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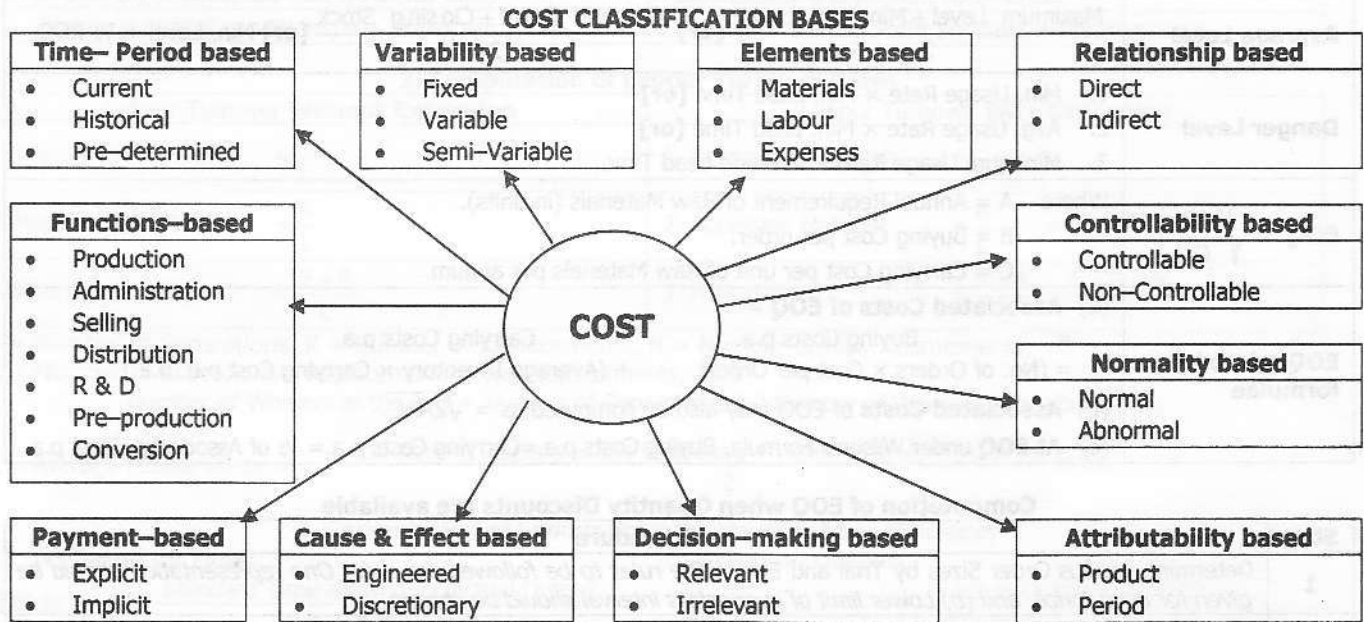
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Fast Track Referencer

– Important Formula & Hints to Remember

Chapter 1 Basic Cost Concepts



FORMAT OF COST SHEET

Particulars	Rs.
Add: Opening Stock of Raw Materials	
Add: Purchases (including Carriage Inwards, Transit Insurance etc.) _____	
Less: Closing Stock of Raw Materials _____	
Add: Direct Materials Consumed / Raw Materials Consumed	
Add: Direct Labour	
Add: Direct Expenses	
PRIME COST	
Add: Factory Overheads (also called Works OH / Manufacturing OH / Production OH)	
Add: Opening Stock of Work-in-Progress	
Less: Closing Stock of Work-in-Progress	
FACTORY COST / WORKS COST	
Add: Administration Overheads (also called Office OH / General OH / Management OH)	
Research and Development OH (apportioned) (if any)	
COST OF PRODUCTION	
Add: Opening Stock of Finished Goods	
COST OF GOODS AVAILABLE FOR SALE	
Less: Closing Stock of Finished Goods	
COST OF GOODS SOLD	
Add: Selling and Distribution Overheads (also called Marketing OH)	
COST OF SALES	
Add: Profit / Loss (Balancing Figure)	
SALES	

Chapter 2 Materials

Concept	Formula
ABC Analysis	% in Total Value = 70%, 20% and 10% for A, B, C respectively, & vice-versa for % in total quantity.
Re-Order Level	1. Maximum Usage Rate × Maximum Lead Time [or] 2. Safety Stock + Lead Time Consumption
Minimum Level	Re-Order Level – (minus) (Average Usage Rate × Average Lead Time)
Maximum Level	Re-Order Level + Re-Order Quantity – (minus) [Minimum Usage Rate × Min. Lead Time]
Average Level	$\frac{\text{Maximum Level} + \text{Minimum Level}}{2}$ [or] $\frac{\text{Opening Stock} + \text{Closing Stock}}{2}$ [or] Min. Level + $\frac{1}{2}$ ROQ
Danger Level	1. Min. Usage Rate × Min. Lead Time [or] 2. Avg. Usage Rate × Min. Lead Time [or] 3. Minimum Usage Rate × Average Lead Time
EOQ = $\sqrt{\frac{2AB}{C}}$	Where A = Annual Requirement of Raw Materials (in units). B = Buying Cost per order. C = Carrying Cost per unit of Raw Materials per annum.
EOQ related formulae	(a) Associated Costs of EOQ = = Buying Costs p.a. + Carrying Costs p.a. = (No. of Orders × Cost per Order) + (Average Inventory × Carrying Cost p.u. p.a.) (b) Associated Costs of EOQ may also be computed as = $\sqrt{2ABC}$ (c) At EOQ under Wilson's Formula, Buying Costs p.a. = Carrying Costs p.a. = $\frac{1}{2}$ of Associated Costs p.a.

Computation of EOQ when Quantity Discounts are available

Step	Procedure
1	Determine various Order Sizes by Trial and Error. <i>The rules to be followed are – (a) One representation should be given for every price, and (b) Lower limit of every class interval should be chosen.</i>
2	Find the number of orders for each Order Size chosen above. No. of Orders = Annual Requirement ÷ Order Size.
3	Compute Buying Costs per annum = Number of Orders × Cost per Order.
4	Compute Average Inventory = $\frac{1}{2}$ of Order Size = $\frac{1}{2}$ of Step 1 .
5	Compute Carrying Costs per annum = Average Inventory × Carrying Cost per unit p.a.
6	Compute Associated Cost per annum = Buying Costs p.a. + Carrying Costs p.a. = Step 3 + Step 5 .
7	Determine Costs of Purchase p.a. for each price.
8	Compute Total Costs p.a. = Associated Costs + Costs of Purchase = Step 6 + Step 7 .
9	Decision: Quantity relating to Least Total Costs p.a. shall be selected as the EOQ.

