

FTR 1 Standard Costing & Variance Analysis

Issue	Points to remember				Page
Classification of Variances	Based on		Classification		1.1
	1. Type of Cost		(a) Material, (b) Labour, & (c) Overheads.		
	2. Causal Factor		Variances of – (a) Efficiency, (b) Price, (c) Volume.		
	3. Impact on Profit		(a) Favourable, & (b) Adverse.		
Groups of Variances	Elements of Cost	Variance of Efficiency	Variance of Price	Variance of Volume	1.2
	Materials	Usage, Mixture, Yield	Price	Revision	
	Labour	Efficiency, Idle Time	Rate of Pay		
	VOH	Efficiency	Expenditure	Revision	
	FOH	Efficiency	Expenditure	Capacity, Calendar	
	Sales	Quantity, Mixture	Price		
Material Variance – Reasons	1. Controllable – Failure to purchase anticipated quantities, Not availing cash discount, Failure to buy standard quality of materials, Deficiencies in price negotiation. 2. Non controllable – Change in prices of basic materials, changes in related charges, Failure to buy standard quality of materials.				1.2
Material Usage Variance – Reasons	1. Use of sub-standard/ defective materials. 2. Carelessness in use of material. 3. Products failing to pass inspection & further material required for rectification.		4. Pilferage 5. Wastage. 6. Difference in material quality 7. Use of non-standard mix.		1.2
Labour Rate Variance – Reasons	1. Increase in Wage Rate due to inflation, cost of living index, etc. 2. Higher wage awards not anticipated at the time of setting standards. 3. Special increments/ allowances given to workers. 4. Use of wrong type of labour. 5. Using a composition different from that of standard. 6. Excessive overtime & consequent premium payment.				1.2
Labour Eff. Variance – Reasons	1. Changes in quality stds or material specifications. 2. Use of sub-standard employees. 3. Poor working conditions.		4. Inefficient organisation. 5. Defective machinery or equipment. 6. Incompetent Supervision		1.3
VOH Variances – Reasons	1. Over/ Under spending. 2. Faulty planning & selection of wrong base for estimation of absorption rates. 3. Differences in rate of cost. 4. Differences in processing time.				1.3
FOH Variances – Reasons	1. Over or under spending – Expenditure Variance . 2. Difference in output due to time factor – Capacity Variance . 3. Difference in output due to quantity factor – Efficiency Variance . 4. Difference in output due to days factor – Calendar Variance .				1.3
SOH Variance Analysis	Based on – 1. Head of Expenditure, 2. Nature of Expenses, 3. Product-wise, 4. Manager-wise / Salesman-wise.				1.3
AOH Variance Analysis	1. Budget to Actual 2. Operation Costing or ABC		3. Ratio Analysis 4. Trend Analysis		1.4
Sales Variances – Reasons	1. Changes in unit selling prices – Price Variance , 2. Changes in physical volume of each product sold – Quantity Variance , and 3. Changes in proportion of volume – Mix Variance .				1.4
Profit Variances – Reasons	1. Direct substitution of products. 2. Actual quantity of constituents of sales different from budgeted quantity. 3. Actual total quantity different from budgeted total quantity. 4. Difference between actual and budgeted unit cost. 5. Difference between actual and budgeted unit sale price.				1.4
Accounting Types	1. Partial Plan, 2. Single Plan & 3. Dual Plan Note: For Journal Entries under 1 & 2, Refer Page 1.14.				1.13

Issue	Points to remember			Page
Differences between Partial & Single Plan	Particulars	Partial Plan	Single Plan	1.13
	1. Computed at	End of the period.	At the point of transaction.	
	2. Nature of Control	Helps only post-control.	Current control is facilitated.	
	3. MPV computed for	Actual Quantity Consumed.	Actual Quantity Purchased.	
	4. RM Valuation	Valued at Actual Cost.	Valued at Standard Cost.	
	5. Variances adjusted	in WIP Control Account.	in respective Cost Accounts.	
	6. Nature of analysis	Suitable if simple analysis of variance is sufficient.	Preferred if frequent detailed analysis of variance is desired.	
	7. Documentation	Detailed documentation not necessary.	Requires more planning & effective documentation at each stage.	
Disposition of Adverse Cost Variances	A. Write-off all variances to Costing P&L A/c at the end of every period – Assuming all variances are abnormal.	Costing P&L A/c Dr. To Variance A/cs (individually)		1.15
	B. Assuming all variances are normal, Distribute all variances proportionately to – (1) Units Sold, (2) Closing Stock of FG, & (3) Closing Stock of WIP.	Cost of Sales A/c Finished Goods Control WIP Control A/c To Variance Accounts (individually)	Dr. (for units sold) Dr. (for Closing FG) Dr. (for Closing WIP)	
	C. Write off Quantity Variances (MUV, LEV etc.) to Costing P&L A/c & apportion Price Variances (MPV, LRV etc.) over Cost of Sales, WIP and FG stocks. Note: Quantity Variances are assumed abnormal while Price Variances are deemed normal.	Costing P&L A/c Cost of Sales A/c Finished Goods Ctrl A/c WIP Control A/c To Variance Accounts (individually)	Dr. (For Quantity Var.) Dr. Dr. Dr.	
Disposition of Favourable Cost Variances	A. Write-off all Variances to Costing P&L A/c at the end of every period – Assuming all Variances are abnormal.	Variance A/cs (individually) Dr. To Costing P&L A/c		1.15
	B. Carry forward to next accounting period	No Journal Entry is required.		
	C. Reversal of Cost Absorption Entries – Assuming all Variances are normal, and excess cost absorbed to be reversed to reflect correct cost, profits & stock values.	Variance Accounts (individually) Dr. To Cost of Sales A/c (for units sold) To Fin. Goods Ctrl A/c (for Closing FG) To WIP Control A/c (for Closing WIP)		
Stds in Job Industry	Standards are to be set and analysed with respect to – 1. Material Quantities, 2. Material Prices, 3. Labour Standards, 4. Overhead Standards.			1.15
Standard Costing with ABC System	1. Standards are established for each cost element based on specifications & variances between Budgeted & Actual Costs analysed for remedial measures. 2. In ABC System, costs are collected around Activity Pools & assigned to products & services using appropriate Cost Drivers, thereby, standards set for carrying out each type of activity.			1.16
Opportunity Costs in Variance Reports	1. Opportunity Cost arises from failure to use scarce resources efficiently & it is appropriate to include Contribution Loss in reporting Material Usage Variance/ Labour Efficiency Variance, in case material is scarce/ labour hours are scarce. 2. Loss of contribution should be included in Variance Report, and assigned / charged to the Manager, whose sub-standard performance caused loss.			1.16
Inventory Valuation at Standard Cost	Inventories should be valued at Normal Costs , i.e. Standard Costs adjusted in light of variances unconnected with efficiencies. Reasons for inventory valuation at Standard Costs are – 1. Efficiency Variations 2. Carryover Effect of efficiencies or inefficiencies of a period 3. Need for Online Valuation			1.16
Problems of Std Costing during inflation	1. Assumptions regarding inflation. 2. Price Indices. 3. Standard Mixes requiring different inputs.	4. Efficiency Variances. 5. Decision making. 6. Operations to maintain up-to-date standards.		1.16

Issue	Points to remember		Page
Std Costing & Budg Ctrl	A Budgetary Control System can operate without Standard Costs. The two systems are not inter-dependent , i.e. they can exist independently. Though the two are not independent, they are inter-related, and function well as complementary to one another.		1.17
Std Costing vs Budgetary Control	Particulars	Standard Costing	Budgetary Control
	Meaning	Standards Costs are pre-determined costs representing what the costs should be, at the level of efficient conditions of production and operation.	Budgets are financial and/or quantitative statements, prepared and approved prior to a defined period of time, of the policy to be pursued during that period for achieving that objective.
	Coverage	Generally restricted to Costs .	Include estimates of income, costs and employment of capital .
	Basis	Determined by the collection of technical data .	Determined based on Management's plans .
	Effect of temporary conditions	Effect of short-run temporary changes will not be reflected in Standard Costs.	Effect of short-term changes in cost structure, etc, will be fully reflected in Budgeted Costs.
Behavioural aspects of Std Costing	Permanence	Standard Costs are usually semi-permanent in nature.	They are estimated usually for one year .
	1. Static Behaviour in Managers and Employees. 2. Undue Importance to Material Price, Labour Rate, Efficiency and Capacity Usage. 3. Emphasis on Standard Cost than Allowable Cost. 4. Unsuitable for Pricing Decisions.		1.17

