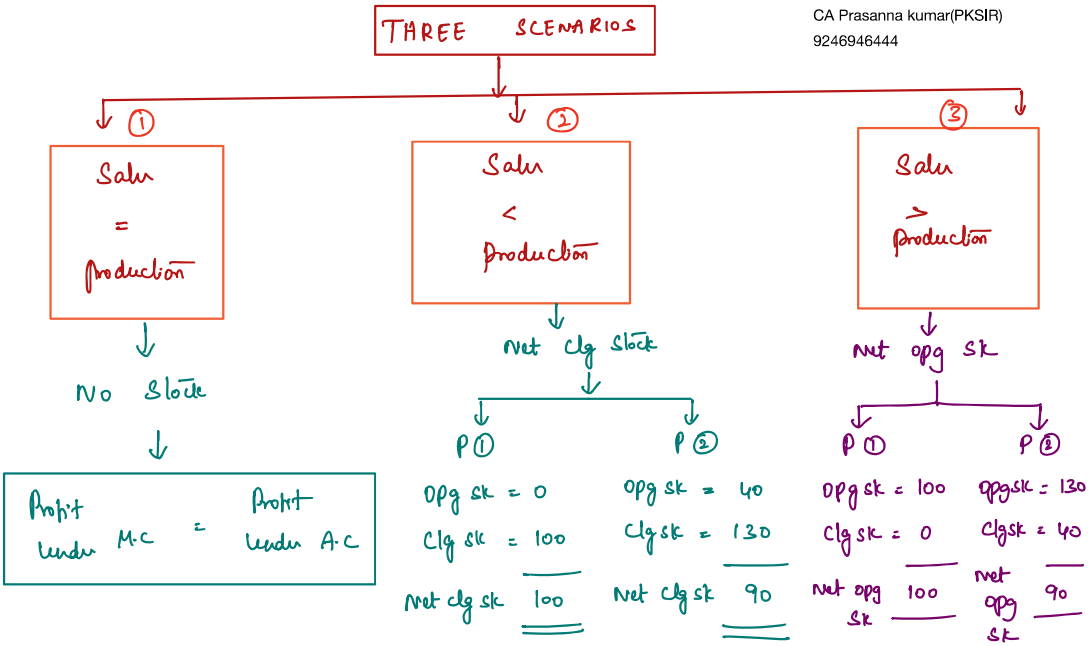

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Scenario ②

① Why profits are different ?

② Bcoz of presence of Stocks

② Why presence of Stocks is affecting profit ?

② Bcoz Stocks are valued differently as per M.C & A.C System.

③ Why Stocks are valued differently ?

④ How Stocks are valued differently ?

Ans

Where Stocks are physically present ? (Finished goods Stock)

↓

Where ?

↓

Warehouse / Godown

↓

Factory

↓

They are made up of factory Costs

↓

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A.C

DM	50
DL	40
VFOH	20
FFOH	30
	140

Product Costs

M.C

DM	50
DL	40
VFOH	20
~~FFOH~~	~~30~~
	110

Period Costs

SCENARIO ②

↓

Net Closing Stock

↓

Tendency of closing Stock is to increase profit

↓

More closing Stock → More profit

less closing Stock → less profit

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As per M.C ⇒ Closing Stock → 110 → profit ↑ by 110

As per A.C ⇒ Closing Stock → 140 → profit ↑ by 140

Conclusion
AC > MC by 30

SCENARIO 3

↓

Net opening Stock

↓

Tendency of opening Stock is to reduce profit

↓

More opening Stock → less profit

less opening Stock → More profit

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As per M.C → opg Sk → 110 → plt ↓ by 110

As per A.C → opg Sk → 140 → plt ↓ by 140

Conclusion
M.C > A.C by 30

B) Why Stocks are valued differently ?

@ Bcoz FFOH are treated as Period Costs as (Expired)

Per M.C System & the same FFOH are treated as Product Costs (unexpired) as per A.C System.

All manf Costs (Factory) that goes in to Stock valuation (Product Costs)

All non-manf Costs that gets expired in the period in which they are incurred.

* When you debit Something in Costing P&L A/c → Expired

B) Why FFOH is treated as product Costs as per A.C System ? Why the same FFOH is treated as period Costs as per M.C System ?

A.C System

↓

External reporting

↓

No Costs is irrelevant

↓

All Costs are relevant

↓

All are reported and nothing is ignored.

M.C System

↓

Decision making

↓

Fixed Costs is not relevant

↓

Ignore it

↓

You ignore it by treating it as period Costs.

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BEP — Sales level

It is a level of sales at which a firm ends up in no profit - no loss situation

@ BEP	P	Amt
Sales		XXX
(-) V. Cost		XXX
Contribution		XXX
(-) F Cost		XXX
Profit		NIL

If profit is NIL, then Contribution = Fixed Cost

@ BEP, C = F Cost

Loss = URFC

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$$BEP = \frac{F\ Cost}{C/unit} \quad (units)$$

$$BEP\ (in ₹) = \frac{F\ Cost}{C/V} = \frac{F\ Cost}{P/V\ ratio}$$

$$Cash\ BEP = \frac{Cash\ F\ Cost}{C/unit}$$

* Dep excluded

Example

S.P = 10
VC = 8
C = 2

F Cost = 1000/-

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Units to be sold to recover 1000 = $\frac{1000}{2}$

⇒ 500 units

At this level, F Cost is recovered fully & V. Cost is already recovered. ⇒ Total Cost is recovered

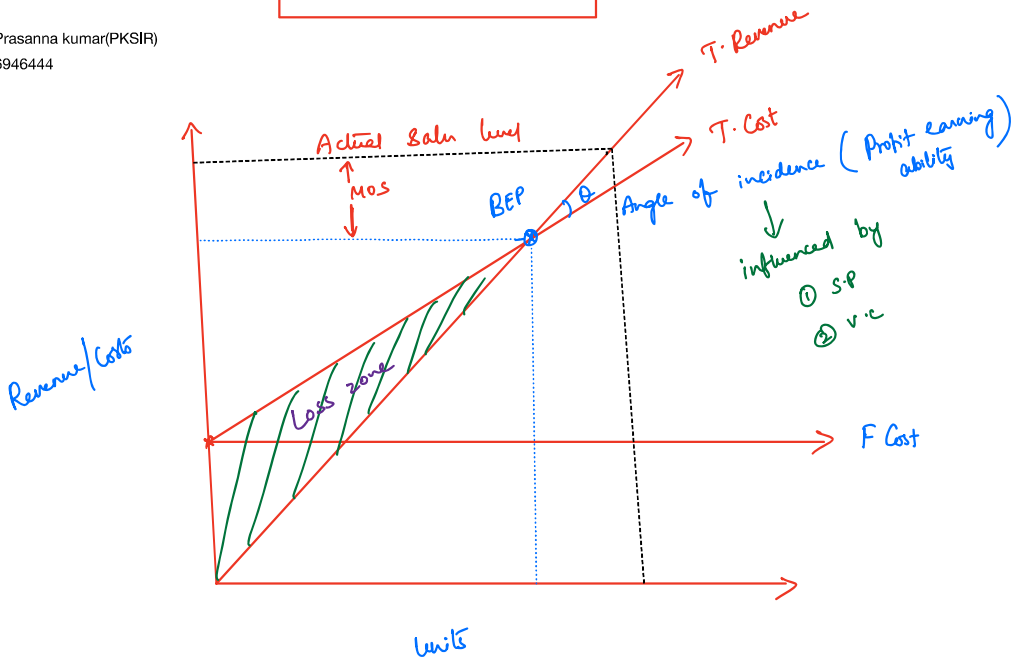
Once your total Cost is recovered ⇒ It is BEP.

Presumptions behind BEP formula

1. S.P / unit → Constant
2. V.C / unit → Constant
3. F Cost in total → Constant
4. The relationship b/n Cost & Revenue is linear.

* **Loss = UNRECOVERED FIXED COST** *

Break even Chart



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Margin of Safety

How much Safe you are ? (Company)

Safe → is linked with profits

The greater the profits you have, the safer you are

Mos = Actual exp Sales − BEP Sales

↓

Sales beyond BEP Sales

* **Mos (in ₹) = Profit / P/V ratio**

* **Mos (in units) = Pft / C/unit**

↓ logic behind the above formula

Profit = T. Sales × P/V ratio − Fixed Cost

(Contribution)

(Or)

Profit = Mos Sales × P/V ratio − NIL

↓ Bcoz fixed cost is fully recovered

Mos Sales = Profit / P/V ratio

Mos Sales (units) = Profit / C/unit

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Income Statement beyond BEP (Max Sales)

	Sales	XXX
(-)	V.C	XXX
	Contrib	XXX
(-)	F.cost	NIL
	Profit	XXX

Same (Contribution itself is profit)

* Ill ① (2.15), Ill ②, ③ 2.17, Ill ④ 2.18, Ill ⑤, ⑥
Ill ⑦, ⑧, ⑨

Key factor | limiting factor | Critical factor

↓

Scarce resources → Inputs → RM, M hrs, L hrs

Anything that has the ability to limit your production.

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Q. How to apply this Concept ?

Ex (Products)

	A	B	C
S.P/unit	80	50	30
(-) V.C/unit	40	20	10

C/unit	40	30	20
Ranking	①	②	③
RM/unit of FG	2 kgs	1 kg	0.5 kgs
C/RM	20/kg	30/kg	40/kg
Ranking	③	②	①

Summary

① No limiting factor → Take decision based on C/unit
↓
This will give you maximum profit

② limiting factor → Take decision based on C/limiting factor
↓
This will give you maximum profit

Relevant & Irrelevant Costs for Decision Making

Cost	Relevance	Reason
(i) Historical Cost	Irrelevant	The cost has already been incurred and do not affect the decision. Example: Book value of machinery etc.
(ii) Sunk Cost	Irrelevant	The cost which are already paid either for goods or services availed or to be availed. Example: Raw material purchased and held in store without having replacement cost, Cost of drawing, blueprint etc.
(iii) Committed Cost	Irrelevant	The committed costs are the pre-agreed cost which cannot be revoked under the normal circumstances. This is also a sunk cost. Examples: Cost of materials as per rate agreement, Salary cost to employees etc.
(iv) Opportunity Cost	Relevant	The opportunity cost is represented by the forgone potential benefit from the best rejected course of action. Had the option under consideration not chosen, the benefit would come to the organisation.
(v) Notional or Imputed Cost	Relevant	Notional costs are relevant for the decision making only if company is actually forgoing benefits by employing its resources to alternative course of action. For example, notional interest on internally generated fund is treated as relevant notional cost only if company could earn interest from it.
(vi) Shut-down Cost	Relevant	When an organization suspends its manufacturing operations, certain fixed expenses can be avoided and certain extra fixed expenses may be incurred depending upon the nature of the industry. By closing down the manufacturing, the organization will save variable cost of production as well as some discretionary fixed costs. This particular discretionary cost is known as shut-down cost.

* Ill (10), (11), (12), (13)

Income Statement (Absorption costing)

			(₹)
Sales			*XXXXX*
Production Costs:			
	Direct material consumed		*XXXXX*
	Direct labour cost		*XXXXX*
	Variable manufacturing overhead		*XXXXX*
	Fixed manufacturing overhead		*XXXXX*
	Cost of Production of goods produced in current period		*XXXXX*
Add:	*Opening stock of finished goods*		*XXXXX*
	(Value at cost of previous period's production)		
			XXXXX
Less:	*Closing stock of finished goods*		*XXXXX*
	(Value at production cost of current period)		
	Cost of Goods Sold		*XXXXX*
Add:	*(or less) Under (or over) absorption of fixed*		
	Manufacturing overhead		*XXXXX*
Add:	*Administration costs*	*XXXXX*	
	Selling and distribution costs	*XXXXX*	*XXXXX*
	Total Cost		*XXXXX*
	Profit (Sales – Total cost)		*XXXXX*

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Income Statement (Marginal costing)

		(₹)
	Sales	XXXXX
	Variable manufacturing costs:	
	– *Direct material consumed*	XXXXX
	– *Direct labour*	XXXXX
	– *Variable manufacturing overhead*	XXXXX
	Cost of Goods Produced	XXXXX
Add:	*Opening stock of finished goods (Value at cost of previous period)*	XXXXX
Less:	*Closing stock of finished goods (Value at current variable cost)*	
	Cost of Goods Sold	XXXXX
Add:	*Variable administration, selling and dist. overhead*	XXXXX
	Total Variable Cost	XXXXX
Add:	*Selling and distribution costs*	
	Contribution (Sales – Total variable costs)	XXXXX
Less:	*Fixed costs (Production, admin., selling and dist.)*	XXXXX
	Net Profit	XXXXX

* ILL (14) 2.46

CONCEPT OF INDIFFERENCE POINT

" It is a level of Sales at which Total Cost of two options will be same and as a result profit of two options are also same. Hence a person taking decision will be indifferent between both the options. "

Vamshi

↓

Cafe business

Option ① — labour dominated

Option ② — Machine dominated

?

Plus → Capital Inv ↓ (FC ↓) | V.C (↓)

Minus → V.C ↑ | Capital Inv (↑) (F.C ↑)

↓ Solution

Applying IDP

① Calculate IDP Sales → $\frac{\Delta FC}{\Delta VC/unit}$

② estimate your Sales

③ Compare both

① exp Sales < IDP Sales → low F Cost option.

② exp Sales = IDP Sales → either of the options

③ exp Sales > IDP Sales → low V. Cost option (8) High F Cost option

FC ↑ V.C ↓ | FC ↓ V.C ↑ →

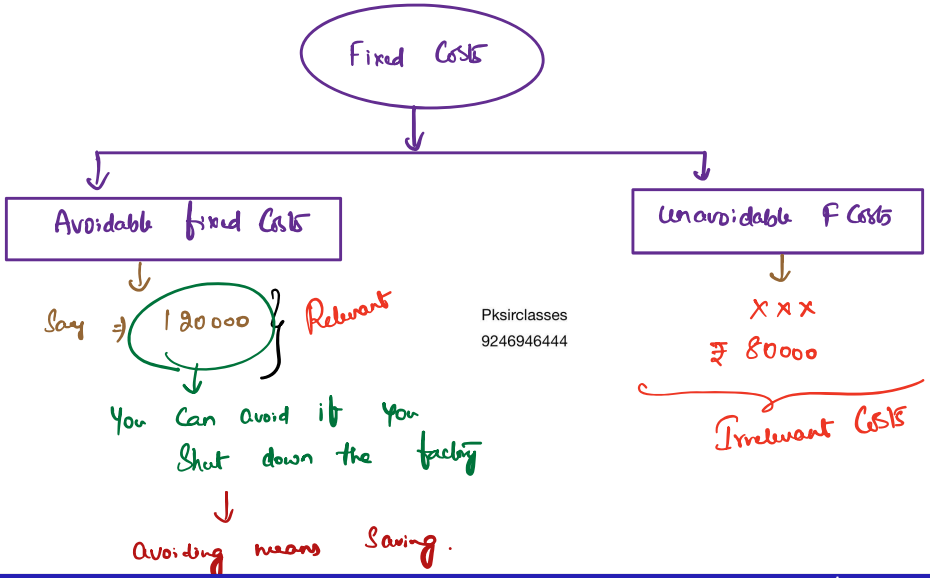
If you want to reduce V.C/unit, then you have to invest in Fixed Cost.

Based on Diff

		Labour D		Machine D
	Sales (A)	xxx	=	xxx
(-)	V. Cost	xxx ↑	≠	xxx ↓
(-)	F Cost	xxx ↓	≠	xxx ↑
	T. Cost (B)	xxx	=	xxx
	Profit (A) - (B)	xxx	=	xxx

* Concept of Shut down point

It is a Sales level below which it is not recommended to Continue the operations of a Company (or) It is recommended to Shut down.



Saving means earning. [Saved outflow is deemed inflow]

You are Earning 120000 ≃ Contribution

120000 / 70% → 171428 → Shut down point Sales

Suppose if Company operates →

Sales = 200000
P/V ratio = 70%
C = 140000

$$SDP = \frac{AFC}{P/V\ ratio}$$

Applying this

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Total Fixed Costs = 80000

Avoidable → 55000 (80000 − 25000)
Unavoidable → 25000

$$SDP = \frac{AFC}{P/V\ ratio} = \frac{55000}{40\%} = ₹\ 137500$$

Conclusion If the actual Sales level is below 137500, then he would be better off by locking down his business.

COST SHEET

Most Imp

Birds eye view

- Functional Classification
- Head of Costs in Cost Sheet
- Format of Cost Sheet
- Advantages of Cost Sheet

One of objectives of Cost accounting System

→ Ascertainment of Cost for Cost object (Product / Service)

- Collection of Costs
- accumulation of Costs
- Arrange in a Cost Sheet

* "A Cost Sheet is a document which provides a detailed Cost information"

Functional Classification

- Production (or) Manf Cost
- Admin Cost
- S&D Cost
- R&D Costs

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Cost heads in a Cost Sheet

- Prime Cost
- Cost of production
- Cost of goods sold
- Cost of Sales

① PRIME COST (DM + DL + Dexp)

DM

Opg Stk	XXX
(+) Pur	XXX
(−) Clg Stk	XXX
RM Consumed	

* valuation of materials is already discussed in "Materials" Chapter.

DL

Total of payment made to elees

↓ Includes

- Wages & Salary
- Allowances & Incentives
- Payment for overtime
- Bonus / ex-gratia
- E'lee Contrib to provident fund
- Other benefits (medical, leave with pay, subsidised food)

Eg

Dexp

- Royalty paid
- Hire charges amt for power fuel
- Fee for know how
- Amortised Cost of moulds, patents etc
- Job Charges (direct)
- Cost of product / service design which is specific
- Cost of product / service specific software
- Fee for Technical assistance
- (+) Exp paid for utilities.

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COST OF PRODUCTION

Prime Cost	xxx
Add : Factory Overheads	xxx
Gross Works Costs / Factory Cost / Manf Cost	xxxx
Add: Opening stock of Work-in-process	xxx
Less: Closing stock of Work-in-process	(xxx)

Factory or Works Costs	xxxx
Add: Quality Control Cost	xxx
Add: Research & Development cost (Process related)	xxx
Add: Administrative Overheads related with production	xxx
Less: Credit for recoveries (miscellaneous income)	(xxx)
Add: Packing Cost (Primary packing)	xxx
Cost of Production	**xxxx**

Net

Imp

(i) Factory OH

* Consumable Stores & Spares
* Dep of Plant & Machinery, factory Building
* Lease rent of production assets
* R & Maint of Plant & Machinery, factory Building
* Indirect elec Cost
* Insurance of Plant & Machinery, factory Building
* Service dept Cost such as Tool room, Engineering & Maint, Pollution Control.

(ii) WIP Stock

* Valued based on % of Completion in each element of Cost.

(iii) Quality Control Cost

* Cost of resources towards Quality Control procedures.

(iv) Research & Development Cost

* Includes those which are incurred for improvement of process, system, product & services.

(v) Adm OH

Administrative Overheads related with production — NOT General Adm OH

(vi) Credit for Recoveries

Realised value of Scrap is reduced from Cost of prod (COP)

(vii) Primary Packing Cost

Packing material which is essential to hold & preserve the product for its use by Customer.

(viii) Joint & By-Products

* Joint Costs are allocated b/n joint products
* NRV of by-products is reduced from COP.

* COP, COGS & COS *

Cost of Production	xxx
Add: Cost of Opening stock of finished goods	xxx
Cost of goods available for Sale	xxx
Less: Cost of Closing stock of finished goods	(xxx)
Cost of Goods Sold	**xxxx**

Cost of Goods Sold	xxx
Add: Administrative Overheads (General)	xxx
Add: Selling Overheads	xxx
Add: Packing Cost (secondary)	xxx
Add: Distribution Overheads	xxx
Cost of Sales	**xxxx**

COST SHEET

Specimen Format of Cost Sheet for a Manufacturing entity

	Particulars	Total Cost (₹)	Cost per unit (₹)
1.	Direct materials consumed:		
	Opening Stock of Raw Material	xxx	
	Add: Additions/ Purchases	xxx	
	Less: Closing stock of Raw Material	xxx	
	RM Consumed	xxx (1)	
2.	Direct employee (labour) cost	xxx	
3.	Direct expenses	xxx	
4.	**Prime Cost (1+2+3)**	**xxx**	
5.	Add: Works/ Factory Overheads	xxx	
6.	Gross Works Cost (4+5)	xxx	
7.	Add: Opening Work in Process	xxx	
8.	Less: Closing Work in Process	(xxx)	
9.	**Works/ Factory Cost (6+7-8)**	**xxx**	
10.	Add: Quality Control Cost	xxx	
11.	Add: Research and Development Cost	xxx	

12.	Add: Administrative Overheads (relating to production activity)	xxx	
13.	Less: Credit for Recoveries/Scrap/By-Products/ misc. income	(xxx)	
14.	Add: Packing cost (primary)	xxx	
15.	**Cost of Production (9+10+11+12-13+14)**	**xxx**	
16.	Add: Opening stock of finished goods	xxx	
17.	Less: Closing stock of finished goods	(xxx)	
18.	**Cost of Goods Sold (15+16-17)**	**xxx**	
19.	Add: Administrative Overheads (General)	xxx	
20.	Add: Marketing Overheads :		
	Selling Overheads	xxx	
	Distribution Overheads	xxx	
21.	**Cost of Sales (18+19+20)**	**xxx**	

Cost sheet/statement for services is also prepared but the format and presentation may differ as per the information requirement. Format and presentation has been discussed in "Service Costing" chapter.

Treatment of various items in Cost Sheet

- **Abnormal Costs** → Does not form Cost of Prod
  - Eg Cost due to Pandemic, lockdown
- **Subsidy / Grant / Incentives** → Reduced from CoP
- **Penalty, fine, Damages, Demurrage** → Deduct from part of Cost
- **Interest & other finance Costs** → Not included in CoP

* PLL ①, ②, ③ solved in class.

Advantages of Cost Sheet

- Cost / unit
- Cost Comparison
- helps in prep of Cost estimates
- helps in arriving S.P
- Cost Control

CHAPTER ⇒ COST ACCOUNTING SYSTEMS

Birds eye view

- Non-Integral accounting System (Cost Control System)
  - ↓ Reconciliation of profit
- Integral accounting System
  - ↓ No reconciliation

Where cost and financial accounting records are integrated, the system so evolved is known as integrated or integral accounting system. In case cost and financial transactions are kept separately, the system is called Non-Integrated Accounting system or Cost Control System.

NON-INTEGRATED ACCOUNTING SYSTEM

- Separate ledgers for Cost & financial accounts.
  - ↓ This is called Cost ledger accounting System
- Under this Only those transactions related to the Product/Service are recorded.
  - ↓ Means exp like Interest, Bad debts, Revenue/Income from other than Sale of Product/Service
    - ↓ These exclusions are represented by an account called "Cost ledger Control A/c" (or) "GLA A/c"

* D↑ Asset c↓ D↑ Exp c↓ D↓ Liab c↑ D↓ Income c↑

II ledger A/c

1. Stores ledger Control A/c (SLC A/c) (Or) RM Control A/c
2. Factory WIP Control A/c
3. Warehouse FG Control A/c

(1), (2), (3) → Stock Accounts (Assets)

4. Wage Control A/c
5. P/MOH Control A/c
6. ADH " A/c
7. SLD OH " A/c

(4) to (7) → Expense Accounts

8. Abnormal loss A/c → loss A/c
9. Cost of Sales A/c → Box of all expired expenses (Same logic we have seen in MC chapter)
10. Costing P&L A/c
11. GLA (OR) Cost ledger A/c. → Self balancing ledger

Just like a dustbin If you can't find anything fit an entry, throw here.

Example Transaction

RM related

1. Purchase of RM

Stores A/c
TO GLA A/c

2. Issue of RM to Prod

WIP A/c
TO Stores A/c

(In Financial A/cs NO entry ↓ It is an utilisation entry.)