Note: Instead of Cost of Purchase p.a. under Step 7, Discounts received p.a. can also be considered. In such case, Step 8 = Step 6 Less Step 7.

$$\text{RM Turnover Ratio} = \frac{\text{Cost of Raw Materials Consumed}}{\text{Average Stock of Raw Materials}} \quad \frac{\text{Quantity of Raw Materials Issued / Consumed}}{\text{Average Quantity of Raw Materials in Stock}}$$

$$\text{Number of Days average inventory is held} = \frac{365}{\text{Material Turnover Ratio}}$$

Chapter 3 Labour

1. Treatment of Idle Time Cost

Cost of Normal Idle Time is treated as a regular part of cost of production. It is treated – (a) either as Direct Wages by inflating the Wage Rate (for Direct Workers) or (b) as Production OH (for Indirect Workers)	Cost of Abnormal Idle Time constitutes a Loss , and debited to Costing P & L A/c. If it is controllable, the responsibility should be fixed on the person in default.
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2. Treatment of Overtime Premium

Situation	Accounting Treatment of Overtime Premium
1. Due to genuine labour shortage.	Treated as Regular Cost of Production, as Direct Labour, by inflating normal wage rate.
2. At Customer's desire, e.g. immediate delivery, etc.	Charged to the Job directly. Such amount will be suitably recovered from the customer by charging at a higher rate.
3. Irregular overtime to meet production requirements due to unexpected developments.	Charged to Job – treated as Factory Overheads.
4. Due to fault of a particular department, e.g. non-availability of materials during normal time.	Charged to the department in default, in order to fix responsibility and prevent recurrence.
5. Due to abnormal conditions, e.g. strike, etc.	Charged to Costing Profit and Loss Account as Loss.

3. Computation of Labour Turnover Rates

Labour Turnover Without Expansion	Labour Turnover With Expansion
1. Separation Method: $= \frac{S}{L}$	1. Separation Method: $= \frac{S}{L}$
2. Replacement Method: $= \frac{R}{L}$	2. Accession Method: $= \frac{A}{L} = \frac{R + N}{L}$
3. Mixed Method: $= \frac{S + R}{L}$	3. Flux Method: $= \frac{S + A}{L} = \frac{S + R + N}{L}$

S = Number of Separations, R = Number of Replacements, N = Number of New Recruitments,

A = Number of Accessions = Replacements + New Recruitments, (or)

Number of Workers at the end + Number of Separations (–) Number of Workers at the beginning.

L = Average Labour Force = $\frac{[\text{Number of workers at the beginning} + \text{Number of workers at the end}]}{2}$

4. Computation of Labour Productivity or Labour Efficiency

(a) **Based on Time:**

Efficiency = $\frac{\text{Standard Time allowed for Actual Output}}{\text{Actual Time taken}}$

(b) **Based on Output:**

Efficiency = $\frac{\text{Actual Output produced}}{\text{Standard Output for Actual Time worked}}$

5. Computation of Wages under different Wages and Incentive Schemes

System	Formula for Wages
Simple Time Rate	Total Wages = Actual Hours Worked × Rate per hour.
Differential Time Rate	Total Wages = Actual Hours Worked × Rate per hour. (Rate is based on Workers' efficiency)
High Wage Plan	Total Wages = Actual Hours Worked × Rate per hour. (Rate is higher than industry average)
Measured Day Work	Total Wages = Actual Hours Worked × Rate per hour. (Rate has Fixed and Variable Components)
Simple Piece Rate	Total Wages = Actual Units produced × Rate per piece.
Taylor's Differential Piece Rate	Total Wages = Actual Units produced × Rate per piece, where Rate per piece is as under –
	Efficiency less than 100% 83% of Normal Piece Rate
	Efficiency equal to or more than 100% 125% of Normal Piece Rate
Merrick's Differential Piece Rate	Total Wages = Actual Units produced × Rate per piece, where Rate per piece is as under –
	Efficiency upto 83% Normal Piece Rate
	Efficiency above 83% but upto 100% 110% of Normal Piece Rate
	Efficiency above 100% 120% of Normal Piece Rate
Gantt's Task and Bonus System	Total Wages is calculated as under –
	Efficiency < 100% Guaranteed Time Rate, i.e. (Hours worked × Rate per hour)
	Efficiency = 100% Time Rate + 20% Bonus, i.e. (Hrs worked × Rate per hour) + 20% thereon
	Efficiency > 100% High Piece Rate, i.e. (Actual Output × 120% of Piece Rate per unit)
Emerson's Efficiency System	Total Wages is calculated as under –
	Efficiency < 66.67% Guaranteed Time Rate, i.e. (Hours worked × Rate per hour)
	Efficiency above 66.67% upto 100% Time Rate + Increasing Bonus based on actual efficiency, from 0.01% to a maximum bonus of 20% on Time Rate.
	Efficiency > 100% 120% of Time Rate + 1% incr. for every 1% incr. in output beyond 100%