Computation of Variances

1. Material Cost Variances:

Particulars	$SQ \times SP$	$RAQ \times SP$	$AQ \times SP$	$AQ \times AP$
	Col. (1)	Col. (2)	Col. (3)	Col. (4)
Material A				
Material B				
Total	WN 1	WN 2	WN 3	WN 4

Differences

$$\text{Material Yield Variance} + \text{Material Mix Variance} + \text{Material Price Variance}$$

$$= SQ \times SP - RAQ \times SP = RAQ \times SP - AQ \times SP = AQ \times SP - AQ \times AP$$

$$\text{Material Usage Variance} + \text{Material Price Variance b/fd as above}$$

$$= SQ \times SP - AQ \times SP$$

Total Material Cost Variance

$$= \text{Standard Material Cost} - \text{Actual Material Cost}$$

$$= SQ \times SP - AQ \times AP$$

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.
- S.P** = Standard Price per unit of material consumed.
- A.P** = 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 –

$$MPPV = PQ \times SP - PQ \times AP$$

Where PQ = Purchase Quantity,
SP = Standard Prices, and AP = Actual Prices.

2. Labour Cost Variances:

A. Classification based on Grade (Mix) of Labour

Particulars	SH × SR Col. (1)	RAH × SR Col. (2)	AH × SR Col. (3)	AH × AR Col. (4)
Grade A				
Grade B, etc.				
Total	WN 1	WN 2	WN 3	WN 4
Differences	$\begin{aligned} &\text{Labour Sub-Efficiency Variance} + \text{Labour Mix Variance} + \text{Labour Rate Variance} \\ &= \text{SH} \times \text{SR} - \text{RAH} \times \text{SR} = \text{RAH} \times \text{SR} - \text{AH} \times \text{SR} = \text{AH} \times \text{SR} - \text{AH} \times \text{AR} \\ &\text{Labour Efficiency Variance} + \text{Labour Rate Variance b/fd as above} \\ &= \text{SH} \times \text{SR} - \text{AH} \times \text{SR} \\ &\text{Total Labour Cost Variance} \\ &= \text{Standard Wages} - \text{Actual Wages} \\ &= \text{SH} \times \text{SR} - \text{AH} \times \text{AR} \end{aligned}$			

B. Classification based on Idle Time Analysis

Particulars	SH × SR Col. (1)	Net AH × SR Col. (2)	Total AH × SR Col. (3)	Total AH × AR Col. (4)
Grade A				
Grade B, etc.				
Total	WN 1	WN 2	WN 3	WN 4
Differences	$\begin{aligned} &\text{Labour Net Efficiency Variance} + \text{Labour Idle Time Variance} + \text{Labour Rate Variance} \\ &= \text{SH} \times \text{SR} - \text{Net AH} \times \text{SR} = \text{Net AH} \times \text{SR} - \text{Total AH} \times \text{SR} = \text{AH} \times \text{SR} - \text{AH} \times \text{AR} \\ &\text{Labour Gross Efficiency Variance} + \text{Labour Rate Variance b/fd as above} \\ &= \text{SH} \times \text{SR} - \text{Total AH} \times \text{SR} \\ &\text{Total Labour Cost Variance} \\ &= \text{Standard Wages} - \text{Actual Wages} \\ &= \text{SH} \times \text{SR} - \text{AH} \times \text{AR} \end{aligned}$			

Note: Labour Idle Time Variance is always Adverse.

Meaning of Terms / Abbreviations used:

SR = Standard Rate per Labour Hour.
AR = Actual Rate paid per Labour Hour.
SH = Standard Hours, Time Allowed for actual output.
 = i.e. Expected time for actual output.

AH = Actual Hours paid for.
Net AH = Total AH – Idle Time.
RAH = Revised Actual Hours, i.e.
 = Actual Hours re-written in standard proportion.

3. VOH Cost Variances: A. Based on Time

SH × SR Col. (1)	AH × SR Col. (2)	AH × AR, i.e. AVOH Col. (3)
$\begin{aligned} &\text{VOH Efficiency Variance} + \text{VOH Expenditure Variance} \\ &= \text{SH} \times \text{SR} - \text{AH} \times \text{SR} = \text{AH} \times \text{SR} - \text{AH} \times \text{AR} \\ &\text{Total VOH Cost Variance} = \text{SH} \times \text{SR} - \text{AH} \times \text{AR} \end{aligned}$		

(or) B. Based on Output

AO × SR Col. (1)	SO × SR Col. (2)	AO × AR, i.e. AVOH Col. (3)
$\begin{aligned} &\text{VOH Efficiency Variance} + \text{VOH Expenditure Variance} \\ &= \text{AO} \times \text{SR} - \text{SO} \times \text{SR} = \text{SO} \times \text{SR} - \text{AO} \times \text{AR} \\ &\text{Total VOH Cost Variance} = \text{AO} \times \text{SR} - \text{AO} \times \text{AR} \end{aligned}$		

Notes:

- VOH Cost Variance = Standard or Absorbed VOH less Actual VOH. So, Difference in VOH Absorption is called as ~~VOH~~ Cost Variance. Underabsorption represents Adverse Variance, and Overabsorption represents Favourable Variance.
- Either Time Based or Output Based computation may be applied for VOH Variance Computation.

Notes:

- FOH Cost Variance = Standard or Absorbed FOH less Actual FOH. So, Difference in FOH Absorption is called as FOH Cost Variance. Underabsorption represents Adverse Variance, and Overabsorption represents Favourable Variance.
- Either Time Based or Output Based computation may be applied for FOH Variance Computation.
- When idle-time data is available, FOH Efficiency (i.e. Gross Efficiency) Variance is also further sub-classified into –
 - (a) FOH **Idle Time** Variance = Idle Hours × FOH Standard Rate per hour, (this is always adverse), **and**
 - (b) FOH **Net Efficiency** Variance = (Total AH – Net AH) × FOH Standard Rate per hour. [i.e. Gross Efficiency Variance less Idle Time Variance]
- When Calendar Variance is not given, (i.e. days related data not given), then Capacity Variance will be WN 2 – WN 4, i.e. $\frac{AH}{SR} \times SR - \frac{BH}{SR} \times SR$.
- The above FOH Variance Computation is applicable when a Firm adopts Absorption Costing System. If the Firm adopts Marginal Costing System, **only** FOH Expenditure Variance will be computed.

5. Sales Variances: Sales Variances can be analysed and computed in any of the following approaches –
 1. Impact on Turnover – Total or Turnover Approach, and 2. Impact on Profit – Margin or Profit Approach.

A. SALES VARIANCES UNDER TOTAL APPROACH (IMPACT ON TURNOVER)

Particulars	Col. (1): BQ × BP	Col. (2): RAQ × BP	Col. (3): AQ × BP	Col. (4): AQ × AP
Product A				
Product B				
Total	WN 1	WN 2	WN 3	WN 4
Differences	$\begin{aligned} &\text{Sales Quantity Variance} + \text{Sales Mix Variance} + \text{Sales Price Variance} \\ &= \text{BQ} \times \text{BP} - \text{RAQ} \times \text{BP} \quad = \text{RAQ} \times \text{BP} - \text{AQ} \times \text{BP} \quad = \text{AQ} \times \text{BP} - \text{AQ} \times \text{AP} \\ &\text{Sales Volume Variance} = \text{BQ} \times \text{BP} - \text{AQ} \times \text{BP} + \text{Sales Price Variance b/fd as above} \\ &\text{Total Sales Variance} \\ &= \text{Budgeted Sales Value} - \text{Actual Sales Value} \\ &= \text{BQ} \times \text{BP} - \text{AQ} \times \text{AP} \end{aligned}$			

B. SALES VARIANCES UNDER MARGIN APPROACH (IMPACT ON PROFIT)

Particulars	Col. (1): BQ × BM	Col. (2): RAQ × BM	Col. (3): AQ × BM	Col. (4): AQ × AM
Product A				
Product B				
Total	WN 1	WN 2	WN 3	WN 4
Differences	$\begin{aligned} &\text{Sales Margin Quantity Variance} + \text{Sales Margin Mix Variance} + \text{Sales Margin Price Variance} \\ &= \text{BQ} \times \text{BM} - \text{RAQ} \times \text{BM} \quad = \text{RAQ} \times \text{BM} - \text{AQ} \times \text{BM} \quad = \text{AQ} \times \text{BM} - \text{AQ} \times \text{AM} \\ &\text{Sales Margin Volume Var.} = \text{BQ} \times \text{BM} - \text{AQ} \times \text{BM} + \text{Sales Margin Price Variance b/fd as above} \\ &\text{Total Sales Margin Variance} \\ &= \text{Budgeted Sales Margin} - \text{Actual Sales Margin} \\ &= \text{BQ} \times \text{BM} - \text{AQ} \times \text{AM} \end{aligned}$			

Meaning of Terms / Abbreviations used:

BP	= Budgeted Selling Price Per Unit.	AP	= Actual Selling Price Per Unit.
BQ	= Budgeted Sales Quantity.	AQ	= Actual 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.		