③ RM returned to Stores

SLC A/c Dr
To WIP A/c

④ RM returned to Supplier

GLA A/c Dr
To SLC A/c

⑤ Purchase of RM for Special Order

WIP A/c (Directly goes to manf)
To GLA A/c

⑥ IM Issued to production (Cotton used for Cleaning in Textile manf)

MOH / POH A/c
To SLC A/c

⑦ RM Lost (Abnormal)

AL A/c Dr
To SLC A/c

⑧ Transfer of RM from one job to another

(Transferee) Rec Job A/c
To Giving Job A/c (Transferor)

} Sub A/c of WIP only

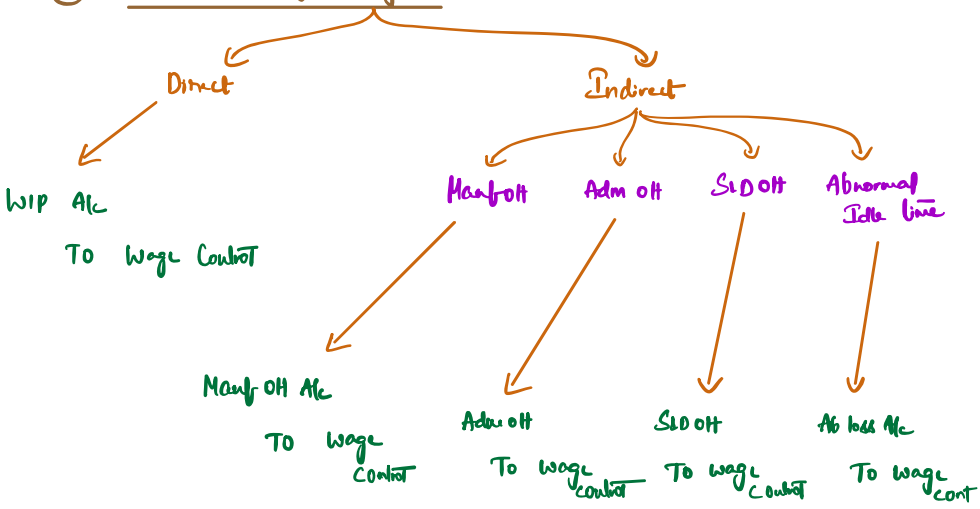
Wages related

⑨ Wages incurred (Paid / Payable) (Always wages A/c should tally as its expense A/c)

(Total wages both Direct & Indirect)

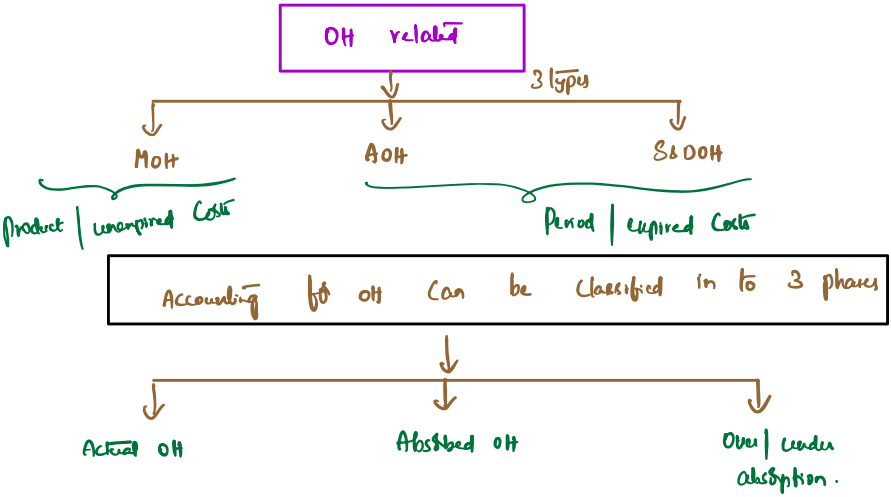
Wage Control A/c
To GLA A/c

(10) Utilisation of wages



(11) Direct expenses incurred

WIP A/c Dr
To GLA A/c



(12) **Indirect exp Incurred**

MOH / POH A/c
  To GLA A/c

(13) **Manf OH absorbed**

WIP A/c
  To MOH A/c

> **Note** Debit Side of POH is actual exp & Credit Side represents OH absorbed

* By default under / over absorption is trsfd to Costing P&L A/c

* If normal reasons are specifically given in the Q, then under / over absorption will be taken by WIP, FG & Cost of Sales A/c

MOH A/c (Actuals ↑ debit side; Absorbed ↑ credit side)

Dr (Actuals)	Cr (Absorbed)
To SLC IM	By WIP
To WC IW	By Costing P/L (or)
To GLA Iexp	By COS } By FG } By WIP }

AOH (Actuals ↑ debit side; Absorbed ↑ credit side)

Dr (Actuals)	Cr (Absorbed)
To WC IW	By COS (or) By FG
To GLA Iexp	By Costing P&L

S&DOH (Actuals ↑ debit side; Absorbed ↑ credit side)

Dr (Actuals)	Cr (Absorbed)
To WC IW	By COS
To GLA Iexp	By Costing P&L

> * Sometimes AOH is also used to value FG

(Some people do this But its wrong Still for exam we should do it JAI ICAI)

↓

In this Chapter most of the Problem are dealt by using above logic. (JAI ICAI)

↓

In this Case, AOH will be taken to FG A/c not COS A/c

Abnormal loss of materials & Abnormal Idle time

To SLC	By Costing P&L
To WC	

(14) Adm OH Incurred

AOH
To GLA A/c

(15) FGoods created / work

FG A/c
To WIP A/c

(16) Goods Sold

COS A/c
To FG A/c

(17) SED OH Incurred

SED OH A/c
To GLA A/c

(17) Sales

GLA
To Costing P&L A/c

(18) AOH & SEDOH trfd to COS a/c

COS	COS
To AOH A/c	To SEDOH A/c

Drs To Sales × Sales To P&L

Combine

Drs To P/L

GLA To Costing P/L

Under / over absorption treatment

POH

20000

15K

By under absorption

5000

(2) Normal reason → WIP / COS / PG

(1) Abnormal reason → Costing P&L A/c

(3) (Next)

C/f to next year
hopefully it will get set off by over absorption

But If there is under absorption next year also, it means your Absorption rate is wrong

So rectify your budget.

How will I know this method is followed by the Q's?

Simple If in opening Trial balance in Q's, if you see POH A/c, it means they are following the above method

GLA A/c

To Costing P&L (Sales) XXX

① SL → XXX
⑨ WC → XXX
⑫ MoH → XXX
⑭ AoH → XXX
⑰ SLO → XXX

OH adj A/c

Indirect purpose & Repairs

Stores ledger A/c

① XXX
XXX ⑥
② Direct purpose

Wage Control A/c

⑨ incurred OW XXX
IW XXX
XXX ⑩

Manf OH A/c

To SL ⑥ XXX
WIP ⑬ XXX
To WC XXX
Iwages ⑩
To GLA ⑫ XXX
OH incurred

Direct purpose ⑩
Indirect wages ⑩ to Adm workers

WIP Control A/c

To Stores ledger ① XXX
By FG XXX ⑮
MoH ⑬ XXX
To WC ⑩

Adm OH A/c

WC ⑩ XXX
⑭ GLA XXX
XXX To WIP XXX ⑮

FG A/c

By CoS XXX ⑯

SLO OH A/c

WC A/c ⑩ IW XXX
GLA ⑰ XXX
XXX

Cost of Sales A/c

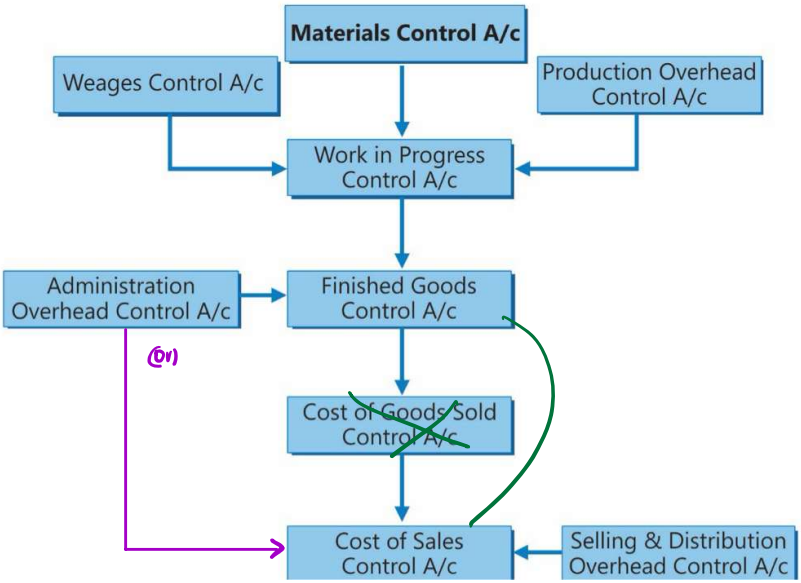
To Adm OH XXX
To SLO OH XXX
To FG ⑯ XXX
By P&L XXX

Costing P&L A/c

To CoSales XXX
To under absorption XX
To AL XX
By GLA (Sales) XXX
By over absorption XX

* **Note: Sometimes, Overhead Adjustment Account is dispensed with and under/over absorbed overheads is directly transferred to Costing Profit & Loss Account from the respective overhead accounts.**

SUMMARY



* Ill ① & ② Solved in Class.

INTEGRATED ACCOUNTING SYSTEM

* Cost & financial accounts are kept in same set of books.
* So * NO need of reconciliation
  * less efforts
  * less time Consuming
  * Economical process.

* In Non-Integrated → No personal accounts, so CLA is used.

* But in Integrated →
  - Debtors A/c
  - Creditors A/c
  - Prov fo dep A/c
  - Fixed assets A/c
  - Share Capital A/c.
  - Bank A/c

* Ill ③, ⑥, ⑤ Solved here.

Reconciliation of Financial & Cost Accounts (Only under Non-Integrated)

↓ Why?

① Pure financial exp

* Int on loans
* Bank Mortgages
* Exp and Disc on issue of Shares, Deb
* Capital losses (fire loss)
* loss on sale of fixed assets, Inv
* Income tax, Donations Subscriptions.

① Pure financial Income

* Int recd
* Divd recd
* Profits on Sale of F Assets
* Rent receivable etc

② Items included only in Cost books (Notional exp)

* Rent of own premises
* Int on own Capital
* Salary of Proprietor
* Notional dep on Assets fully depreciated fo which book value is Nil

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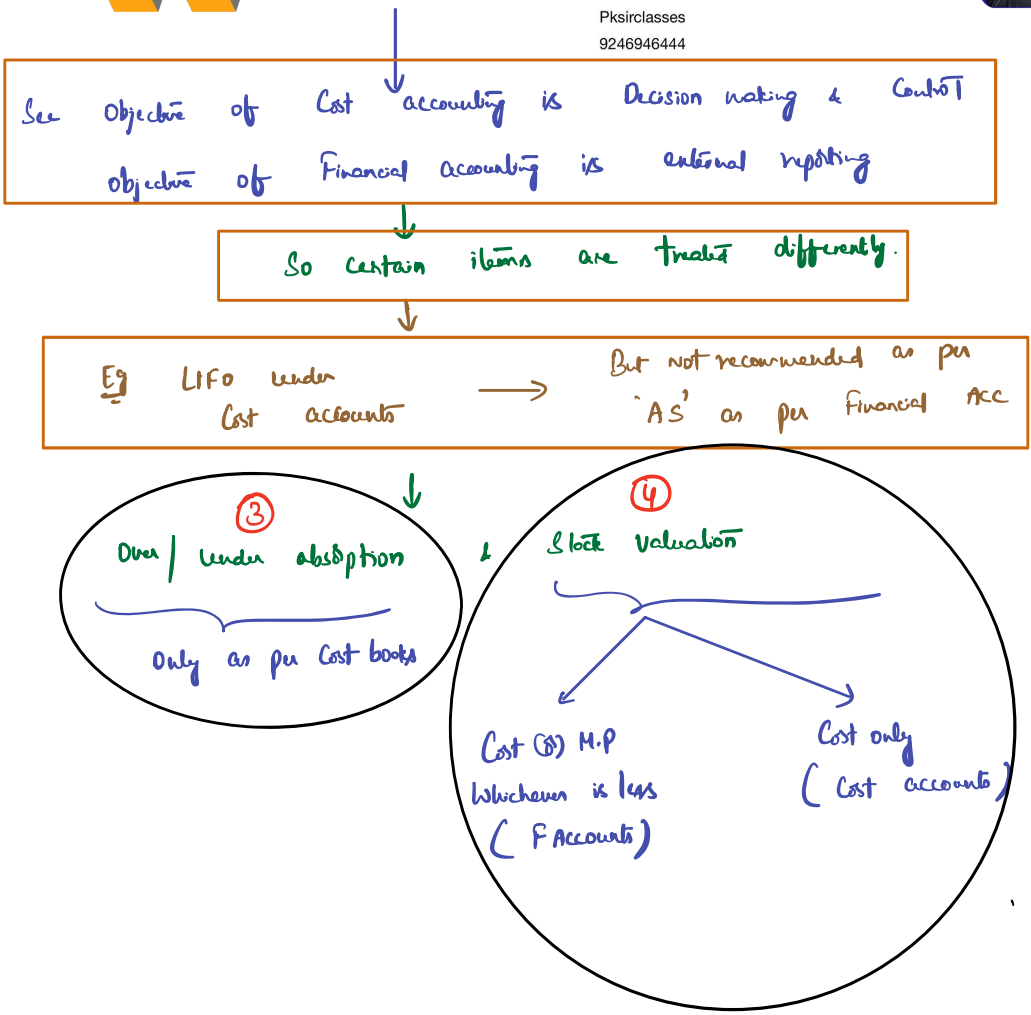
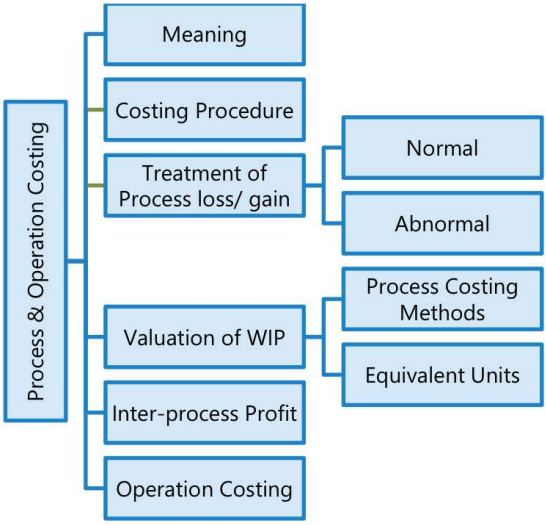


PROCESS & OPERATION COSTING

Birds eye view



Def

Process Costing is a method of costing used in industries where the material has to pass through two or more processes for being converted into a final Prod.

So what we do is we open a Separate account for each process and all expenses are Charged in that account.

Eg Steel, Paper, Chemicals, Rubber, Vegetable oil etc

Here output of one process becomes input of another process

Features of Industry where we can apply process Costing

- No: of Processes
- Manf is done by means of multiple process run Sequentially (or) Simultaneously
- Output of one becomes Input of another
- End product are like units (Identical)
- Not possible to trace output to Input. (Sugar to Sugarcane bags)

* The Cost of each process comprises the cost of:

Each Process account is debited

(*i*) Materials
(*ii*) Employee Cost (Labour)
(*iii*) Direct expenses, and
(*iv*) Overheads of production.
↓
Debited on pre-determined basis

Ill ① (with out any loss) Solved.

TREATMENT OF NORMAL, ABNORMAL LOSS & ABNORMAL GAIN

① Normal loss
↓
the loss of material which is inherent in the nature of work.
↓
It is expected & unavoidable
↓
(Cost of Normal loss units − Realisable value) is absorbed by good units.

Eg ① & ② Solved here.

② Abnormal loss

↓

as the **loss in excess of the pre-determined loss** (Normal process loss).

↓

Cost of Abnormal loss unit = Cost of good unit

↓

$$\text{Value of Abnormal loss} = \left(\frac{\text{Total Cost} - \text{Rv of N loss}}{\text{Total Input} - \text{NL units}}\right) \times \text{AL units}$$

↓

Trsfd / debited in Costing P&L A/c

* Eg ② Solved.

③ Abnormal gain

↓

Sometimes loss under a process is less than expected normal loss.

↓

So diff b/n actual loss & expected loss is Abnormal gain

↓

It's unexpected gain

↓

Reasons : Over estimation of process loss
Improvement in work efficiency of workers
use of better technology in production

↓

Treatment : Valued as good units

Eg ④ Solved here, Ill ① Solved, Ill ③ Solved in class.

Valuation of Work in Progress

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Equivalent units Concept ⇒ 200 units of 25% work done = 50 E.units

Table used to Calculating E.U

Input	Units	Output	Units	Material %	Material Units	Labour %	Labour U	Overhead %	Overhead U
			a	b	c = a×b	d	e = a×d	f	g = a×f
Opg WIP	xxx	Opg & Completed	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Units Introduced	xxx	Introd & Completed	xxx	xxx	xxx	xxx	xxx	xxx	xxx
		Normal loss	xxx	–	–	–	–	–	–
		Abnormal loss / gain	xxx	xxx	xxx	xxx	xxx	xxx	xxx
		Closing WIP	xxx	xxx	xxx	xxx	xxx	xxx	xxx

Process Costing Methods

- **FIFO method** → Ill ④ Solved
- **Weighted avg method** → Ill ⑤ Solved

INTER - PROCESS PROFITS

Ill ⑥ Solved

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JOINT & BY-PRODUCTS

Birds eye view

- Meaning
- Apportionment of joint costs
- Treatment of By-product

Eg Agricultural product Industries
Chemical Process Industries
Sugar Industries

Problems faced by management bcoz of J & By products

- Valuation of Inventory
- Pricing of product
- Problem of taking decision
- Apportionment of joint cost
- Determination of Separation point

* **(i) Joint Products** - Joint products represent "**two or more products separated in the course of the same processing operation** usually requiring further processing, each product being in such proportion that no single product can be designated as a major product".

Eg Oil Industry => Gasoline, lubricants, kerosene from Crude oil

* Byproduct is Secondary (or) Subsidiary product which is produced ***incidentally from the material used in the manufacture of main or desired products, such a by-product having either a net realisable value or a usable value which is relatively insignificant in comparison with the saleable value of the main or desired products. By-product may be further processed to*** inc their realisable value.

Eg By products of Sugarcane => Molasses, Bagasse
Glycerin from manf of Soap
Tar, Ammonia from Carbonisation of Coal.

* ***Split of Point – this is a point in a production process where joint products emerging from the process gets separately identifiable.***

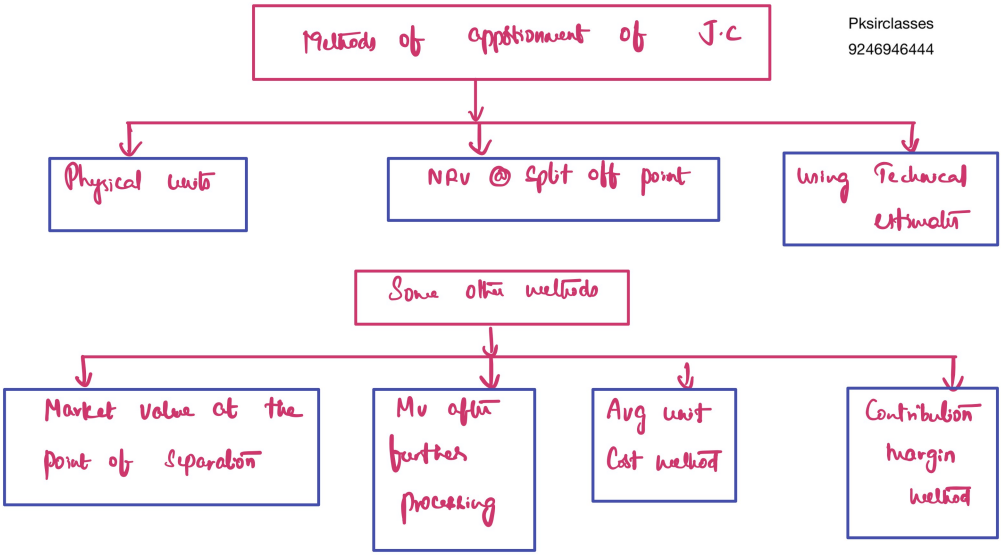
Split of Point has its importance in the joint product costing as joint cost incurred up to this point only and needs to be borne jointly by the products emerging from the common process.

Any cost incurred after Split of Point is a product specific cost and to be borne by the product concerned. *

Apportionment of Joint Costs

↓

Joint costs are the expenditures incurred upto the point of separation i.e. split-off point*Joint Cost is the resources spent by a manufacturer\producer for producing more than one product from processing a common input. These costs include raw material, labour, power, fuel, depreciation and overhead costs towards the production of the joint products.*



① Physical units method :-

* Based on Physical units, J.c are apportioned.
* If Physical units are different, then Convert to Common unit.

* -ve point is it gives equal importance to all products (value)

* This method is used when sale price of all products are uniform

Ill ① Solved here.

② NRV @ Split off point method :-

* NRV @ Split off Point = SVAFP - Selling exp - FPC

Example -1: An entity incurs a joint cost of ₹ 64,500 in producing two products A (200 units) and B (200 units) and earns a sales revenue of ₹ 86,000 by selling @ ₹ 170 per unit of product A and product B @ ₹ 260 per unit. Further processing costs for products A and B are ₹ 4,000 and ₹ 32,000 respectively the Joint cost can be apportioned to products A and B as follows:

	Product- A Amount (₹)	Product- B Amount (₹)
Sales Value	34,000 (₹170 × 200 units)	52,000 (₹260 × 200 units)
Less: Post split-off cost (Further processing cost)	(4,000)	(32,000)
Net Realisable Value	30,000	20,000
Apportionment of Joint Cost of ₹64,500 in ratio of 3:2	38,700	25,800

③ Market Value at the point of Separation :-

* Multiplying factor = $\frac{\text{JC}}{\text{Total SV}} \times 100$ (for apportionment of J.C)

Example – 2: An entity incurs a joint cost of ₹ 64,500 in producing two products A (200 units) and 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.

The multiplying factor in this case is obtained by dividing the total joint cost by total sales revenue and finally multiplying the figure so obtained by 100. The multiplying factor based on the data can be computed as follows:

Multiplying Factor: $\frac{₹\ 64,500}{₹\ 86,000} \times 100 = 75\%$

Joint cost apportioned over product A = Sales revenue of product A × 75%

= ₹ 34,000 × 75% = ₹ 25,500

Joint cost apportioned over product B = Sales revenue of product B × 75%

= ₹ 52,000 × 75% = ₹ 39,000

Alternatively - This joint cost may be apportioned in the ratio of sales values of different joint products.

④ Market value after further processing :-

Example – 3: Suppose that in the example – 2 given above, if sales prices of products A and B after further processing are ₹ 200 and ₹ 300 respectively the joint cost apportioned over Products A and B is as follows:

The pre-separation costs of ₹ 64,500 will be apportioned in the ratio of (2: 3) as follows: Joint Costs

Market sales value after further processing

	(₹)
A : 200 units × ₹ 200	= 40,000
B : 200 units × ₹ 300	= 60,000
	1,00,000

Joint cost apportionment:

A = ₹ 64,500 × $\frac{₹\ 40,000}{₹\ 1,00,000}$ = ₹ 25,800

B = ₹ 64,500 × $\frac{₹\ 60,000}{₹\ 1,00,000}$ = ₹ 38,700

* **The use of this method is unfair where further processing costs after the point of separation are disproportionate or when all the joint products are not subjected to further processing.** The net realisable value method which is discussed as above overcomes the shortcoming of this method.

⑤ Average unit Cost method :-

(Joint cost)

Avg unit Cost = $\frac{\text{Total prodn Cost up to Separation point}}{\text{Total units of joint product produced.}}$

This is a simple method. The effect of application of this method is that **all joint products will have uniform cost per unit**. If this method is used as the basis for price fixation, then all the products may have more or less the same price. Under this method customers of high quality items are benefitted as they have to pay less price on their purchase.

[Note: Students may note that the physical unit method also follows the same steps of calculation as followed under Average unit cost method, ultimately giving the same outcome.] (lol)

* Ill ② Solved

⑥ Contribution margin method :- (Marginal Cost method)

Joint Costs → Variable J.C → based on physical units
Joint Costs → Fixed J.C → based on Contribution
Sales − V. portion of J. Costs

Summary of different types of method of apportioning joint costs that can be used under certain circumstances:

Physical Unit Method	When sale price of all the products is uniform.
Net Realisable Value (NRV) at Split-off Point Method	When the ~~realisable~~ Sale value of joint products at split-off is not known.
Technical Estimates	When the result obtained by Net Realisable Value (NRV) at Split-off Point Method does not match with the resources consumed by joint products.
Market value at the point of separation	Where further processing costs are incurred disproportionately.
Market value after further processing	Where further processing costs after the point of separation are proportionate and all the joint products are subject to further processing.
Average Unit Cost Method	When units produced have same ~~unit~~ Cost / value / benefit derived from joint Cost.