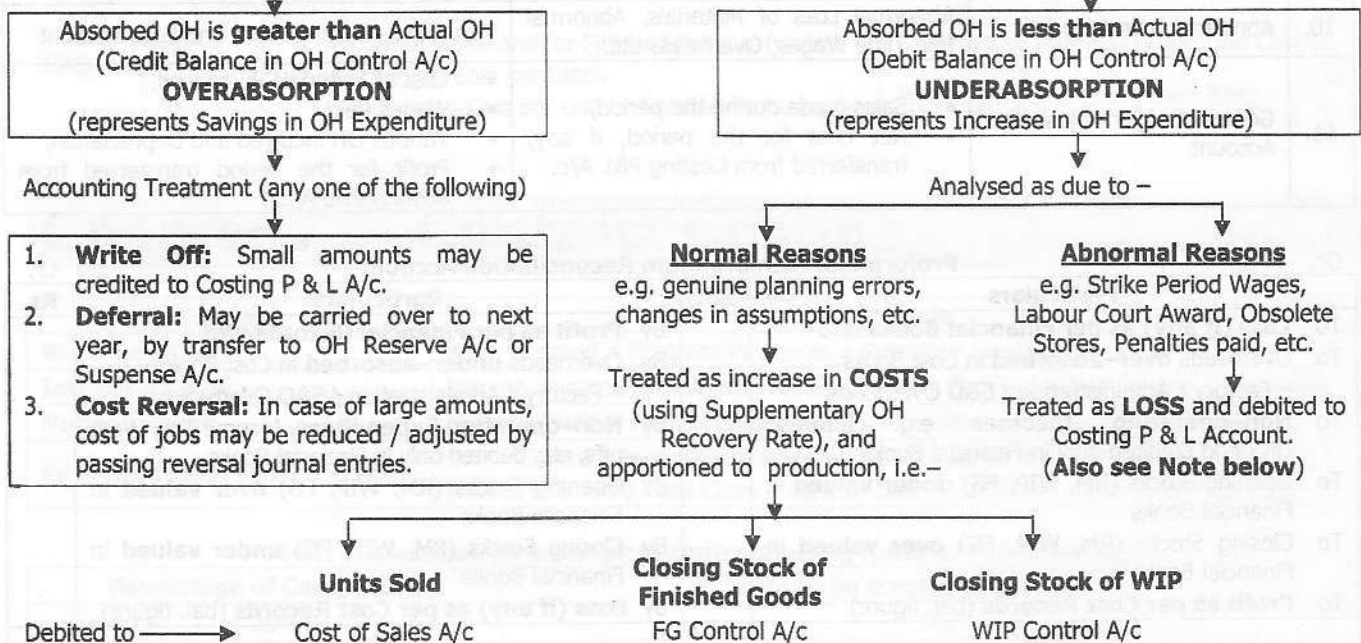
System	Formula for Wages		
Points Systems	Total Wages = Basic + Bonus, and is calculated as under –		
	System	Bedeaux	Haynes
	Basic	Hrs Worked × Rate per hour	Hours Worked × Rate per hour
	Bonus	75% × Points Earned × Rate per point	Repetitive work: 5/6 th × Points × Rate per point Non-repetitive work: 50% × Points × Rate per point
	Points	Expressed in B's (Bedeaux's)	Expressed in MANITS (Man-Minutes).
Premium Bonus Systems	Total Wages = Basic + Bonus, and is calculated as under –		
	System	Basic Component	Bonus Component
	Halsey-Weir	Hrs Worked × Rate p.h.	30% × Time Saved × Rate per hour
	Halsey	Hrs Worked × Rate p.h.	50% × Time Saved × Rate per hour
	Rowan	Hrs Worked × Rate p.h.	$\frac{\text{Actual Hours}}{\text{Standard Hours}} \times \text{Time Saved} \times \text{Rate per hour}$
	Barth	Total Wages = Rate per hour × $\sqrt{[\text{Standard Hours} \times \text{Actual Hours}]}$	

Chapter 4 Overheads

Concept	Formula		
Segregation of SV Costs – High and Low Points Method, etc.	- Variable Costs as a % of Sales Value = $\frac{\text{Difference in Total Costs}}{\text{Difference in Sales Value}}$ - Variable Costs at either highest or lowest volume as Sales × Variable Cost % computed above. - Fixed Costs = Total Costs less Variable Costs as computed above.		
	Note: The above principle can also be used with Difference in Output Quantity or Difference in Operating Hours in the Denominator (instead of Difference in Sales Value), to get Variable Cost per unit or Variable Cost per hour, as the case may be.		
Meaning of Output for OH	Type of OH	Output means	
	Factory OH	= Units sold + Closing Stock of Finished Goods + Closing Stock of WIP.	
	Admin OH	= Units sold + Closing Stock of Finished Goods.	
	S & D OH	= Units sold	
Absorption Costing Steps	1. Collection	2. Classification	3. Allocation
	4. Apportionment	5. Re-apportionment	6. Recovery
Assumptions and Methods in Re-apportionment	Assumption		Method
	Service Departments do not serve one another.		Direct Distribution Method.
	One Service Department serves the other, but does not take back services in return .		Step Ladder Method, or Step Method, or Non-Reciprocal Services Method.
	Service Departments serve one another.		Reciprocal Services Method – - Repeated Redistribution Technique (or Trial and Error Technique), (or) - Simultaneous Equations Technique.
Capacity Concepts	1. Licensed Capacity is the production capacity of the Plant for which license has been issued by an appropriate authority / Government Agency.		
	2. Installed Capacity is the maximum productive capacity according to the Manufacturers' specification of machines / equipment.		
	3. Practical Capacity = Maximum Capacity minus Normal / Unavoidable Time Loss.		
	4. Normal Capacity is the capacity of a Plant, which is expected to be utilised over a long period based on sales expectations. Normal Capacity = Practical Capacity minus Loss of productive capacity due to external factors.		
	5. Actual Capacity Utilization is the volume of production achieved, or actual operating hours worked, in relation to installed capacity.		
	6. If Actual Capacity Utilization < Installed Capacity, the difference is called Idle Capacity (or) Forecast Plant Idle Capacity.		

Concept	Formula	
	7. If Actual Capacity Utilization > Installed Capacity, the difference is Excess Capacity Utilization . 8. Abnormal Idle Capacity is the difference between Practical Capacity and Normal Capacity or Actual Capacity Utilization whichever is higher. So, Abnormal Idle Capacity = Practical (or sometimes Normal) Capacity minus Actual Capacity Utilisation.	
Overhead Recovery Methods	1. Direct Method (Based on Output) 2. Indirect Methods: (a) Percentage of Direct Materials, (b) Percentage of Direct Labour, (c) Percentage of Prime Cost, (d) Labour Hour Rate, and (e) Machine Hour Rate	
Machine Hour Rate Concepts	If Total OH include	Machine Hour Rate is called
	Machine-related Direct Costs only	Direct Machine Hour Rate
	Machine-related Direct and Indirect Costs	Simple Machine Hour Rate
	All Machine-related Costs + Operators' Wages	Comprehensive Machine Hour Rate

Treatment of Difference in Absorption = OH Variance = Absorbed OH Less Actual OH



Chapter 5 Cost Accounting Systems

Accounts maintained under Non-Integrated System

	Name of Account	Debited with	Credited with
1.	Stores Ledger Control Account [or] Raw Materials Control Account	Receipt of Materials in Stores Department, i.e.– • Cost of Purchases including Carriage Inwards, • Materials Returned from Production Department.	• Materials Issued to – (i) Jobs (i.e. to WIP), (ii) Repairs Work (Factory OH), (iii) Office (Administration OH), (iv) Sales Department (Selling OH), • Materials returned to Vendor. • Normal and Abnormal Loss of Materials.
2.	Wages Control Account	Wages Paid.	Wages analysed into – • Direct Wages, • Indirect Wages, • Abnormal Idle Time / OT Wages, if any.
3.	Factory OH Control Account [or] Production OH Control Account	Factory OH incurred i.e. – • Indirect Material consumed, • Indirect Wages, • Indirect Expenses.	• Factory OH absorbed to production, i.e. transfer to WIP Control A/c. • Adjustment for Underabsorption, if any.