Relationship between Total and Margin Approach

Factor	Relationship	No. of Products	Method of Costing
1. Price	Sales Price Variance = Sales Margin Price Variance, i.e. SPV = SMPV	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 × Budgeted Net Profit Ratio, i.e. SMVV = SVV × Budgeted Net Profit Ratio	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 × Budgeted Profit Volume Ratio.**

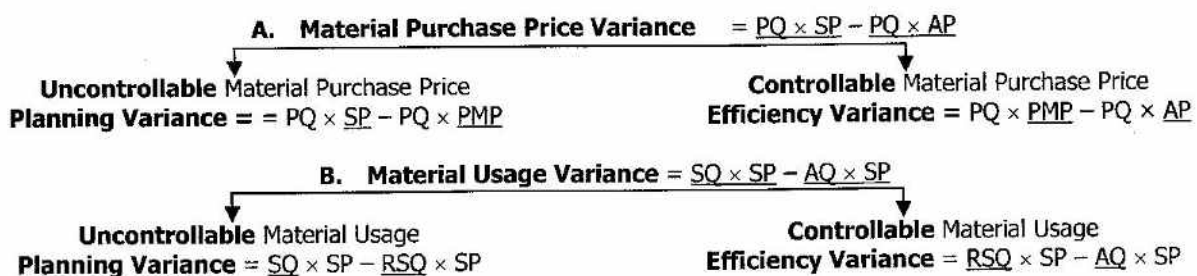
6. Methods of Reconciliation:

Particulars	Method 1 (Marginal Costing)	Method 2 (Absorption Costing)
Budgeted Profit	BQ × Budgeted Profit per unit	BQ × Budgeted Profit per unit
Effect of Sales Variances		
+/- Sales Volume Variance Effect on Profit	SVV × Budgeted PVR	SVV × Budgeted NP Ratio
Sales Price Variance	Either SPV or SMPV	Either SPV or SMPV
Effect of Cost Variances		
+/- Material Variances Usage		
Price		
Labour Variances Net Efficiency		
Idle Time		
Rate		
VOH Variances Net Efficiency		
Idle Time		
Expenditure		
FOH Variances Net Efficiency	Not Applicable	
Idle Time	Not Applicable	
Capacity	Not Applicable	
Expenditure		
Actual Profit		

Notes:

- FOH Volume Variances:** Under Marginal Costing, FOH are treated as Period Costs and not absorbed to products. Hence, FOH Volume Variance and its sub-variances are **not applicable** under Marginal Costing. However, FOH Expenditure Variance is applicable both under Marginal and Absorption Costing.
- PV Ratio and NP Ratio:** SVV under Total Approach (i.e. effect on Turnover) is adjusted for the effect on profit by using Budgeted PV Ratio under Marginal Costing, and by using Budgeted NP Ratio under Absorption Costing. Alternatively, under Absorption Costing Method, SMVV may be used (since $SMVV = SVV \times NP \text{ Ratio}$).
- Under Method 2, Budgeted Profit ± Sales Volume Variance impact on Profit, is called **Standard Profit on Actual Sales**, i.e. AQ sold × Budgeted Profit per unit.
- Profit Differences:** In case of presence of inventory (either WIP or FG), Profits under Method 1 (Marginal Costing System) and Method 2 (Absorption Costing System) will differ due to impact of inventory valuation. Also, if the above statement is prepared under Single Plan, i.e. use of Material Purchase Price Variance (instead of Material Price Variance), the reported profits as per Operating Statement and Profit Statement may differ.

7. Special Variances:



$$C. \text{ Labour Rate Variance} = SH \times SR - AH \times SR$$

$$\text{Planning Component} = AH \times SR - AH \times RSR$$

$$\text{Operational Component} = AH \times RSR - AH \times AR$$

$$D. \text{ Sales Margin Volume Variance} = BQ \times BM - AQ \times BM$$

Planning Element

Less: Original Budgeted Sales Volume ×
(Budgeted Selling Price – Std. Cost)
Expert's Budgeted Sales Volume ×
(Expert's Selling Price – Std. Cost)

Appraisal Element

Less: Expert's Budgeted Sales Volume ×
(Expert's Selling Price – Std. Cost)
Actual Sales Volume ×
(Actual Selling Price – Std. Cost)

where **Expert's Budgeted Sales Volume** = Total Market Sales Volume × Target Market Share Percentage.

E. Market Share & Market Size Variance

Sales **Margin Quantity Variance** (i.e. Impact on Profit) can also be sub-classified into

- (a) **Market Size Variance** = Budgeted Market Share % × (Budgeted Industry Sale Quantity × Budgeted Average Contribution p.u.)
less Actual Industry Sale Quantity
- (b) **Market Share Variance** = Actual Industry Sale Quantity × (Budgeted Market Share % × Budgeted Average Contribution p.u.)
less Actual Market Share %

FTR 2 Marginal Costing, CVP & Decision Making

FORMULAE

PV Ratio	$\frac{\text{Total Contribution}}{\text{Total Sales Value}} \times 100 = \frac{\text{Contribution per unit}}{\text{Sales Price per unit}} \times 100 = \frac{\text{Change in Contribution}}{\text{Change in Sales}} \times 100$ $= \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100 = 100\% \text{ Less Variable Cost Ratio.}$	
BEP	$\frac{\text{Fixed Costs}}{\text{PV Ratio}}$	$\frac{\text{Fixed Costs}}{\text{Contribution per Unit}}$
MOS	$\text{Total Sales Less BEP Sales} = \frac{\text{Pr ofit}}{\text{PV Ratio}}$	$\text{Total Sales Qty Less BEQ} = \frac{\text{Pr ofit}}{\text{Contribution per Unit}}$
Indifference Point	$\frac{\text{Difference in Fixed Costs}}{\text{Difference in PV Ratio}}$ $= \frac{\text{Difference in Fixed Costs}}{\text{Difference in Variable Cost Ratio}}$	$\frac{\text{Difference in Fixed Costs}}{\text{Difference in Contribution per Unit}}$ $= \frac{\text{Difference in Fixed Costs}}{\text{Difference in Variable Cost per Unit}}$
Shut Down Point	$\frac{\text{Avoidable Fixed Costs}}{\text{PV Ratio}}$	$\frac{\text{Avoidable Fixed Costs}}{\text{Contribution per Unit}}$

Issue	Points to remember		Page
Marginal Costing	Technique of decision making – involves – 1. Ascertainment of Total Costs, 2. Classification of Costs into – (a) Fixed, and (b) Variable. 3. Use of such information for analysis and decision-making.		2.1
Variable Cost & Fixed Cost	Particulars	Variable Cost	Fixed Cost
	Meaning	Cost which changes or varies proportionately based on output / volume / quantity.	Costs which are assumed to remain constant , for a given period of time, irrespective of level of output during that period.
	Items	Direct Materials + Direct Labour + Direct Expenses + Variable POH + Variable S&D OH.	Fixed Cost = Fixed Production OH + Administrative OH + Fixed S&D OH.
	Examples	Raw Materials, Labour, etc.	Rent, Salary, Insurance, etc.

