

CA - INTER/IPCC

COSTING CONCEPTS & FORMULAE

(Relevant for both Old & New Syllabus)

HANDWRITTEN EDITION

COSTING REVISION COMPILER

CA. Arushi Upadhyay

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①

OPERATING COSTING

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Method of Costing

→ The cost units usually used in the following service sectors are as below ↓

- Transport Service - Passenger km, Tonne km, Quintal km.
- Hospitals - Passenger per day, Room per day, operation per day, per Bed etc.
- Power Co - Kilo Watt hrs
- Supply Co. (Gas, water) - Per litre, per kg etc
- Cinema - per Ticket

When Goods are Transported cost unit is tonne km or Quintal km.

Absolute Tonne km
(Weighted Avg)

Commercial Tonne km
(Simple Avg)

Procedure of operating Costing -

STEP ①

Collection of Cost

STEP ②

Classification of Cost

operating & Running (Variable Cost)
Cost

Fixed Cost (Standing Cost)

Maintenance (Semi Variable Cost)
Cost

STEP ③

Determination of Cost per unit

Components of operating Cost -

operating & Running Cost

Eg. Cost of Diesel, Petrol, etc.
(**VARIABLE COST**)

Standing Cost

Eg. Salary of Drivers, Rent, Insurance etc.
(**FIXED COST**)

Maintenance Cost

Eg. Cost of repairs, painting, overhauling etc.
(**SEMI VARIABLE COST**)

Influenced by both time & volume of operations

(2)

MARGINAL COSTING

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→ MC is the practice of charging all MCs to operations, processes or products and writing off all fixed costs against the profit in the period in which they arise.

Types of Cost

Variable

Fixed

Product Cost

Period Cost

Charged to operations, processes or products

written off against profits in period in which they arise.

• DM • DL • DE • Variable Prod'n o/h

• Fixed Prod'n o/h • S&D o/h • Admin o/h

Marginal Cost

Advantages

- Simplified Pricing Policy
- Proper recovery of o/h
- Shows Realistic Profit
- How much to produce
- More control over expenditure
- Helps in decision making

Limitations

- Difficulty in classifying fixed & variable elements
- Scope for low profitability
- Faulty valuation
- Unpredictable nature of cost
- M.C ignores time factor & investment.

Income Statement under MC.

Particulars	Amt
<u>Sales</u>	XX
(-) Variable cost of sales	
- DM	XX
- DL	XX
- DE	XX
- V Prod ⁿ O/H	XX
Variable cost of goods purchased	XX
(+) Add of stock	XX
(-) Cl. Stock	XX
(+) Variable Admin O/H	XX
(+) Variable S & D O/H	XX
<u>VARIABLE COST OF SALES</u>	(XX)
<u>CONTRIBUTION</u>	XX

- <u>FC</u>	
F. Prod ⁿ O/H	XX
F. Admin O/H	XX
F. S & D O/H	XX
	(XX)
<u>Profit under MC</u>	XX

FORMULAE -

① ~~PVR~~ Profit Volume Ratio (Marginal Income Ratio)

$$PVR = \frac{\text{Contri} \times 100}{\text{Sales}}$$

OR

$$PVR = \frac{\Delta \text{Profit} \times 100}{\Delta \text{Sales}}$$

Indicates effect on Profit for a given change in sales

② Volume Cost Ratio (VCR) or Marginal Cost Ratio.

$$VCR = \frac{VC}{Sales} \times 100$$

OR

$$VCR = \frac{\Delta TC}{\Delta Sales} \times 100$$

$$VCR = 100 - PVR$$

③ Break Even Point

- refers to that volume of operation at which total sales revenue is just equal to total cost.
- No Profit - / - No Loss -
- Point at which $Contri = FC$

In units

$$BEP = \frac{FC}{Contri \text{ per unit}}$$

In Amt

$$BEP = \frac{FC}{PVR}$$

$$BEP = \frac{FC}{Contri \text{ (in units)}} \times S.P$$

FC = Fixed Cost

SP = Selling Price.

④ Cash Break Even Point.

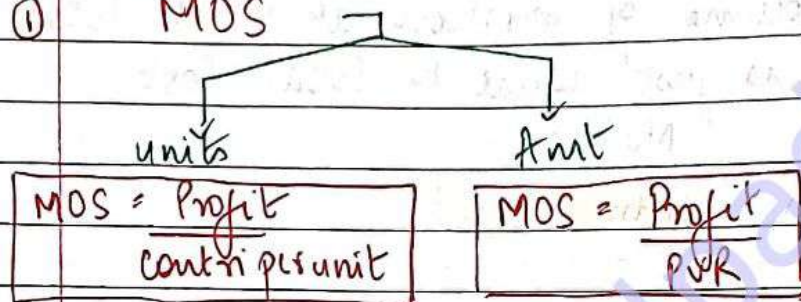
- In this depreciation & other non-cash FC are excluded from FC

$$CBEP = \frac{\text{Cash FC}}{\text{Contri per unit}}$$

⑤ Margin of safety (MOS)

- Difference b/w Actual sales & BEP sales
- At this level, $FC = 0$, since FC are covered at BEP.
- At this MOS, $Contri = Profits$

① MOS



$$\textcircled{2} \quad \text{MOS} = \frac{\text{Actual Sales (or units)} - \text{BEP Sales (or units)}}{\text{Actual Sales (or units)}}$$

$$\textcircled{3} \quad \% \text{ of MOS} = \frac{\text{MOS}}{\text{Actual Sales}} \times 100$$

⑥ Angle of Incidence

- It is the angle b/w total sales line & total cost line drawn in case of Break-even chart.
- It indicates the rate at which profits are being earned.

⑦ Key factor -

Key factor is a factor which limits the activities of an undertaking. Some eg are -

- Shortage of RM
- Shortage of labour
- Plant capacity available
- Sales capacity available
- Cash available

Contri Key factor (Contri per key factor) must be considered to decide upon the priority of products to be produced & sold.

⑧ Cost Break Even point
- level of activity where the total cost under two alternatives are same

- Also known as Cost Indifference Point.
If only Indifference Point is asked → Point where Profits are same

⑨ Differential Costing.

It is a technique used in the preparation of adhoc information in which only cost & Income differences in b/w alternative courses of action are taken into account.

* Imp formulae

$$① \text{ Sales req. to earned desired profit (units)} = \frac{FC + \text{Profit}}{\text{contri/unit}}$$

$$② \text{ Sales req. to earn desired profit (Amt)} = \frac{FC + \text{Profit}}{PVR}$$

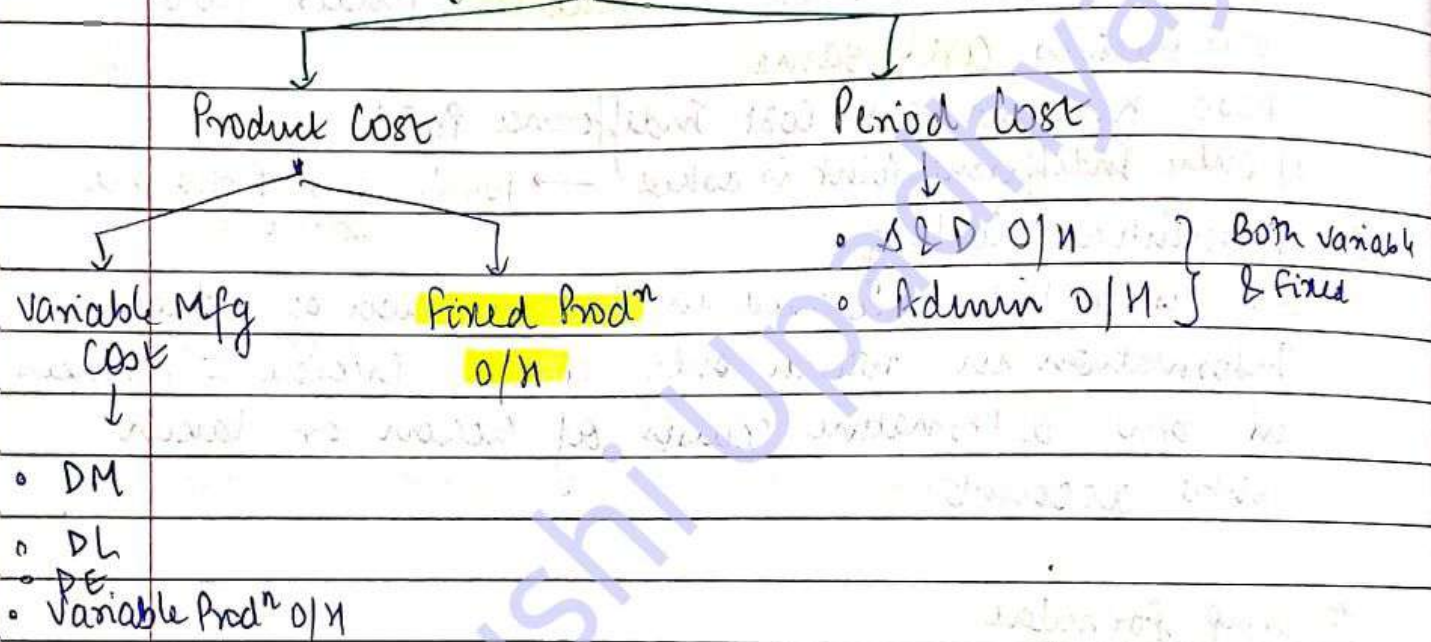
$$③ \text{ Sales req. to earn given per unit Profit (units)} = \frac{FC}{SP - (VC/\text{unit} + \text{Profit/unit})}$$

$$④ \text{ Sales req. to earn a \% of Profit on sales} = \frac{FC}{SP - (VC + \% \text{ of Profit on Sales})}$$

ABSORPTION COSTING

It is the practice of charging all ~~to~~ variable mfg cost and fixed P.O/H to operations, process or products & writing off Admin, S & D o/n against profits in the period in which they arise.