* Ill ③, ④ Solved here.

Methods of apportionment of J.C to By-products

(i) NRV method :- J.C — R.V of by product

(ii) Standard Cost :- By products may be valued at Standard Cost.

(iii) Comparative price :- Based on price of Similar / alternative material

Eg Suppose in a large automobile plant, a blast furnace not only produces the steel required for the car bodies but also produces gas which is utilised in the factory. This gas can be valued at the price which would have been paid to a gas company if the factory were to buy it from outside sources.

(iv) Re-use basis :- value of by-product = Material put in to the process

TREATMENT of BY PRODUCT (B.P) IN COST ACCOUNTING

- When B.P is of Small value
  - either Credited to Costing P&L A/c
  - Reduced from J.C
- When B.P is of Considerable value
  - They may be regarded as joint products rather than by products
- When B.P needs further processing
  - NRV of B.P = SVAFP of B.P − FPC
    - If it is Considerable value → They may be regarded as joint products rather than by products
    - If this is Small value → then

SERVICE COSTING (operating Costing)

Not operation ✗

Birds eye view

- Service Costing
  - Application of Service Costing
  - Service Costing vs Product Costing
  - Methods of Ascertaining Service cost unit
    - Composite Unit
    - Equivalent Unit
  - Service Cost Statement
  - Costing of Services:
    - (i)Transport
    - (ii) Hotels & Lodges
    - (iii) Hospitals
    - (iv) IT & ITES
    - (v) Toll Roads
    - (vi) Educational Institutes
    - (vii) Insurance
    - viii) Financial Institutes
    - (ix) Others

Application of Service Sector Costing

- Internal
  - Service Cost Centre to Responsibility Centres as Support
    - ① Canteen & Hospital for staff
    - ② Boiler house for Supplying Steam to production dept
    - ③ IT dept Services
- External
  - Services offered to Outside Customers as a profit Centre
    - Mean Usual business
      - Hospitality Services provided by Hotel

Service Costing (VS) Product Costing

- Tangibility
  - Intangible & NO Storage
- Cost units
  - Unique
- Material (VS) Elec Cost
  - Major Cost here
- Traceability of Costs
  - Indirect Costs (major)

Service Cost Unit

Service industry	Unit of cost (examples)
Transport Services	Passenger- km., (In public transportation) Quintal- km., or Tonne- km. (In goods carriage)
Electricity Supply service	Kilowatt- hour (kWh)
Hospital	Patient per day, room per day or per bed, per operation etc.
Canteen	Per item, per meal etc.
Cinema	Per ticket.
Hotels	Guest Days or Room Days
Bank or Financial Institutions	Per transaction, per services (e.g. per letter of credit, per application, per project etc.)
Educational Institutes	Per course, per student, per batch, per lecture etc.
IT & ITES	Cost per project, per module etc.
Insurance	Per policy, Per claim, Per TPA etc.

KPI

↓

Quantitative & Qualitative factors used to assess performance of an org

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↓

Eg Telecom Industry → Avg Return per user (ARPU)

Industry	KPI	Meaning
Transportation	Number of Shipments,	This logistics metric monitors the number of orders that are shipped out of the warehouse.
	Truck Turnaround Rate (Truck Turning),	The time from when a delivery truck enters the warehouse to collect or deliver products to when it exits the facility.
	Lead Time (Order Cycle Time)	The amount of time in between order placement by customer and receipt of order.

	On-Time and In-Full (OTIF)	The number of orders delivered according to the schedule and quantity specified.
Hotel Industry	Cost per Occupied Room (CPOR)	The average cost per occupied room.
	Occupancy Rate	The ratio of rented or used rooms to the total amount of available rooms.
	Revenue per available room (RevPAR)	The average revenue per available room days.
Hospitals/ Health care Industry	Bed Occupancy Rate	The proportion of hospital beds in use at any one time.
	Staff-To-Patient Ratio	The number of staff resources present to attend to the patients in a hospital over a certain period of time.
	Average Treatment Charge	The average amount that a facility charges a patient for a treatment.
IT & ITES sector	Gross Burn Rate	The rate at which the company uses up its available cash to cover operating expenses.
	Customer Acquisition Cost (CAC)	The amount it takes to attract new customers.
	Customer Lifetime Value (CLV)	The typical net profit a company generates over the entire life cycle of a single customer.
	Monthly Recurring Revenue (MRR)	The amount earned each month through subscription renewals, new sales, upsells, and fluctuations on a monthly basis.
	Churn Rate	The percentage of customers that cancel their recurring subscriptions over a given time period.
	Cost Per Feature	How much a specific feature costs your business, based on usage and cloud costs.

Methods for ascertaining Service Cost unit

↓

Composite Cost unit

↓

Two measurement units are Combined together to know the Cost of Service (s) operation

↓

Eg Cost per passenger km, Tonne-km, patient-days, Room-days.

Composite units may be Computed in two ways

↓

Weighted avg basis (Absolute)	Simple avg basis (Commercial)
$\Sigma[(W\times D)_1 + (W\times D)_2 + (W\times D)_3 \ldots\ldots (W\times D)_n]$	$\Sigma\left[(D_1 + D_2 + \ldots\ldots + D_n) + \left(\frac{W_1+W_2+\ldots W_n}{n}\right)\right]$
↓	↓
Absolute Tonne-km	Commercial Tonne-km
↓	↓
(Weight x distance)	(Total distance km x Avg load qty)

* ILL (1) Solved here

Equivalent Cost unit / Service unit

↓

To Calculate Cost of pricing of 2 (s) more different grade Services which uses Common resources.

↓

Then each grade of Service is assigned a weight & Converted in to Equivalent units.

Eg

Hotel

3 types of Suites

	Standard (S)	Deluxe (D)	Luxurious (L)
No: of rooms	100	50	30
Room tariff	–	2.5 x S	2 x D
Room – days (360 days / year)	36000 (100 x 360)	18000 (50 x 360)	10800 (30 x 360)
Equivalent Room – days	36000 (36000 x 1)	45000 (18000 x 2.5)	54000 (10800 x 5)

Here we have taken Standard Suite as 1.

(Or)

	7200 (36000 x 1/5)	9000 (18000 x 1/2)	10800

We have taken Luxurious Suite as 1.

Statement of Costs for Service Sector

Based on variability

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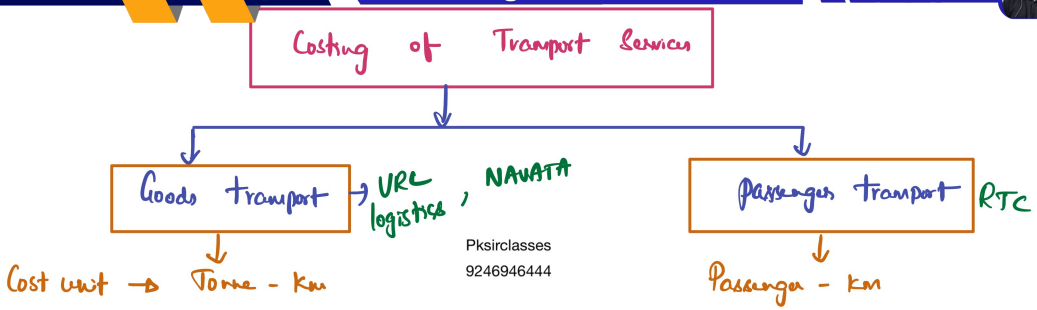
- **Fixed Costs (or) Standing charges**
  - Eg: Dep (effluxion of time), Interest
- **Variable costs (or) Operating exp**
  - Dep (activity (or) usage) (Running charges)
- **Semi variable Costs (or) Maintenance expenses**



(i) **Standing Charges or Fixed costs:** These are the fixed costs that remain constant irrespective of the distance travelled. These costs include the following:

- Insurance
- License fees
- Salary to Driver, Conductor, Cleaners, etc if paid on monthly basis
- Garage costs, including garage rent
- Depreciation (if related to efflux of time)
- Taxes
- Administration expenses, etc.

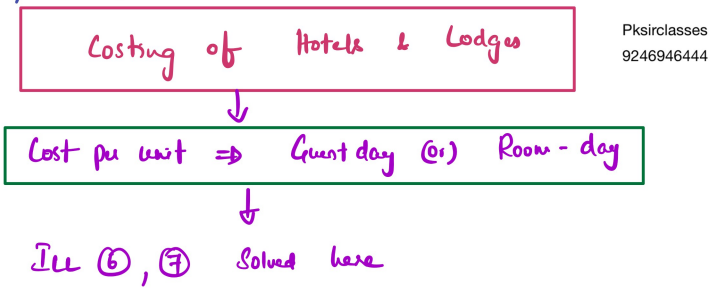
(ii) **Variable costs or Running costs:** These costs are generally associated with the distance travelled. These costs include the following:

- Petrol and Diesel
- Lubricant oils,
- Wages to Driver, Conductor, Cleaners, etc. if it is related to operations
- Depreciation (if related to activity)
- Any other variable costs identified.

(iii) **Semi-Variable Costs or Maintenance Costs:** These costs include the following:

- Repairs and maintenance
- Tyres
- Spares, etc.

Ill ②, ③, ④, ⑤ Solved here.



COSTING OF HOSPITALS

A Hospital is providing various types of medical services to the patients. Hospital costing is applied to decide the cost of these services.

A hospital may have different departments catering to varied services to the patients – such as

- Out Patient
- In Patient
- Medical services like X-Ray, Scanning, etc.
- General services like Catering, Laundry, Power house, etc.
- Miscellaneous services like Transport, Dispensary, etc.

7.1 Unit of Cost

Common unit of costs of various departments are as follows:

- Out Patient – Per Out-patient
- In Patient – Per Room Day
- Scanning – Per Case
- Laundry – Per 100 items laundered

Fixed costs are based on timelines and irrespective of services provided. For example, Staff salaries, Depreciation on Building and Equipment, etc.

Variable costs vary with the level of services rendered. For example, laundry charges, Cost of food supplied to patients, Power, etc.

ILL (6) Solved here.

COSTING OF IT & ITES

Information Technology (IT) and Information Technology Enabled Services (ITES) organizations provide their customers with services or intangible products. These organizations are highly labour intensive.

The services of IT and ITES organizations may be used for – provision of services to outside customers or provision of services internally (captive consumption)

In this sector employee (labour) cost constitutes a significant portion of the total operating costs. The direct employee cost is traceable to services rendered.

In addition to employee cost, significant overhead costs for offering the services are incurred and are classified as service overhead. To arrive at the cost incurred for rendering the services, it is necessary to allocate / apportion such overheads to cost units.

In general – IT & ITES industries, the jobs undertaken are considered as Project. Each project is unique in nature and varies in size, functionality requirements, duration and staffing requirements.

Direct Manpower (Direct Cost of the Project)

In a typical software implementation project, three to four levels of man-power would be directly engaged, as mentioned below: -

- Software Engineers / Functional Consultants / Business Analysts
- Project Leaders
- Project Manager
- Program Manager, etc

Support Manpower

In addition to the above persons, who are directly engaged in project, there could be support persons or indirect manpower, who are indirectly involved in the project.

For example, Quality Assurance Team, Testing Team, Version Control team, Staffing Manager, etc who are indirectly support the projects by providing required level of support services over the life of the projects.

If their time can be identified with a project, they will be treated as direct manpower. Accordingly, the cost incurred on them will be treated as direct cost.

However, if their time is not traceable with a single project, then it may either be allocated or apportioned to various projects on some suitable basis. Accordingly, the cost incurred on them will be treated as overhead and the same will be apportioned to various projects on some suitable basis.

Effort Cost in these types of organizations are calculated on the basis of cost per Person Day or cost per Person week or cost per Person month. That means cost incurred for a person for rendering services per day or per week or per month.

Depending on the requirement of the customer, the periodicity will be defined. For example, implementation of new software may require eight to twelve person months. In such a case, the cost will be calculated on Per Person month basis. On the other hand, implementation of one or two new functionality in already implemented (existing) software may require one- or two-week's efforts. In such a case, the cost will be calculated on per Person week basis.

Different types of Costs

A. Hardware and software costs involved → D / I.D

- If they are identifiable with a project, then they are directly allocated to the project
- If they are not directly identifiable with a project or not fully allocable to a project, then they are treated as service overhead

B. Travel and training costs → D / I.D

- If they are incurred for a project, then they are directly allocated to the project
- If they are not directly identifiable with a project or allocable over a number of projects, then they are treated as service overhead. For example, Java (software language) training provided to the software engineers, may useful in multiple Java based projects. Hence treated as overhead costs

C. Effort costs (By default → It will be treated as Direct Costs)

- Effort costs are basically identified with a project. They can be classified as direct cost, unless otherwise specified.

D but can also be I.D

- Effort costs are not just the salaries of the software engineers or programmers who are involved in the project. Organisations compute effort costs in terms of overhead costs where they take the total cost of running the organisation and divide this by the number of productive staff. Therefore, the following costs are all part of the total effort cost:

1. Costs of providing, heating and lighting office space
2. Costs of support staff such as accountants, administrators, system managers, cleaners and technicians
3. Costs of networking and communications
4. Costs of central facilities such as a library or recreational facilities
5. Costs of Social Security and employee benefits such as pensions and health insurance, etc.

↓

In short Effort Cost includes Salary of the Staff Concerned as part of Common Overhead

ILL (9) Solved here.

COSTING OF TOLL ROADS

Two major types of Costs

↓

9.1.1 Capital Costs

The capital cost consists of cost incurred during the construction period. Generally, this sort of road construction projects run across multiple financial years. The total expenditure to be incurred during the construction period is termed as capital cost.

The total cost includes the cost of construction of road and other structures and consultancy charges. In addition to this cost, it also includes the cost of construction of tollbooths.

Construction expenses can be broadly classified as follows:

- Preliminary and pre-operative expenses
- Land Acquisition
- Materials
- Labour
- Overheads incurred in the course of actual construction
- Contingency allowance
- Interest during construction period

9.1.2 Operating and Maintenance Costs

Routine maintenance cost would be incurred once the Toll road is operational. Routine maintenance involves Patching of potholes, sealing of cracks, Edge Repair, Surface Renewal, Periodic maintenance for new highways would be met with in accordance with the analysis of the life cycle model carried out for the project.

Annual operating cost includes the cost of operating tollbooths, administrative expenses, emergency services, communications and security services and other costs of operation.

Maintenance cost includes the cost of annual maintenance (routine) and periodic maintenance.

- Annual maintenance cost includes primary maintenance of wearing surface, railings, roadside furniture, etc.
- Periodic maintenance cost includes the cost of overlays (wearing coats), painting of railings, etc.

Operating and Maintenance expenses can be broadly classified as follows:

- Toll collection expenses
- Administrative expenses for day-to-day operation.
- Maintenance expenses, which include routing and periodic maintenance.
- Interest expenses incurred for servicing term loans.

Build, Operate, Transfer approach (BOT approach)

With BOT, the private sector designs, finances, constructs and operate the facility and eventually, after specified concession period, the ownership is transferred to the Government. Therefore, BOT can be seen as a developing technique for infrastructure projects by making them amenable to private sector participation.

The fundamental principle in determining user levy is, 'if the price for a transport facility is set at a level that reflects the benefit, each user gains from improvements in the facility, it will result in traffic flow levels that equate social costs with user benefits.'

* Toll rate * From exam point of view

In general, the toll rate should have a direct relation with the benefits that the road users would gain from its improvements. The benefits to road users are likely to be in terms of fuel savings, improvement in travel time and good riding quality.

To compute the toll rate following formula with rounding off to nearest multiple of five has been adopted:

User Fee = Total Distance × Toll Rate per km

ILL (10)

COSTING OF EDUCATIONAL INSTITUTIONS

Objective ⇒ may be Not for Profit (or) Profit

* Cost and management is also inevitable for this sector for Cost Social benefit analysis, allocation of funds & Budgeting (ZBB) & performance evaluation.

Income of Educational Institutions

One-time fees

Eg Admission fee, Annual fee

Recurring fees

Eg Tuition fee, Sports fee, laboratory fee.

Expenditure of Educational Institutions

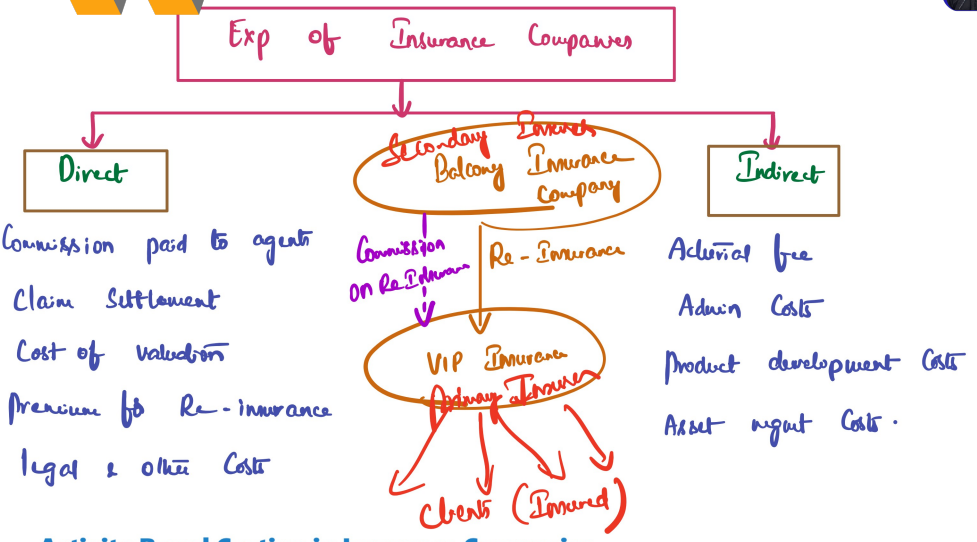
- **Operational Cost**
  - Salary of Teaching & Non-Teaching Staff
  - Lab, Computer, Building maintanence charges
  - Admn exp
  - Finance Charges
- **R&D Cost**
  - It a Cost Centre
  - * Ill (11) Solved here.
- **Cost of publication of Research & Other materials**
  - Any Cost incurred will be directly allocated to that respective dept.

COSTING IN INSURANCE COMPANIES

- **Life Insurance policies**
  - With (or) Without maturity benefits
- **General Insurance**
  - Health, fire, property, Travel Insurance
- **Other Services**
  - Re-insurance
  - Fund management (Pension, Gratuity)

Income of Insurance Companies

- **Premium on policy**
- **Commission on Re-Insurance**
  - Giving back to primary insurer
- **Fund admin fee**
  - RoI on funds.

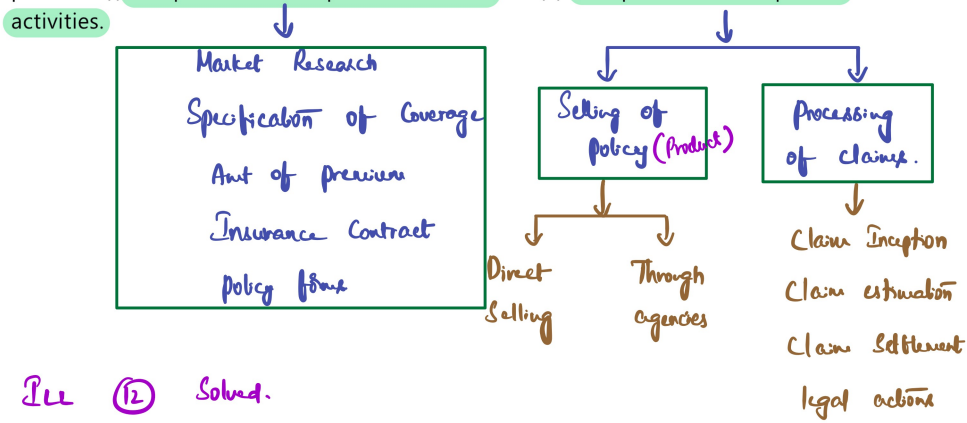


Activity Based Costing in Insurance Companies

Activity based costing (ABC) is used for analysis of cost-benefit of a product (Direct Product Profitability), policy profitability (Customer Profitability Analysis) etc.

Costs that occur in insurance companies are to be identified with appropriate activities that have caused its occurrence. Then costs must be reassigned from activities to cost objects (insurance contracts and policies, customers, delivery channels) based on identified cost drivers.

Identification of activities and assignment of costs are the most critical for the implementation of activity-based costing. The activities can be divided into two parts i.e. (i) Pre-product development activities and (ii) Post product development activities.



Ill (12) Solved.

COSTING IN FINANCIAL INSTITUTIONS (FI)

Cost Components

- Man power Cost (Major portion)
- Interest Cost
- Finance charges

ABC in financial Institutions

- Identify & analyse the profitability of the product
- Analyse the Profitability of the Customer
- Identify activity level unit Costs
  - Then build up Product level Costs
    - This forms basis for Product level pricing (or) Customer level pricing
- FI can improve their profits by
  - Concentrating on Products & Customers that are more profitable

* ILL 13 solved here

COSTING FOR POWER HOUSES

Power houses are engaged either in electricity generation or steam generation use the concepts of service costing i.e., 'Powerhouse Costing.' Service cost statement can be prepared by identifying the costs associated with the power generation or steam generation.

Cost unit is different for electricity generation and steam generation.

The cost unit for electricity generation organization is cost per kilowatt-hour (kWh) – that means cost of generating one kilowatt of power per hour. Please note that kWh is commonly known as a "Unit".

Different types of Costs

(i) **Standing Charges or Fixed costs:** These are the fixed costs that remain constant irrespective of the power or stream generated. These costs include the following:

- Rent, Rates & Taxes
- Insurance
- Depreciation (effluxion of time)
- Salaries, if paid on Time (Monthly) basis (Not directly related to power generation)
- Administration expenses, etc.

(ii) **Variable costs or Running costs:** These costs are generally associated with the power or stream generated. These costs include the following:

- Fuel Charges
- Water Charges
- Wages / Labour charges, if paid on the basis of production (Directly related to power generation)
- Any other variable costs identified.

(iii) **Semi-variable costs or Maintenance costs:** These costs include the following:

- Meters
- Furnaces
- Service materials
- Tools, etc.

Ill (14), (15) Solved here.

STANDARD COSTING → Objective is Cost Control.

Birds eye view

- Standard Costing
  - Meaning of Standard cost and Standard Costing
  - Types of Standards
  - The Process of Standard Costing
  - Setting-up of Standard Cost
  - Types of Variances
  - Classification of Variances
  - Computation of Variance
  - Advantages and Criticism of Standard Costing

Why do we need Standard Costing ← Averages

- Prediction of future Cost for Decision making
- Provide target to be achieved
- Used in budgeting & performance evaluation
- Interim profit measurement & Inventory valuation

STANDARD COSTING

10M

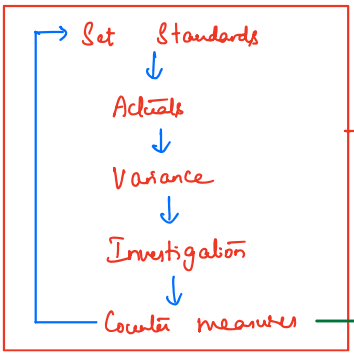
↓

Technique of Costing

↓

Cost Control & Performance management.

Process of Standard Costing



→ This is how Costs are Controlled using Standard Costing.

→ Disposition of Variances

① What is a Standard Cost ? (Averages)

(a) Estimated unit Cost

↓

A Standard Cost is estimated unit Cost built up of standards for each Cost element.

Types of Standard Costing

To value Inventories

To prepare Cost budgets for production

To provide Control information (variances)

Example → Product Spool

STANDARD COST CARD

P	Cost	Req	₹	
DM				
A	2/kg	6 kgs	12	
B	3/kg	2 kgs	6	
C	4/litre	1 litre	4	
Others			2	
				24
DL				
Grade 1	4/hr	3 hrs	12	
Grade 2	5.40/hr	5 hrs	27	
				39
V.P OH	1/hr	8 hrs	8	
FP OH	3/hr	8 hrs	24	
				32
Standard full Cost of production				95

The above info is based on estimates determined by management

* The expected prices of materials, labours & expenses
* Efficiency levels in the use of Materials & labour

* Budgeted OH Costs & Budgeted volume of activity.

Other important uses of Standard Costing

① To evaluate managerial performance

② Management by exception.