Issue	Points to remember			Page
	Cost per unit	Variable Cost per unit is assumed to remain constant at all levels of output.	Fixed Cost per unit will vary inversely with changes in the level of output.	
	Point of incurrence	Incurred only when production takes place. Hence, no production means no Variable Costs.	Incurred even at zero level of output. Hence, even at Nil Activity Level, Fixed Costs will be incurred.	
	Cost Behaviour	Once incurred, Variable Costs will increase proportionately based on the level of output / quantity.	Fixed Costs, once incurred, will be constant at all output levels.	
	Nature	Variable Costs are considered as product-related costs.	Fixed Costs are treated as period-related costs.	
	Inclusion in Inventory	Variable Costs are Product Costs, and hence included in inventory valuation.	Fixed Costs are not included in Inventory Valuation, and charged off to P&L A/c.	
Methods of segregating Semi-Variable Costs	Expenses that exhibit characteristics of Fixed and Variable Costs, which can be segregated using – 1. Graphical Method (Scatter Graph) or Line of Best Fit Method, 2. Analytical Method or Best Judgement Method, 3. High and Low Points Method, 4. Comparison by Period or Level of Activity Method, and 5. Least Squares Method. Need: (a) Control over Expenses, (b) Budgeting & Estimates, and (c) Decision-Making			2.2, 2.3
MC Eqn	Sales Less Variable Cost = Contribution = Fixed Cost + Profit			2.4
Difference between Marginal & Absorption Costing	Particulars	Marginal Costing	Absorption Costing	2.4
	Inventoriable Cost Classification Treatment of Fixed Cost Presentation Effect of Stockholding Variance Reporting	Only Variable Fixed & Variable Regarded as Period Cost Sales – VC = Contribution Does not affect Unit COP FOH Expenditure Variance only	Both Fixed and Variable Based on functions Charged to Cost of Production Sales – Cost (Fixed & Var) = Profit Affects Unit COP FOH Exp. & Volume Variances	
Product & Period Cost	Particulars	Product Cost	Period Cost	2.5
	Meaning	Costs which are assigned to the product and are included in inventory valuation. These are called Inventoriable Costs .	Costs which are not assigned to the products but are charged as expenses against the revenue of the period in which they are incurred.	
	Examples	Manufacturing Costs, e.g. Cost of Raw Materials, Direct Wages, Production OH, Depreciation of Plant, Equipments, etc.	Non-Manufacturing Costs, e.g. General Administration Costs, Salesmen Salary, Depreciation of Office Assets, etc.	
	Inclusion in Inventory Valuation	These are included in inventory valuation. They are treated as assets till the goods to which they are assigned are actually sold.	These are not included in Inventory Valuation. They are written off as expense in the period in which they are incurred.	
Contribution	Sales – Variable Costs = Contribution. It is called so, since it initially contributes towards recovery of Fixed Costs and thereafter towards Profit of the business.			2.6
Profit	Contribution – Fixed Cost = Profit. Hence, Surplus Contribution = Profit.			2.6
Loss	Loss = Excess of Fixed Cost over Contribution. Hence, Loss = Unrecovered Fixed Costs			2.6
PV Ratio	1. Ratio of Contribution to Sales. 2. Basic Indicator of Profitability. 3. Higher PVR is better.			2.7
Break even Point	1. Meaning: Level of Sales where Contribution is sufficient only to recover Fixed Costs. Hence, there is no profit or no loss. So, at BEP, Total Sales = Total Costs, Contribution = Fixed Costs, Profit / (Loss) = Zero. 2. Significance:			2.7
	Level of Sales		Impact on Profits	
	Less than BEP		Firm incurs Losses. [Contribution < Fixed Cost]	
	Equal to BEP		No Profit & No Loss. [Contribution = Fixed Cost]	
	Greater than BEP		Firm earns Profits. [Contribution > Fixed Cost]	

Issue	Points to remember			Page
Assumptions of BE Analysis	1. Costs classifiable into Fixed and Variable Costs only. 2. Factors remain unchanged – SP per unit, VC per unit, Total Fixed Costs, Productivity of factors of production, Inventory, Sales Mix (incase of multi-product Co.) 3. Revenue and Cost functions are linear over the range of activity under consideration. 4. All resources are abundantly available for consumption (i.e. There is no Key Factor).			2.8
Break-Even Chart	Graphical representation of Cost-Volume-Profit rel'ship. Depicts – (a) Profitability, (b) BEP, (c) Angle of Incidence, (d) Rel'ship between VC, FC and contribution, and (e) Margin of Safety.			2.8
Types of Break Even Chart	1. Contribution Break-Even Chart 2. Cash Break-Even Chart 3. Control Break-Even Chart	4. Analytical Break-Even Chart 5. Product-wise Break-Even Chart 6. Profit Graph		2.9
Impact of Non Linear Sales and Cost functions	1. Optimum Output Level: In case of non-linear relationships, the Company should operate at the Optimum Output Level, i.e. the output where the profitability is maximum , which is – (a) Gap / Distance between Total Sales and Total Cost is the greatest, i.e. Maximum Contribution and Maximum Profit, (b) Total Contribution (and not Contribution p.u.) is the highest, and (c) Incremental Contribution (or Additional Contribution) equals Zero.			2.10
	2. BEP: (a) BEP is identified as the point at which Total Revenue Curve cuts Total Cost Curve from below and not from above , (i.e. from "Loss" area to "Profit" area, and not otherwise). (b) In case of Step-Fixed Costs with multiple points of intersection between Total Sales and Total Cost Curves, every point at which Total Revenue Curve cuts the Total Cost Curve from below , will be a BEP. Hence, there may be multiple BEPs at different activity levels.			
	3. Effect on Profits:			
	Particulars	At Optimum Level	Beyond Optimum Level	
	(a) Gap between TR and TC Curves	Maximum	Narrows down / reduces.	
(b) Total Contribution and Total Profit	Maximum.	Reduces.		
(c) Incremental Contribution	Zero.	Negative.		
Margin of Safety	1. Meaning: Difference between Total Sales and the Sales at Break-Even Point. 2. Significance: (a) Profit = Contribution earned out of MOS. (b) Low MOS means Firm has large Fixed Costs and is more vulnerable to changes in Sales. (c) High MOS means a slight fall in Sales may not affect the business very much.			2.11
Indifference Point	1. Meaning: Level of Sales at which Total Costs (and hence Total Profits) of two options are equal . Decision-maker is indifferent as to option chosen, since both options lead to same profit. 2. Significance:			2.12
	Level of Sales	Profitable Option to be chosen		
	Below Indifference Point	Option with Lower Fixed Cost.		
	At Indifference Point	Both options are equally profitable.		
Shut Down Point	1. Meaning: Level of operations (Sales), below which it is not justifiable to pursue operations / production. Contribution is insufficient even to recover Avoidable Fixed Costs. 2. Significance:			2.13
	Level of Sales	Decision	Reason	
	Below Shut down Point	Close Down Operations	Avoidable Fixed Costs are not fully recovered.	
	At Shut down Point	Continue Operations	Avoidable Fixed Costs are just recovered.	
CVP Analysis	1. Meaning: Level of operations (Sales), below which it is not justifiable to pursue operations / production. Contribution is insufficient even to recover Avoidable Fixed Costs. 2. Significance:			2.13
	1. Meaning: Level of operations (Sales), below which it is not justifiable to pursue operations / production. Contribution is insufficient even to recover Avoidable Fixed Costs. 2. Significance:			
Advantages of Marginal Costing	• Analysis of three variables, viz. Cost, Volume and Profit. • Aims at measuring variations of Profits and Costs with Volume, which is significant to business profit planning.			2.14
	1. Pricing decisions 2. Overhead Variances 3. True Profit 4. Control over Expenditure			
	5. Break-Even Analysis 6. Control over Expenditure 7. Business Decision-Making			