Types of costs



Difference b/w Absorption & Marginal Costing

Basis	A/C	M/C
→ Product Cost	• DM • DL • DE • V. Prod^n o/n • Fixed Prod^n o/n	• DM • DL • DE • V Prod^n o/n
→ Period Cost	S & D o/n, Admin o/n	• Fixed Prod^n o/n • S & D o/n, Admin o/n
→ Value of stock	Value of c/stock Includes Fixed Prod^n o/n	Value of stock comprises only v/c
→ Under/over Absorbing	Under/over Absorbing of P.O/H generally arises	Under/over of ^{recovery} P.O/H does not arise

Income Statement under Absorption Costing.

Particulars

Sales

Amnt

(-) V.Mfg Cost of goods sold

xx

- DM

xx

- DL

xx

- DE

xx

- Variable Prodⁿ o/h

xx

- Fixed Prodⁿ o/h

xx

Total COGS

xx

+ Add op. Stock

xx

- Cl Stock

(xx)

Std. COGS

xx

+ Add under absorbed FP o/h

xx

- less over absorbed FP o/h

(xx)

Adj v Mfg COGS

xx

(xx)

Gross Profit

xx

(-) less Admin S&D o/h

- V. Admin o/h

xx

- Fixed Admin o/h

xx

- Variable S&D o/h

xx

- Fixed S&D o/h

xx

(xxx)

xxx

Profit under Absorption Costing.

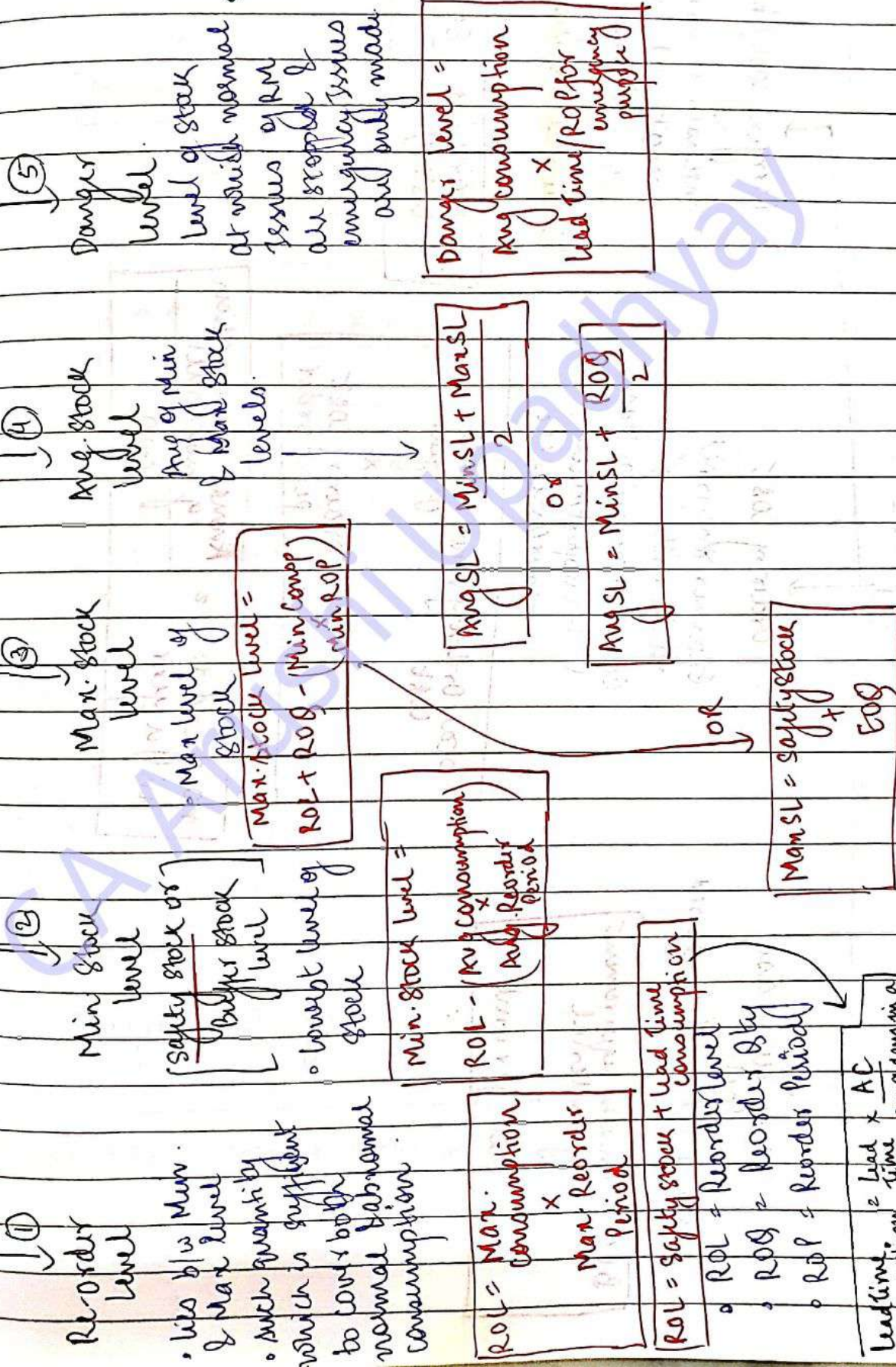
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MATERIAL

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Setting of various stock levels



Cost of Material

Basic Purchase Cost

Cost of material purchased

$$BPC = \text{Annual Requirement of material} \times \text{Cost per unit}$$

Ordering Cost

Expenses incurred while ordering

Eg - Stationary postage, Transportation, Insurance etc

$$\text{Total Ordering Cost} = \text{no. of orders in a year} \times \text{ordering cost per order}$$

$$\text{no. of orders in a year} = \frac{\text{Annual Consumption of material}}{\text{EOQ}}$$

Carrying cost/holding cost
Expenses incurred to keep the material in stock
Eg - Storage, Interest.

Incurrd on units kept in stock

$$\text{Total carrying cost} = \frac{\text{EOQ}}{2} \times \text{Carrying cost per unit per annum}$$

Economic Order Qty. EOQ

The size of the order for which,

$$\text{Ordering Cost} + \text{Carrying Cost} = \text{Min}$$

$$\text{Ordering Cost} = \text{Carrying Cost}$$

$$EOQ = \sqrt{\frac{2 \times A \times O}{C}}$$

A = Annual consumption of Material

O = Ordering Cost per order

C = Carrying cost per unit per annum.

Assumptions

- A & O & C are known & fixed
- Cost per unit is constant
- Lead Time = 0.