↓

(A Standard Cost when established, is actually an average expected unit Cost and because it is only an average, actual results will vary to some extent above & below the average, so only significant differences between actuals & standards should be reported and if necessary investigated.)

③ Decision making (Prediction of future Costs)

④ Motivate Staff

⑤ Provides guidance on possible ways of improving efficiency.

Q) Where Standard Costing Should be used?

a) Most Suited to mass production & repetitive assembly work, where large Quantities of Standard product are manufactured.

↓

Greatest benefit can be gained only if there is large amount of repetition.

↓

Average (or) expected usage of resources can be determined

↓

It is not well suited to production systems where items are manufactured to customers demand & specification.

↓

In case of service sector, Any restaurants that deal with standard recipe for meals → you can apply Std Costing.

Deriving Standards | Setting Standards

↓

(i) Setting Standards for material Cost :- (Price standards)

↓

DM/unit will be estimated by the purchasing department from the following factors.

1. Purchase Contracts (Future deliveries) already agreed; MSP
2. Pricing discussions with regular suppliers.
3. Forecast movement of prices in the market (Fluctuations)
4. Availability of bulk purchase discounts
5. Quality of RM required by production dept
6. Stock of materials on hand

Out of all the above factors, the most challenging one is dealing Inflation.

Eg Suppose that Material Costs ₹ 10/kg as of now. During next 12 months, it is expected to go up to 12/kg (↑ 20%).

↓

What Standard price should be selected ?

↓

* If S.P = 10, Adv variance will be right from the start / as soon as the prices go up.

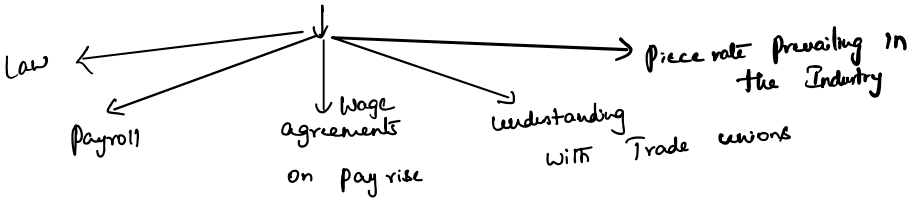
* If S.P = 11, price variance = favourable → first half
price variance = Adverse → Second half

* How price is going to increase ? → gradually over a period of time
→ Sudden Jump.

(ii) Setting Standards for labour Costs :- (Production Manager)

↓

Direct labour rate / hour is set based on



* Same problems with respect to inflation faced while Setting material Standards shall be faced here as well.

Setting Standards for Overheads :-

↓

Concept of Absorption

↓

Recovery rate / Absorption rate / Standard rate / Pre-determined rate

↓

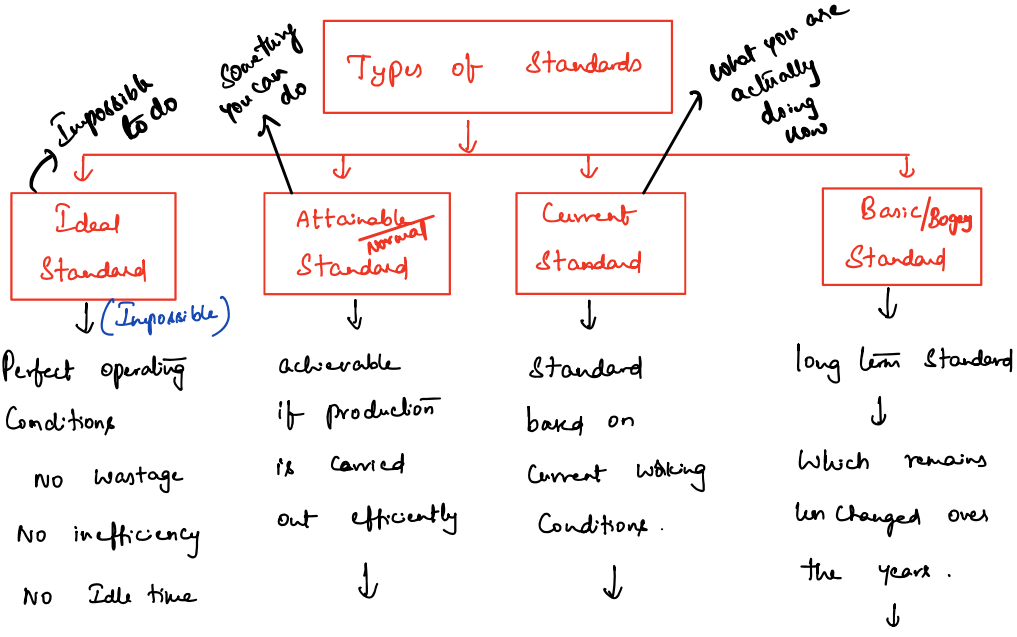
SR x Actuals = Absorbed OH / Standard OH

↓

* OH budgets are fixed based on optimum level of output

↓

$SR/BR = \frac{BOH}{BOP}$



No breakdowns

↓

Will never ever be achieved in reality.

Some allowance will be made for waste & inefficiency.

(More practical)

Will have Current wastage Current inefficiency

least useful.

How are they useful?

↓

Attainable Standard can be used for

(100% efficiency)

① Product Costing

② Cost Control

② Inventory valuation

↓

Current Standard can be used for

(> 100% eff, < 100% eff) (Current efficiency)

① When Inflation is high (Revised on monthly basis)

② Best basis for budgeting.

Types of Costs

↓

Budgeted Costs → BOP × BC/unit / SC/unit

Standard Costs → AOP × BC/unit / SC/unit

Actual Costs → AOP × AC/unit

Volume

Costs planned — Costs allowed — Costs incurred

Cost variances

Types of profit

- **Budgeted profit** → B Sales × BM/unit
- **Standard profit** → A Sales × BM/unit
- **Actual profit** → A Sales × AM/unit

Volume

Types of Overheads

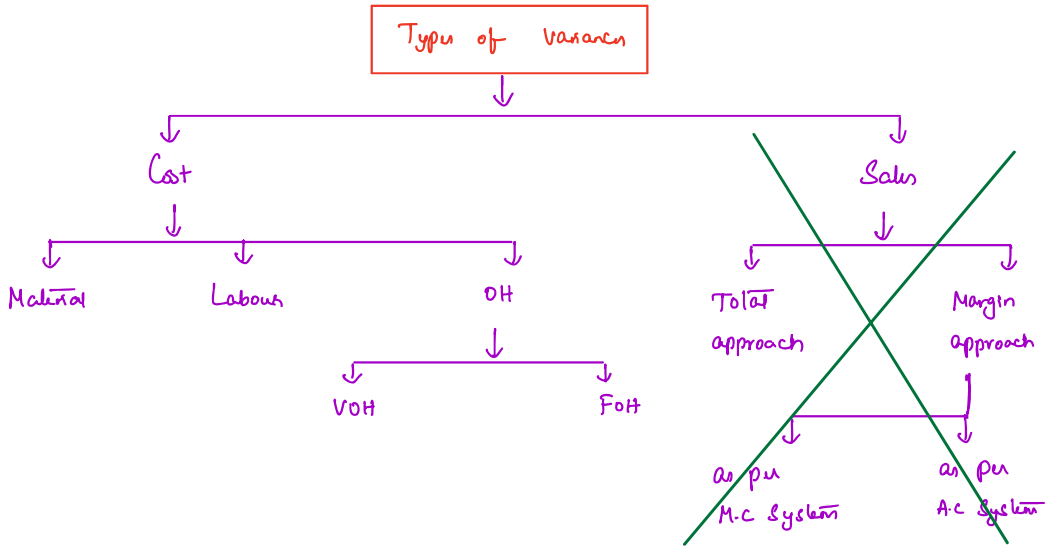
- **Budgeted OH** → BOP × BR/unit
- **Absorbed / Standard OH** → AOP × BR/unit
- **Actual OH** → AOP × AR/unit

SR/unit
Absorption rate
Recovery rate
Pre-determined rate

Volume

Types of variances

- **Favourable** → Any variance that has the effect of increasing your actual profit
- **Adverse** → Decreases your actual profit.



FAQs by Students with respect to Standard Costing

Some say Go for logics to Calculate Variances

Some say Go for formulae to Calculate Variances

PK Sir's answer → ICAI exams (Desi) → Go for both (Time is Constraint)

International exams (CIMA, ACCA) → Go for logics (Coz time is available)

Variance Calculation

① Material Variances

- MCV (1-2)
  - MPV (Purchase dept) (3-2)
  - MUV (Production dept) (1-3)
    - MMU (4-3)
    - MYU (1-4)

① SQ×SP ② AQ×AP ③ AQ×SP ④ RAQ×SP

JAI ICAI

SQ = SQ of RM required for AOP (RM allowed)

SP = Standard price

AQ = AQ of RM Consumed for AOP → for usage variance
(or) AQ of material purchased for price variance

AP = Actual price

RAQ = Revised actual quantity.
(AQ resulted in standard mix)

Single RM in Q	⇒	MPV & MUV	①, ② & ③
Multiple RM in Q	⇒	MPV, MMU, MYU (MUV)	①, ②, ③ & ④

* If no info is given in Q, the AQ(C) = AQ(P) for price variance (assumed)

logics behind above formula (Discussed in class)

Formula is Created → Applied → Number '300'

↓ Meaningless

↳ use this

Not able to use this

Behind all Std Costing formulae

One variable should change

Every thing else should remain Constant.

Applying this logic

~~SQ~~ AQ

MPV ⇒ Price must change ⇒ (SP − AP) AQ

Qty should be Constant

SP ~~AP~~

MQV ⇒ Qty – Change ⇒ (SQ − AQ) SP

Price – Constant

Multiple RM (Example discussed in class)

MMV = Mix → Change

Yield → Constant

⇒ (RAQ − AQ) SP

MYV = Yield → Change

Mix → Constant

⇒ (SQ − RAQ) SP

Example

	SQ	AQ	RAQ
Gold	150	140	165
Copper	50	80	55
	200	220	220

AQ = 220

G : C

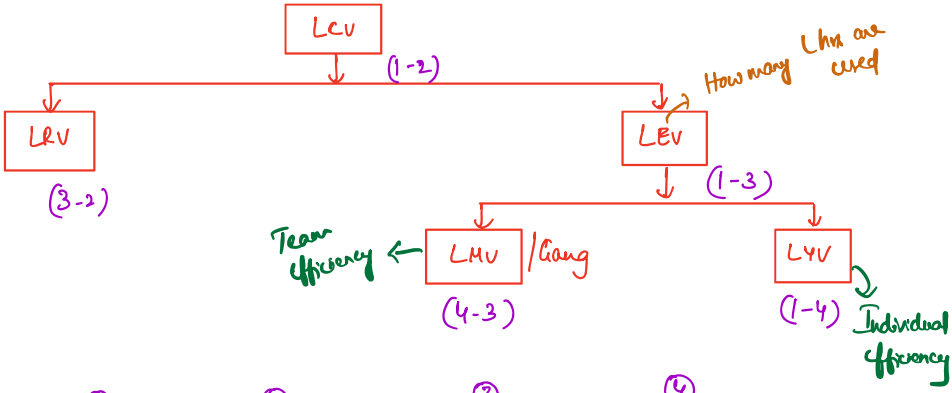
3 : 1 (Std mix)

165 : 55

Labour Variance

With out idle time

Actual hrs paid = Idle hrs + Actual hrs worked



① SH×SR/hr ② AH×AR/hr ③ AH×SR/hr ④ RAH×SR/hr

SH = SHrs req for AOP (No: of hrs allowed)

SR = Standard rate

AH = AHrs Consumed for AOP

RAH = Revised actual hrs (AHrs recalculated in Std mix)

With Idle time

No: of Hrs paid = No: of hrs worked + Idle hrs

HP = Hw + Ihrs

Production manager / foreman

LCV (1-2)

LRV (3-2)

Personnel manager is responsible for labour rate negotiation
But generally they are influenced by external factors which are beyond control

LEV (1-3) Hrs paid

LITV (Idle hrs x SR/hr)

LREV (1-3')

Hrs worked

LMV (4-3') Gang

LYV (1-4) Revised efficiency

① SH x SR/hr

② AHP x AR/hr

③ AHP x SR/hr

③' AHW x SR/hr

④ RAHW x SR/hr

SR/hr ⇒ BVOH / BHrs

SR/unit ⇒ BVOH / BOP

OH variances

VOH Cost (1-2)

VOH exp (3-2)

VOH eff (1-3)

Based on time ⇒ ① SH x SR/hr
2 x 500 x 10

Based on output ⇒ AOx SR/U
500 x 20

② AHx AR/hr
AVOH
AOx AR/U

③ AHx SR/hr
AHW
SOx SR/U

1 unit = 2 hrs Rate/hr = 10

AOP = 500 units

So = Std output for actual hrs worked.

(Expected output)

In other words output based on 100% efficiency.

Logic behind VOH efficiency variance

VOH → variable → varies with output → output is influenced by L hrs and thus efficiency.

FOH Variances

FOH Cost (1-2)

- FOH exp (3-2)
- FOH volume (1-3)
  - Capacity (4-3) or (4-5)
  - efficiency (1-4)
  - Calendar (5-3)

$SR/hr = \frac{BFOH}{BHrs}$

$SR/U = \frac{BFOH}{BOP}$

Standard OH

Absorbed OH

① SH x SR/hr or AO x SR/U

② AFOH — AH x AR/hr, AO x AR/U

② BFOH — BH x SR/hr, BO x SR/U

④ AH x SR/hr → AHW — SO x SR/U

⑤ PFOH — PH x SR/hr or BFOH x AO/BD

Types of Variances

- **Controllable**
  - These Controlled under normal operating conditions
- **Uncontrollable**
  - Occurs due to Conditions which are beyond Control.

Advantages of Standard Costing

- Serves as basis for measuring operating performance & Cost Control
- It aids price fixing
- Facilitate evaluation of jobs & Introduction of Incentives
- Facilitate estimation of Cost of new Products.
- Basis for Inventory Valuation
- Used for measurement of profit
- Used in planning, budgeting & Decision making
- Used in Standardization of Products, operations & processes
- Serves as incentive to departmental head to achieve targets.

Criticism of Standard Costing

- Variation in price
- Varying levels of output
- Changing Standard of technology
- Attitude of technical people
- Mix of Products
- Level of performance
- Fixation of Standards may be costly.

Procedure for Setting labour time Standards (No: of hrs)

- Standardisation of Product Study
  - Eg Aloevera soap
- Labour Specification
  - (based on part records)
  - Diff Types of labour
- Standardisation of methods
  - (Proper machines, Proper Sequence)
- Time & Motion Study
  - (learning effect)
  - Video tapes
- Plant layout
  - Tom Bread
- Training & Trial

Procedure for Setting Material Qty Standards (Qty of RM)

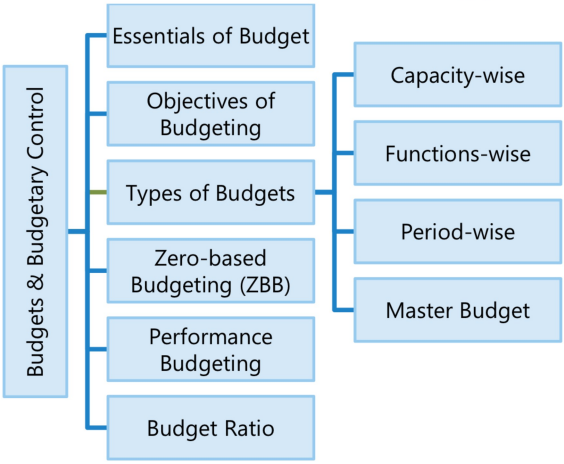
- Standardisation of products
- Product Study
- Preparation of Specification list
- Test runs

BUDGETS & BUDGETARY CONTROL

10M

Bird's eye view

↳ Cost Control is objective of Budgeting & Performance Measurement.



Q1 What is Budget ?

Budget: A budget is an instrument of management used as an aid in the planning, programming and control of business activity. The Chartered Institute of Management Accountants (CIMA), UK defines budget as "A financial and/or quantitative statement, prepared and approved prior to a defined period of time of the policy to be pursued during that period for the purpose of attaining a given objective. It may include income, expenditure and employment of capital" The budget is a blue-print of the projected plan of action expressed in quantitative terms for a specified period of time.

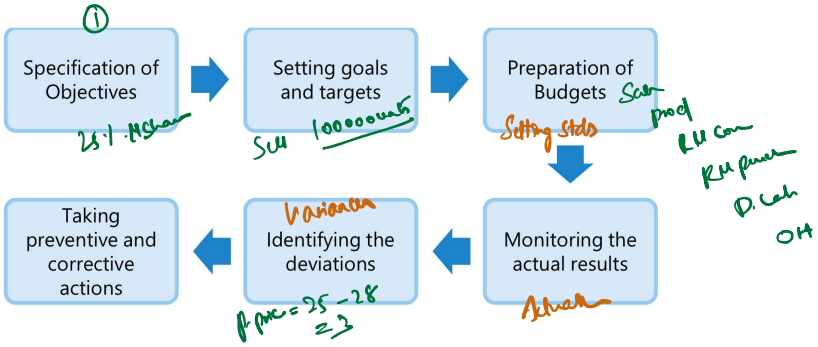
Q2 What is Budgeting ?

Budgeting: Budgeting is the process of designing, implementing and operating of budget. The main emphasis in budgeting process is the provision of resources to support plans which are being implemented. It is a means of coordinating the combined intelligence of an entire organisation into a plan of action based on past performance and governed by rational judgment of factors that will influence the course of business in the future.

Essential Characteristics of Budget

- Defined future Period
- Written document
- Detailed plan of all economic activities
- All dpts Should Co-operate for preparation of budget
- Means to achieve business objectives
- It is a Continuous process (needs to be updated Corrected, Controlled)
- Helps in planning & Control
- acts as business Barometer
- Usually prepared based on past experiences
  - Exception to this point is ZBB.

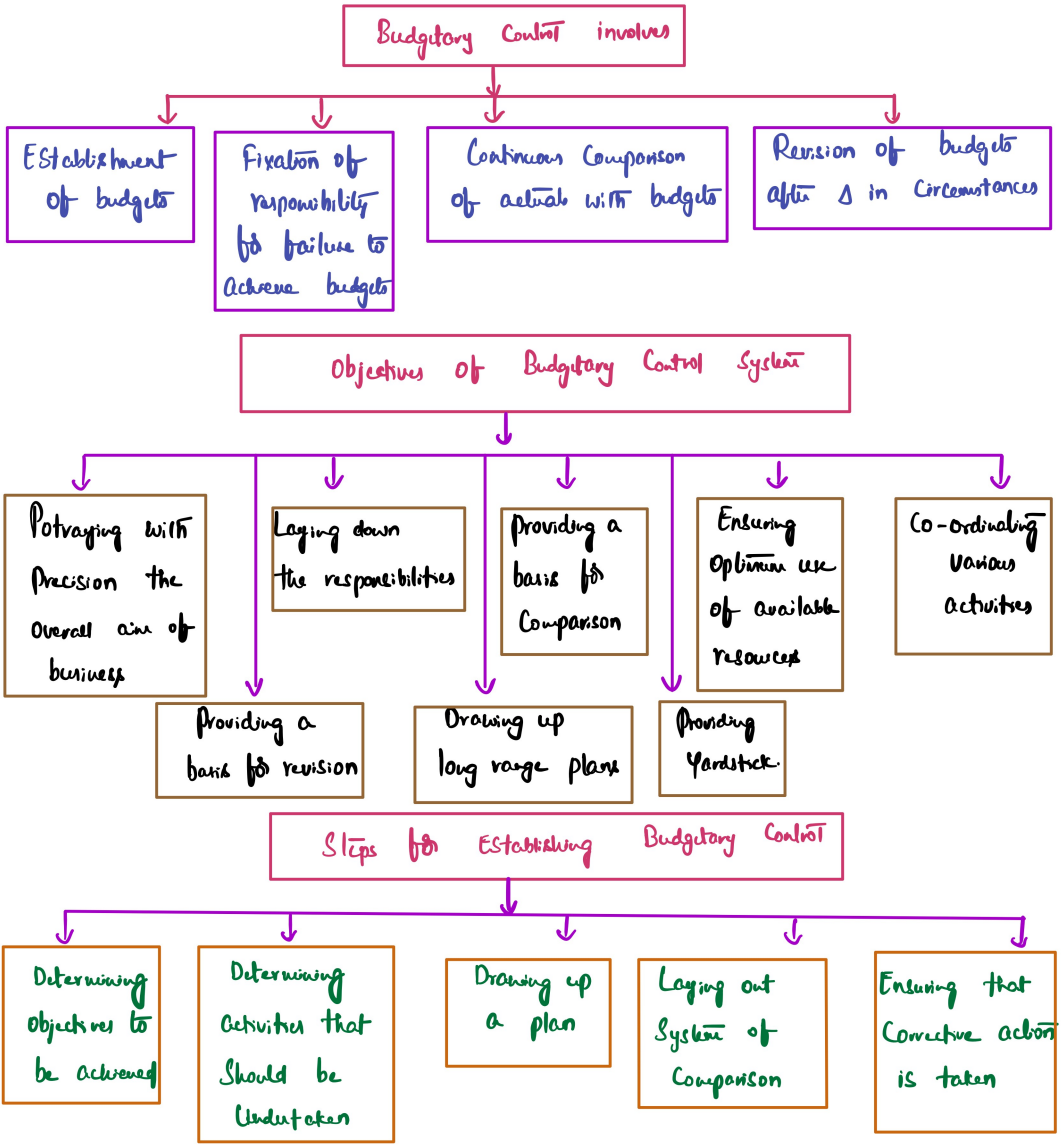
BUDGET PROCESS



Objectives of Budgeting

Budgetary Control

It is the system of management control and accounting in which all the operations are forecasted and planned in advance to the extent possible and the actual results compared with the forecasted and planned results.



① Feed back Control

* It will simply compare Actual results (vs) Budgeted results.
* It is a reaction after action has taken place.
* So there should be error in order to take Corrective action.
* Feed back Control mechanism measures the difference b/n Budgeted output & Actual output, and accordingly modifies subsequent actions / plans to achieve desired results.

Feed forward Control mechanism

* Forecasting future error now itself & taking action before error actually take place.
* In budgetary Control System, feed forward Control means forecasting difference between budget & Actuals and accordingly taking Corrective actions.

Eg ① Indication of increase in price would cause buying before price go up.

② For a 'Can' manf Company, its better to do Weighing of a 1kg product before its packed/Sealed Instead of weighing after packing/sealing. This will avoid Scrapping of cans having lesser quantity.

③ While preparing Cash budget, if cash balance is not as per expectation, preventive action can be taken to meet expectation.

CA Prasanna kumar(PKSIR)
9246946444

Budget Committee & Budget officer

The responsibility for successfully introducing and implementing Budgetary Control System rests with the Budget Committee acting through the Budget Officer. The Budget Committee would be composed of all functional heads and a member from the Board to preside over and guide the deliberations.

The main responsibilities of the Budget Committee/Budget Officer are to:

1. **Assist in the preparation of the separate budget for various departments** by coordinating the work of the accounts department, which is normally responsible to compile the budgets—with the relevant functional departments like Sales, Production, Plant maintenance etc.;
2. **Forward the budget to the individual departments heads who are responsible** to implement the budget. The Budget Officer should guide them in overcoming any practical difficulties, in its working;
3. **Prepare the periodical budget reports** for circulation to the individuals concerned; (Beginning/start of the year)
4. **Follow-up action to be taken on the budget reports**;
5. **Prepare an overall budget working report** for discussion at the Budget Committee meetings and to ensure follow-up on the lines of action suggested by the Committee;
6. **Prepare periodical reports** for the Board meeting. Comparing budgeted Profit and Loss Account and the Balance Sheet with the actual results attained. (End of the year)

Advantages of Budgetary Control System

- Efficiency
- Cost Consciousness
- Control on exp
- Finding deviations
- Effective utilisation of resources
- Credit rating
- Revision of plans
- Implementation of standard Costing

Limitations of Budgetary Control System

- Based on estimates
- Time factor
- Co-operation required
- Expensive
- Not a Substitute for Management
- Rigid document

Components of Budgetary Control System

- Physical budgets
- Cost budgets
- Profit budgets
- Financial budgets

Different types of Budget

- BUDGET
  - Capacity Wise
    - Fixed Budget
    - Flexible Budget
  - Function Wise
    - Sales Budget
    - Production Budget
    - Plant utilisation Budget
    - Direct-material usage Budget
    - Direct-material purchase Budget
    - Direct-labour (personnel) Budget
    - Factory overhead Budget
    - Production cost Budget
    - Ending inventory Budget
    - Cost of goooods-sold Budget
    - Selling and distribution cost Budget
    - Administration expenses Budget
    - Research and development cost Budget
    - Capital expenditure Budget
    - Cash Budget
  - Master Budget
  - Period Wise
    - Long-term Budget
    - Short-term Budget
    - Current Budget

① Capacity wise

Fixed Budget (Static budget)

Prepared based on Standard (or) fixed level of activity irrespective of level of activity actually attained. (Suitable for fixed exp)

Condition suitable

① Business is not Seasonal

② No Impact of external factors

Flexible budget

This budget is designed to Δ in relation to level of activity attained by recognising F, V & SV Costs.