Issue	Points to remember		Page
Limitations of Marginal Costing	1. Difficult to classify 2. Contribution is not final 3. Wrong pricing decisions	4. Stock Valuation 5. Naïve assumptions 6. Ignores time value	2.14
Decision Making Areas	1. Determination of Selling Price – (a) under normal circumstances, (b) for special market or for a special customer, (c) during recession, (d) at Marginal Cost or below Marginal Cost, (e) price–mix and price–discrimination decisions. 2. Product Mix Decisions , viz. – (a) Selection of optimal product mix, (b) Substitution of one product with another, (c) Discontinuing or dropping of a product line, etc. 3. Production vs Outsourcing – whether to Make or Buy a certain component / product. 4. Shut–down or Continue , determination of output level in period of recession or depression. 5. Marketing Decisions , viz. – Selling in the Domestic Market or in the Export Market, acceptance of Export Offers, etc. 6. Change vs. Status Quo , Retaining or replacing a Machine / Process, etc. 7. Expanding or Contracting decisions, etc.		2.15
Factors in MC decisions	1. Contribution 2. Specific Fixed Cost, if any 3. CVP Relationship	4. Incremental Contribution 5. Capacity 6. Non–Cost Factors	2.15
Key Factor	Key Factor / Budget Factor / Critical Factor represents a resource whose availability is less than its requirement. Denotes a Resource Constraint situation, e.g. RM or DLH or Plant capacity shortage. Steps: 1. Identify the Key Factor. 2. Compute Total Contribution or Contribution per unit of the product. 3. Compute Contribution per unit of the Key Factor, i.e. Contribution per Direct Labour Hour, Contribution per kg of Raw Material, etc. 4. Rank the products based on Contribution per unit of the Key Factor. 5. Allocate the Key Resources based on Ranks given above, and other conditions.		2.15
Key Factor – Principles	1. If Availability < Requirement, that Resource is called a Key Factor or Key Resource. 2. If Availability > Requirement, that Resource is called as an Idle Resource. 3. Key Resource and Idle Resource are mutually exclusive terms, i.e. they do not refer to the same resource as such. 4. Key Resource should not be kept idle, and an Idle Resource will always have spare capacity. 5. Key Resource has Opportunity Costs, while Idle Resources have no Opportunity Costs. 6. A Key Resource, if kept idle, will erode / reduce Contribution. 7. For identifying Key Resource, Availability = Normal Resource Availability at Normal Costs. Any additional resource availability at higher cost (e.g. additional labour hours due to Overtime Work and Premium) will not be considered. 8. For identifying Key Resource, Requirement = Requirement at 100% Capacity Levels, i.e. Maximum Output. 9. In case of minimum production condition, minimum resource requirements should be allocated independent of the Key Factor Ranking priority. Additional Resource requirements only should be allocated based on Key Factor Ranking. 10. In case of Multiple Products and Multiple Key Factors with difference in ranking priority, Linear Programming (LPP) Techniques may be applied for Resource Allocation decision. 11. Application of Key Factor Principles is subject to – (a) feasibility, and (b) Company policy.		2.16
Direct Costing	1. Direct Costing is the practice of charging all Direct Costs to operations, processes or products, leaving all Indirect Costs to be written off against profits in the period in which they arise. 2. Under Direct Costing, Stocks are valued at Direct Costs, i.e. costs whether fixed or variable, which can be directly attributable to the cost units. 3. Direct Costing differs from Marginal Costing in the sense that some Fixed Costs considered direct are charged to operations, processes or products, whereas in Marginal Costing only Variable Costs are considered in inventory valuation. 4. Applications of Direct Costing: (a) Stock Valuation, (b) Minimum quantity to be produced to recover pattern or mould cost, separately incurred for that order, (c) Close Down Decisions – like closing down of a Department or Shop.		2.16

Issue	Points to remember	Page
Differential Costing	Differential Cost is "the increase or decrease in total cost or the change in specific elements of cost that result from any variation in operations". It represents an increase or decrease in total cost resulting out of – 1. producing or distributing a few more or few less of the products, 2. a change in the method of production or of distribution, 3. an addition or deletion of a product or a territory, and 4. selection of an additional sales channel. Differential Cost includes Fixed and Semi-Variable expenses. It is the difference between the total costs of two alternatives. Differential Cost may be either incremental or decremental.	2.16
Areas of decision making	1. Stock Management and Inventory Control Decisions, 2. Plant Location Decisions, 3. Machinery Replacement / Capital Budgeting Decisions, 4. Sale at Split-off or Further Processing Decisions, 5. Product Decisions – Dropping or adding a product line, 6. Marketing Decisions, 7. Submitting Tenders and Quotations for new jobs based on relevant cost analysis, 8. Acceptance of Incremental Orders in situations like spare capacity, full capacity, etc. 9. Make or Buy Decisions, 10. Operate or Shut Down Decisions, 11. Product Pricing Decisions – Reduction or maintenance of price, 12. Opening of new sales territory or branch, 13. Intra-Company Transfer Pricing Decisions, 14. Purchasing vs. Lease Financing Decisions.	2.16
Non-Cost considerations in Shut Down Point	1. Loss of Market Share to competition, 2. Loss of Goodwill and Market Image, 3. Strain in Labour – Mgmt. relations, 4. Availability of Skilled Labour on re-opening, 5. Risk of obsolescence of Machinery, 6. Need to maintain machine in operating condition, 7. Arrangement of finance for compensation payable on retrenchment, if any. 8. Re-engineering Purchase decisions, viz. change in procurement policy to 'shop around' may be considered to achieve economy in purchases, rather than merely accept high quality and high priced suppliers quotations. 9. Possibility of Wage Freeze (This may be considered as an extreme measure.)	2.17
Divestment Strategy	1. Meaning: Divestment involves a strategy of selling-off or shedding business operations to divert the resources, so released, for other purposes. Selling-off a business segment of Product Division is one of the frequent forms of Divestment Strategy. It may also include selling-off or giving up the control over a Subsidiary whereby the wholly-owned Subsidiaries may be floated as independently quoted Companies. 2. Reasons: (a) Opportunity to get more profitable product or segment but has resource constraints. (b) In case of purchase of new business, if some of the part of the acquired business is not upto the standard norms of profitability. (c) If any Business Segment / Product / Subsidiary pulls down the profit of the whole Firm. (d) If managing the organisation is very constrained, it is better to dispose off those divisions which involve large management skill, but less profitability. (e) If the Firm has considerable losses, selling-off or divestment policy is one suitable option to "exit" the current situation, and to go for Turnaround Strategy.	2.17
Decisions involving Dropping / Adding a Product	1. In case of dropping off unprofitable products, the Firm may have 2 options – (a) leave capacity unutilized, or (b) utilize the capacity for the manufacture of a more remunerative product. 2. For this purpose, the Contribution approach is adopted, taking following factors into account – (a) Contribution from unprofitable product (i.e. Sale Revenue Less Variable Costs) (b) Specific Fixed Costs of the unprofitable product, which can now be avoided or reduced. (c) Contribution from the other profitable product, which is proposed to be produced with the balance capacity.	2.17

Issue	Points to remember		Page
Product Mix Decision	Relevant Costs: (a) Future Costs, and (b) Differential Costs. Other factors include – 1. Available Production Capacity and Limiting Factors, if any. 2. Contribution per unit of the Limiting Factor. 3. Market Demand for the products. 4. Opportunity Costs, if any.		2.18
Product Distribution Decision	1. Objective: Getting the right goods to the places at the right time for the optimal cost. 2. Basic output: % of customers who should get their order in so many number of days. 3. Considered efficient if it maintains a particular level of service at minimum cost. 4. Decision-making tools: (a) Linear Programming (Transportation Model), (b) Inventory Models, and (c) Simulation Models.		2.18
Channel of distribution – Factors	1. Type of Product 2. Type of Market	3. Industry Practices 4. Effect on Profitability	2.18
Make or Buy Decisions – Factors	1. Quality of goods supplied by Supplier. 2. Reasonable certainty of the Supplier meeting the delivery dates, i.e. Timeliness. 3. Availability of more than one Supplier to reduce the risk involved in buying. 4. Lead Time involved in receiving the materials versus time involved in own production. 5. Supplier Stability, i.e. whether the Supplier will support the Firm in the long-run also. 6. Availability of skilled labour, technical know-how & capability to make product / component. 7. Labour relations – adverse effect on labour relations if it is decided to buy instead of making. 8. Cost of labour redundancies, if any. 9. Cost of Special Machineries to be installed in making the component. 10. Possible use of released capacity and facility as a result of buying instead of making. 11. Possibility of expanding capacity or creating extra capacity (e.g. Overtime Work, II Shift) 12. Process of making – whether confidential or patented or a general process. 13. Technical obsolescence of the component – whether investment in machinery is risky or not. 14. Seasonal demand of Components, leading to costs of inventory holding. 15. Price Stability and possibility of escalations in the Price of Components purchased. 16. Possibility of adverse Foreign Exchange Rate Fluctuations in respect of Imported Components. 17. Availability of transport and other infrastructure for procuring the component from outside. 18. Behaviour of cost of make and cost of buy in the long run. Note: Of the above (1) to (5) are relating to Suppliers, (6) to (8) are relating to Labour, (9) to (13) are relating to Capacity & the balance are relating to Other Factors.		2.18
Asset Replacement Decisions	Cost Factors 1. Operating Costs 2. profitability Return on Capital Employed and Interest on Capital 3. Opportunity Costs 4. Effect of disposal of the existing plant 5. Additional Capital Expenditure 6. Effect on tax liability	Non Cost Factors 1. Market standing of the product 2. Nature of the market 3. Constraints on the resources 4. Possibility of any bottleneck 5. Possibility of any substitute product 6. Likely effects of any change in Government policy	2.19
Expansion of Capacity – Factors	1. Additional Fixed Overheads 2. Possible decrease in Selling Price 3. Whether the demand is sufficient		2.20