NOTE →

If carrying cost given in %, → apply on Cost per unit

$$\text{Total ordering cost} + \text{Total carrying cost} = \sqrt{2 \times A \times O \times C}$$

Inventory Turnover Ratio

$$ITR = \frac{\text{Cost of RM Consumed}}{\text{Avg Stock of RM}}$$

$$\begin{aligned} \star \text{ Cost of RM consumed} &= \text{Op stock of RM} \\ &+ \text{Purchases} \\ &+ \text{DE} \\ &- \text{Closing stock of RM} \end{aligned}$$

$$\star \text{ No. of days for which Avg Inventory (is held)} = \frac{\text{No. of days in a year}}{ITR}$$

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JOINT PRODUCT & BY PRODUCT

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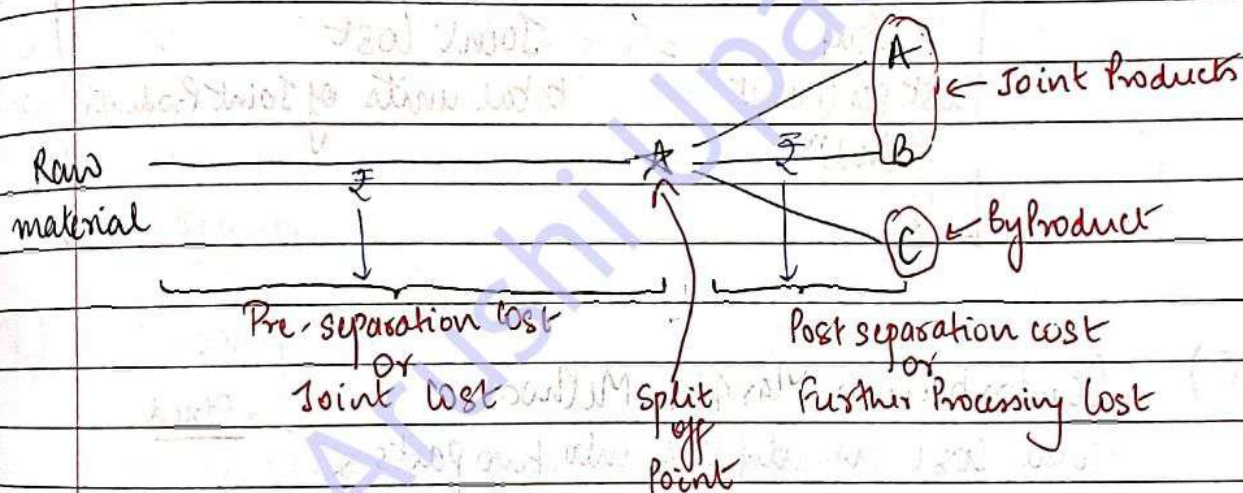
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Joint Product

- Two or more products of equal Importance produced simultaneously from the same process.
- Almost equal value
- Produced Simultaneously

By Product

- Emerges as a result of processing operation of another product or they are produced from scrap or waste arising in the process.
- relatively small value
- Emerges Incidentally.



Methods for distribution or Apportionment of Joint Cost

- ① Physical Unit Method
- ② Avg. unit Cost Method
- ③ Contribution Margin Method
- ④ Market Value Method
- ⑤ Survey Method

On the Basis of Physical Basis

Eg. weight, length, or volume

I) Physical Unit Method

JC apportioned → on the Basis of Physical Base

Physical Base branches into:

- length (m)
- weight (kg)
- volume (tonne)

II) Avg Unit Method

$$\text{Avg Cost per Unit of Prodn} = \frac{\text{Joint Cost}}{\text{total units of Joint Products}}$$

III) Contribution Margin Method

Total Cost is divided into two parts

- Fixed
- Variable

STEP ① - Apportion the variable cost by Phy. unit Method or Avg unit Method.

STEP ② - Add Variable Cost Post separation (Further Proc. Cost)

STEP ③ - Find Out Contribution (Sales - vc)

STEP ④ - Apportion fixed cost in Contribution Ratio

FPC = further Proc. Cost

SV = sales value
FS = finished stage
JP = Joint Prod

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IV) Market Value Method

MV at the point
of separation

On the Basis
of sales value
of JP
at the split
off point

✓ By default.

MV after further
processing

On the Basis of
sales value of
JP at the
finished stage

NRV Method

on the Basis of NRV

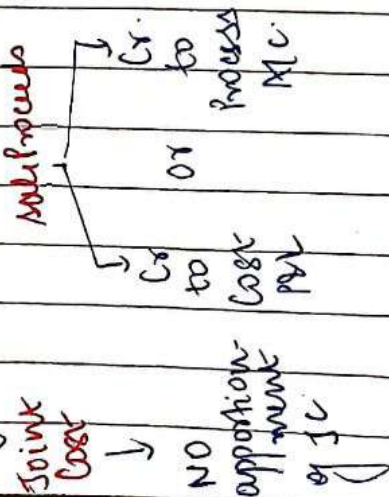
SV at FS of JP	xx
(-) Est Profit Margin	(xx)
(-) S&D Exp	(xx)
(-) FPC	(xx)
NRV	xx

V) Survey Method

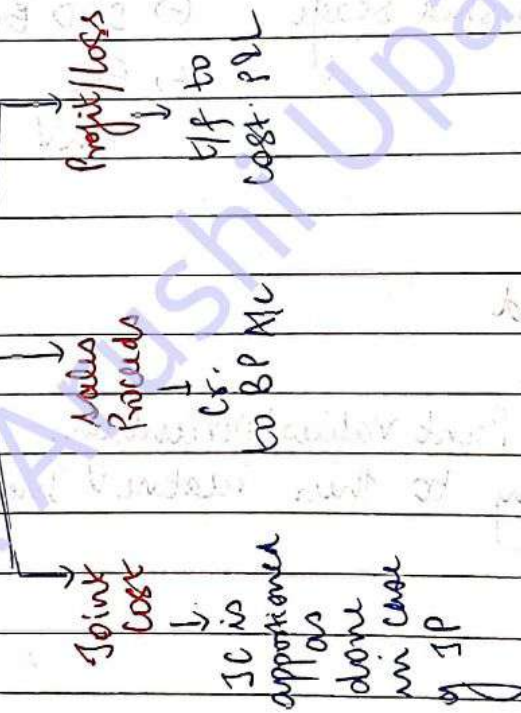
On the Basis of Point values/percentages assigned to the products according to their relative Importance.

Treatment of By-Product in Cost Accounting

(I) where BP are of small total value



(II) where BP are of considerable total value



(III) when By-Products require further processing.

sales value is small amt
treatment same as that of I

sales value is of considerable amt
treatment same as that of II

On the basis of NRV

Realisable value of BP at CS	xx
→ FPC of BP	(xx)
	<u>xx</u>

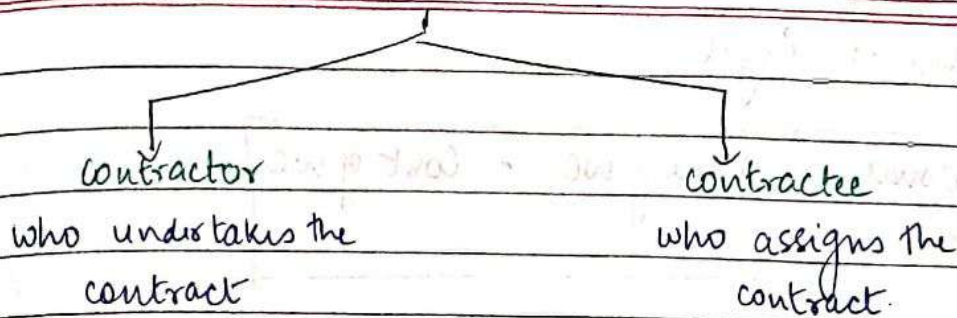
NRV at split off

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CONTRACT COSTING

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• Important Terms

- ① Work Certified - that portion of work completed which has been certified/ approved by architect.

Valued in Terms of contract Price

- ② Retention Money - that portion of value of work which is retained by contractor as security.

$$RM = \text{Value of work certified} - \text{cash received}$$

- ③ Cash Received - that portion of value of work certified which is paid by contractor.

(In % of work certified)

$$CR = \text{Work Certified} - \text{Retention Money}$$

- ④ Work Uncertified - that portion of work completed which has not been certified/ approved by architect valued at cost

$$\text{Cost of WUC} = \text{Total Cost Incurred till date} - \text{Cost of WC}$$

⑤ Notional Profit

$$\text{Notional Profit} = \text{Value of WC} - \text{Cost of WC}$$

or

$$\text{Notional Profit} = \text{Value of WC} - (\text{Total Cost Incurred till date} - \text{Cost of WUC})$$

⑥ Estimated Profit - Excess of Contract Price over Estimated Total Cost.

$$EP = \text{Total Contract Price} - \text{Est. Total Cost}$$

⑦ Est. Total Cost -

$$ETC = \text{COWTD} + \text{FEC}$$

Cost of work
Till date

future
Est. Cost

★★

ESCALATION CLAUSE

If during the execution of period of a contract the prices of material or labour etc. changes BEYOND a certain limit, the contract price will be changed by an agreed amt. Inclusion of such a clause in a contract deed is called as Escalation clause.