Exactly opposite points here

③ Demand is Certain & Stable
④ Market of product is domestic
⑤ Trend of Price Stability
⑥ Supply of Inputs is regular
⑦ No need of Special labour

exactly opposite points here

Summary is Fixed budget is not Suitable in business Concerns.

Ill ①, ②, ③ Solved here

Function - wise

Eg: Production budget related to many function

① Sales budget (Everything starts here)

- **Sales forecast is the commencement of budgeting and hence sales budget assumes primary importance**. The quantity which can be sold may be the principal budget factor in many business undertakings. In any case in order to chalk out a realistic budget programme, there must be an accurate sales forecast.

* Sales budget is prepared for each product
includes
Qty
S.P
Data given by sales representatives

The sales budget may be prepared under the following classification or combination of classifications:

1. Products or groups of products.
2. Areas, towns, salesmen and agents.
3. Types of customers as for example: (i) Government, (ii) Export, (iii) Home sales, (iv) Retail depots.
4. Period—months, weeks, etc.

Factors Considered for estimating Sales

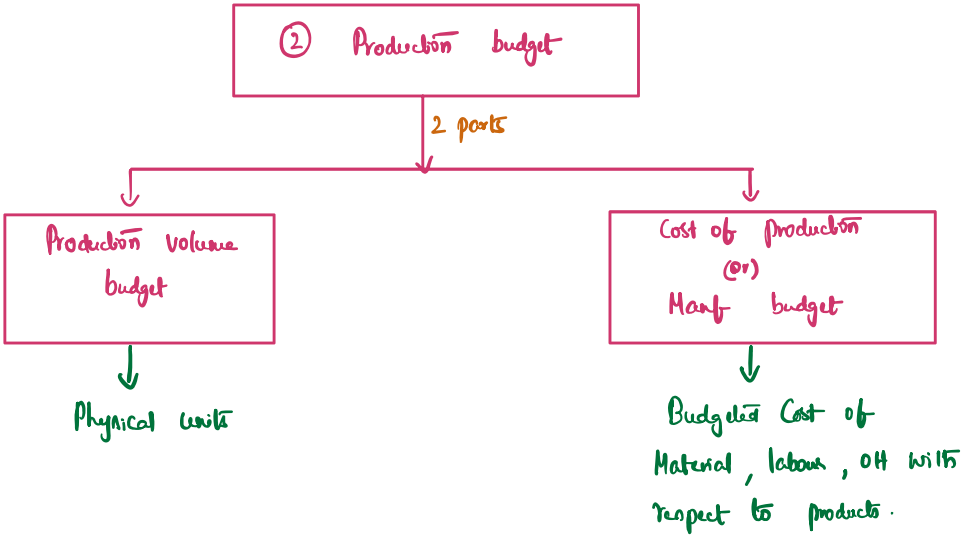
(i) Backlog of unfulfilled sales orders
(ii) Planned advertising and promotion
(iii) Expected industry and general economic conditions
(iv) Productive capacity
(v) Projected pricing
(vi) Findings of market research studies
(vii) Relative product profitability.
(viii) Competition.

* Example of sales budget:

XYZ COMPANY

Sales Budget for the year ending March, 20....

	Units	***Selling price* Per unit (₹)**	***Total* (₹)**
Product A	5,000	75	3,75,000
Product B	10,000	80	8,00,000
			11,75,000



* **Production budget is normally stated in units of output**. Production should be carefully coordinated with the sales budget to ensure that production and sales are kept in balance during the period. **The number of units to be manufactured to meet budgeted sales and inventory needs for each product is set forth in the *production budget*.**

Production budget shows the production for the budget period based upon:

1. Sales budget,
2. Production capacity of the factory,
3. Planned increase or decrease in finished stocks, and
4. Policy governing outside purchase.

Example of production budget:

XYZ COMPANY

Production budget in units for the year ending March 31, 20....

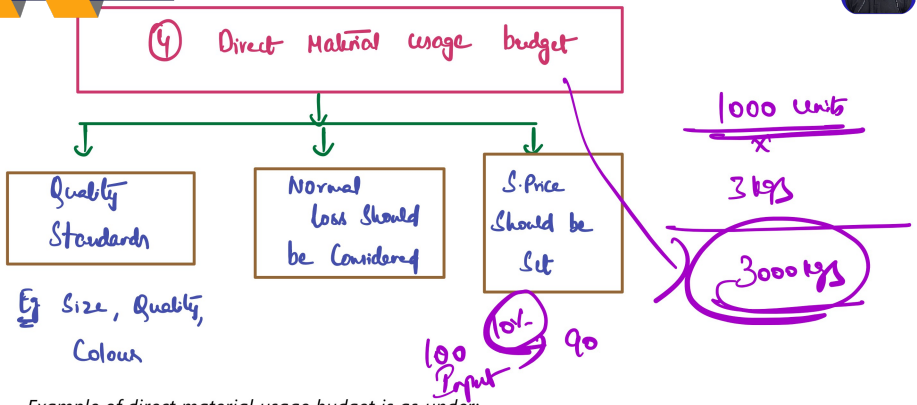
	Products	
	A	***B***
Budgeted sales	5,000	10,000
Add : Desired closing stock	500	1,000
Total quantity required	5,500	11,000
Less : Opening stock	1,500	2,000
Units to be produced	4,000	9,000

③ Plant utilization budget

Plant utilisation budget represents, in terms of working hours, weight or other convenient units of plant facilities required to carry out the programme laid down in the production budget.

The main purposes of this budget are:

1. To determine the load on each process, cost or groups of machines for the budget period.
2. To indicate the processes or cost centres which are overloaded so that corrective action may be taken such as: (i) working overtime (ii) sub-contracting (iii) expansion of production facility, etc.
3. To dovetail the sales production budgets where it is not possible to increase the capacity of any of the overloaded processes.
4. Where surplus capacity is available in any of the processes, to make effort to boost sales to utilise the surplus capacity.



Example of direct material usage budget is as under:

XYZ COMPANY
Direct material usage in units and in amount for the year ending March 31, 20...

	Direct Materials				
Type of material	**Product A (4,000 units)**	**Product B (9,000 units)**	**Total direct material usage (Units)**	**Material cost per unit (₹)**	**Total cost of material used (₹)**
X (12 units per finished product)	48,000	1,08,000	1,56,000	1.50	2,34,000
Y (4 units per product A & 2 units per product B)	16,000	18,000	34,000	2.50	85,000
				Total	3,19,000

⑤ Direct Material purchase budget

- **The production budget is the starting point for determining the estimated quantities of direct materials to be purchased.**
- Multiplying these quantities by the expected unit purchase price determines the total cost of direct materials to be purchased.

Two important considerations that govern purchase budgets are as follows:

(i) Economic order quantity. → what qty of RM?

(ii) Re-order point with safety stocks to cover fluctuations in demand.
↓ What time you need to buy?

An example of material purchase budget is as under:

XYZ Company
Direct material purchase budget
for the year ending March 31, 20.....

	Material X	*Material Y*	*Total*
Desired closing stock (units)	3,000	500	
Units required for production	1,56,000	34,000	
Add:			
Total Requirement	1,59,000	34,500	
Less: Opening stock (units)	4,000	300	
Units to be purchased	1,55,000	34,200	
Unit price (₹)	1.50	2.50	
Purchase cost (₹)	2,32,500	85,500	3,18,000

⑥ Direct Labour budget

- Once sales budget and Production budget are compiled and plant utilisation budget is decided detailed amount of the various machine operations involved and services required can be calculated. This will facilitate preparation of an estimate of different grades of labour required.

From this, the standard hours required to be worked can be calculated the total labour component thus budgeted can be divided into direct and indirect labour. Standard rates of wages for each grade of labour can be introduced and then the direct and indirect labour cost budget can be prepared.

Sales → Prod → Plant utilisation → Material wise → D.L Cost → G1 G2 G3 → Net Purchase

Example of direct-labour cost budget:

XYZ COMPANY
Direct-labour cost budget
for the year ending March 31, 20...

	Units to be produced	*Direct labour hour, per unit*	*Total hours*	*Total budget cost (₹) @ ₹2 per hour*
Product A	4,000	7	28,000	56,000
Product B	9,000	10	90,000	1,80,000
			1,18,000	2,36,000

⑦ Production (or) Factory OH budget

Estimated POH Cost

Pre-determined rate is Calculated

Already discussed in detail in OH Chapter.

Example of factory overhead budget:

XYZ COMPANY
Factory overhead budget for the year ending March 31, 20....
(Anticipated activity of 1,18,000 direct labour hours)

	(₹)	(₹)
Supplies	12,000	
Indirect labour	30,000	
Cost of fringe benefits	10,000	
Power (variable portion)	22,000	
Maintenance cost (variable portion)	15,000	
Total variable overheads		89,000
Depreciation	10,000	
Property taxes	2,000	
Property insurance	1,000	
Supervision	12,000	
Power (Fixed portion)	800	
Maintenance (Fixed portion)	3,200	
Total fixed overheads		29,000
Total factory overheads		1,18,000

Factory overhead recovery rate is:

$\frac{₹1,18,000}{1,18,000 \text{ labour hours}}$ = ₹1 per direct labour hour

⑧ Production cost budget

Same as production budget

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⑨ Ending Inventory budget

↓

Shows Closing Stock of RM & FG } This Info is required for COGS budget.

⑩ COGS Budget

↓

(COP) Cost of goods produced (DM + DL + Manf OH)
(+) cost of opg Inv (FG)
(−) Cost of clg Inv (FG)
COGS (FG)

XYZ Company cost-of-goods-sold budget for the year ending March 31, 20....

	Amount (₹)
Direct materials used	3,19,000
Direct labour	2,36,000
Factory overhead	1,18,000
Total manufacturing costs	6,73,000
Add : Finished goods (opening)	1,79,500*
	8,52,500
Less : Finished goods (closing)	77,500*
Total cost of goods sold	7,75,000

**Assumed figure*

In the above budget if adjustments for opening and closing inventory of finished goods are not shown. The budget will be called production cost budget.

(11) Selling & Distribution Cost budget

* Selling Cost is defined as Cost of Seeking to Create & Stimulate demand and of Securing orders.

Eg Advertising, Sales promotion, Sales office, Salesmen, Credit Collection, Market research, After Sales Service

* • **Distribution cost has been defined as the cost of the sequence of operations which begins with making the packet of product available for dispatch and ends with making the re-conditioned return of empty package, if any available for re-use.** It includes transport cost, storage and warehousing costs, etc.

(12) Administrative Exp budget

* The administrative expenses are mostly policy costs and are, therefore, fixed in nature. **The most practical method to follow in preparing estimate of these expenses is to follow the past experience with due regard to anticipated changes either in general policy or the volume of business.** To

* to be adjusted. Examples of such expenses are: board meeting expenses, expenditure incurred on staff employed in human resources and finance departments, audit fees, depreciation of office equipment, insurance, subscriptions, postage, stationery, telephone, telegrams, office supplies, etc.

(13) R&D cost budget

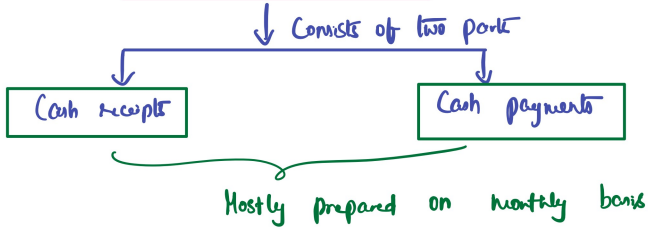
Research and development expenditure is to be incurred so that the products or methods of production do not become obsolete. The research and development budget is the forecast of all such expenses. **Research is required in order to develop and/or improve products and methods. When research results in definite benefit to the company, development function begins.** After

(14) Capital expenditure budget

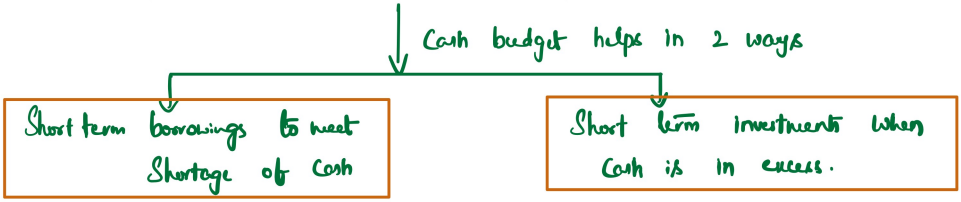
The capital expenditure budget represents the planned outlay on fixed assets like land, building, plant and machinery, etc. during the budget period. This budget is subject to strict management control because it entails large amount of expenditure. The budget is prepared to cover a long period of years and it projects the capital costs over the period in which the expenditure is to be incurred and the expected earnings.

Ill (4), (5) Solved

(15) Cash budget



* Cash budget represents the cash requirements of the business during the budget period. **It is the plan of receipts and payments of cash for the budget period**, analysed to show the monthly flow of cash drawn up in such a way that the balance can be forecasted at regular intervals.



MASTER BUDGET

* Summary budget incorporating its Component functional budgets which is finally approved, adopted & employed. *

↓

Once all the functional budgets have been prepared

↓

Then Budget offices will prepare Master budget which Consists of Budgeted P/L A/c & Budgeted B/S

Ill ⑥ Solved.

Classification on the basis of Time period

- **Long term budget** → more than a year (3 - 10 years)
- **Short term budget** → 1 - 2 yrs → Consumer goods Industries like Sugar, Cotton, Textile
- **Current budget** → Months & weeks → Based on current activities of business.

ZERO BASED BUDGETING (ZBB)

It starts from zero not on the basis of trends (or) historical levels of expenditure

↓

* Zero based budgeting differs from the conventional system of budgeting because it mainly starts from scratch or zero and not on the basis of trends or historical levels of expenditure. In the customary budgeting system, the last year's figures are accepted as they are, or cut back or increases are granted. Zero based budgeting on the other hand, starts with the premise that the budget for next period is zero so long the demand for a function, process, project or activity is not justified for each rupee from the first rupee spent.

↓

ZBB is ABB (Activity based budgeting) where budgets are prepared for each activity rather than functional dept

↓ (at your choice)

In case of corporate entities, ZBB is best suited for discretionary costs like research and development cost, training programmes, advertisement etc.

↓

ZBB is also called priority based budgeting where resources are allocated based on priority

PERFORMANCE BUDGETING

↓

* Performance Budgeting provide a meaningful relationship between estimated inputs and expected outputs as an integral part of the budgeting system. **A performance budget is one which presents the purposes and objectives for which funds are required,** the costs of the programmes proposed for achieving those objectives, and quantitative data measuring the accomplishments and work performed under each programme. Thus, PB is a technique of presenting budgets for costs and revenues in terms of functions. Programmes and activities are correlating the physical and financial aspect of the individual items comprising the budget.

BUDGET RATIOS

FOH volume (Activity) = $1-3 = \frac{1}{3} = \frac{SH \times Sr/hr}{BH \times Sr/hr} = \frac{SH}{BH} \times 100$

FOH Capacity = $4-3 = \frac{4}{3} = \frac{AH \times Sr/hr}{BH \times Sr/hr} = \frac{AHW}{BH} \times 100$

FOH Efficiency = $1-4 = \frac{1}{4} = \frac{SH \times Sr/hr}{AH \times Sr/hr} = \frac{SH}{AH} \times 100$

FOH Calendar = ~~BOH~~ $\times \frac{AD}{BD} = \frac{AD}{BD} \times 100$

Std Capacity usage ratio = $\frac{\text{BHrs}}{\text{Max possible hrs in budget period}} \times 100 \left(\frac{BH}{PH}\right)$

Actual Capacity usage ratio = $\frac{\text{AHrs worked}}{\text{Max possible hrs in a period}} \times 100$

$4.5 = \frac{4}{5} = \frac{AH \times Sr/hr}{PH \times Sr/hr} = \frac{AH}{PH}$

Actual usage of Budgeted Capacity ratio = $\frac{\text{AHrs worked}}{\text{BHrs}} \times 100$

Ill (7) Solved.

UNIT & BATCH COSTING

CHAPTER OVERVIEW

- Methods of Costing
  - Unit Costing
    - Meaning
    - Process of Cost Accumulation and Calculation
  - Batch Costing
    - Meaning
    - Process of Cost Accumulation and Calculation
    - Determination of Economic Batch Quantity (EBQ)
    - * Difference between Job and Batch Costing *

Basically we have two type of Industries

- Industry doing Job work
  - Eg Ship building
    Roads & Bridges
    Heavy Machinery manf
    - Job Costing
    - Contract Costing
    - Batch Costing
- Industries engaged in Mass production
  - Eg Chemical
    Pharma
    Paints, Textile, rubber
    - Process Costing
    - Single Output Costing
    - operating Costing.

These two are Covered in this Chapter

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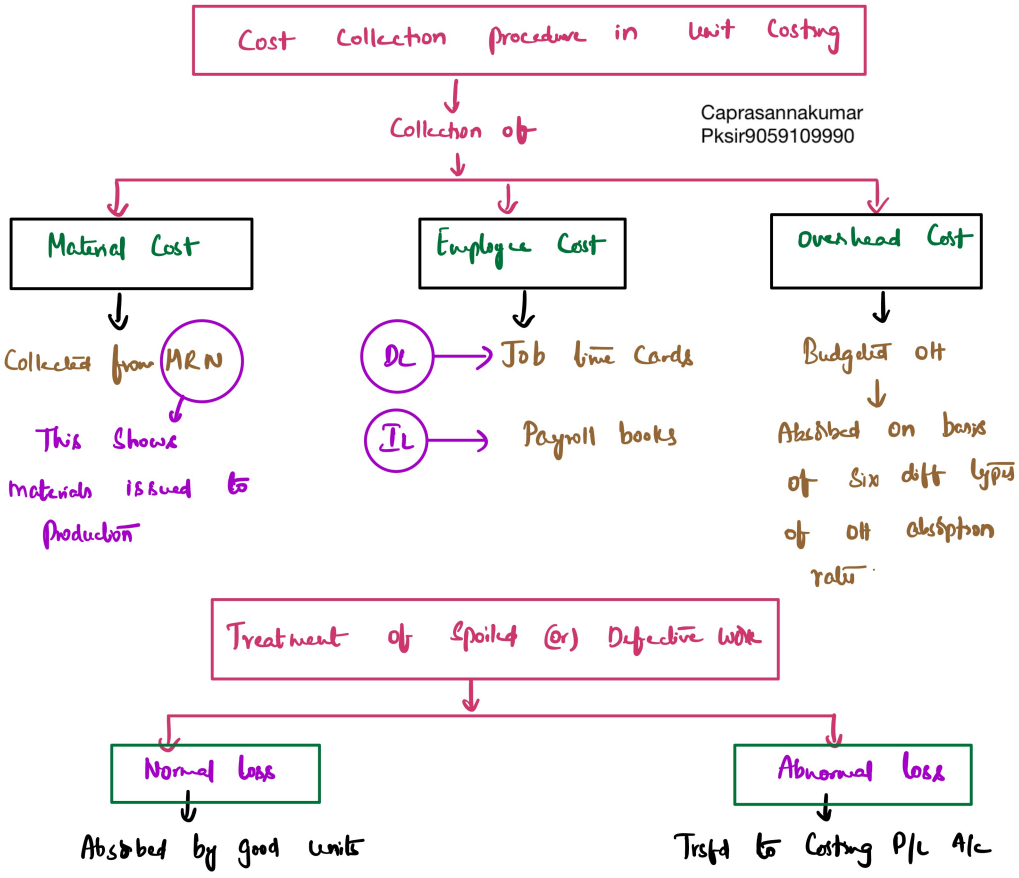
UNIT COSTING

* **Unit costing is that method of costing where the output produced is identical and each unit of output requires identical cost.** Unit costing is synonymously known as single or output costing, but these are sub-division of unit costing method. This method of costing is followed by industries which produce single output or few variants of a single output. Under this method costs, are collected and analysed element wise and then total cost per unit is ascertained by dividing the total cost with the number of units produced. If we have to state it in the form of a formula, then

$$\text{Cost per unit} = \frac{\text{Total Cost of Production}}{\text{No. of units produced}}$$

This method of costing, therefore finds its application in industries like paper, cement, steel works, mining, breweries etc. These types of industries produce identical products and therefore have identical costs.



Ill ①, ② Solved.

BATCH COSTING

* **Batch Costing is a type of specific order costing where articles are manufactured in predetermined lots, known as batch**. Under this costing method, the cost object for cost determination is a batch for production rather output as seen in unit costing method.

Eg Pens manf, invitations, visiting cards.

Ill ③, ④ Solved.

Economic Batch Quantity (EBQ)

* Same logic as EOQ as we have already seen in Materials chapter except for one difference.

$$EBQ = \sqrt{\frac{2DS}{C}} \qquad EOQ = \sqrt{\frac{2AB}{C}}$$

D = Annual demand of the product

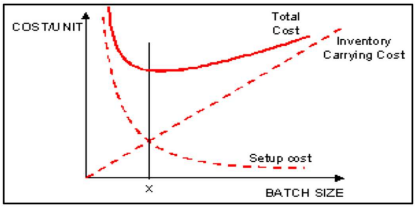
S = Set up Cost per batch

C = C.C per unit of production.

* 1. Machine Set Up Costs and
  2. Inventory holding costs.

If the size is higher, the set up cost may decline due to lesser number of set ups required; but units in inventory will go up leading to higher holding costs. If the lot size is lower, lower inventory holding costs are accomplished but only with higher set up costs. **Economic batch quantity is the size of a batch where total cost of set-up and holding costs are at minimum.**

This relationship is explained with the help of following diagram



Ill 5, 6, 7 Solved

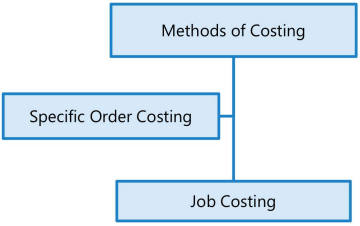
Diff b/n Job & Batch Costing

Sr. No	Job Costing	Batch Costing
1	Method of costing used for non- standard and non-repetitive products produced as per customer specifications and against specific orders.	Homogeneous products produced in a continuous production flow in lots.
2	Cost determined for each Job	Cost determined in aggregate for the entire Batch and then arrived at on per unit basis.
3	Jobs are different from each other and independent of each other. Each Job is unique.	Products produced in a batch are homogeneous and lack of individuality

JOB COSTING

Imp – 8M (avg) (Small Chapter)

Birds eye view



Job Costing Def :-

CIMA London defines Job Costing as "**the category of basic costing methods which is applicable where the work consists of separate contracts, jobs or batches, each of which is authorised by specific order or contract.**" A[redacted]g

Principle of Job costing

- Analysis & Ascertainment of Cost of each unit of production
- Control & regulate Cost
- Determine the profitability

Process of Job Costing

1. Prepare Separate Cost Sheet for each job
2. Disclose Cost of materials issued for the Job
3. Elec Cost incurred based on → BOM / Time cards
4. Once job done, OH are added to get total Cost

In what situations we should use job costing ?

- When jobs are executed for different customers according to their specifications.
- when no two orders are alike and each order/job needs special treatment.
- Where the work-in-progress differs from period to period on the basis of the number of jobs in hand.

Job Cost Card / Sheet

✱ Each job order is asymmetrical to other due to specific and customised requirements. To ascertain cost of a particular job, it is necessary to record all the expenditure related with a job separately. For this purpose, Job Cost card is used. Job cost card is a cost sheet, where the quantity of materials issued, hours spent by different class of employees, amount of other expenses and share of overheads are recorded. This is helpful in knowing the total cost, profitability etc. of a job. The following is an illustrative format of Job Cost card/ sheet.