	Name of Account	Debited with	Credited with
4.	WIP Control Account [or] Job Ledger Control Account	Factory Cost items of Jobs i.e. – • Direct Materials, • Direct Wages, • Factory Overheads absorbed.	• Factory Cost of Production, i.e. transfer to Finished Goods Control Account. • Abnormal Loss in Production Department, if any.
5.	Administrative Overhead Control Account	AOH incurred.	AOH absorbed to goods produced, i.e. transfer to Finished Goods Control A/c.
6.	Finished Goods Control Account [or] Stock Ledger Control Account	• Factory Cost of Production, & • Administrative Overheads absorbed, • Cost of goods returned by Customers, if any.	• Total Cost of Goods Sold, i.e. transfer to Cost of Sales Account. • Abnormal Loss in Warehouse, if any.
7.	Selling and Distribution Overheads Control Account	Selling and Distribution Overheads incurred.	S & D OH absorbed to units sold, i.e. transfer to Cost of Sales Account.
8.	Cost of Sales Account	• Cost of Goods Sold, & • Selling & Distribution OH absorbed.	Total Cost of Sales, i.e. transfer to Costing P&L A/c.
9.	Sales Account	Transfer to Costing P & L A/c.	Sales Value.
10.	Abnormal Loss Account	Abnormal Loss of Materials, Abnormal Idle Time Wages, Overheads etc.	Transfer to Costing Profit and Loss Account
11.	General Ledger Adjustment Account	• Sales made during the period, • Net Loss for the period, if any, transferred from Costing P&L A/c.	• Cost of Materials Purchased, • Wages Paid, • Various OH incurred and Depreciation, • Profit for the period transferred from Costing P&L A/c.

Dr.

Proforma of Memorandum Reconciliation Account

Cr.

Particulars	Rs.	Particulars	Rs.
To Loss (if any) as per Financial Books b/fd		By Profit as per Financial Records b/fd	
To Overheads over-absorbed in Cost Books – Factory / Administration / S&D Overheads		By Overheads under-absorbed in Cost Books – Factory / Administration / S&D Overheads	
To Non-operating Incomes e.g. Interest, Dividend credited only in Financial Books		By Non-operating Expenditure , Income Tax, Write offs, etc. debited only in Financial Books	
To Opening Stocks (RM, WIP, FG) under valued in Financial Books		By Opening Stocks (RM, WIP, FG) over valued in Financial Books	
To Closing Stocks (RM, WIP, FG) over valued in Financial Books		By Closing Stocks (RM, WIP, FG) under valued in Financial Books	
To Profit as per Cost Records (bal. figure)		By Loss (if any) as per Cost Records (bal. figure)	
Total		Total	

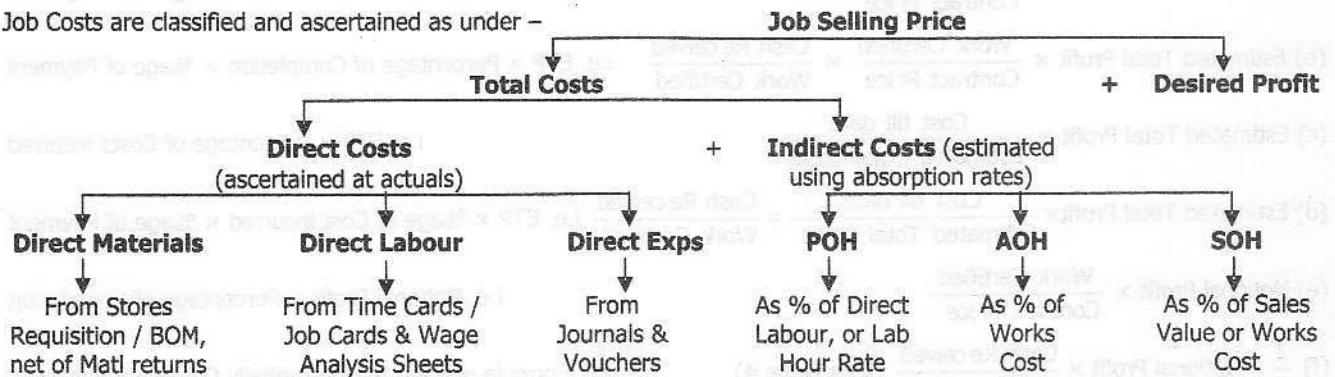
Note: The above account may be considered as an extension of the Financial P & L Account. Hence, Financial Profit is taken on the **credit side** of this account. Debit / Credit approach to reconciliation is as under –

1. Identify the item causing difference e.g. Production Overheads, Goodwill written-off etc.
2. See whether the item relates to the Debit or Credit side of the Financial P & L Account.
3. Ascertain the direction of the change i.e. whether the amount is to be increased or reduced in order to arrive at the figure as per the Cost Records.
4. If the amount is to be increased, record the difference in the same side, if the amount is to be reduced, reverse the difference by posting it in the opposite side.
5. Reconciliation Decision Table may be prepared as under –

Item	As per Financial Books	To be changed to..... (as per Cost Books)	Difference and adjustment required
Underabsorbed OH	Dr.	To be reduced toDr.	Cr.
Overabsorbed OH	Dr.	To be increased to ... Dr.	Dr.
Non-Operating Incomes	Cr.	To be reduced to Nil	Dr.
Non-Operating Expenses	Dr.	To be reduced to Nil	Cr.
Opening Stock overvalued in Financial Books	 Dr.	To be reduced to Dr.	Cr.
Opening Stock undervalued in Financial Books	Dr.	To be increased to ...Dr.	Dr.
Closing Stock overvalued in Financial Books	Cr.	To be reduced to Cr.	Dr.
Closing Stock undervalued in Financial Books	Dr.	To be increased to ...Cr.	Cr.

Chapter 6 Job and Batch Costing

Job Costs are classified and ascertained as under –



$$EBQ = \sqrt{\frac{2AS}{C}}, \text{ where}$$

A = Annual Demand for Finished Product (units).

S = Set-Up Cost per batch.

C = Carrying Cost per unit of Finished Product p.a.

If Rate of Interest (I) and Unit Cost of Production (C) is given, then $EBQ = \sqrt{\frac{2AS}{IC}}$

Chapter 7 Contract Costing

Concept	Formula
Work Certified	Work Certified = Progress Payments + Retention Money.
Income till date	Income on a contract till date = Value of Work Certified + Cost of Work Uncertified.
Notional Profit	Notional Profit = Income till date (Less) Expenditure till date on the contract.
Estimated Total Profit / (Loss)	ETP = Contract Price (Less) Estimated Total Costs on the contract. [Note: Estimated Total Costs = Cost till date + Additional Costs to be incurred.]