P&L on Incomplete Contract

Completion of Contract	Amt. b/f to P&L A/c.
① Less than 25%	No Profit
② $\geq 25\%$ - $< 50\%$	$\frac{1}{3} \times NP \times \frac{CR}{WC}$
③ $\geq 50\%$ - $< 90\%$	$\frac{2}{3} \times NP \times \frac{CR}{WC}$
④ $\geq 90\%$ (near to completion)	i) $EP \times \frac{WC}{CP}$
NOTE $\% \text{ of completion} = \frac{WC}{CP} \times 100$	ii) $EP \times \frac{CR}{CP}$
	iii) $EP \times \frac{COWTD}{ETC}$
	iv) $EP \times \frac{COWTD}{ETC} \times \frac{CR}{WC}$
	v) $NP \times \frac{WC}{CP}$

- NP = Notional Profit • CP = Contract Price
- CR = Cash Received • COWTD = Cost of work till Date
- WC = Work Certified • ETC = Est. Total Cost
- EP = Est. Profit

Types of Contract

Fixed Price Contract

Contract price is generally fixed & it is determined at the time of entering into a contract.

These contracts are generally entered into when it is almost possible to estimate the contract cost with reasonable degree of accuracy.

Cost Plus Contract

The contract price is ~~cost~~ ascertained by adding a fixed % of profit to the total cost of the work.

These contracts are entered when it is not possible to estimate the contract cost with reasonable accuracy.

Advantages

- No risk of shoring loss
- Contractor can satisfy himself about the cost of the contract because he is empowered to examine the books & documents of the contractor & to verify the cost of contract.

Disadvantages

Contractor may not try to avoid wastage and affect economy in production to reduce cost.

⑥

LABOUR

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Direct Labour

Consists of wages paid to workers directly engaged in converting RM → FG

Indirect Labour

Indirect Labour is not directly engaged in prodⁿ operations but only to help in prodⁿ

Idle Time

- Represents a loss of time for which the enterprise pays wages but secures no benefit of work.
- It increases labour cost without any increase in output

Normal Idle Time

Arises due to normal reasons which cannot be avoided

- Eg. - Setting up of machine
- Job taking up time
- Time for Personal needs

TREATMENT

Direct

broken as

part of DL cost by inflating wage rate.

Indirect

becomes

part of prodⁿ O/H Expense.

Abnormal Idle Time

Arises due to abnormal reasons which can be avoided

- Eg. - failure of Power,
- Breakdown of P&M

TREATMENT

Eff to Cost P&L.

Overtime

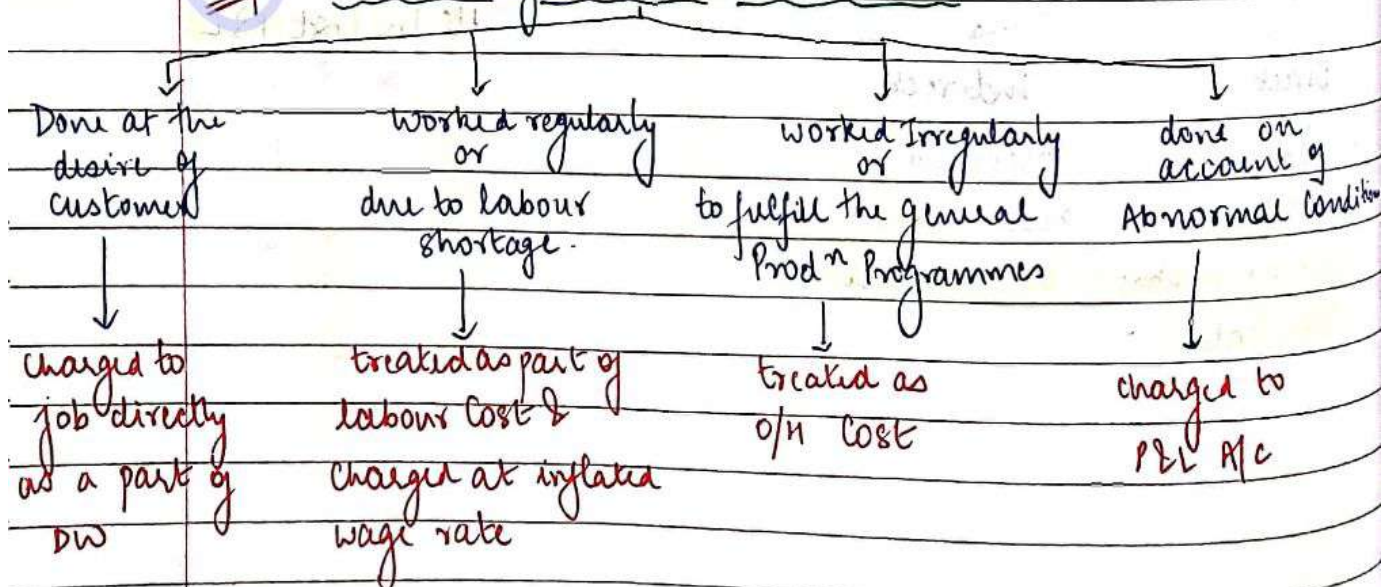
Overtime represents the work done by employees in excess of normal working hours.

- * According to Factories Act, 1948 a worker is entitled to overtime when he works for more than

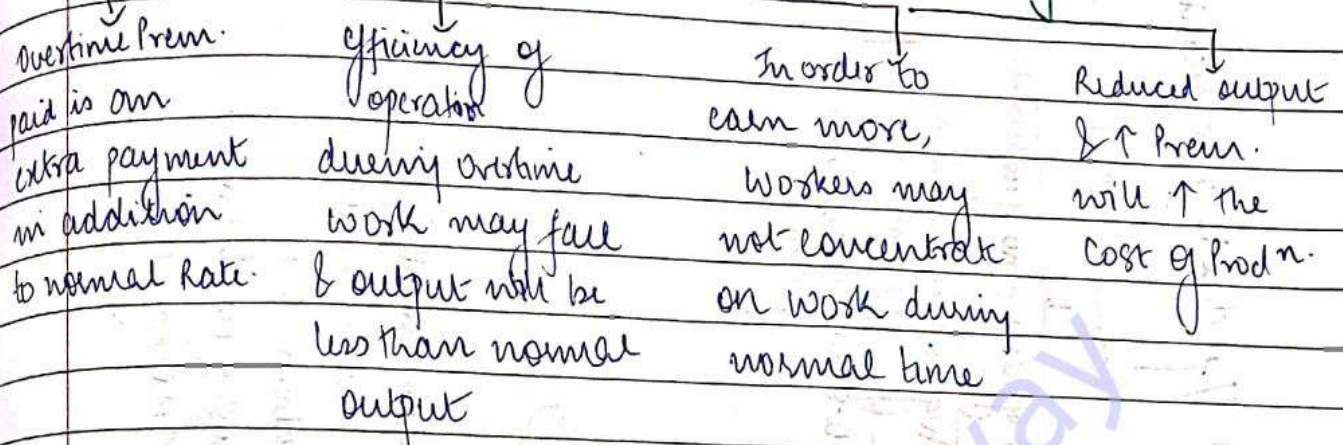
9 hours on (OR) 48 hours
 any day in a week

Basis	Occasional Overtime	Regular Overtime
• Nature	Healthy sign	Bad sign
• Indicators	• optimum capacity • capacity being fully utilized	• firm needs larger capacity • Men have got habit of postponing work

Treatment of OVERTIME PREMIUM



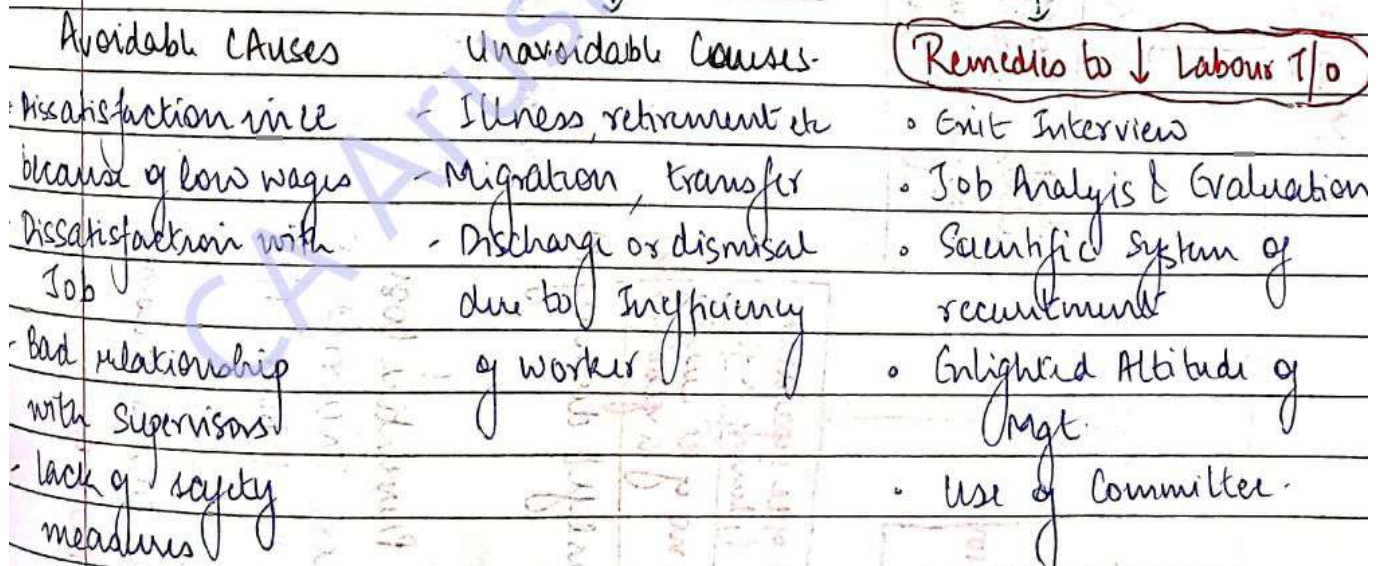
Effect of overtime payment on Productivity



LABOUR TURNOVER

- Refers to the rate of change in the composition of labour force during a particular period measured against a suitable Index.