FTR 3 Pricing Decisions

Issue	Points to remember	Page
Cost Plus Cost plus	Selling Price= Estimated Cost plus a fixed Profit Margin.	3.1
Cost determination principles Cost determination principles	1. Size of the unit and scale of operations 2. Uniform Costing for whole industry 3. Cost Classification	3.1
	4. Determination of Fixed Costs 5. Depreciation	

Cost determination Principles

Issue	Points to remember		Page
Advantages of Cost Plus Pricing	1. Guaranteed Contribution 2. Assured Profit 3. Reduced risks and uncertainties 4. Most suitable in long run	5. Considers market factors 6. Full Recovery of all costs 7. Price Stability 8. Simplicity	3.2
Disadvantages	1. Ignores demand 2. Ignores competition 3. Arbitrary Cost allocation	4. Ignores opportunity costs 5. Price–Volume relationships	3.2
ROCE Pricing	1. ROCE Pricing is used when each division is treated as an Investment Centre.. 2. Determination: The Firm should determine an average mark-up on cost, which is necessary to produce a desired rate of ROCE. The issues to be considered are – (a) Basis and Assumptions on which the Capital Employed is computed, (b) Components to be covered in the ROCE, and (c) Fairness of the ROCE. 3. Advantages: Allowing each Firm (and hence the industry as a whole) to earn an adequate ROCE would – (a) attract additional capital, (b) increase the number of factories and production of the commodity, which would ultimately lead to competition and reduction in costs and prices.		3.3
Marginal Cost Pricing – Situations	1. When goods are of perishable nature. 2. When the Firm has already purchased huge quantities of Raw Materials, and the prices of these Materials is falling considerably in the market. 3. To launch or introduce a new product in the market at competitive prices (using Penetration Pricing Strategy).	4. To eliminate Competitors from the market. 5. To obviate shut-down costs. 6. To push up sales of another highly profitable product. 7. To capture / retain future market. 8. To capture / retain foreign market. 9. To ensure sale of old and defective stocks, seconds, etc.	3.3
Conversion Cost Method	Based on the assumption that Profit should be related to Value Added in the form of Conversion Costs since Materials Cost do not contribute to Profits. Price = Conversion Cost + Profit Margin on Conversion Cost + Materials Cost.		3.3
Std. Cost Method	Selling Price = Standard Costs + Suitable Profit Margin.		3.3
Efficiency Curve Method	1. Recognises improvements in production efficiency due to repetitive nature of operations and large batch quantities. 2. As efficiency improves, the unit cost of production comes down and this is reflected in pricing.		3.3
Differential Selling Price	Use of Differential Selling Price, which is above Marginal Cost but below Total Cost, is primarily intended to absorb surplus capacity. It can be achieved by – 1. Different Markets – Export Pricing, 2. Different products.		3.4
Going Rate Pricing	1. It is a method of Competitive pricing method wherein a Firm tries to keep its price at the average level charged by the industry. 2. Advantages: (a) Useful where it is difficult to measure costs, (b) Yields fair return to all Firms in the industry, (c) Most conducive for industry's harmony, (d) Signifies the pricing practice in homogeneous product markets. 3. This method can be used in Pure Competition and Oligopoly Markets.		3.4
Sealed Bid Pricing	Bid constitutes the Firm's Offer Price. The quotation is generally based on the Incremental Costs plus a Reasonable Mark-Up. • Low price quoted in order to win the contract – Firm may lose on profits. • High prices quoted – chances of gaining the contract may be reduced. • Probability Analysis may be used to analyse the impact of various bid prices.		3.5
Incremental Pricing	1. Involves comparison of the impact of decisions on revenues and cost. If a pricing decision results in a greater increase in revenue than in costs, it is favourable. 2. Analyses – (a) Relevant Cost, (b) Product–Line Relationship, (c) Opportunity Cost, (d) Time factor, (e) CVP, and (f) Risk.		3.5
Non–Cost Factors in Pricing Decisions	1. Provide an incentive to the Firm for adopting improved technology & maximising production, 2. Encourage optimum utilisation of resources, 3. Work towards better balance between demand and supply, 4. Promote exports and / or other avenues to utilize the Firm's spare capacity, and		3.6