Profit Recognition on incomplete contracts using Notional Profit concept

Percentage of Completion	Profit to be transferred to P & L A/c
≤ 25%	NIL
26% to 50%	$\frac{1}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$
51% to 90% (See Note c)	$\frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$
91% – 99% (See Note c)	Profit is recognised on the basis of Estimated Total Profit
100%	$\text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$ (See Note d)

Notes:

(a) Percentage of Completion = $\frac{\text{Work Certified}}{\text{Contract Price}}$

- (b) If there is a loss at any stage, i.e. irrespective of percentage of completion, such Loss should be **fully** transferred to the Profit and Loss Account.
- (c) Substantially completed can also be considered as **51% to 95%** completed. In such case, the next slab of Almost Complete Contracts will be taken as **95% to 99%** completed.
- (d) For fully complete contracts, the balance portion of profit is recognised only upon receipt of Retention Money. If entire amount is fully received, the whole of profit can be recognised.
- (e) The principle of prudence / conservatism is generally followed for recognizing profit. Hence, for exact 50% completion, 1/3rd of Notional Profit will be recognised (and not 2/3rd).

Profit Recognition on incomplete contracts using Estimated Total Profit

Any of the following alternative formula may be used for recognition of profit –

- (a) Estimated Total Profit $\times \frac{\text{Work Certified}}{\text{Contract Price}}$ i.e. ETP $\times$ Percentage of Completion
- (b) Estimated Total Profit $\times \frac{\text{Work Certified}}{\text{Contract Price}} \times \frac{\text{Cash Received}}{\text{Work Certified}}$ i.e. ETP $\times$ Percentage of Completion $\times$ %age of Payment
- (c) Estimated Total Profit $\times \frac{\text{Cost till date}}{\text{Estimated Total Costs}}$ i.e. ETP $\times$ Percentage of Costs incurred
- (d) Estimated Total Profit $\times \frac{\text{Cost till date}}{\text{Estimated Total Costs}} \times \frac{\text{Cash Received}}{\text{Work Certified}}$ i.e. ETP $\times$ %age of Cost incurred $\times$ %age of Payment
- (e) Notional Profit $\times \frac{\text{Work Certified}}{\text{Contract Price}}$ i.e. Notional Profit $\times$ Percentage of Completion
- (f) $\frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$ (See Note 4) i.e. Formula relating to Substantially Complete contracts.

Note:

- ETP based formula can be applied –
 - for almost complete contracts (**91% – 99%**), or
 - for any other contract **above 25% complete**, if future costs can be reasonably estimated.
- In the absence of any specific requirement or other information, **Formula (b)** may be applied.
- Even where the ETP related information is available, Notional Profit may also be used to recognize profit. Hence, Formula (e) & (f) may be applied for profit recognition.
- Formula (f) shall be modified as $\frac{1}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$, in case of 26% to 50% complete contracts.
- The Profit recognised / transferred to the P & L Account should be determined on **prudence / conservatism basis**, i.e. if all the formulae are applied, the **least** of the resulting profits should be considered.
- If the amount of Notional Profit is less than the amount to be recognised by applying the above formula, then profit transferred to P & L A/c shall be the **least** of the two. (e.g. If Profit to be recognised based on ETP is Rs.48,000, but Notional Profit is only Rs.36,000, then the amount transferred to P&L A/c shall be Rs.36,000 only).

Rules for provisioning for Losses on contracts

The rules in respect of Profits and Losses to be recognized on Contracts is summarized below –

Combination		Treatment
Current Year	Estimated	
Notional Profit	Estimated Total Profit	Profit should be recognized only if percentage of completion is $\geq 25\%$. Any of the 6 formula may be applied, on prudence basis.
Notional Profit	Estimated Total Loss	Estimated Total Loss is fully provided for in the current year. Profit should not be recognized.
Loss	Estimated Total Profit	Current Loss is fully provided for . Profit is not recognised even though there may be a profit when the contract is finally completed.
Loss	Estimated Total Loss	Current Loss or Estimated Total Loss, whichever is worse , is fully provided for in the current year.

Chapter 8 Joint and By Products Costing

Concept	Formula
Methods of Joint Cost Apportionment	1. Physical Quantities Method, 2. Average Unit Cost Method, 3. Survey / Technical Evaluation Method, 4. Contribution Margin Method, and 5. Market Value Methods – (a) Sale Value at Split Off Point, (b) Sale Value after Further Processing, and (c) NRV at Split Off Point.

Concept	Formula
Accounting for By-Product Revenue	1. Cost Recognition Methods – (a) Market Value, (b) NRV, (c) Standard Cost, (d) Comparative Price, and (e) Re-use or Opportunity Costs 2. Revenue Accounting – (a) Low, (b) Moderate, and (c) High Revenue situations
Further Processing Decisions	See Steps given below.

Step	Procedure
1	Compute Additional Revenue = Sale Value after further Processing Less Sales Value at Split off.
2	Compute Additional Costs = Further Processing Costs + S & D OH if any.
3	Compute Additional Profit = Additional Revenue Less Additional Costs.
4	Decide: If Additional Profit ≥ 0 , process further. If not, sell at split off point.

Chapter 9 Process Costing

Accounting Procedure for Process Losses

Stage A: LOSS ANALYSIS

Step	Procedure
1	Compute Process Loss = Input Quantity Less Output Quantity.
2	Determine Normal Loss Quantity , either based on Input or Expected Production.
3	Compute Abnormal Loss or Abnormal Gain , as the case may be. [Step 1 Less Step 2]

Stage B: COST ANALYSIS

Step	Procedure
1	Determine – (a) Gross Cost , i.e. Total of Debit Side of Process Account, and (b) Gross Input Quantity , i.e. Total Input Quantity for the Process.
2	Determine Normal Loss Quantity , and Scrap Value , if any, of Normal Loss.
3	Compute – (a) Net Cost = Gross Cost Less Scrap Value of Normal Loss. (b) Net Expected Output = Gross Input Quantity Less Normal Loss Quantity.
4	Compute Effective Cost per unit = $\frac{\text{Net Cost}}{\text{Net Expected Output}} = \frac{\text{Step 3(a)}}{\text{Step 3(b)}}$. (This is called as Good Unit Rate)

Stage C: VALUATION: The various items are valued as under–

	Item	Basis of Valuation
1	Units Produced & Transferred	Effective Cost per unit as per B(4) above.
2	Normal Loss	Scrap Value only.
3	Abnormal Loss	Effective Cost per unit as per B(4) above. (Note: Abnormal Loss is considered as Deemed Good Production, and is valued, as if it were good units produced.)
4	Abnormal Gain	Effective Cost per unit as per B(4) above. (Note: Abnormal Gain constitutes Actual (excessive) Good Production.)