Causes of Labour T/O



Measurement of Labour T/O

(Labour T/O due to new recruitment)

Replacement Method

no. of ce replaced during a period	$\times 100$
Avg. no. of ce during a period	

no. of ce separated during a year
Avg no. of ce during a year
(workers left & discharged)

Separation Method

no. of ce replaced + no. of ce separated	
Avg no. of ce during a period	

no. of new ce during a period
ex: replacements
Avg no. of ce during a period

New Recruitment

Accession Method

no. of new + no. of replacements	
Avg no. of ce during a period	

(workers recruited & joined)

Flux Method

no. of accession + no. of separation	
Avg no. of ce during a period	

Cost associated with Labour T/O

Preventive Cost
This cost incurred to keep the labour T/O at low level
Eg: medical services, pension schemes etc.

Replacement Cost
Cost which arises due to high labour T/O
Eg: cost of unemployment, training etc.

System of Wage Payment & Incentives



I) Time rate System

$$\text{Wages} = \text{no. of hrs worked} \times \text{Rate per hr}$$

II) Piece rate System.

- Straight piece rate

$$\text{Wages} = \text{no. of units produced} \times \text{Piece rate per unit}$$

- Differential Piece rate
based on their efficiencies

i) Taylor Differential wage rate

Efficiency	Rate
< 100%	83% of normal Piece rate
≥ 100%	125% of normal Piece rate

ii) Merrick Differential Wage rate

Efficiency	Rate
≤ 83%	Normal Piece rate
> 83% - ≤ 100%	110% of Normal Piece rate
> 100%	120% or 130% of NPR

III Combination of Time rate & Piece rate System.

• Gantt Task & Bonus System.

Actual output < std output	Time rate
$AO = SO$	Time rate + 20% of Bonus
$AO > SO$	High Piece rate or 120% of Piece rate

• Emerson Plan

Efficiency	Rate
< 66.67%	Time Rate
$\geq 66.67\% - \leq 100\%$	Time rate + 20% Bonus
> 100%	Time rate + 20% Bonus + 1% Bonus for each 1% ↑ over 100%.

• Bedaux Point System

$$\text{Earnings} = \text{hrs worked} \times \text{Rate/hr} + 75\% \text{ of } \left[\frac{\text{Bedaux Points saved} \times \text{rate/hr}}{60} \right]$$

IV Premium Bonus Method.

• Halsey Plan

- Wages = Actual time $\times$ Rate/hr
- Bonus = (Time saved $\times$ Rate/hr) % of Bonus.
- Time saved = Std time - Actual time

$$\text{Total Wages} = \text{Wages} + \text{Bonus}$$

(If % of Bonus is not given assume = 50%)

Rowan Plan

- Wages = Actual time $\times$ Rate/hr
- Bonus = (Time saved $\times$ Rate per hr) $\times$ $\frac{\text{Actual time}}{\text{Std time}}$

(If % is given assume = 30%)

$$\text{Total Wages} = \text{Wages} + \text{Bonus}$$

Halsey Weir Plan

- Same as that of Halsey

(% of Bonus if not given = 30%)

Barth Scheme

$$\text{Total Earnings} = \text{hrly rate} \times \sqrt{\text{Std hrs} \times \text{Actual hrs}}$$

Time Keeping & Book Keeping

Means keeping a record of attendance of workers inside & outside the factory.

Manual

Attendance Register Method

- An attendance Reg is kept at the factory gate of each dept.

Metal Disc/TOKEN Method

- Each worker is allotted a metal disc/token bearing his identification no.
- These are kept at the gate
- On arrival worker removes his token & time keeper records attendance.

Mechanical

Dial Time Recorder

- This is a machine which has a no. of holes & each hole bears a number corresponding to identification of worker
- There is radial arm at the centre of the dial which the worker presses

Time Recording clocks

- Each worker is given a time card which is valid for a particular duration.
- Worker picks up the card & puts in time recorder or clock

Objectives of Time Keeping

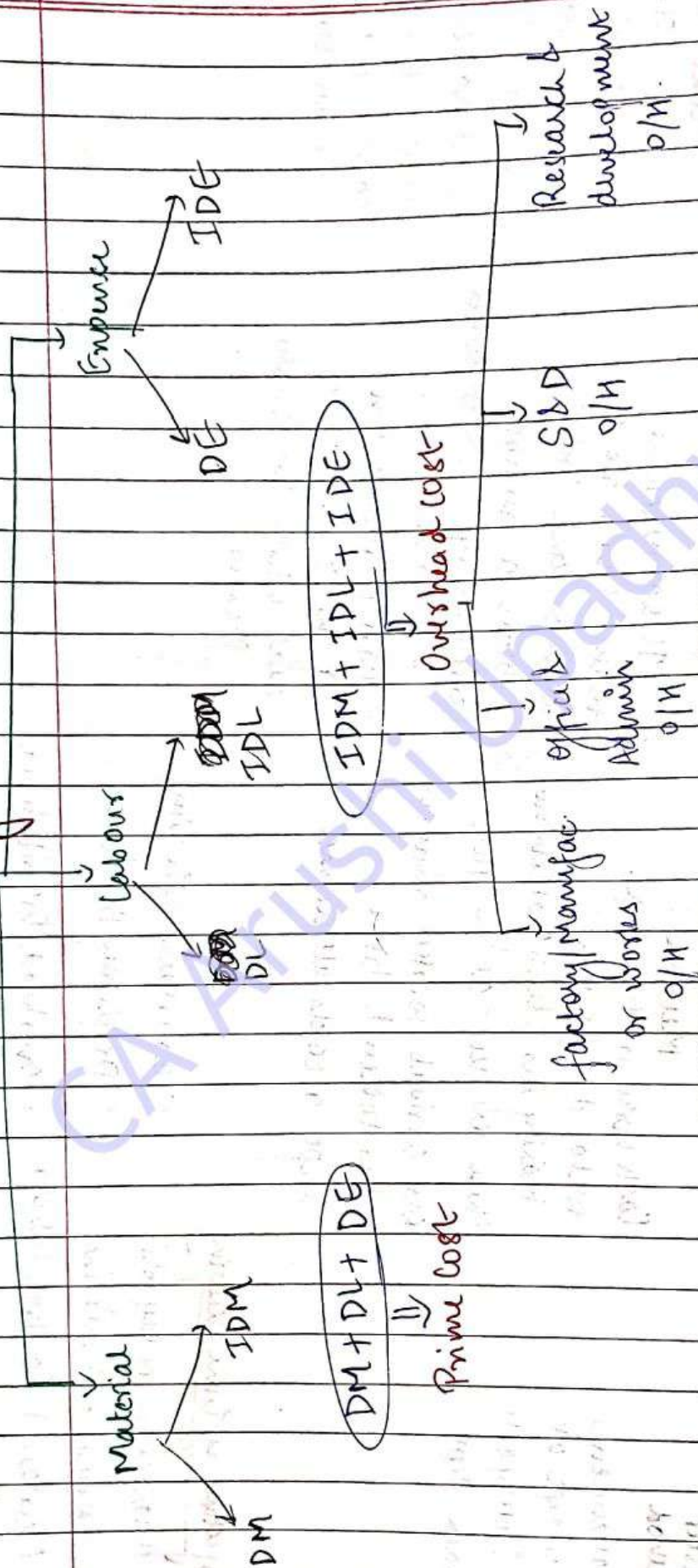
- Preparation of Pay rolls
- Calculating Overtime
- Ascertain Control Labour Cost
- Ascertain Idle time
- Disciplinary Purpose
- Overhead Distribution