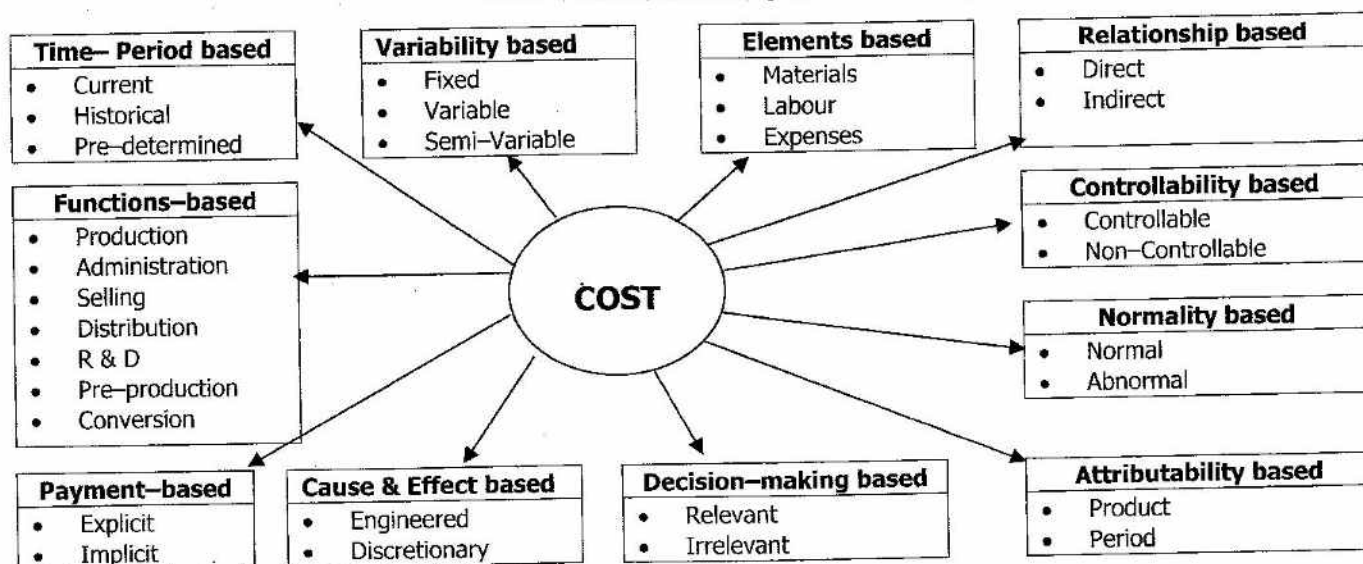
Issue	Points to remember	Page
	5. Avoid adverse effects on the rest of the economy. Note: Non-Cost Factors are relevant in – (a) Price Discrimination, and (b) Peak Load Pricing.	
Curvilinear CVP Analysis	Optimum Output is the point where the gap between the Total Cost and Total Revenue curves is the maximum . If volume is increased beyond this level, Profits are reduced since the Incremental Cost is more than the Incremental Revenue.	3.6
Pricing in Pure Competition Market	1. Features: (a) Large number of Buyers & Sellers, (b) Homogenous product, (c) Free entry or exit, (d) Perfect knowledge of Purchasers and Sellers on prices & quantities, (e) Absence of Market Segmentation, (f) Absence of Transportation Cost, and (g) Perfect mobility of Factors of Production. 2. Price determination conditions: (a) Firm has no pricing policy of its own as it has to accept the prevalent market price. (b) Firm can sell nothing at any higher price. (c) Decision is not on price, but on the quantity to sell. (d) Every Firm can continue to produce so long as its Marginal Cost is less than or equal to its Selling Price.	3.7
Pricing in Monopoly	1. Features: (a) One Seller of a particular good or service, (b) Absence of Competition, (c) Absence of Close Substitutes, and (d) Power to influence price. 2. Price determination conditions: (a) A Monopolist can raise the price of its products without frightening away all his customers. Extent of price increase depends on the elasticity of demand for the product. (b) Optimal Price is determined at the level of output at which Marginal Revenue equals Marginal Cost.	3.7
Pricing in Monopolistic Competition	1. Features: (a) Product Differentiation, (b) Existence of many Sellers and Buyers, (c) Availability of Close Substitutes (similar but not identical). 2. Price Determination conditions: (a) For short run optimal price: Marginal Revenue = Marginal Cost. (b) For long run optimal price: Average Revenue = Average Cost, and Marginal Revenue = Marginal Cost.	3.8
Pricing in Oligopoly Market	1. Characterised by the presence of a few large sellers occupying a major share of the market. 2. Decision of each Seller will necessarily be in tune with the industry. 3. Firms tend to charge the same price as is being charged by their competitors. 4. One Firm assumes the role of Price Leader and the others follow any change in price by the Leader.	3.8
Optimal prices for New Products	Procedure: 1. Market Survey 2. Price Volume Relationship 3. Incremental Contribution Approach	3.8
Pricing Strategies	1. Meaning: Broad plan of action by which an organisation intends to reach its goal. 2. Types: (a) Market Entry Strategies, (b) Discount Strategies, (c) Price Discrimination Strategies, and (d) Geographic Pricing Strategies.	3.9
Skimming Pricing	1. Meaning: Policy of charging high prices during the early period of a product's existence and in the later years the prices are gradually reduced. 2. Reasons: (a) Inelastic Demand, (b) Sales Boost, (c) Assured Profit, (d) Cost-Revenue Matching.	3.9
Penetration Pricing	1. Meaning: Policy of using a low price as the principal instrument for penetrating mass markets early. This method is used for pricing a new product and to popularise it initially. 2. Circumstances: (a) Elastic demand, (b) Mass Production and, (c) Frighten off competition.	3.10
Distributor's Discount	1. Meaning: Price deductions that systematically make the Net Price vary according to Buyer's position in the chain of distribution. These discounts are given to various Distributors in the trade channel. 2. Forms: (a) Different Net Prices for different Distributor Level, (b) Uniform List Price subject to a discount structure, differing for various Distributors, (c) Single discount combined with differing supplementary discounts.	3.10
Price Discrimination	• Meaning: Charging different prices and it takes various forms according to whether the basis is customer, product, place or time. • Conditions: 1. Segmentable Market, 2. No resale, 3.No competition • Forms: Based on – 1. Customers, 2. Product Version, 3. Place, 4. Time.	3.10

Price Discrimination

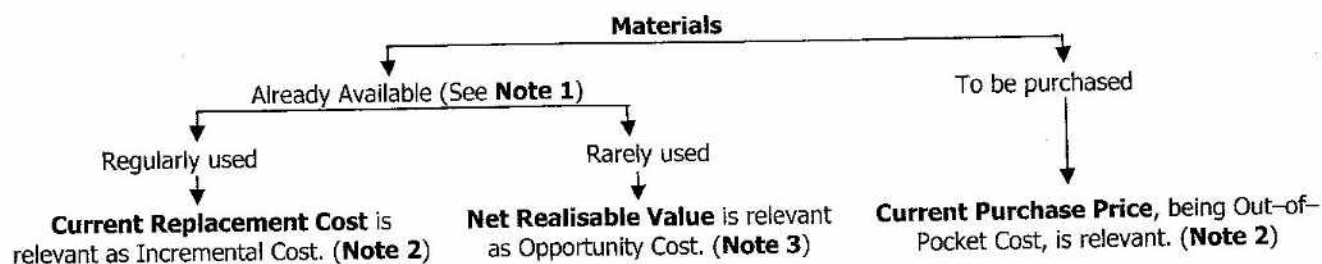
Issue	Points to remember	Page
Time Differentials	Meaning: Charging different prices on the basis of time is a kind of price discrimination called Time differentials. Classification: 1. Clock-Time Differentials, 2. Calendar-Time Differentials, 3. Geographical Price Differentials, and 4. Consumer Category Price Differentials.	3.11
Geographic Pricing	1. Point-of-Production Pricing 2. Uniform Delivered Pricing 3. Zone-Delivered Pricing 4. Freight-Absorption Pricing	3.12
Pareto Analysis	1. Focus on the most important aspects of decision making, in order to simplify the DM process. 2. Management can use 80:20 relationship in a number of business situations to direct its attention to key control mechanism or planning aspects, It helps to clearly establish top priorities and to identify both profitable and unprofitable target.	3.13
Pareto Analysis – Applications	1. Product Pricing 2. Customer Profitability Analysis 3. ABC Analysis – Stock Control 4. Activity Based Costing 5. Quality Control	3.13

FTR 4 Relevant Cost Analysis

Cost Classification (Page 4.1)



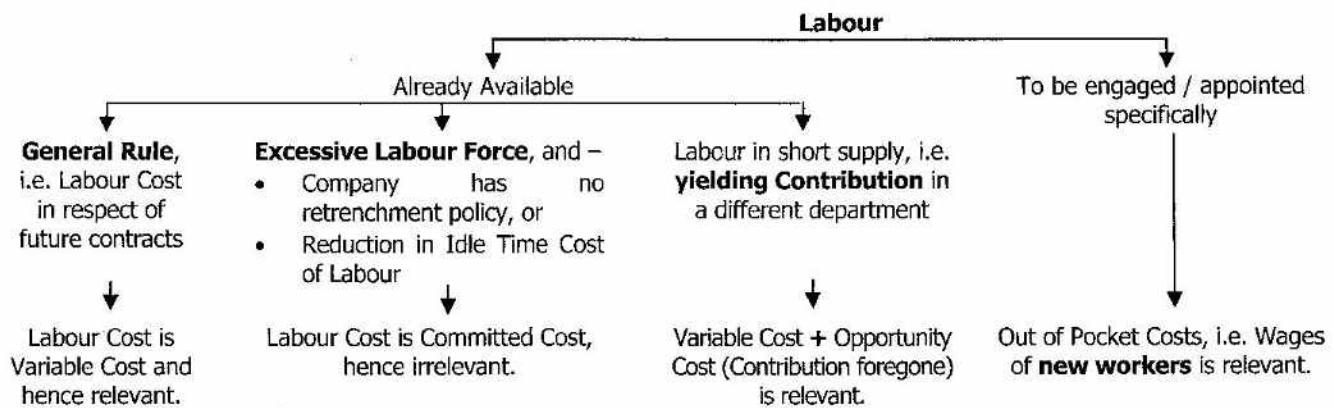
Relevance of Material Cost (Page 4.5)



Notes:

- Materials already available includes – (a) Materials under Firm Purchase Orders, (b) Materials in Transit, where the risk / property in materials is already with the Buyer Company.
- Generally, Current Replacement Cost = Current Purchase Price = Current Market Price of the Material.
- If there are alternatives for disposal of rarely used material, e.g. substitution or re-use or scrap, the highest Opportunity Costs shall be considered relevant.
- If a regularly used material is restricted in supply, the Total Relevant Cost = Current Purchase Price Plus Indirect Opportunity Cost.