Stage D: SCRAP REALISATION ENTRIES (Abnormal Loss / Gain Accounting)

	Item	Treatment
1	Normal Loss A/c	- Debit with Normal Loss Quantity and Scrap Value thereon. - Credit with amount realized by way of sale of scrap. - When Process Loss < Normal Loss, the difference is transferred to Abnormal Gain A/c.
2	Abnormal Loss A/c	- Debit with Abnormal Loss Quantity and Cost thereon at Effective Cost pu, as per Process A/c. - Credit with amount realized by way of sale of scrap. - Net Abnormal Loss is transferred / debited to Costing P & L A/c.
3	Abnormal Gain A/c	- Credit with Abnormal Gain Quantity and Value thereon. - Debit / Adjust Normal Loss Scrap Value, when Process Loss < Normal Loss. - Net Abnormal Gain is transferred / credited to Costing P & L A/c.

Equivalent Production: The following steps are involved –

Step 1	Input – Output Reconciliation of quantities on physical basis.
Step 2	Determination of Percentage of Completion and Computation of Equivalent Production.
Step 3	Computation of Cost per equivalent unit.
Step 4	Apportionment of Total Cost over Production, Abnormal Loss and Closing WIP.
Step 5	Preparation of Process Account.

Note: Before applying the above steps, Students are first required to decide on the following –

1. Method of Valuation, i.e. FIFO or WAC:

- FIFO Method should be used if – (i) degree of completion for Opening WIP is given, and (ii) Cost break-up of Opening WIP is not given.
- WAC Method should be used if – (i) degree of completion for Opening WIP is not given, and (ii) Cost break-up of Opening WIP is given.

2. First Process or Subsequent Process:

- For the First Process, the Cost Elements are – (i) Material, (ii) Labour and (iii) POH.
- For any Subsequent Process, the Cost Elements are – (i) Material A – i.e. transferred in material from the previous process, (ii) Process B – Direct Material Input into the Subsequent Process, (iii) Labour and (iv) POH.

Explanation for Steps

Step 1 Input – Output Reconciliation	- Compute Total Input during the period = Opening WIP units + Freshly introduced units. - Compute Normal Loss Quantity based on – (i) Percentage of Total Input, or (ii) Percentage of Expected Production, i.e. [Opening WIP + Fresh Units – Closing WIP]. - Determine Quantity transferred to next process, and classify it into – (i) Transfer from Opening WIP & (ii) Transfer from Fresh units. [Note: This classification is only for FIFO, and not for WAC Method]. - Identify the units lying as Closing WIP and compute Abnormal Loss / Gain as balancing figure.	
Step 2 Percentage of Completion and Equivalent Units (See Note below)	Item	Percentage of Completion
	(a) Transfer to next process out of – (i) Opening WIP	100% Less Percentage completed in the prior period, i.e. balance Percentage of Completion.
	(ii) Fresh Units introduced	100%
	(b) Normal Loss	Nil
	(c) Abnormal Loss	100% (generally) or as specified in the Question for Scrap.
	(d) Closing WIP	As specified in the Question.
Step 3 Cost per Equivalent Unit	(e) Abnormal Gain, if any	100% (quantity written within brackets to signify subtraction)
	- This is obtained by dividing the Cost (Materials, Labour & POH) by the respective equivalent units. - Scrap Value of Normal Loss, if any, is reduced from the Cost of Materials. In case of second or Subsequent Process, it is reduced from Cost of Material A, i.e. Previous Process Raw Material. - Under WAC Method, the Total Cost (Opening WIP Cost + Current Cost) is determined for calculating the Cost per Equivalent Unit.	
Step 4 Cost Apportionment	Total Cost is apportioned over Production, Abnormal Loss and Closing WIP by multiplying the equivalent units at the appropriate Cost per Equivalent Unit.	
Step 5 Process Account	Costs are debited to the Process Account. The credit side is updated using the figures determined in Step 4 above. Under FIFO method, Cost of Production consists of Cost of Opening WIP and Cost of Processing during the period.	

Note:

- Under FIFO Method, in case of Second or Subsequent Processes, Material A is regarded as 100% complete in all respects, except for transfer out of Opening WIP units and Normal Loss.
- Under WAC Method, total transfer to next process is taken as 100% complete. Break-up between Opening WIP and fresh units introduced, is not considered.

Chapter 10 Operating Costing

- **Absolute (Weighted Average) Tonne-Kilometres:** Each Route Distance $\times$ Respective Load Quantities.
- **Commercial (Simple Average) Tonnes-Kilometres:** Total Distance (i.e. Kms) $\times$ Average Load Quantity (Tonnes).

Chapter 11 Standard Costing

$$\begin{aligned} \text{1. MATERIAL COST VARIANCE} &= \text{Standard Material Cost} - \text{Actual Material Cost} \\ &= \text{SQ} \times \text{SP} - \text{AQ} \times \text{AP} \\ &= \text{WN (1)} - \text{WN (2)} \end{aligned}$$

$$\begin{aligned} \text{Material Price Variance} &= \text{AQ} \times \text{SP} - \text{AQ} \times \text{AP} \\ &= \text{WN (3)} - \text{WN (2)} \end{aligned}$$

$$\begin{aligned} \text{Material Usage Variance} &= \text{SQ} \times \text{SP} - \text{AQ} \times \text{SP} \\ &= \text{WN (1)} - \text{WN (3)} \end{aligned}$$

$$\begin{aligned} \text{Material Mix Variance} &= \text{RAQ} \times \text{SP} - \text{AQ} \times \text{SP} \\ &= \text{WN (4)} - \text{WN (3)} \end{aligned}$$

$$\begin{aligned} \text{Material Yield Variance} &= \text{SQ} \times \text{SP} - \text{RAQ} \times \text{SP} \\ &= \text{WN (1)} - \text{WN (4)} \end{aligned}$$

Working Notes:

WN Column No.	(1)	(2)	(3)	(4)
Computation	$\text{SQ} \times \text{SP}$	$\text{AQ} \times \text{AP}$	$\text{AQ} \times \text{SP}$	$\text{RAQ} \times \text{SP}$
Material A				
Material B, etc.				
Total				

	Meaning of Terms / Abbreviations used:
SQ	= Standard Quantity, i.e. = Expected consumption for actual output.
AQ	= Actual Quantity of Material Consumed.
RAQ	= Revised Actual Quantity, i.e. = Actual Quantity re-written in standard proportion.
SP	= Standard Price per unit of material consumed.
AP	= Actual Price per unit of material consumed.