7

COST SHEET

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Elements of Cost



COST SHEET - A statement which is used to determine the total cost of a particular product

Est. Cost sheet

Actual Cost sheet

Format of Cost sheet

Particulars	Amt.
DMC (WN1)	xx
+ DL	xx
+ DE	xx
⇒ Prime Cost	xx
+ Factory o/h / Mfg o/h / Works o/h	xx
+ op WIP	xx
(-) cl WIP	(xx)
⇒ Factory op / Mfg / works COST	xx
+ off & Admin o/h	xx
Cost of Prod ⁿ	xx
+ op FG	xx
- cl FG	(xx)
COGS	xx
+ S & D o/h	xx
Cost of Sales	xx
+ Profit	xx
Sales Value	xx

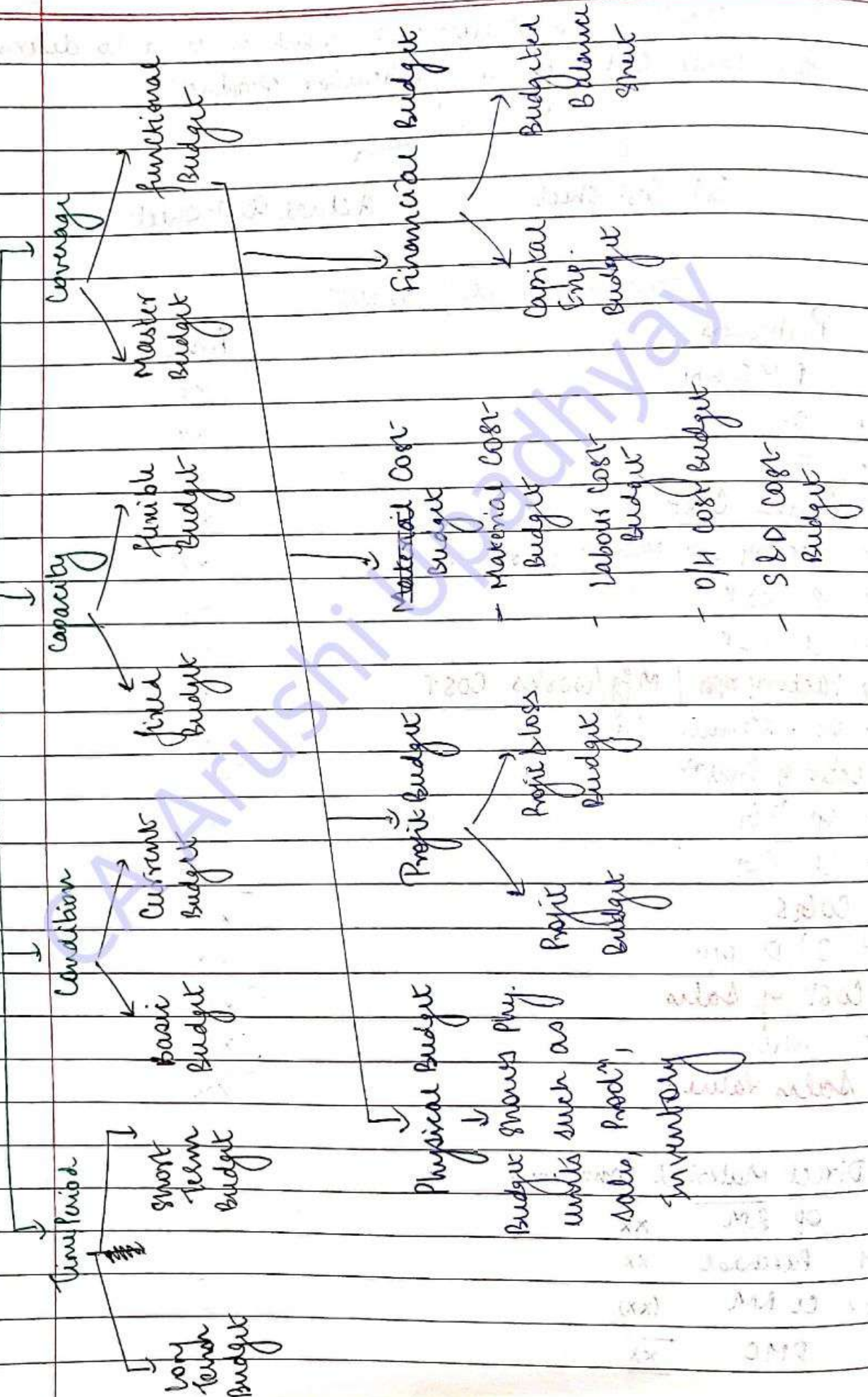
(WN1) Direct Material Consumed

op RM	xx
+ Purchase	xx
(-) cl RM	(xx)
DMC.	xx

⑧

BUDGETORY CONTROL

Types of Budget



Difference b/w

Fixed Budget

- does not change with actual level of activity
- Rigid or Inflexible
- It operates for a single level of activity.
- variance analysis does not give useful info.
- Comparison of actual performance with budgeted targets will be meaningless especially when there is a difference b/w the two activity levels.

Flexible Budget

- changes with actual level of activity
- Not Rigid
- consists of various budgets for different level of activities
- variance analysis gives useful info.
- Provides meaningful basis of comparison of the actual performance with the budget targets.

Budget Ratios

① Efficiency ratio

Std hrs	x 100
Actual hrs	

② Activity Ratio

Std hrs	x 100
Budgeted hrs	

OR

① x ③

③ Calendar Ratio

Available working days	x 100
Budgeted working days	

④ Std. capacity usage Ratio

Budgeted hrs	x 100
Max possible hrs in budgeted period	

⑤ Actual capacity usage Ratio

Actual hrs worked	x 100
Max. possible working in a period	

⑥ Actual usage of Budgeted capacity Ratio

Actual hrs worked	x 100
Budgeted hrs	

* Zero Based Budgeting (ZBB) -

ZBB is defined as a method of Budgeting which requires each cost ~~material~~ element to be specifically justified, although the activities to which the budget relates are being undertaken for the first time, without approval, the Budget Allowance is zero.

* Performance Budgeting (PB) -

A performance budget is one which presents the purposes & objectives for which funds are required, the costs of the programmes proposed for achieving those objectives and quantities data measuring the accomplishments & work performed under each programme.

Thus PB is a technique of presenting budgets for costs & revenues in terms of function.

9) PROCESS COSTING - I

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PROCEDURE of Process Costing

classification of Prodⁿ activities into Distinct Process



classification of Cost by Process



Separate Account

Treatment of

Normal loss



It increases the cost of Prodⁿ by increasing the Price per unit
(valued at Scrap value)

Abnormal loss



It is taken directly to Costing P&L

(value at cost per unit)

Abnormal Gain



It is taken directly to Costing P&L.

★ Inter-Process Profit

- Inter-Process Profit is made by the tff of output of one process to another
- It poses problem for the valuation of closing WIP. because for financial statement purpose closing WIP should be valued at cost or market value (WEL), whereas under this system WIP should be valued at Cost + Profit

$$\text{cost per unit} = \frac{\text{Total cost} - \text{Scrap value of NL}}{\text{Total units} - \text{N.L units}}$$

Imp. A/c

N.L A/c

To Process A/c	xx	By cash	xx
		By AG A/c	xx
	<u>xx</u>		<u>xx</u>

AL Loss A/c

To Process A/c	xx	By cash	xx
		By cost P&L	xx
	<u>xx</u>		<u>xx</u>

Ab. Grain A/c

To NL A/c	xx	By Process A/c	xx
To cost P&L	<u>xx</u>		

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PROCESS COSTING - II

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Valuation of WIP

FIFO

LIFO

Avg. Cost Method

units first entering the process are completed first

units last entering the process are completed first

Op. WIP & its cost are merged with the prodⁿ & cost of current period respectively.

$$\text{Avg. cost} = \frac{\text{Total Cost}}{\text{Total Equivalent units}}$$

Equivalent Prodⁿ

- Equivalent Prodⁿ refers to a systematic procedure of expressing the output of a process in terms of completed units
- It is the conversion of uncompleted prodⁿ into its equivalent completed units.

$$\text{Eq. units} = \text{No. of incomplete units} \times \% \text{ of completion}$$