Format of Job Cost Sheet:

JOB COST SHEET					
Description: _____ Blue Print No.: _____ Material No.: _____ Reference No.: _____			Job No.: _____ Quantity: _____ Date of delivery: _____ Date commenced: _____ Date finished: _____		
Date	**Reference**	**Details**	**Material**	**Labour**	**Overhead**
		Total			

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Summary of costs	Estimated (₹)	Actual (₹)	For the job _____ Units produced _____ Cost/unit _____ Remarks _____ Prepared by: _____ Checked by: _____
Direct material cost Direct wages Production overhead			
PRODUCTION COST			
Administration and Selling & Distribution Overheads			
TOTAL COST			
PROFIT/LOSS			
SELLING PRICE			

Collection of Costs for Job Costing

① Material Cost

↓

Separate Stores requisitions for each job

↓

Prepared from BOM

② Labour Cost

↓

From Job time Cards / Sheets

③ Overheads

↓

Same as OH Chapter

3 steps

Treatment of Spoiled & Defective Work

* **Spoiled work is the quantity of production that has been totally rejected and cannot be rectified.**

Defective work refers to production that is not as perfect as the saleable product but is capable of being rectified ~~and brought to the required degree of~~

	Circumstances	Treatment
(1)	**Where a percentage of defective work is allowed in a particular batch as it cannot be avoided.**	When a normal rate of defectives has already been established, if the actual number of defectives is within the normal limit or is near thereto **the cost of rectification will be charged to the whole job and spread over the entire output of the batch**. If, on the other hand, the number of defective units substantially exceeds the normal, the cost of rectification of the number which exceeds the normal will be written off as a loss in the Costing Profit and Loss Account.
(2)	**Where defect is due to bad workmanship.**	In this case cost of rectification will be abnormal cost, *i.e.,* not a legitimate element of the cost. Therefore, **the cost of rectification shall be written off as a loss**, unless by an arrangement, it is to be recovered as a penalty from the workman concerned. It is possible, however that the management did provide for a certain proportion of defectives on account of bad workmanship as an unavoidable feature of production. If that be the case, the cost of rectifying to the extent provided for by the management will be treated as a normal cost and charged to the batch.
(3)	**Where defect is due to the Inspection Department wrongly accepting incoming material of poor quality.**	In this case the **cost of rectification will be charged to the department and will not be considered as cost of manufacture of the batch.** Being an abnormal cost, it will be written off to the Costing Profit and Loss Account.

v.v.imp

ACCOUNTING OF COSTS FOR A JOB

↓

* Entries same as Cost accounting Systems (Non - Integrated)

Ill ① , ② Solved.

4.3 Difference between Job Costing and Process Costing

The main points which distinguish job costing and process costing are as below:

Job Costing	Process Costing
(i) A Job is carried out or a product is **produced by specific orders**.	The process of producing the product has a continuous flow and the **product produced is homogeneous.**
(ii) Costs are determined **for each job.**	Costs are compiled on time basis i.e., for production of a given accounting period **for each process** or department.
(iii) **Each job is separate and independent** of other jobs.	**Products lose their individual identity** as they are manufactured in a continuous flow.
(iv) Each job or order has a number and costs are collected against the same job number.	The unit cost of process is an average cost for the period.
(v) **Costs are computed when a job is completed**. The cost of a job may be determined by adding all costs against the job.	**Costs are calculated at the end of the cost period.** The unit cost of a process may be computed by dividing the total cost for the period by the output of the process during that period.
(vi) As production is not continuous and each job may be different, so **more managerial attention is required for effective control.**	Process of production is usually standardized and is therefore, quite stable. Hence **control here is comparatively easier**.

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JOINT AND BY PRODUCTS

CONCEPT

INTRODUCTION

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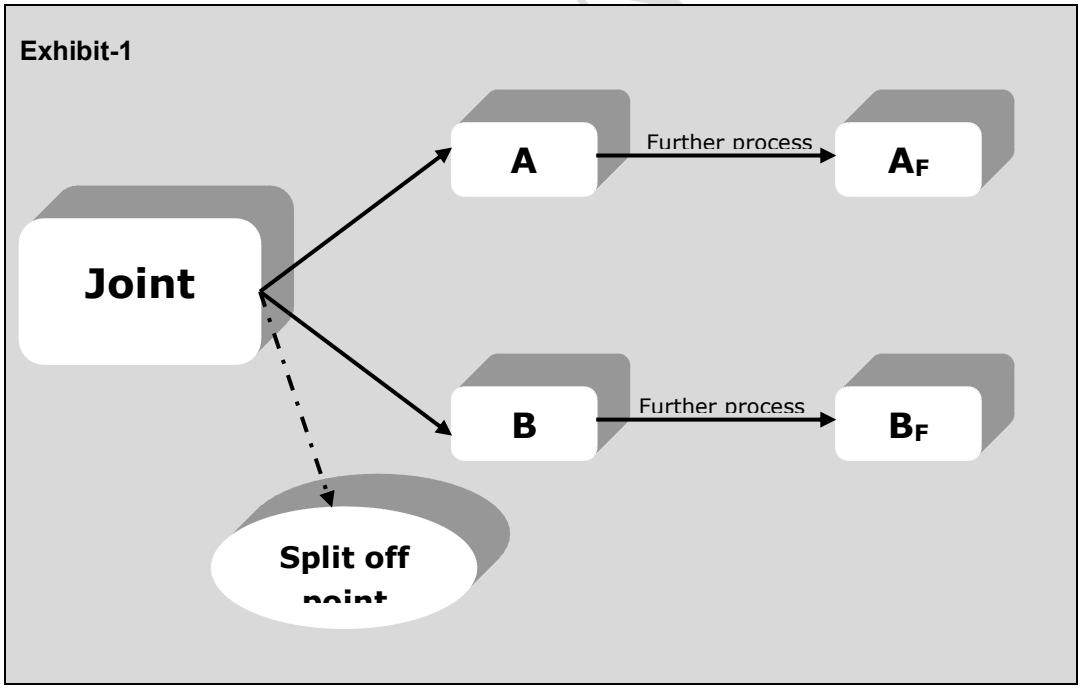
Introduction

When a group of individual products are simultaneously produced from a common process, the process is referred as **joint process**. In the Exhibit-1 below it could be seen that from a joint process two products emerge namely A and B. These products which arise from a common process are referred as **joint products**. In a joint product situation, production of one product makes it inevitable, the production of the other products.

The significant feature of a joint process is that, the products are not identifiable as different products until a specific point in the production is reached. That specific point in the production process where the products physically emerge as distinguishing products is referred as **split off point**. The identification of the spit off point in the joint process is very important because all the cost spent before the split off point are cost incurred for all the joint products as a common cost or joint cost.

The joint products can be sold as soon as they emerge from the joint process [at split off point] or can be further processed into a much more refined product and sold at a higher market value. In the Exhibit-1, products A & B can be sold at split of point or can be further process into improved products A_F & B_F and sold at a higher market value. The cost incurred for further processing a product is referred to as Further Processing Cost [FPC]. These costs are also referred to as "Post separation cost", "Separable cost" or "Specific cost".

Exhibit-1

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Since joint costs are incurred as common cost for all the joint products, it should be apportioned on a suitable basis among the joint products. For stock valuation and profit computation purpose, apportionment of joint cost is inevitable because cost of a product is nothing but its share of joint cost plus its further processing cost.

Cost of a Product = Share of Joint cost + Further processing cost

In the first part of this chapter we would see the different methods used for apportioning joint cost among the joint products. Then in the next part we would see the meaning of by product and the treatment of by product cost and income in cost accounts. The final part of this chapter provides framework for making decisions regarding further processing.

Methods of apportionment of Joint cost

In the earlier discussion we have seen that joint costs are common costs and needs to be apportioned between the joint products. In this section we would be seeing the different methods used for apportioning the joint cost.

B. Physical units Method

Under this method joint costs allocated to joint products in proportion to their volume. The volume depending on the nature of output like solid, liquid and gas may be measured in different ways like Kilos, litres, gallons, tonnes etc. Here each unit is assumed to receive the same benefit from the joint cost. Let us now see from example 1, how joint costs are apportioned on the basis of physical units.

Example 1:

From a joint process three joint products emerge, namely A,B and C. The joint cost incurred in manufacturing the joint products is Rs 500000. The output details and the Selling price of the joint products are given in the table below. Apportion the joint cost on the basis of Physical units and prepare a product wise profitability statement. Also comment on the effectiveness of Physical units method as a method of joint cost apportionment.

Products	Units produced	Selling price
A	30000	7.5
B	20000	25
C	50000	3

Solution:

I Apportionment of Joint cost on the basis of physical units

Products	Units	%	Joint cost
A	30000	30	500000x30% = 150000

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B	20000	20	500000x20% = 100000
C	50000	50	500000x50% = 250000
Total	100000	100	500000

II Computation of Profitability of joint products

Particulars	A	B	C	Total
Units	30000	20000	50000	
SP	7.5	25	3	
Sales	225000	500000	150000	875000
Less: Joint cost	(150000)	(100000)	(250000)	(500000)
Profit	75000	400000	(100000)	375000

.

C. Market value methods

Here the joint costs are apportioned to joint products on the basis of their respective market values [sales values]. Since the joint costs are allocated to the products on the basis of value of their output, the profit measurement is even. Low value product gets lower share of joint cost and high value product gets higher share.

The market value of the joint products are of three types namely (a) Market value at split off point (b) Market value after further processing and (c) Net Realisible value. Depending on the market value used for the joint cost apportionment, there are three methods of apportioning joint costs using the market measures. They are as follows:

- Sales value at split of point method
- Final sales value method [sales value after further processing]
- Net Realisible value at split off point method.

Let us now see from example 2, how joint costs are apportioned under these three methods.

Example 2:

From a joint process three joint products emerge, namely A,B and C. The joint cost incurred in manufacturing the joint products is Rs 500000. The output details, the selling price and further processing cost of the joint products are given in the table below.

Products	Units produced	Selling price at split off	Selling price after further processing	Further processing cost
A	30000	7.5	10	30000
B	20000	25	30	80000
C	50000	3	5	50000

Apportion the joint cost on the basis of the following methods and also calculate the gross margin % under each of the methods.

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- Sales value at split of point method
- Final sales value method [sales value after further processing]
- Net Realisible value method.

Solution:

Part 1: Sales value at split off point method

Products	Units	SP	Sales value	%	Joint cost
A	30000	7.5	225000	25.72	500000x25.72% = 128600
B	20000	25	500000	57.14	500000x57.14% = 285700
C	50000	3	150000	17.14	500000x17.14% = 85700
Total			875000	100	500000

Part 2: Sales value after further processing method

Products	Units	SP	Sales value	%	Joint cost
A	30000	10	300000	26.09	500000x26.09% = 130450
B	20000	30	600000	52.17	500000x52.17% = 260850
C	50000	5	250000	21.74	500000x21.74% = 108700
Total			1150000	100	500000

Part 3: Net Realisible value method: (Imaginary S.P @ Split off point)

NRV = Sales value after further processing – Further processing cost

A. Calculation of Net Realisible Value [NRV]

Product	SVAFP	FPC	NRV
A	300000	30000	270000
B	600000	80000	520000
C	250000	50000	200000

- SVAFP = sales value after further processing
- FPC = Further processing cost

B. Apportionment of joint cost on the basis of NRV

Products	NRV	%	Joint cost
A	270000	27.27	500000x27.27% = 136350
B	520000	52.53	500000x52.53% = 262650

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C	200000	20.20	500000x20.20% = 101000
Total	990000	100	500000

Market value of Production and not market value of goods sold

Example 3:

From a joint process two joint products emerge, namely A and B. The joint cost incurred in manufacturing the joint products is Rs 500000. The output, units sold and the selling price of the joint products are given in the table below.

Products	Production [units]	Sales [units]	SP
A	30000	20000	10
B	20000	10000	5

Apportion the joint cost on sales value basis.

Solution:

I The wrong way to apportion joint cost

Products	Units	SP	Sales value	%	Joint cost
A	20000	10	200000	80	500000x80% = 400000
B	10000	5	50000	20	500000x20% = 100000
Total			250000	100	500000

II The Correct way to apportion joint cost

Products	Units	SP	Sales value	%	Joint cost
A	30000	10	300000	75	500000x75% = 375000
B	20000	5	100000	25	500000x25% = 125000
Total			400000	100	500000

C. Constant Gross Margin Percentage Method

Example 4:

From a joint process three products A, B & C arises. The joint cost incurred in the joint process amounts to Rs 1500000. Other details about the products are as follows:

Products	Sales	Further processing cost
A	2500000	750000
B	1500000	250000
Total	4000000	100000

Apportion the joint cost among the joint products in such a manner that, both the products report the same gross margin percentage.

Solution:

Step 1: Calculation of gross margin % for the entire process

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Particulars	Amount
Sales	4000000
Less: Joint cost	(1500000)
Less: Further processing cost	(1000000)
Gross margin	1500000
Gross margin % [1500000/4000000x100]	37.50%

Step 2: Apportionment of Joint cost

Particulars	A	B	Total
Sales	2500000	1500000	4000000
Less: Gross margin [37.50%]	(937500)	(562500)	(1500000)
Total manufacturing cost	1562500	937500	2500000
Less: Further processing cost	(750000)	(250000)	(1000000)
Joint cost allocated	812500	687500	1500000

D. Marginal cost method

(Contribution Margin method)

In this method, joint costs are classified into two types namely (a) Variable joint cost and (b) Fixed joint cost. The variable joint costs are apportioned in the ratio of physical units and the fixed joint cost in the ratio of contribution.

Example 5:

From the following information apportion variable joint cost and fixed joint cost on suitable basis and obtain profit/loss for each of the joint products –

- Sales A 100 kg. @ Rs.60 per kg. and B 120 kg. @ Rs.30 per kg.
- Total joint cost: Variable joint cost Rs.4,400 and fixed joint cost Rs.3,900.

Solution:

I Apportionment of variable joint cost in the ratio of physical units

Products	Units	%	Variable Joint cost
A	100	45.45	4400x45.45% = 2000
B	120	54.55	4400x54.55% = 2400
Total	220	100	4400

II Apportionment of Fixed joint cost in the ratio of contribution

Products	Sales	Variable cost	Contribution	%	Fixed joint cost
A	6000	2000	4000	76.92	3900x76.92% = 3000
B	3600	2400	1200	23.08	3900x23.08% =900
Total	9600	4400	5200	100	3900

III Ascertainment of profit of each of the joint products

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Particulars	A	B	Total
Sales	6000	3600	9600
Less: Variable joint cost	(2000)	(2400)	(4400)
Contribution	4000	1200	5200
Less: Fixed joint cost	(3000)	(900)	(3900)
Profit	1000	300	1300

E. Estimated joint cost method

Example 6:

A factory produces three products, A, B and C, which originate from a joint process. Other details are:

	Joint cost	Subsequent processing costs		
		Product A	Product B	product C
	Rs.	Rs.	Rs.	Rs.
Material	10,000	700	650	290
Labour	1,800	210	200	190
Overheads	800	90	50	120
Total	12,600	1,000	900	600
Total sales value		10,000	7,000	6,000
Estimated profit on sales value		20%	30%	40%

Prepare a statement showing apportionment of joint costs of manufacture. Find the total cost for each product.

Solution:

I Calculation of Estimated joint cost

Particulars	A	B	C
Sales	10000	7000	6000
Less: Estimated profit	(2000)	(2100)	(2400)
Estimated total cost	8000	4900	3600
Less: Further processing cost	(1000)	(900)	(600)
Estimated joint cost	7000	4000	3000

II Apportionment of Actual joint cost in the ratio of estimated joint cost

Products	Estimated joint cost	%	Actual joint cost
A	7000	50	12600x59% = 6300
B	4000	28.57	12600x28.57% = 3600
C	3000	21.43	12600x21.43% = 2700
Total	14000	100	12600

III Calculation of total cost of the products

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Particulars	A	B	C
Share of joint cost	6300	3600	2700
Further processing cost	1000	900	600
Total cost	7300	4500	3300

Treatment of By-Product in cost accounts

Example 7:

A factory produces three products from joint process namely Joint products A & B and by-product C. Joint cost incurred in the joint process is Rs 525000. Other details are as follows:

A	30000 kg
B	20000 kg
C	5000 kg

The by-product is further processed at a cost of Rs 5000 and sold for Rs 6 per kg. Apportion the joint cost on the basis of physical units.

Solution:

- Net income from by-product = [5000x6] – 5000 = 25000
- Joint cost to be apportioned to joint product = 525000 – 25000 = 500000
- Joint cost apportionment

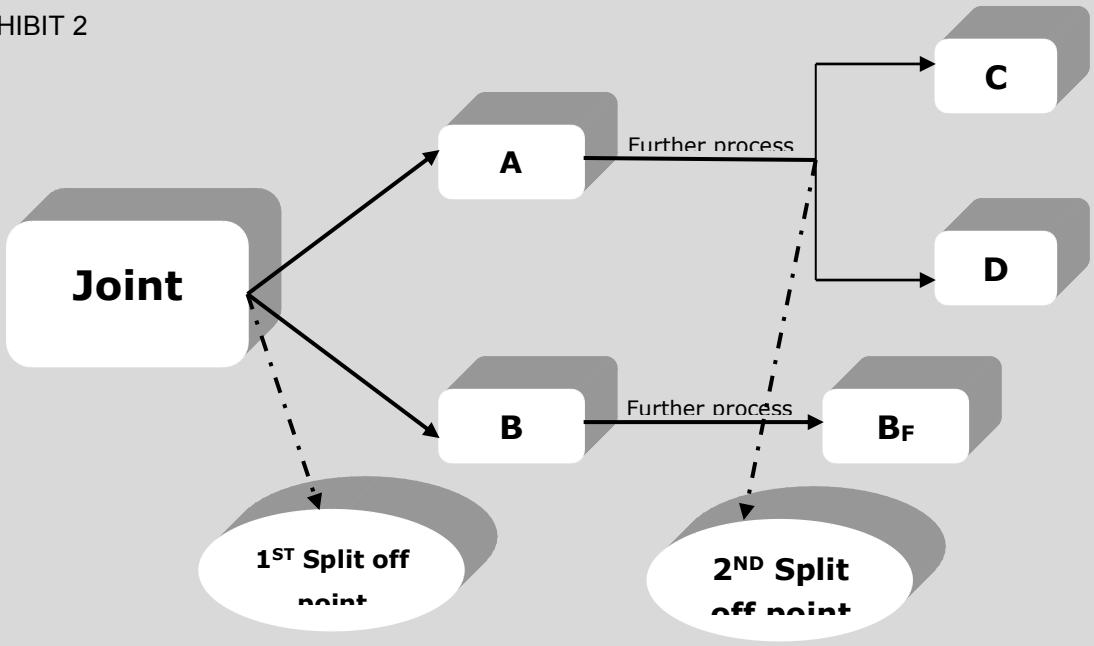
Products	Units	%	Joint cost
A	30000	60	500000x60% = 300000
B	20000	40	500000x40% = 200000
Total	50000	100	500000

Note: Alternatively, the by-product income can be credited to costing P&L and the full joint cost of Rs 525000 can be apportioned to the joint products.

Concept of Multiple Split off Point

Till now we have seen how to apportion joint cost when there is only one split off point in the production process. Now we will see the process of joint cost apportionment when there are more than one split off point in the production process. Multiple split off point will arise when further processing of a joint product results in more than one type of improved product. This can be through Exhibit 2:

EXHIBIT 2



Let us now see two comprehensive examples to understand how joint cost should be apportioned when there is multiple split off point in a production process. Example 8 is a multiple split off point problem where joint cost is apportioned using physical units method and Example 9 is a multiple split off point problem where joint cost is apportioned using NRV method.

Example 8:

A distillation plant, which works continuously, process 1,000 tonnes of raw material each day. The raw material costs Rs.4 per tonne and the plant operating costs per day are Rs.2,600. From the input of raw material the following output is produced:

	(%)
Distillate X	40
Distillate Y	30
Distillate Z	20
By-product B	10

From the initial distillation process, Distillate X passes through a heat process which costs Rs.1,500 per day becomes product X which requires blending before sale.

Distillate Y goes through a second distillation process costing Rs.3,300 per day and produces 75% of product Y and 25% of product X1.

Distillate Z has a second distillation process costing Rs.2,400 per day and produces 60% of product Z and 40% of product X2.

The three streams of products X, X1 and X2 are blended, at a cost of Rs.1,155 per day to become the saleable final product XXX.

There is no loss of material from any of the process. By-product B is sold for Rs.3 per tonne and such proceeds are credited to the process from which the by-product is derived. Joint costs are apportioned on a physical unit basis.

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You are required to:
(a) Draw a flow chart, flowing from left to right, to show for one day of production the flow of material and the build up of the operating costs for each product.
(b) Present a statement for management showing for each of the products XXX, Y and Z, the output for one day, the total cost and the unit cost per tonne;
(c) Suggest an alternative method for the treatment of the income receivable for by-product B than that followed in this question. (Figures are not required).

Example 9:

Raw material "Z" when processed yields two products – "A" (50%) and "B" (40%) and a residual waste "W" (10%).
Product "A" has to be processed further which yields jointly two other products – "C" (60%) and "D" (40%). "C" can be sold as it is. "D" has to be processed further to make it saleable.
Product "B" has also to be processed further to make it into a saleable product "E".
Sale price of C, D and E are Rs. 15, Rs. 20, and Rs. 12.5 per kg respectively.
Input batch: 8,000 kg of raw material "Z". Cost details are as follows (Rs.):

	1st split-off processing "Z"	2nd split-off processing "A"	Separable	
			B	D
Material	20000	5000	--	--
Labour	8000	1500	2500	1000
Overhead	4000	1500	1500	1000
Total	32000	8000	4000	2000

You are required
(i) Determine NRV at split-off points;
(ii) Allocate joint costs;
(iii) Calculate final cost of each product.

Relevance of joint cost in decision making

A. Further Process or not

In our earlier discussions we have seen that a joint product can be sold as soon as it emerges from the joint process [at split off point] or can be further processed into a more refined product and sold. Should the product be sold at split off point or after further processing, should be decided based on the cost-benefit analysis.

The benefit from further processing the product is the extra sales revenue which the improved product gives due to further processing and the cost of further processing is the "Further Processing Cost". If the benefit exceeds the cost, then further process else sell the product at split off point.

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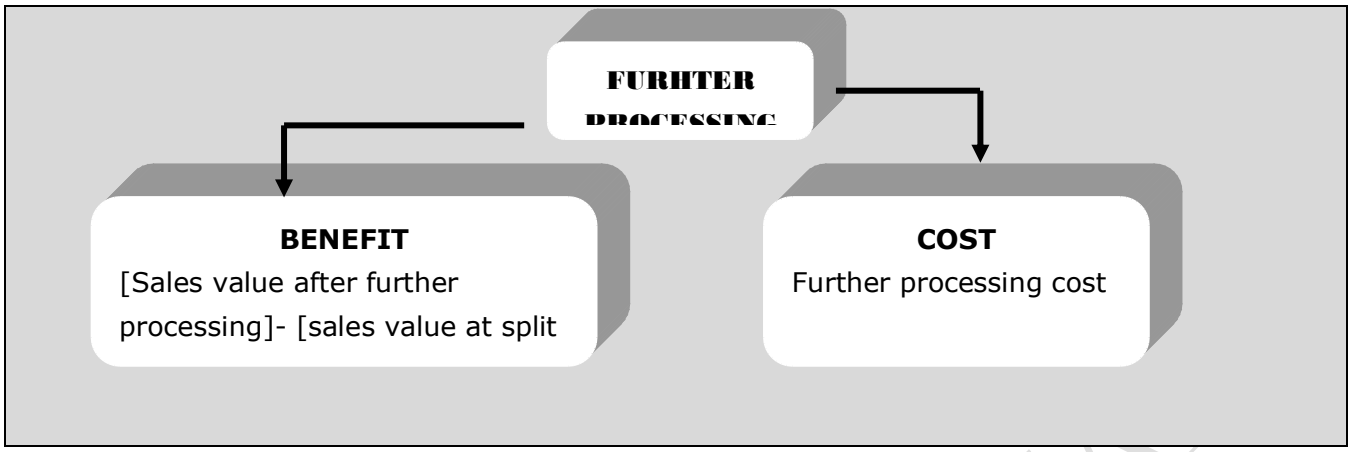

Joint costs are irrelevant cost for further processing decisions because they are not incremental cost. Whether a product is further processed or sold at split of point, these joint cost do not change, they remain same under both the alternatives.