Note: Material Purchase Price Variance (MPPV)

Material Price Variance is computed for the actual quantity of materials consumed. If such Price Variance is computed for the actual material quantity **purchased**, it is called as Material Purchase Price Variance. It is computed as –

$$\text{MPPV} = \text{PQ} \times \text{SP} - \text{PQ} \times \text{AP}$$

Where PQ = Purchase Quantity,

SP = Standard Prices, and AP = Actual Prices.

$$\text{2. LABOUR COST VARIANCE} = \text{SH} \times \text{SR} - \text{AH} \times \text{AR} = \text{WN (1)} - \text{WN (2)}$$

$$\begin{aligned} \text{Labour Rate Variance} &= \text{AH} \times \text{SR} - \text{AH} \times \text{AR} \\ &= \text{WN (3)} - \text{WN (2)} \end{aligned}$$

$$\begin{aligned} \text{Labour Efficiency Variance} &= \text{SH} \times \text{SR} - \text{AH} \times \text{SR} \\ &= \text{WN (1)} - \text{WN (3)} \end{aligned}$$

$$\begin{aligned} \text{Labour Mix Variance} &= \text{RAH} \times \text{SR} - \text{AH} \times \text{SR} \\ &= \text{WN (4)} - \text{WN (3)} \end{aligned}$$

$$\begin{aligned} \text{Labour Sub-efficiency Variance} &= \text{SH} \times \text{SR} - \text{RAH} \times \text{SR} \\ &= \text{WN (1)} - \text{WN (4)} \end{aligned}$$

Working Notes:

WN Column No.	(1)	(2)	(3)	(4)
Computation	$\text{SH} \times \text{SR}$	$\text{AH} \times \text{AR}$	$\text{AH} \times \text{SR}$	$\text{RAH} \times \text{SR}$
Grade A				
Grade B, etc.				
Total				

Meaning of Terms / Abbreviations used:

- SH** = Standard Hours, i.e.
= Expected time for actual output.
- AH** = Actual Hours paid for.
- RAH** = Revised Actual Hours, i.e.
= Actual Hours re-written in standard proportion.
- SR** = Standard Rate per Labour Hour.
- AR** = Actual Rate paid per Labour Hour.

Note: Labour Idle Time Variance (LITV)

When information on idle time is given, Labour Efficiency Variance (LEV) is alternatively sub-classified into—

- (1) Labour Idle Time Variance (LITV), and
(2) Labour Revised Efficiency Variance (LREV).

Labour **Efficiency** Variance

Labour **Idle Time**
Variance

Labour **Revised**
Efficiency Variance

(Refer below for Formula and Computation.)

LITV = Actual Idle Hours × Standard Rate Per Hour (Always Adverse).

LREV = Balancing Figure, LEV ± LITV, depending upon whether LEV is Favourable or Adverse.

3. VOH COST VARIANCE = Standard (or Absorbed VOH) – Actual VOH

$$= SH \times SR - AH \times AR = WN (1) - WN (2)$$

VOH **Expenditure** Variance

$$= AH \times SR - AH \times AR$$

$$= WN (3) - WN (2)$$

VOH **Efficiency/Utilisation** Variance

$$= SH \times SR - AH \times SR$$

$$= WN (1) - WN (3)$$

VOH **Idle Time** Variance

$$\text{Actual Idle Hours} \times SR$$

(Always Adverse)

VOH **Revised Efficiency** Variance

(Balancing Figure)

i.e. VEV ± VITV

Working Notes:

Based on Time			Based on Output		
SH × SR	AH × AR, i.e. AVOH	AH × SR	AO × SR	AO × AR, i.e. AVOH	SO × SR
(1)	(2)	(3)	(1)	(2)	(3)

Note: Either Time Based or Output Based computation may be applied.

4. FOH COST VARIANCE = Standard or Absorbed FOH – Actual FOH

$$= AO \times SR - AFOH = WN (1) - WN (2)$$

FOH **Expenditure** Variance

$$= BFOH - AFOH$$

$$= WN (3) - WN (2)$$

FOH **Volume** Variance = $AO \times SR - BFOH$

$$= WN (1) - WN (3)$$

Capacity Variance

$$= AH \times SR - BH \times SR, \text{ (or) } AH \times SR - PH \times SR$$

$$= WN (4) - WN (3), \text{ (or) } WN (4) - WN (5)$$

Note: WN (5) will be used only when Calendar Variance is available.

Efficiency Variance

$$= AO \times SR - SO \times SR, \text{ i.e. } = SH \times SR - AH \times SR$$

$$= WN (1) - WN (4)$$

Calendar Variance

$$= PH \times SR - BH \times SR$$

$$= PO \times SR - BO \times SR$$

$$= PFOH - BFOH$$

$$= WN (5) - WN (3)$$

Note: When idle-time information is available, FOH Efficiency Variance is also further sub-classified into –

- FOH **Idle Time** Variance (FITV) = Actual Idle Hours × Standard Rate Per Hour (Always adverse)
- FOH **Revised Efficiency** Variance (FREVE) = Balancing Figure, FOH Efficiency Variance ± FITV, depending upon whether FOH Efficiency Variance is Favourable or Adverse.

Working Notes:

(1)	(2)	(3)	(4)	(5)
AO × SR	AFOH	BFOH	AH × SR	PFOH

Meaning of Terms / Abbreviations used:

- AO** = Actual Output.
BO = Budgeted Output.
SO = Standard Output, i.e.
 = Expected Output for Actual Hours worked.
PO = Possible Output, i.e.
 = Expected Output for Actual Days worked.
AH = Actual Hours worked.
BH = Budgeted Hours.
SH = Standard Hours, i.e.
 = Expected Time (Time Allowed) for Actual Output.
PH = Possible Hours,
 = i.e. Expected Hours for Actual Days worked.
AFOH = Actual Fixed Overhead.
BFOH = Budgeted Fixed Overhead.
PFOH = Possible Fixed Overhead = Expected Fixed Overhead for Actual Days worked = $BFOH \times \frac{AD}{BD}$
SR = Standard Rate per Unit or per Hour, as the case may be. Where **AD** = Actual Days & **BD** = Budgeted Days.

Conversion Factors used in computation

	Time-based	Output-based	This represents...
1.	$SH \times SR \text{ ph} =$	$AO \times SR \text{ pu} =$	Standard or Absorbed Fixed OH
2.	$AH \times SR \text{ ph} =$	$SO \times SR \text{ pu} =$	Std Cost of Actual Hours worked
3.	$BH \times SR \text{ ph} =$	$BO \times SR \text{ pu} =$	Budgeted Fixed OH
4.	$PH \times SR \text{ ph} =$	$PO \times SR \text{ pu} =$	Possible Fixed OH

5. SALES VARIANCES

Meaning of Terms / Abbreviations used:

- BP** = Budgeted Selling Price Per Unit.
BQ = Budgeted Sales Quantity.
RAQ = Revised Actual Sales Quantity = Actual Quantity Sold re-written in Budgeted Proportion.
BM = Budgeted Margin = Budgeted Price per unit minus Standard Cost per unit.
AM = Actual Margin = Actual Sales Price per unit minus Standard Cost per unit.
AP = Actual Selling Price Per Unit.
AQ = Actual Sales Quantity.