① Stat. of Eq. Prodⁿ

Input		Output		Eq. units					
Items	Units	Items	Units	M ₁ , M ₂		L		O/H	
• op WIP	xx	Units t/f		%	units	%	units	%	units
		• op WIP	xx	xx	xx	xx	xx	xx	xx
		• Units Intro	xx	xx	xx	xx	xx	xx	xx
• Units Intro	xx	NL	xx	-	-	-	-	-	-
		cl WIP	xx	xx	xx	xx	xx	xx	xx
		Ab. loss	xx	xx	xx	xx	xx	xx	xx
			xx	xx	xx	xx	xx	xx	xx
		(-) Ab Grain	xx	xx	xx	xx	xx	xx	xx

$$\text{Prod}^n = \text{op} + \text{Intro} - \text{cl}$$

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② Stat of Cost

Elements	Total Cost (TC)	Eq. units (EU)	Cost/unit (TC/EU)
M [(-) value of NL]	xx	xx	xx
L	xx	xx	xx
O/H	xx	xx	xx
		Total cost	xx

③ Stat of Evaluation

Particulars	Amount
① Units completed & off	
i) op WIP	
M EU x CPU = xx	
L EU x CPU = xx	
O/H EU x CPU = xx	xx
+ M+L+O/H already done	xx
ii) Units Intro	
unit Intro x 1 CPU	xx
② NL units x SV	xx
③ cl WIP	
M EU x CPU = xx	
L EU x CPU = xx	
O/H EU x CPU = xx	xx
④ Ab. Gain	xx
⑤ Ab Loss	
M xx	
L xx	
O/H xx	xx
	xx

(11)

JOB & BATCH COSTING

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Job Costing

- Is a specific Order Costing
- It is undertaken in such Industries where work is done as per customer's Req.
- No two Jobs are alike
- Cost is determined on Job Basis
- Cost is est. before Prodⁿ

Eg - furniture, repair workshop etc

Batch Costing

- Is a special type of Job Costing
- It is undertaken in such Industries where Prodⁿ is of Repetitive nature
- Articles produced in Batch are alike
- Cost determined on Batch Basis
- Cost is determined after completion of Prodⁿ

Eg - Garment, TV, Radio etc

ECONOMIC BATCH Qty (EBQ)

Set up Cost

Cost of setting up and dis-assembling of machines & tools

Setup Cost	$\propto$	$\frac{1}{\text{Batch size}}$
------------	-----------	-------------------------------

Batch size $\uparrow$ setup cost $\downarrow$

Carrying Cost

Cost associated with holding the Inventory is called Carrying Cost

Variable cost & depends on batch size.

$$EBQ = \sqrt{\frac{2 \times A \times S}{C}}$$

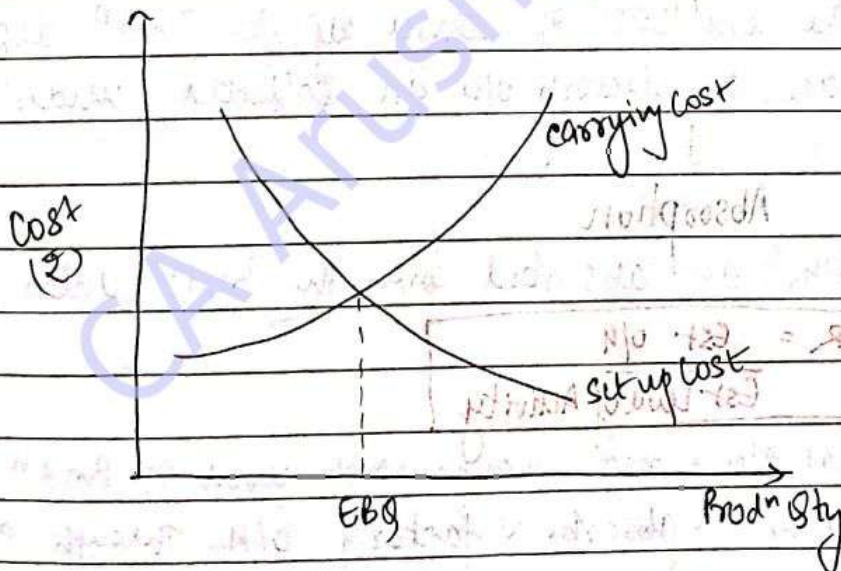
S = set up cost per Batch

C = Carrying cost per unit Prodⁿ

A = Annual demand for the Product.

If, rate of Int. (I) & unit cost of Prodⁿ (C) are given

$$EBQ = \sqrt{\frac{2 \times A \times S}{I C}}$$



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OVERHEADS

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Procedure for Estimating Overheads

- ① Estimation & Collection of Manufacturing overheads
Estimate the amt of o/h keeping in view the past figures & adjusting them for known figure changes

Cost Allocation

Primary
Distribution
Statement

Est. o/h should be allocated directly to various dept. to the extent possible.

Cost Apportionment

Those Est o/h which cannot be directly allocated to various dept. are apportioned on a suitable Basis.

Reapportionment

Secondary
Dist.
Statement

Reapportion the o/h cost of service dept to prodⁿ dept.
At this stage, all factory o/h are collected under Prodⁿ dept.

Absorption

Prodⁿ dept o/h are absorbed over the Prodⁿ units.

$$PDR = \frac{\text{Est. o/h}}{\text{Est. Level of Activity}}$$

As the actual M^y year begins each unit of Prodⁿ automatically absorbs factory o/h through PDR.

- ⑥ Treatment of Under & Over absorption of overheads.
Difference b/w actual amt. of o/h & absorbed amt of o/h

Methods for Reapportionment of service dept. PM to Prod. Dept

Direct Re-distribution Method

SD cost are apportioned over PD only ignoring the services rendered by one service Dept to other SD

Step Method or Non-Reciprocal Service Method

STEP ① - Find out SD that provides services to main no. of other dept.

STEP ② - Distribute the cost of this service dept to other dept on suitable basis

STEP ③ - Identify other SD which gives next largest no. of dept.

Distribute cost of such SD to other SD including whose cost are already apportioned

NOTE: Pending more no. of services to main no. of dept by same more amount of services

Reciprocal Method

(Simpler)

Repeated Dist method or continuous Dist method

SD is apportioned to other SD till one SD becomes zero

Trial & Error Method

Cost of SD is dist to other SD

by PD continuously till the cost in all SD is zero or negligible

Methods of Absorption of Production o/n

Prodⁿ Unit Method

$$PDR = \frac{\text{Prod}^n \text{ o/n}}{\text{no. of units (output)}}$$

Percentage Method

% on DM

$$PDR = \frac{\text{Prod}^n \text{ o/n}}{\text{DM}}$$

% on DL

$$PDR = \frac{\text{Prod}^n \text{ o/n}}{\text{DL}}$$

% on Prime Cost

$$PDR = \frac{\text{Prod}^n \text{ o/n}}{\text{P.C}}$$

Hourly Rate Method

Machine hours rate

$$PDR = \frac{\text{Prod}^n \text{ o/n}}{\text{machine hrs}}$$

Direct labours hours rate

$$PDR = \frac{\text{Prod}^n \text{ o/n}}{\text{DL hrs}}$$

Types of o/n recovery rate (PDR)

Blanket o/n Rate

refers to computation of single o/n rate for the whole factory.

Departmental o/n Rate refers to separate rate for each individual dept. or cost centre

Treatment of under & over Absorption

Due to Normal Reasons

Diff. small.
↓
charged to costing P&L

Diff. Large

Goods complete & sold
↓
charged to COS M/C

Goods complete & held in stock
↓
charged to F&W M/C

WIP
↓
charged to WIP M/C

Due to Abnormal Reasons

↓
charged to costing P&L M/C

but is large then first calculate

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Actual units = Actual Prodⁿ
units sold + units held in stock + equivalent units in WIP

★ when we have to distribute difference due to normal reason & supplementary rate (SR)

under absorbed

$$\text{+ve SR} = \frac{\text{Under absorbed}}{\text{Actual units}}$$

over absorbed

$$\text{-ve SR} = \frac{\text{Over absorbed}}{\text{Actual units}}$$

Concepts Related to Capacity

Rated Capacity (RC)
A.K.A

- Max. Capacity or Installed Capacity or
- Theoretical Capacity

Refers to capacity of machine or a plant as indicated by Manufacturer

Practical Capacity (PC)
A.K.A

- operating capacity or net capacity or
- Available capacity

↓
Actually utilised capacity of plant

Capacity based on sales expectancy

↓
Capacity of plant based on expected sales

Actual Capacity (AC)

↓
Capacity actually achieved during a given period

It is somewhere b/w practical capacity & capacity based on expected sales.

Normal Capacity (NC)
A.K.A

↓
Avg Capacity of the plant which is expected to be utilised over a long period

Normal IC may be based on sales expectancy

Idle Capacity (IC)
Part of capacity of plant or machine which cannot be effectively utilised.

$$IC = PC - AC$$

- IC cost are generally fixed in nature.
- IC cost can be treated as product costing

Abnormal IC

Charged to cost P&L

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↑ supplementary rate

↑ PDR

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ACTIVITY BASED COSTING

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Activity Based Costing is an accounting methodology that assigns costs to activities rather than products or services.