Example:10

From a joint process two product A and B emerge. The joint cost incurred in the joint process is Rs 1000000. Other details are as follows:

Products	Units	SP at split off	SP after further processing	Further processing cost
A	50000	10	12	150000
B	50000	10	15	150000

Advise the stage of production at which the joint products should be sold.

B. Evaluation of specific offer

Now we will be looking at another decision making area in joint product situation. Some times companies may be getting a special order for sale of one of the joint product. In such a situation one should understand that production of that product alone in an independent production process is not possible. To produce the product having the specific offer, we need to produce other joint products also. In such a situation, when we have to decide whether the specific order is feasible or not, it is not only the incremental cost incurred for production of that product is relevant, but variable joint cost also becomes relevant for the decision making. This can be understood with the help of the following example.

Example 11:

A company incurs joint production cost of Rs 300000 for production of two products A & B. This joint cost comprises of Rs 240000 as fixed cost and Rs 5 per unit as variable cost. Other details are as follows:

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Products	Units produced	Units sold	FPC per unit	SP
A	10000	10000	8	40
B	2000	2000	10	35

A new customer approaches the company with an offer to purchase 600 units of Product B at Rs 25 per unit. This sale will not affect the market price to the other customers. Should the specific offer be accepted?

Process accounts - Joint Products - Stock valuation

Example 12:

A company manufactures two types of industrial sealant by passing materials through two consecutive processes. The results of operating the two processes during the previous month are shown below:

Process 1	
Costs incurred (Rs.):	
Materials 7,000 kg at Rs.0.50 per kg	3,500
Labour and overheads	4,340
Output (kg):	
Transferred to process 2	6,430
Defective production	570
Process 2	
Cost incurred (Rs.):	
Labour and overheads	12,129
Output (kg):	
Type E sealant	2,000
Type F sealant	4,000
By-product	430

It is considered normal for 10% of the total input from process 1 to be defective and all defective output is sold as scrap at Rs.0.40 kg. Losses are not expected in process 2. There was no work in process at the beginning or end of the month and no opening stocks of sealants.

Sales of the month's output from Process 2 were:

Type E sealant	1,100 kg
Type F sealant	3,200 kg
By-product	430 kg

The remainder of the output from Process 2 was in stock at the end of the month. The selling prices of the products are: Type E sealant Rs.7 per kg and Type F sealant Rs.2.50 per kg. No additional costs are incurred on either of the two main products after the second process. The by-product is sold for Rs.1.80 per kg after being sterilized, at a cost of Rs.0.30 per kg, in subsequent process. The operating costs of process 2 are reduced by the net income receivable from sales of the by-product.

Required:

(a) Calculate, for the previous month, the cost of the output transferred from process 1 into process 2 and the net cost or saving arising from any abnormal losses or gains in process 1.

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(b) Calculate the value of the closing stock of each sealant and the profit earned by each sealant during the previous month using the following methods of apportioning costs to joint products:
(i) According to weight of output,
(ii) According to market value of output.

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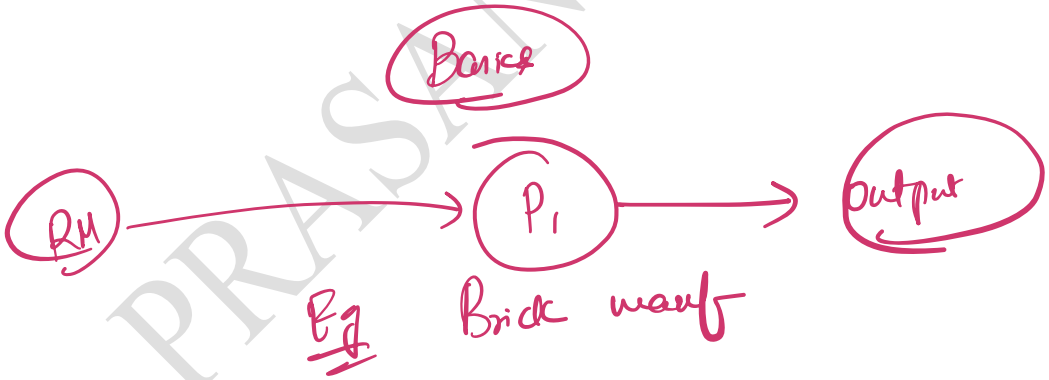
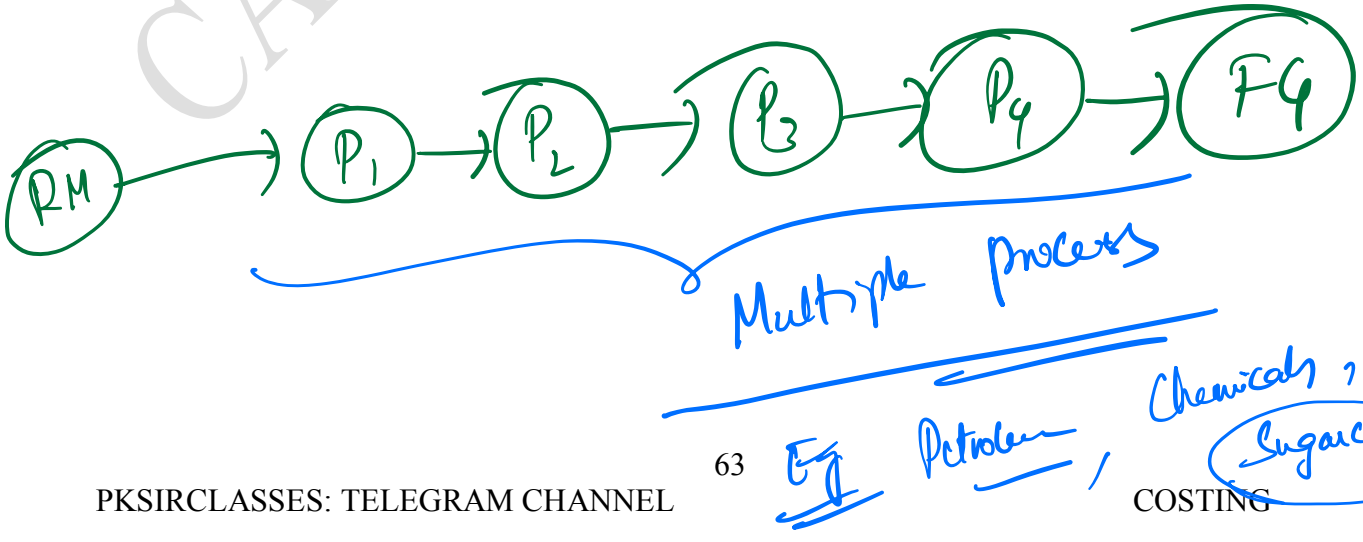
CONCEPT

INTRODUCTION

PROCESS COSTING





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Introduction

Product costing is one of the main objectives of a costing system. It involves two stages namely (a) accumulating the costs incurred in the production process and (b) assigning these costs to every unit produced. The product costing system used in manufacturing organizations can be classified into two types namely Job costing system and unit costing system. Which system should be used by an organization depends upon the nature of its manufacturing process and the product manufactured.

Those organizations which produce customer specific products, in distinct batches or job orders and which are non-repetitive use job costing system. Job costing system accumulates the cost of every job order separately for costing purpose.

In organizations where homogenous goods are manufactured in mass scale on a repetitive basis, unit costing system is used. Under this system, the total cost is accumulated and then divided by the number of units produced to find out the cost per unit. In other words the products are valued at average cost and each unit is not separately costed.

Process costing system is a variant of this unit costing system. It is used in those industries where large numbers of identical units are manufactured in a continuous flow. Examples of some products which are costed through process costing system are paper, textiles, food processing, checals and petroleum.

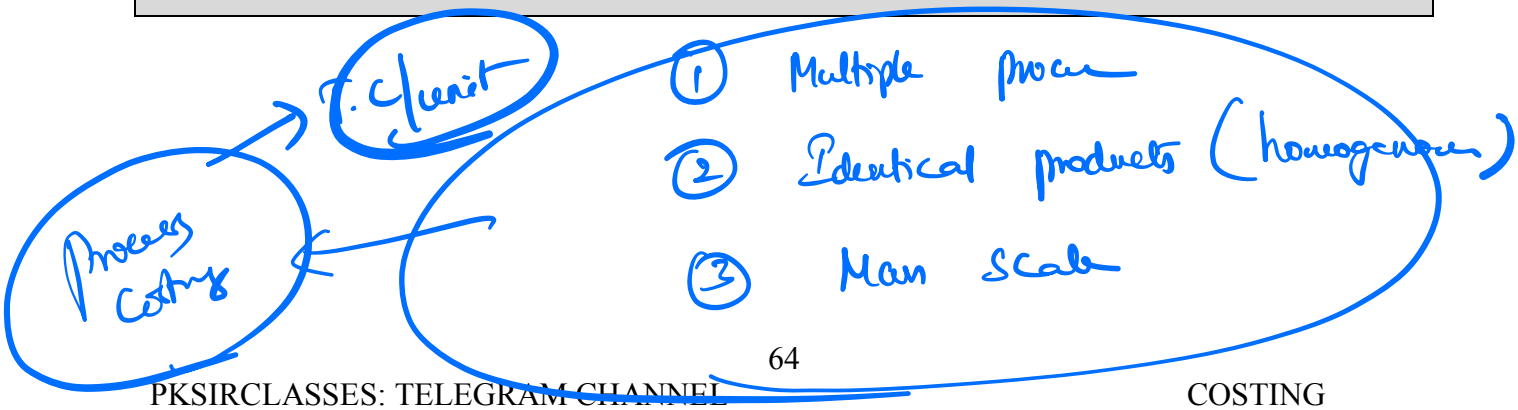
Let us understand through a small example how Products are costed under a process costing system.

Example 1

Product A is produced after three distinct processes. The following information is obtained from the accounts of a period: -

Items	PROCESS			
	Total Rs.	I Rs.	II Rs.	III Rs.
Direct material	2,200	1,800	300	100
Direct wages	400	100	200	100
Direct expenses	500	300	-	200

Production overhead incurred is Rs.800 and is covered @ 200% of direct wages. Input into Process I during the period was 100 kg. @ 10 per kg; there was no opening or closing stocks. Prepare process cost accounts assuming there is no process loss.



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Solution:

Main RM

By Xfr to P II

Ancillary Secondary

Process I Account

Particulars	Units	Amount	Particulars	Units	Amount
To Input Materials	100	1000	By Process II	100	3400
To Materials	-	1800			
To Labour	-	100			
To Direct expenses	-	300			
To Production Overhead	-	200			
Total	100	3400	Total	100	3400

Cost per unit of Process I output = 3400/100 = Rs 34 per unit.

Process II Account

Particulars	Units	Amount	Particulars	Units	Amount
To Process I	100	3400	By Process III	100	4300
To Materials	-	300			
To Labour	-	200			
To Direct expenses	-	-			
To Production Overhead	-	400			
Total	100	4300	Total	100	4300

Cost per unit of Process II output = 4300/100 = Rs 43 per unit.

Process III Account

Particulars	Units	Amount	Particulars	Units	Amount
To Process II	100	4300	By Finished goods	100	4900
To Materials	-	100			
To Labour	-	100			
To Direct expenses	-	200			
To Production Overhead	-	200			
Total	100	4900	Total	100	4300

Cost per unit of Process I output = 4900/100 = Rs 49 per unit.

Understanding Process accounts

The debit side of Process account represents input into the process and the credit side represents the output given by the process. In any process we put some basic raw materials into it, further process it by spending some labour and other costs on it. This processed raw material which is the output of the current process becomes the input of the subsequent process, which is further processed and transferred to the next process and so on. In the last process when the goods are completed, it is transferred to finished goods account. From this it could be understood that, output of the last process only can be called as finished output and output of all the other processes starting from Process I to the penultimate process are

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all only unfinished goods or WIP. Hence all the process accounts are nothing but Work in progress accounts only.

Types of Material input

In each process we can see that there are two types of raw materials. There is a main raw material which passes through all the processes to become the finished goods. It is on this material work is done in all the process. It is this material which becomes the finished output. All the processes are undertaken only to process this material. From now onwards we call this material by the name Transferred in Material [TIM]. The second type of material is the ancillary materials which are added in each process to act as a catalyst for processing the TIM. In the units column in the process accounts we write the units of the main raw material only and not the ancillary materials.

Types of output

In the above example the cost per unit Rs 49 can be arrived alternatively as follows:

Input raw materials	1000
Materials	2200
Labour	400
Direct expenses	500
Production overheads	800
Total cost of all the three processes	4900
Units of finished output	100
Cost per unit	Rs 49

The above computation is very simple. Then why should we unnecessarily prepare three process accounts for valuing the cost per unit of this finish product?

If all the units that are put into Process I becomes the finished goods in Process III, then this computation will suffice. But normally there are three things that could happen to units that are put as input into any process:

(a) Some units will be fully completed and transferred to next process
(b) Some units may remain incomplete in the process. These units are called as WIP.
(c) Some units may be lost in the process. The loss which so occurs can be normal or abnormal loss

Suppose a loss takes place in first Process, Process I cost only can be attributed to such loss. If it happens to be a loss in second Process, then Process I and II cost should be attributed to such loss and so on. Same analogy applies to WIP in different processes. Hence we can see that preparation of all the process accounts is inevitable to facilitate proper loss and stock valuations.

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The objective of this chapter is to understand how the process outputs such as completed units, WIP and loss should be valued and also learn to prepare process accounts.

Specimen Format of a Process Account

Particulars	Units	Amount	Particulars	Units	Amount
To Opening WIP To Materials To Wages To Overheads To Abnormal gain			By Normal Loss By Transfer to next process By Abnormal loss By Closing WIP		
Total			Total		

Process Accounts with losses

In Example 1, we have seen how to prepare a simple process account with no losses or WIP. Now we are going to see how process accounts are prepared when losses arise in the process.

Example 2

Product B is obtained after it passes through three distinct processes. The following information is obtained from the accounts for the week:

Items	Total Rs.	PROCESS I Rs.	II Rs.	III Rs.
Direct material	7,542	2,600	1,980	2,962
Direct wages	9,000	2,000	3,000	4,000
Production overhead	9,000			

1,000 units Rs.3 each were introduced to process I. There was no stock of materials or work-in-process at the beginning or end of the period. The output of each process passes direct to the next process and finally to finished stores. Production overhead is recovered on 100% of direct wages. The following additional data are obtained:

	Output during the week	Percentage of normal loss to input	Value of scrap per unit
Process I	950 units	5%	Rs.2
Process II	840 units	10%	Rs.4
Process III	750 units	15%	Rs.5

Prepare process cost accounts and abnormal gain or loss accounts.

Solution:

Process I Account

Particulars	Units	Amount	Particulars	Units	Amount

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To Main Input material	1000	3000	By Normal loss	50	100
To Material	-	2600	By Process II	950	9500
To Labour	-	2000			
To Overheads	-	2000			
Total	1000	9600	Total	1000	9600

Working note 1: Cost per unit

Cost per unit = [Total cost – Normal loss scrap] / [Input – Normal loss]
= [9600-100] / [1000-50] = Rs 10

Explanation:

The total cost spent in process 1 is Rs 9600. This cost is spent for processing 1000 units of input. However 950 units only resulted as good output which is transferred to next process and the balance 50 units is lost in the process. It is normal for the process to have 5% of the input as loss. Thus when 1000 units are put as input, we expect 50 units to be lost. These expected losses are called as normal loss. The process cost of Rs 9600 has been spent on both good units produced and the normally lost units and hence needs to be apportioned between the two. But in the chapter 'Materials' itself we have seen that, no share of cost will be given to normally lost units and that the cost of normally lost units will be taken by the good units produced. Hence the cost per unit is inflated to include normal loss cost also, which are then given to the good output produced.

The units lost generate scrap income of Rs 100. This scrap income is credited to the process account to reduce the process cost. Hence the net process cost of Rs 9500 only is taken for valuing the completed output transferred to the next process.

Process II Account

Particulars	Units	Amount	Particulars	Units	Amount
To Process I	950	9500	By Normal loss	95	380
To Material	-	1980	By Process III	840	16800
To Labour	-	3000	By Abnormal loss	15	300
To Overheads	-	3000			
Total	950	17480	Total	950	17480

Working note 1: Cost per unit

Cost per unit = [Total cost – Normal loss scrap] / [Input – Normal loss]
= [17480-380] / [950-95] = Rs 20

Explanation:

The 950 units completed costing Rs 9500 is now transferred to Process II for further processing. Out of these 950 units processed in this process, 840 units were completed and transferred to Process III, while

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110 units were lost during processing. It is normal for the process to have 10% of its input to be lost. Hence a loss of 95 units [950x10%] is an expected loss. Since the actual loss is 110 units, the unexpected loss is 15 units. This loss is referred as abnormal loss.

The company has spent Rs 17480 for processing 950 units. This cost is spent for good units as well as units lost and hence needs to be apportioned between the two. As we have seen earlier that normal loss will not be given any share of cost, we need to apportion the process II cost between good units and abnormally lost units only. Therefore after crediting the scrap income from normal loss units the net cost of Rs 17100 is apportioned between good units and abnormal loss. This abnormal loss cost is transferred to abnormal loss account. In that account after netting off the scrap income obtained from sale of abnormal loss units, the balance is transferred to costing P&L account.

To summarise, the units which are abnormally lost are valued in the same way as completed units. The completed unit's value is transferred to next process account while the abnormal loss value is transferred to abnormal loss account.

Process III Account

Particulars	Units	Amount	Particulars	Units	Amount
To Process II	840	16800	By Normal loss	126	630
To Material	-	2962	By Finished goods	750	28500
To Labour	-	4000			
To Overheads	-	4000			
To Abnormal gain	36	1368			
Total	876	29130	Total	876	29130

Working note 1: Cost per unit

Cost per unit = [Total cost – Normal loss scrap] / [Input – Normal loss]

= [27762-630] / [840-126] = Rs 38

Explanation:

The 840 units completed costing Rs 16800 is now transferred to Process III for further processing. Out of these 840 units processed in this process, 750 units were completed and transferred warehouse as finished goods, while 90 units were lost during processing. It is normal for the process to have 15% of its input to be lost. Hence it was expected that 126 units would be lost during the production process in this process [840x15%]. However only 90 units were lost and the process unexpectedly produced 36 units. This is referred as abnormal gain.

The abnormal gain is valued in the same way as the completed units and is transferred to abnormal gain account. From there after netting of the opportunity loss of scrap income, it is credited to costing P&L account.

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Abnormal Loss Account

Particulars	Units	Amount	Particulars	Units	Amount
To Process II	15	300	By Cash	15	60
			By Costing P&L	-	240
Total	15	300	Total	15	300

Abnormal Gain Account

Particulars	Units	Amount	Particulars	Units	Amount
To Normal loss	36	180	By Process III	36	1368
To Costing P&L	-	1188			
Total	36	1368	Total	36	1368

Process account with Work In Progress

We have already seen in our earlier discussions that three things could happen to the units put into a process namely some units may be completed, some units may be lost and some units may be partially complete. Those units which are not yet fully complete at the end of the period are called as Work in Progress. In our previous discussions we have seen how we should value units fully completed and units which are lost. Now we are going to see how WIP should be valued and process accounts be prepared when there is WIP in the process.

1000 units @ 50% ⇒ E.U = 500

WIP is of two types namely Closing WIP and Opening WIP. Those units that are lying incomplete at the end of the period in the production process are called as closing WIP. The closing WIP at the end of this period becomes the opening WIP in the next period. In this part we will be discussing two examples one explaining how to prepare process account when there is only closing WIP and the next explains how to prepare process account when there is both opening and closing WIP.

Example 3: Process account with only closing WIP
In Process I, 1,000 units were introduced during January, 200 units 40% complete in all respects remained as closing work-in-progress at the end of the month. Compute the equivalent production and obtain the cost of closing work-in-progress if total process cost during the period be Rs.1,760.

Solution:

When there is WIP, four steps are involved in solving such a problem they are
(a) Statement of Equivalent units
(b) Statement of cost per Equivalent unit
(C) Statement of apportionment
(d) Process account

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I Statement of equivalent units

Input		Output		Equivalent units	
Items	Units	Items	Units	%	Units
Input	1000	Completed	800	100%	800
		Closing WIP	200	40%	80
Total	1000	Total	1000		880

II Statement of cost per Equivalent units

Items	Cost	Equivalent units	Cost per equivalent unit
Total cost	1760	880	2

III Statement of apportionment

A. Closing WIP

80 units x 2 = Rs 160

B. Completed units

800 units x 2 = Rs 1600

Process I account

Particulars	Units	Amount	Particulars	Units	Amount
To input	1000	1760	By Process II	800	1600
			By Closing WIP	200	160
Total	1000	1760	Total	1000	1760

Explanation:

Concept of equivalent units:

In Process I 1000 units were processed at a cost of Rs 1760. The process resulted in an output of 800 completed units and 200 WIP units 40% complete. It would be grossly unfair if the units 100% complete and those 40% complete are valued at same cost per unit i.e we should not compute cost per unit as 1760/1000 = 1.76 per unit and value completed units at Rs 1408 [800 x 1.76]; and WIP at Rs 352 [200x1.76]. The reason is that if cost of one completed unit is say Re X, the WIP should have only 40% of X [the completed unit cost] as only 40% of the work only has been done. The mistake that is done in our cost per unit computation is that we plainly added 800 completed units and 200 WIP units. This is wrong because two dissimilar items cannot be summed up. 2 full apples and 4 half apples will not make it into 6 apples. We need to convert the incomplete units into equivalent completed units. We can consider 4 half

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apples as equivalent to 2 full apples [4x50%]. Similarly 200 units 40% complete can be equated to 80 units 100% complete. This is what we refer as concept of equivalent units. Whenever WIP exist, we should use this concept to convert it into equivalent completed unit and then find out the cost per equivalent unit to value the finished product and the WIP.

In the equivalent unit statement we have three main columns Input, Output and Equivalent units. 1000 units are put into the process as Input. The output being 800 completed units and 200 units WIP units. For the 800 units 100% work has been done and for the 200 units 40% work has been done. Thus the equivalent unit for the completed units and WIP is 800 and 80 respectively.

Total cost spent in this process is Rs 1760. This cost is spent to manufacture 880 equivalent units. Thus the cost per equivalent unit is Rs 2. This computation is done in the second statement called 'statement of cost per equivalent unit'.

In the third statement, the process cost of Rs 1760 is apportioned between the completed units and WIP. In other words completed units and WIP is valued in this particular statement. The equivalent units column in first statement is multiplied by the cost per equivalent unit to value the completed and WIP units.

Finally the process account is prepared with the help of data computed in statement 1 to 3.

It could be noticed that in this example the WIP is valued at Rs 160 and completed units at Rs 1600. If we look at the cost per unit of WIP, it works to Rs 0.80 [160/200] which is 40% of cost per completed unit of Rs 2 [1600/800].

Example 4: Process account with opening and closing WIP

In Process I opening work-in-progress in February 2008 was 200 units 40% complete. 1,050 units were introduced during the period, 1,100 completed units were transferred in Process II and 150 units remained as closing work-in-progress 70% complete. Compute equivalent production and apportion the total process costs of Rs.2,250 to production and work-in-progress inventories under FIFO method. The cost opening WIP brought forward from the previous period is Rs 500. Prepare Process account.

Solution:

I Statement of equivalent units

Input		Output		Equivalent units	
Items	Units	Items	Units	%	Units
Op WIP	200	Opening WIP completed	200	60%	120
Introduced	1050	Introduced and completed	900	100%	900
		Closing WIP	150	70%	105
Total	1250	Total	1250		1125

II Statement of cost per Equivalent units

Items	Cost	Equivalent units	Cost per equivalent unit
Total cost	2250	1125	2

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III Statement of apportionment

A. Closing WIP

105 units x 2 = Rs 210

B. Completed units

Opening WIP completed		
Current year cost	120x2	240
Previous year cost b/f		500
Total		740
Introduced and completed	900x2	1800
Total cost of completed units		**2540**

Process account

Particulars	Units	Amount	Particulars	Units	Amount
To opening WIP	200	500	By Process II	1100	2540
To Input	1050	2250	By Closing WIP	150	210
Total	1250	2750	Total	1250	2750

Explanation:

There are two types of Inputs on which processing is done during the period by Process I namely 'Opening WIP' and 'Freshly introduced units'. It continues the processing of 200 units of Opening WIP which has been partly processed in the previous period and also begins processing 1050 units freshly introduced during the current period. Thus a total of 1250 units are being processed in this process during this period. This is what has been entered as Input in the 'statement of equivalent units'.