1. TOTAL / TURNOVER APPROACH

$$\text{Total Sales Variance} = \text{Budgeted Sales} - \text{Actual Sales}$$

$$= BQ \times BP - AQ \times AP = \text{WN (1)} - \text{WN (2)}$$

Sales Price Variance
 $= AQ \times BP - AQ \times AP$
 $= \text{WN (3)} - \text{WN (2)}$

Sales Volume Variance
 $= BQ \times BP - AQ \times BP$
 $= \text{WN (1)} - \text{WN (3)}$

Sales Mix Variance
 $= RAQ \times BP - AQ \times BP$
 $= \text{WN (4)} - \text{WN (3)}$

Sales Quantity Variance
 $= BQ \times BP - RAQ \times BP$
 $= \text{WN (1)} - \text{WN (4)}$

2. MARGIN / PROFIT APPROACH

$$\text{Total Sales Margin Variance} = \text{Budgeted Sales Margin} - \text{Actual Sales Margin}$$

$$= BQ \times BM - AQ \times AM = \text{WN (1)} - \text{WN (2)}$$

Sales Margin Price Variance
 $AQ \times BM - AQ \times AM$
 $= \text{WN (3)} - \text{WN (2)}$

Sales Margin Volume Variance
 $BQ \times BM - AQ \times BM$
 $= \text{WN (1)} - \text{WN (3)}$

Sales Margin Mix Variance
 $RAQ \times BM - AQ \times BM$
 $= \text{WN (4)} - \text{WN (3)}$

Sales Margin Quantity Variance
 $BQ \times BM - RAQ \times BM$
 $= \text{WN (1)} - \text{WN (4)}$

Working Notes:

	Total Approach				Margin Approach			
WN Col.Ref.	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Computation	$BQ \times BP$	$AQ \times AP$	$AQ \times BP$	$RAQ \times BP$	$BQ \times BM$	$AQ \times AM$	$AQ \times BM$	$RAQ \times BM$
Product A								
Product B, etc.								
Total								

6. RELATIONSHIP BETWEEN TOTAL APPROACH AND MARGIN APPROACH

Factor	Relationship	Reason	No. of Products	Method of Costing
1. Price	Sales Price Variance = Sales Margin Price Variance, i.e. SPV = SMPV	For the actual quantity sold, Standard Cost remaining constant, change in Selling Price will have equal impact on Turnover and Profit.	Applicable for individual products and product combinations also.	Applicable under Absorption Costing as well as under Marginal Costing System.
2. Volume	Sales Margin Volume Variance = Sales Volume Variance $\times$ Budgeted Net Profit Ratio, i.e. SMVV = SVV $\times$ Budgeted Net Profit Ratio	As volume (quantity) increases, Turnover also increases. Since Cost also increases due to volume increase, the impact on Profit is to the extent of Net Profit increase only.	Applicable only for individual products and not for product combinations.	Applicable only under Absorption Costing System. (See Note)

Note: When Marginal Costing System is used, the relationship will be: **SMVV = SVV $\times$ Budgeted Profit Volume Ratio.**

7. BUDGET-RATIOS (or) CONTROL-RATIOS

Ratio	Time-Based Formula	Output-Based Formula
1. Budgeted Capacity Usage Ratio	$\frac{\text{Budgeted Hours}}{\text{Practical Plant Capacity Hours}}$	$\frac{\text{Budgeted Output}}{\text{Practical Plant Capacity Output}}$
2. Actual Capacity Utilisation Ratio	$\frac{\text{Actual Hours}}{\text{Budgeted Hours}} \text{ (or) } \frac{\text{Actual Hours}}{\text{Possible Hours}}$	$\frac{\text{Standard Output}}{\text{Budgeted Output}} \text{ (or) } \frac{\text{Standard Output}}{\text{Possible Output}}$
3. Efficiency Ratio	$\frac{\text{Standard Hours}}{\text{Actual Hours}}$	$\frac{\text{Actual Output}}{\text{Standard Output}}$
4. Calendar Ratio	$\frac{\text{Actual Days}}{\text{Budgeted Days}} \text{ (or) } \frac{\text{Possible Hours}}{\text{Budgeted Hours}}$	$\frac{\text{Possible Output}}{\text{Budgeted Output}}$
5. Volume or Level of Activity Ratio	$\frac{\text{Standard Hours}}{\text{Budgeted Hours}}$	$\frac{\text{Actual Output}}{\text{Budgeted Output}}$

Chapter 12 Marginal Costing

Concept	Formula
PV Ratio	$= \frac{\text{Total Contribution}}{\text{Total Sales Value}} \times 100 \quad \text{(or)} \quad \frac{\text{Contribution per unit}}{\text{Sales Price per unit}} \times 100 \quad \text{(or)}$ $= \frac{\text{Change in Contribution}}{\text{Change in Sales}} \times 100 \quad \text{(or)} \quad \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100 \quad \text{(or)}$ $= 100\% \text{ Less Variable Cost Ratio.}$
Break Even Point	(a) Break Even Point (in Rs.) = $\frac{\text{Fixed Costs}}{\text{PV Ratio}}$ (This is denoted as Break Even Sales Value) (b) Break Even Point (Qty) = $\frac{\text{Fixed Costs}}{\text{Contribution per Unit}}$ (This is denoted as Break Even Quantity).
Margin of Safety	(a) Margin of Safety (in Rs.) = Total Sales Less BEP Sales (or) $\frac{\text{Profit}}{\text{PV Ratio}}$ (b) Margin of Safety (Qty) = Total Sales Qty Less BEQ (or) $\frac{\text{Profit}}{\text{Contribution per Unit}}$
Indifference Point	(a) Indifference Point (Rs.) = $\frac{\text{Difference in Fixed Costs}}{\text{Difference in PV Ratio}}$ (or) = $\frac{\text{Difference in Fixed Costs}}{\text{Difference in Variable Cost Ratio}}$ (b) Indifference Point (units) = $\frac{\text{Difference in Fixed Costs}}{\text{Difference in Contribution per Unit}}$ (or) = $\frac{\text{Difference in Fixed Costs}}{\text{Difference in Variable Cost per Unit}}$
Shut Down Point	(a) Shut Down Point (Rs.) = $\frac{\text{Avoidable Fixed Costs}}{\text{PV Ratio}}$ (b) Shut Down Point (Qty) = $\frac{\text{Avoidable Fixed Costs}}{\text{Contribution per Unit}}$