① Activity - refers to an event that incurs cost

② A Cost object -

It is an item for which cost measurement is required
eg. Product or consumer

③ A Cost driver -

It is a factor that causes a change in the cost of an activity.

A Resource Cost Driver

- It is a measure of the Qty. of resources consumed by an activity.
- It is used to assign the cost of a resource to an activity or cost pool

An 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.

④ Cost pool -

- It represents a group of various individual cost items.
- It consists of costs that have same cause and effect relationship
Eg - Machine set up.

Cost Allocation under

Activity Based Costing

Traditional Systems

Activity Based Costing

- O/P are related to activities & grouped into activity cost pools
- Costs are related to activities & hence are more realistic
- Activity-wise cost drivers are determined
- Activity-wise recovery rates are determined & there is no concept of single O/P recovery rate
- Costs are assigned to cost objects
- ABC aids cost control

Traditional Absorption Costing

- O/P are related to cost centres / Dept.
- Costs are related to cost centres & hence not realistic of Cost-Behaviour
- Time (hrs) are assumed to be the only cost driver governing costs in all dept.
- It has either single blanket rate or departmental O/P rate.
- Cost are assigned to cost units
- It is not suitable for cost control.

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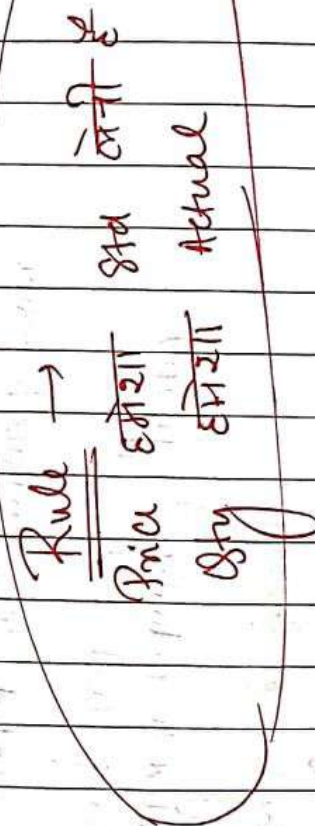
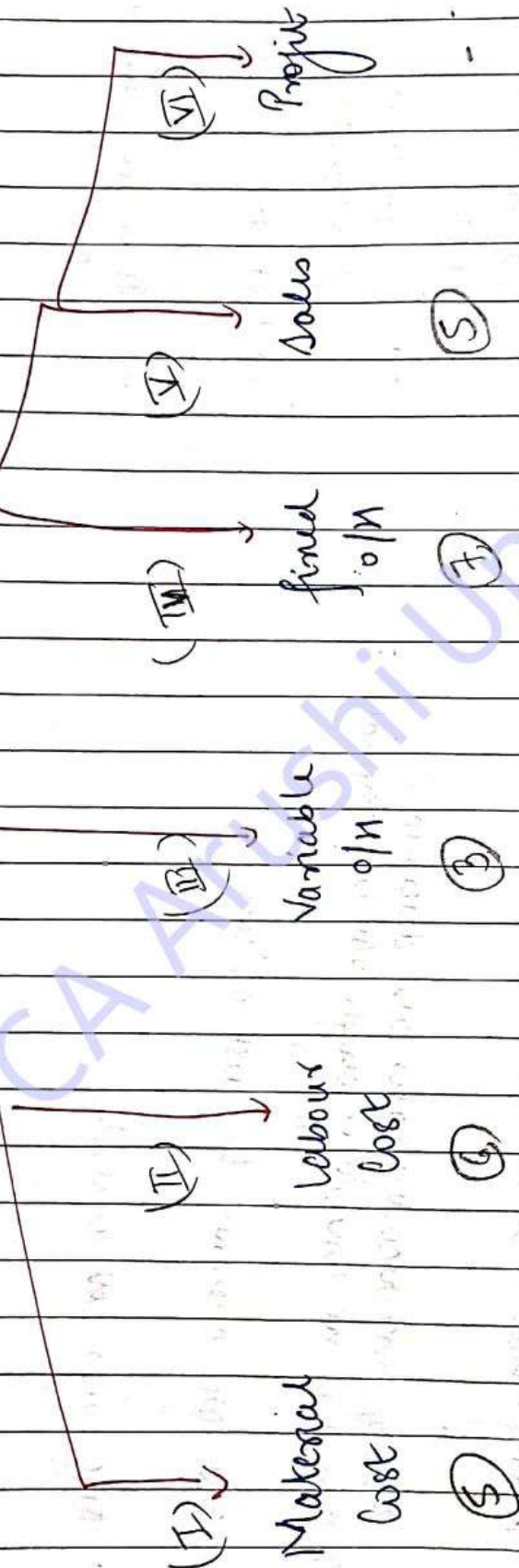
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STANDARD COSTING

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It is a technique of Cost Control.

Std. Costing is applied in 8 areas



I) Material Cost Variance

$$MCV = \text{Std Cost for Actual output} - \text{Actual Cost}$$

Material Price Variance

$$(SP - AP) \times AQ$$

Material Usage Variance

$$(SQ - AQ) \times SP$$

Material Mix Variance

$$(\text{Std Mix for Actual Input} - AQ) \times SP$$

Material Yield Variance

$$(\text{Std Input} - \text{Actual Input}) \times \text{Avg SP}$$

$$\left[\frac{SQ}{\text{Total SQ}} \times TAQ - AQ \right] \times SP$$

NOTE →

SP = Std Price

AP = Actual Price

SQ = Std Qty

AQ = Actual Qty

(Here Std means Revised Std.)

II) Labour Cost Variance

$$SC \text{ for } AO - AC$$

Labour's Rate Variance

$$(SR - AR) \times A \text{ hrs}$$

Efficiency
labours ~~rate~~ Variance

$$(S \text{ hrs} - A \text{ hrs}) \times SR$$

Labour's Min/
Gang Composition
variance

$$(SM \text{ for } A \text{ hrs worked} - A \text{ hrs worked}) \times SR$$

Labour's Idle Time
variance

$$Idle \text{ hrs} \times SR$$

(always adverse)

$SC = \text{std Cost}$
 $AC = \text{Actual Cost}$
 $SR = \text{std Rate}$
 $AR = \text{Actual Rate}$
 $SM = \text{std mix}$
 $A \text{ hrs} = \text{Actual hrs}$
 $S \text{ hrs} = \text{std hrs}$
 $AO = \text{Actual output}$

III) Variable o/h cost variance

$$SC \text{ for } AO - AC$$

Variable o/h Expenditure variance
(labour rate variance)

$$(SR - AR) \times A \text{ hrs}$$

Variable o/h efficiency variance
(labour time variance)

$$(S \text{ hrs} - A \text{ hrs}) \times SR$$

IV) Fixed o/n cost variance

$$\boxed{\text{Std o/n for AP} - \text{Actual o/n}}$$

Fixed o/n Expenditure variance

$$\boxed{\text{Std o/n} - \text{Actual o/n}}$$

Fixed o/n Calendar variance

$$\boxed{(\text{BD} - \text{AD}) \times \text{SR per day}}$$

Fixed o/n Capacity variance

$$\boxed{\left(\frac{\text{SC. hrs AD} - \text{AC}}{\text{hrs}} \right) \times \text{SR per hour}}$$

Fixed o/n Idle time variance

$$\boxed{\text{Idle hrs} \times \text{SR per hr}}$$

Fixed o/n volume variance

$$\boxed{\left[\frac{\text{Std Production}}{\text{(in units)}} - \text{AP} \right] \times \text{SR per unit}}$$

Fixed o/n efficiency variance

$$\boxed{\left(\frac{\text{Shm for AP}}{\text{Actual net hrs}} - \text{Actual net hrs} \right) \times \text{SR per hr}}$$

AP = Actual Prodⁿ

SR = Std Rate

BD = Budgeted days

AD = Actual days

SC = Std. Capacity

AC = Actual capacity

IV) Sales value variance (Comparison on Price basis)

$$SS \text{ for } AO - AS$$

Sales Price variance

$$(SSP - ASP) \times AQ$$

Sales volume variance

$$(SQ - AQ) \times SSP$$

Sales Mix variance

$$(SM \text{ for } AO - AQ) \times SSP$$

Sales Qty. Variance / Yield

$$(SQ - AQ) \times Avg \text{ SSP}$$

- SS = Std Sales
- AS = Actual Sales
- SSP = Std selling Price
- ASP = Actual Selling Price
- AQ = Actual Qty
- AO = Actual output
- ASQ = Std Qty