Out of 1250 units processed, 1100 units were fully completed and balance 150 units remained as closing WIP. Under FIFO method, those units which were started first will be completed first. Thus opening WIP of 200 units will be completed first and balance 900 units completed are from the fresh lot introduced during this period.

Regarding Opening WIP, the entire 100% is not completed this year itself. Already 40% of the work is done in the previous period and the balance 60% of the work is only done this year. Thus the equivalent units completed in the current period are only 120 units. As regards the fresh units completed, they were started this year and also completed this year and hence the entire 100% wonk on these 900 units were done in


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the current year itself. Closing WIP of 150 units was started this year and 70% completed and hence the equivalent units produced is 105 units.

'In the statement of apportionment', while valuing the 1100 units completed, it should be kept in mind that, cost are incurred over two periods for completing the opening WIP. In the previous period a cost of Rs 500 is spent in doing 40% of the work, which is b/f to this year as unexpired cost and further in the current year another Rs 240 is spent to complete the balance 60% of the work. Thus the total cost spent in completing the opening WIP works to Rs 740.

Except for the above issues discussed, all the remaining computations done are similar to the one discussed in example 3.

Process account with Work In Progress and Loss

In example 2 we have seen how to prepare a process account when there is loss in a process and in examples 3 and 4 we have seen process account preparation when there is WIP in a process. Now we are going to discuss process costing problems where both loss and WIP exist in a process.

Example 5:

In process A, there was opening work-in-progress of 100 units 40% complete and closing work-in-progress was 1,100 units 70% complete. Units introduced during the month of January were 11,000 units and completed units transferred to process B 8,600 units. Normal loss was 10% of production. Compute equivalent production & apportion the total process costs of Rs.29,190 to production, abnormal loss and work-in-progress using FIFO method. The cost of Opening WIP b/f from previous period is Rs 500. Prepare process account.

Solution:

I Statement of equivalent units

Input		Output		Equivalent units	
Items	Units	Items	Units	%	Units
Op WIP	100	Opening WIP completed	100	60%	60
Introduced	11000	Introduced and completed	8500	100%	8500
		Closing WIP	1100	70%	770
		Normal loss	1000	-	-
		Abnormal loss [bal fig]	400	100%	400
Total	11100	Total	11100		9730

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Normal loss = 10% of Production = 10% [11100-1100] = 1000 units

II Statement of cost per Equivalent units

Items	Cost	Equivalent units	Cost per equivalent unit
Total cost	29190	9730	3

III Statement of apportionment

A. Closing WIP

770 units x 3 = Rs 2310

B. Abnormal loss

400 units x 3 = Rs 1200

C. Completed units

Opening WIP completed		
Current year cost	60x3	180
Previous year cost b/f		500
Total		680
Introduced and completed	8500x3	25500
Total cost of completed units		**26180**

Process A account

Particulars	Units	Amount	Particulars	Units	Amount
To Opening WIP	100	500	By Normal loss	1000	-
To Input	11000	29190	By Process B	8600	26180
			By Closing WIP	1100	2310
			By Abnormal loss	400	1200
Total	11100	29690	Total	11100	29690

Explanation:

Treatment Normal loss:

It is already known that no share of Process cost should be given to normal loss units. In other words, the normal loss will not be valued separately as we value Completed units, Closing WIP etc. By inflating the cost per unit to include normal loss cost, the normal loss is shared by the remaining units. Let us see how this is done through numbers.


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In this problem, the total cost spent in the process during the period is Rs 29190. This cost is spent for Processing 11100 units including normal loss units of 1000 and hence need to be apportioned to all the units namely completed, Closing WIP and lost units. However normal loss cost will be shared by other units. In the equivalent unit statement, Nil entry is made in the Equivalent units column for normal loss. Due to this, the equivalent units do not include normally lost units. While calculating cost per equivalent unit, the numerator i.e the cost, include all the cost including cost spent for normally lost units but the denominator i.e equivalent units is sans normally lost units. Thus the remaining units share the entire cost including the cost of normally lost units also. Thus the cost per equivalent unit is inflated to have a share of normal loss cost. When this cost per unit is used in the statement of apportionment for valuing Closing WIP, Completed goods and abnormal loss units, a share of normal loss cost is given to all the three of them.

How normal loss units computed?

In the problems, normal loss can be given in two ways (a) as a % of Input (b) as a % of production. If it is given as a % of production, for the purpose of this computation production means Input – Closing WIP.

Treatment Abnormal loss:

Abnormal loss units are valued separately as we value completed and WIP units, and its value is transferred to abnormal loss account. From there after netting scrap income if any, it will be debited to costing profit and loss account.

The percentage completion of abnormal loss depends upon when the loss is detected in the process. Suppose if the loss is detected at 40% stage, it means that 40% of the work is done on those units before it was found to be a wasted unit. Normally when the problem is silent, it will be assumed that losses are detected only at the end of the process and hence we write 100% in the statement of equivalent units for calculating equivalent units for the abnormal loss.

Process account with uneven cost consumption

In our discussion about concept of equivalent units, we saw that the cost consumed by a fully completed unit and partially completed unit will not be same. If say an item is only 40% complete, it would have consumed 40% of the cost of a fully completed unit and so on. Here we have assumed that it would have consumed 40% of all the cost namely Material, labour and overheads. But in reality, it may not be necessarily so. Generally materials are fed at the beginning of the process. So when a unit is started, the entire quantity of material required to process it may be consumed. So irrespective of whether it is fully or partially complete, it would have consumed 100% of the material cost. Items like labour and overheads are

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normally incurred uniformly during the process. So when a unit it 40% complete, it would have consumed 40% of the labour and overhead cost. Conversion Costs

In such as situation since the different costs have different % of completion, we should compute separately equivalent units for the different items of cost i.e equivalent units for material, for labour and for overheads. In our previous examples, we divided the total cost by equivalent units to find the cost per equivalent unit. Now we divide material cost by equivalent units computed for material, labour cost by equivalent units for labour and so on to find out cost per unit for the different items of cost. Let us see how this is done with the help of the next example.

Example 6
The following data are available in respect to Process I for February 2008: -

Opening work-in-progress	:	900 units at Rs.4,500
Degree of completion	:	Materials 100%, Labour 60%, Overhead 60%
Input of materials	:	9,100 units Rs.27,300
Direct wages	:	Rs.8,200
Production overhead	:	Rs.16,400
Units scrapped	:	1,200 units
Degree of completion	:	Material 100%, Labour & Overhead 70%
Closing work-in-progress	:	1,000 units
Degree of completion	:	Materials 100%, Labour 80%, Overhead 80%
Units transferred to next process	:	7,800 units

Normal process loss is 10% of total input (opening stock plus units put in). Scrap value is Rs.3 per unit.
You are required to –
(a) Compute equivalent production;
(b) Cost per equivalent unit for each element and cost of abnormal losses, closing work-in-progress and units transferred to next process; and
Prepare process accounts.

Solution:

I Statement of equivalent units

Input		Output		Equivalent units			
Item	Units	Item	Units	Materials		Lab/OH	
				%	Units	%	Units
Opening WIP	900	Opening WIP completed	900	0%	0	40%	360
Introduced	9100	Introduced and completed	6900	100%	6900	100%	6900
		Closing WIP	1000	100%	1000	80%	800
		Normal loss	1000	-	-	-	-
		Abnormal loss	200	100%	200	70%	140
Total	10000	Total	10000		8100		8200

Normal loss = 10% of Input = 10% x 10000 = 1000 units

II Statement of cost per Equivalent units

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Items	Cost	Equivalent units	Cost per equivalent unit
Materials	24300	8100	3
Labour	8200	8200	1
Overhead	16400	8200	2
Total	48900		6

Working note: Cost of Materials

Cost of materials input into the process	27300
Normal loss scrap realization [1000units x 3]	(3000)
Net material cost	24300

III Statement of apportionment

A. Closing WIP

Materials	1000x3	3000
Labour	800x1	800
Overheads	800x2	1600
Total		**5400**

B. Abnormal Loss

Materials	200x3	600
Labour	140x1	140
Overheads	140x2	280
Total		**1020**

C. Completed units

Opening WIP completed		
Materials	0x3	0
Labour	360x1	360
Overheads	360x2	720
Previous period cost b/f		4500
Total		5580
Introduced and completed		
Total cost of completed goods	6900x6	41400
Total cost of units completed		**46980**

Process I account

Particulars	Units	Amount	Particulars	Units	Amount
To Op WIP	900	4500	By Normal loss	1000	3000
To Materials	9100	27300	By Process II	7800	46980

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To Labour	-	8200	By Closing WIP	1000	5400
To Overheads	-	16400	By Abnormal loss	200	1020
Total	10000	56400	Total	10000	56400

Concept of Transferred-in material

There are two types of raw materials which are fed into a process. There is a main raw material which passes through all the processes to become the finished goods. It is on this material work is done in all the process. It is this material which becomes the finished output. All the processes are undertaken only to process this material. From now onwards we call this material by the name Transferred in Material [TIM]. The second type of material is the ancillary materials which are added in each process to act as a catalyst for processing the TIM. For example, in process III, there can be two types of raw materials. One is the TIM transferred from Process II and another is ancillary materials added in Process III itself.

It is on the Transferred in material, the process is done. So it is always fed at the beginning of the process. This material is neither added in the middle of the process nor uniformly throughout the process. For example, Process III work is done only on the material transferred from Process II. Hence this Process II material will be the basic and first input on which other material cost, labour cost and overhead costs are incurred. In the statement of equivalent units, % of completion for TIM is 100% for completed units, closing WIP and units lost. For opening WIP, since in the previous period itself 100% of TIM would have been added, for this years statement it would be 0%. From this it should be understood that, in the problems, the % of completion for TIM need not be given because it is always 0% for opening WIP and 100% for others. Regarding ancillary materials, compute equivalent units on the basis of % completion given in the problem because they need not be necessarily be fed only at the beginning of the process, it can be fed uniformly or at the end of the process also.

Let us understand how process account is prepared when there is TIM with the help of the following example.

Example 7:

From the following information for May 2008, prepare the process cost accounts for Process III

Opening stock in Process	500 units at	Rs.7,200
Transfer from Process II	21,300 units	Rs.1,65,400 → TIM
Direct materials added in Process III		Rs.80,360 → ancillary Material
Direct wages		Rs.39,620
Production overhead		Rs.19,810
Units scrapped during the period		1,100 units
Transferred to Process IV		18,900 units
Closing stock		1,800 units

Degree of completion:

	Opening stock	Closing stock	Scrap
Material	70%	80%	100%
Labour	50%	60%	80%
Overhead	50%	60%	80%

ancillary material

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There was a normal loss of 5% of production and units scrapped were sold at Rs.3 each.

Solution:

I Statement of equivalent units

Input		Output		Equivalent units					
Item	Units	Item	Units	TIM		Mat		Lab/OH	
				%	Units	%	Units	%	Units
Opening WIP	500	Op WIP completed	500	0%	0	30%	150	50%	250
Transfer from Process II	21300	Introduced and completed	18400	100%	18400	100%	18400	100%	18400
		Closing WIP	1800	100%	1800	80%	1440	60%	1080
		Normal loss	1000	-	-	-	-	-	-
		Abnormal loss	100	100%	100	100%	100	80%	80
Total	21800	Total	21800		20300		20090		19810

Normal loss = 5% of production = 5% x [21800-1800] = 1000 units

II Statement of cost per Equivalent unit

Items	Cost	Equivalent units	Cost per equivalent unit
TIM	162400	20300	8
Materials	80360	20090	4
Labour	39620	19810	2
Overhead	19810	19810	1
Total			15

Working note: Cost of Transferred in Materials [TIM]

Cost of materials input into the process	165400
Normal loss scrap realization [1000units x 3]	(3000)
Net material cost	162400

III Statement of apportionment

A. Closing WIP

Transferred in Materials	1800x8	14400
Materials	1440x4	5760
Labour	1080x2	2160
Overheads	1080x1	1080
Total		**23400**

B. Abnormal Loss

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Transferred in Materials	100x8	800
Materials	100x4	400
Labour	80x2	160
Overheads	80x1	80
Total		**1440**

C. Completed units

Opening WIP completed		
Materials	150x4	600
Labour	250x2	500
Overheads	250x1	250
Previous period cost b/f		7200
Total		8550
Introduced and completed	18400x15	276000
Total cost of completed goods		**284550**

Process III account

Particulars	Units	Amount	Particulars	Units	Amount
To Op WIP	500	7200	By Normal loss	1000	3000
To Process I	21300	165400	By Process IV	18900	284550
To Materials	-	80360	By Closing WIP	1800	23400
To Labour	-	39620	By Abnormal loss	100	1440
To Overheads	-	19810			
Total	21800	312390	Total	21800	312390

Process accounts – Weighted average method

In all the aforesaid examples, FIFO was followed in valuing the completed units and WIP. Now let us see how process accounts are prepared when weighted average method is used through the following example.

Example 8:

From the following information during a period prepare process cost account for Process I using :
(a) FIFO method
(b) Weighted average method

Opening WIP:	20,000 units	**Rs.**
	Material	4,500
	Wages	1,300
	Overhead	800
Unit of introduced:	80,000 units	
	Material	18,500
	Wages	9,200
	Overhead	6,200

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The opening WIP is 100% complete as to material and 50% complete as to Labour and overheads. During the period 60,000 units were completed and transferred to Process II.

Closing WIP:	40,000 units: Materials Wages and overhead	Degree completion 100% 25%

Also analyze how the two methods differ in their procedures.

Solution:

FIFO METHOD

I Statement of equivalent units

Input		Output		Equivalent units			
Item	Units	Item	Units	Materials		Lab/OH	
				%	Units	%	Units
Opening WIP	20000	Opening WIP completed	20000	0%	0	50%	10000
Introduced	80000	Introduced and completed	40000	100%	40000	100%	40000
		Closing WIP	40000	100%	40000	25%	10000
Total	100000	Total	100000		80000		60000

II Statement of cost per Equivalent units

Items	Cost	Equivalent units	Cost per equivalent unit
Materials	18500	80000	0.23125
Labour	9200	60000	015333
Overhead	6200	60000	0.10333
Total	33900		0.48791

III Statement of apportionment

A. Closing WIP

Materials	40000X0.23125	9250
Labour	10000X0.15333	1533
Overheads	10000X0.10333	1033
Total		**11816**

B. Completed units

Opening WIP completed		
Labour	10000X0.15333	1533
Overheads	10000X0.10333	1033
Previous period cost b/f		6600
Total		9166
Introduced and completed		
Total cost of completed goods	40000X0.48791	19518

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Total cost of units completed		28684

Process I account

Particulars	Units	Amount	Particulars	Units	Amount
To Op WIP	20000	6600	By Process II	60000	28684
To Materials	80000	18500	By Closing WIP	40000	11816
To Labour	-	9200			
To Overheads	-	6200			
Total	100000	40500	Total		40500

Weighted Average Method

I Statement of equivalent units

Input		Output		Equivalent units			
Item	Units	Item	Units	Materials		Lab/OH	
				%	Units	%	Units
Opening WIP	20000	Completed	60000	100%	60000	100%	60000
Introduced	80000	Closing WIP	40000	100%	40000	25%	10000
Total	100000	Total	100000		100000		70000

II Statement of cost per Equivalent unit

Items	Op WIP Cost	Current year's cost	Total cost	Equivalent units	Cost per Eq unit
Materials	4500	18500	23000	100000	0.23
Labour	1300	9200	10500	70000	0.15
Overheads	800	6200	7000	70000	0.10
Total	6600	33900	40500		0.48

III Statement of apportionment

A. Closing WIP

Materials	40000x0.23	9200
Labour	10000x0.15	1500
Overheads	10000x0.10	1000
Total		**11700**

B. Completed units

60000 units x 0.48 = 28800

Process I account

Particulars	Units	Amount	Particulars	Units	Amount

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To Op WIP	20000	6600	By Process II	60000	28800
To Materials	80000	18500	By Closing WIP	40000	11700
To Labour	-	9200			
To Overheads	-	6200			
Total	100000	40500	Total	100000	40500

FIFO METHOD VS WEIGHTED AVERAGE METHOD

Sn	FIFO	Weighted Average
1	'Equivalent units statement' gives only current years equivalent production. This is because % completed in previous year for opening WIP is not taken in computing the equivalent units. For example in the above problem, Labour and OH is 50% complete w.r.t opening WIP last year, so in this year's statement, we have written the balance 50% completed.	Equivalent units in this statement represents units completed this year and part of the work done last year also. We write 100% for all the units completed but for the opening WIP units, the entire 100% is not the work done this year, a part of it is done last year also.
2	The cost per equivalent unit represents the current year's cost only. The denominator equivalent units represents only current year's production and the numerator cost does not include Opening WIP cost b/f from previous year. Therefore the cost per unit is only current year's cost per unit.	The cost per equivalent unit represents current year and part of previous year's cost. As discussed in point 1, the denominator represents units completed this year and partly last year. The numerator cost included Opening WIP cost also. Thus the cost per unit has in it current year's cost and opening WIP cost.
3	In the statement of apportionment, the entire opening WIP cost is given to completed units. In nutshell, under FIFO method the 'statement of equivalent units' and 'statement of cost per equivalent unit' deals only with current year production and cost. The opening WIP maintains its identity till the apportionment stage and finally merges fully with completed units.	In the statement of apportionment, the cost of opening WIP is shared by all the units namely completed, closing WIP and abnormal loss or gain. This is achieved by including the cost of opening WIP in the cost per equivalent unit itself. When the units are multiplied with cost per equivalent units, they automatically get the share of opening WIP cost. In nut shell the cost of opening WIP loses its identity, merges with total cost and gets averaged in the cost per equivalent unit computation and goes into valuation of all the types of output.

Stage of Inspection of loss and Treatment of normal loss in valuation of WIP

Losses in a process can be known only when the units are inspected to detect loss. In certain processes losses can be detected only at the end of the process i.e only after 100% work is done on the units, in some cases they can be detected earlier also say at 40% stage or 70% stage and so on.

Suppose loss is detected say at 40% stage. All those units which are put into process on which more than 40% work has been done would have been detected for losses and those units which are less than 40% complete would not have been inspected for losses.

Completed units are those units on which 100% work has been done. With respect to these units, in all scenarios inspection of losses would have been done. But the same cannot be said for WIP. There can be two situations regarding WIP:


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(1) WIP has crossed the stage of inspection
(2) WIP has not crossed the stage of inspection.

We have seen number times in our earlier discussions that, normal loss units should not be given a share of process cost. Instead its cost will be taken by the other units like completed and closing WIP. Now the issue is , should the WIP units be given a share of normal loss cost or not ?. This is the subject matter of discussion in this segment.

Situation 1: WIP has crossed the stage of inspection

In this case all the units including WIP units would have undergone inspection. Hence the cost of normal loss detected during the inspection should be shared by all units including WIP. This is achieved by putting NIL entry for normal loss in the equivalent units statement. The effect is as follows:

(a) Equivalent units does not include normal loss units
(b) In the statement of cost per equivalent unit, the numerator i.e cost includes all costs including cost spent on normally lost unit, while the denominator is sans normal loss units. Due to this the remaining units are forced to take a share of normal loss. The cost per equivalent unit is now loaded with a share of normal loss cost also.
(c) In the statement of apportionment while valuing completed units, closing WIP, abnormal loss and abnormal gain, we take the cost per unit which is loaded with normal loss cost. Thereby we automatically give a share of normal loss to all types of output including closing WIP.

Situation 2: WIP has not reached the stage of inspection

In this situation, since the WIP units are not inspected for losses, it is improper to give a share of loss to WIP. Hence we should not put NIL entry for normal loss units in the statement of equivalent units, as it results in giving normal loss share to all units as explained in situation 1.

The proper method for treatment of normal loss cost is as follows:

(a) Make entry for the normal loss in the equivalent units statement in the same way as we do for abnormal loss.
(b) Value normal loss in the same way as we would value abnormal loss.
(c) The only difference is that, the abnormal loss value will be debited to costing profit and loss account; where as the normal loss will be added to completed units.

Example: 9

ABC Limited manufactures a product 'ZX' by using the process namely RT. For the month of May, 2007, the following data are available:

Process RT	
Material introduced (units)	16,000

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Transfer to next process (units)	14,400
Work in process:	
At the beginning of the month (units) (4/5 completed)	4,000
At the end of the month (units) (2/3 completed)	3,000
Cost records:	
Work in process at the beginning of the month	
Material	Rs. 30,000
Conversion cost	Rs. 29,200
Cost during the month:	
Materials	Rs. 1,20,000
Conversion cost	Rs. 1,60,800

Normal spoiled units are 10% of goods finished output transferred to next process.

Defects in these units are identified in their finished state. Material for the product is put in the process at the beginning of the cycle of operation, whereas labour and other indirect cost flow evenly over the year. It has no realizable value for spoiled units.

Required:
(1) Statement of equivalent production (Average cost method);
(2) Statement of cost and distribution of cost;
(3) Process accounts.
(4) Also rework all the computations if the losses are detected not at the end of the process but when the units are 50% complete.

Solution:

In the basic problem is given that "defects in the units are identified in their finished state". This means that losses are inspected only when the units reach 100% completion stage. Since the closing WIP is only 2/3rd complete, it has not been inspected for loss. Hence it would be inappropriate to give a share of normal loss to these units. This is the case that fits well into the situation 2 discussed above. Let us see how the problem is solved in such a case.

I Statement of equivalent units

Input		Output		Equivalent units			
Item	Units	Item	Units	Materials		Conversion cost	
				%	Units	%	Units
Opening WIP	4000	Completed	14400	100%	14400	100%	14400
Introduced	16000	Closing WIP	3000	100%	3000	66.67%	2000
		Normal loss	1440	100%	1440	100%	1440
		Abnormal loss	1160	100%	1160	100%	1160
Total	20000	Total	20000		20000		19000

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II Statement of cost per Equivalent unit

Items	Op WIP Cost	Current year's cost	Total cost	Equivalent units	Cost per Eq unit
Materials	30000	120000	150000	20000	7.5
Conversion cost	29200	160800	190000	19000	10
Total	59200	280800	340000		17.5

III Statement of apportionment

A. Closing WIP

Materials	3000x7.5	22500
Conversion cost	2000x10	20000
Total		**42500**

B. Abnormal loss

1160 units x 17.5 = 20300

C. Normal loss

1440 units x 17.5 = 25200

D. Completed units

Cost of completed units	14400 x 17.5	252000
Normal loss cost	See part C	25200
Total cost apportioned to completed units		**277200**

Process I account

Particulars	Units	Amount	Particulars	Units	Amount
To Op WIP	4000	59200	By Normal loss	1440	-
To Materials	16000	120000	By Process II	14400	277200
To Conversion cost	-	160800	By Closing WIP	3000	42500
			By Abnormal loss	1160	20300
Total	20000	340000	Total	20000	340000

Reworking computations when the loss are detected at 50% stage

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The closing WIP is 2/3rd complete. When the loss is detected at 50% stage, the WIP has crossed the stage of inspection. Since it is also inspected for losses, a share of normal loss should be given to WIP also. This is a case falling under situation 1.

I Statement of equivalent units

Input		Output		Equivalent units			
Item	Units	Item	Units	Materials		Conversion cost	
				%	Units	%	Units
Opening WIP	4000	Completed	14400	100%	14400	100%	14400
Introduced	16000	Closing WIP	3000	100%	3000	66.67%	2000
		Normal loss	1440	-	-	-	-
		Abnormal loss	1160	100%	1160	100%	1160
Total	20000	Total	20000		18560		17560

II Statement of cost per Equivalent unit

Items	Op WIP Cost	Current year's cost	Total cost	Equivalent units	Cost per Eq unit
Materials	30000	120000	150000	18560	8.0819
Conversion cost	29200	160800	190000	17560	10.8200
Total	59200	280800	340000		18.9019

III Statement of apportionment

A. Closing WIP

Materials	3000x8.0819	24246
Conversion cost	2000x10.82	21640
Total		**45886**

B. Abnormal loss

1160 units x 18.9019 = 21926

C. Completed units

14400 units x 18.9019 = 272188

Process I account

Particulars	Units	Amount	Particulars	Units	Amount
To Op WIP	4000	59200	By Normal loss	1440	-
To Materials	16000	120000	By Process II	14400	272188

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To Conversion cost	-	160800	By Closing WIP	3000	45886
			By Abnormal loss	1160	21926
Total	20000	340000	Total	20000	340000