Relevance of Labour Cost (Page 4.6)



Note: If acceptance of special contract necessitates replacement / transfer of workers, i.e. existing jobs carried out with new workers, and existing workers are transferred to the special contract, the Wages of New Workers is relevant for the special contract.

Relevance of Other Costs (Page 4.6)

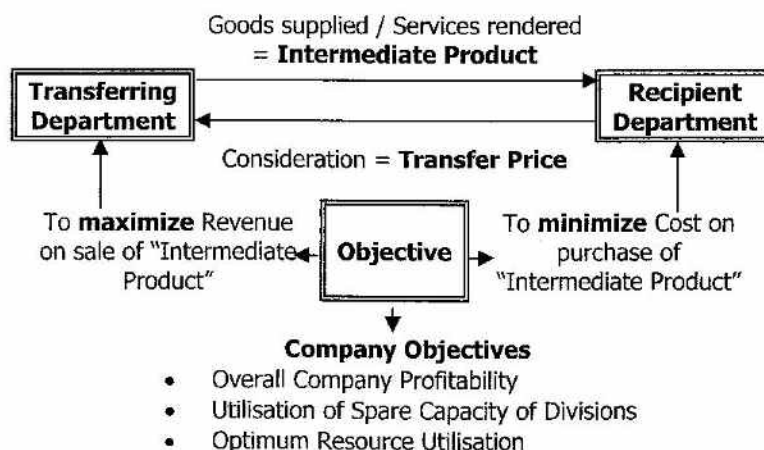
Nature of Cost	Relevant Cost
Variable Overheads	- Irrelevant if already incurred. - Relevant, only if such costs are to be incurred in future.
Fixed Overheads	Relevant, only under specific situations described in Question above.
Depreciation	Irrelevant , as it is an apportionment of Historical Cost. However, fall in Asset Disposal Value due to delay in disposal, becomes relevant.
Other Department Costs	- Irrelevant if already incurred or apportioned. - Relevant if they are to be incurred specifically for any contract / work.
Intra-Company Transfer Price Charges for services	(Incremental Costs upto the point of transfer + Opportunity Costs) are relevant.

Other Points

Issue	Points to remember	Page
Fixed Costs become relevant for decision making	- Fixed Costs are specifically incurred for any contract, - Fixed Costs are incremental in nature, - Fixed portion of Semi-Variable Cost increases due to change in level of activity consequent to acceptance of a contract, - Fixed Costs are avoidable or discretionary, - Fixed Costs are such that one cost is incurred in lieu of another (the difference in costs will be relevant for decision-making.)	4.4
Opportunity Cost – Principles	- Opportunity Cost is a Relevant Cost where alternatives are available. It involves choice and decision-making out of many alternatives. - Opportunity Cost is generally evaluated for short-term purposes. - Opportunity Cost is not useful for accounting, reporting and cost control. It does not find any place in formal accounts and is computed only for comparison purposes. - Opportunity Cost arises only in case of restriction of resources, i.e. Key Factor situation. If resources are abundantly available, they can be used for pursuing all available alternatives / courses of action. - When a number of alternatives are available, the highest of the Opportunity Costs will be considered relevant for decision-making.	4.5
Opportunity Gain	Opportunity Gain = incidental, indirect benefit derived out of choosing a particular course of action, from among various options, and comprises – (a) Savings in Costs , or (b) Additional Indirect benefits derived by accepting / choosing a certain option.	4.6

FTR 5 Transfer Pricing

Transfer Pricing Concept (Page 5.1)



Methods of Transfer Pricing (Page 5.2 & 5.3)

Point	Category 1	Category 2	Category 3
Description	Cost Based Transfer Pricing , using Cost or any variant of cost, with or without markup, e.g.	Market Price based Transfer Pricing	Bargained or Negotiated Transfer Pricing.
	(a) Variable Manufacturing Cost, (b) Full Manufacturing Cost, (c) Total Cost (Actual), (d) Standard Cost.	(a) Market Price of Intermediate Product (as quoted by Outside Supplier) (b) Market Price of substitute, if any.	Combination of Category 1 & Category 2 Methods of Pricing.
Merits	(a) Simple to understand (b) Easy to operate (c) Guarantees cost recovery	(a) Maximum Prices (b) Demand & Supply (c) Opportunity Cost Recovery (d) Objective	(a) Proper Decisions (b) Autonomy & Motivation Value (c) Optimality
Demerits	(a) Not suitable for Performance Evaluation (b) Ignores Opportunity Costs (c) Does not reward cost efficiency.	(a) Availability of Market Prices (b) Impact of S & D Costs (c) Unjust Enrichment	(a) Sub-Optimal (b) Conflicts (c) No scope for Performance Evaluation (d) Time and Cost

Criteria for Setting Transfer Prices (Page 5.4)

Criteria	Cost Based	Market Price Based	Negotiated
1. Achieves Goal Congruence	Often, but not always.	Yes, if markets are competitive.	Yes.
2. Motivates Management Effort	Yes, if based on budgeted costs. There is less incentive to control costs, if transfers are based on actual costs.	Yes.	Yes.
3. Useful for evaluating Sub-Unit performance	Difficult, unless Transfer Price exceeds full costs.	Yes, if markets are competitive.	Yes, but Transfer Prices are affected by bargaining strengths.
4. Preserves Sub-Unit Autonomy	No, since it is rule-based.	Yes, if markets are competitive.	Yes, because it is based on negotiations between sub-units.
5. Other factors	Useful for determining full cost of products and services.	No market may exist or markets may be imperfect or in distress.	Bargaining and negotiations take time, and may need to be reviewed repeatedly as conditions change.

Negotiated / Bargained Transfer Pricing (Page 5.4)

Minimum Transfer Price (from Transferring Division's viewpoint)	Maximum Transfer Price (from Recipient Division's viewpoint)
Minimum TP = Relevant Cost , computed as under –	Maximum TP = Least of the following items –
(a) Variable Costs upto the point of internal transfer. (b) Fixed Costs, if specific to such transfer. (c) Opportunity Costs, i.e. Contribution foregone by the Transferring Division on its External Sales. Note: - Selling and Distribution Costs, not incurred for Internal Transfers are not included. - Opportunity Costs arises only if – (i) Transferring Division produces and sells marketable products, and (ii) Transferring Division operates at full capacity.	(a) Market Price , since this represents the Fair Value in exchange, based on market forces. (b) Effective Purchase Cost , i.e. Market Price + Buying Costs, since the Recipient Division would have to incur this cost if the products are procured externally. (c) Recipient's Ability to Pay , e.g. if Recipient Division sells the Final Product at ₹ 100 after incurring incremental costs of ₹ 15 in its own division, it will be prepared to pay a maximum of ₹ 85 for the Intermediate Product. Note: If the Intermediate Product as such is not available for purchase in the market, the price of its substitute may be considered, in determining the above items.

Negotiation: The Actual Transfer Price may be determined by negotiations between Divisional Managers, subject to the range of minimum to maximum prices. Any price within the given range (i.e. Minimum to Maximum) will be acceptable to both the Managers since –

- Transferring Division has no incentive to transfer at any price **below the minimum**, as its incremental costs and opportunity costs may not be fully recovered.
- Recipient Division has no incentive for internal purchase, at any price **above the maximum**, as external procurement may be beneficial to such division.

Other Points

Issue	Points to remember	Page
Resolving TP Conflicts	1. Dual Rate System: Under this system – - Revenue for Transferring Dept = Full Cost + Mark up - Cost for Recipient Dept = Relevant Costs (Variable Cost + Opportunity Cost) - Company Profits = Total of Divisional Profits Less Interdivisional mark-up 2. Two Part Transfer Pricing: Here, Transfer Price = Marginal Costs + Lumpsum Fixed Fees.	5.6 & 5.7
PAT Maximisation by MNC	1. Income Tax Rates 2. Import Duty 3. Inflation 4. Income Repatriation 5. Penetrating a new market	5.7
Tfr Pricing – Merits	1. Goal Congruence 2. Wholistic Decisions 3. Performance Evaluation 4. Balance between Autonomy & Company's Goals	5.8
Tfr Pricing – Demerits	1. Identity 2. Short Term Focus 3. Reduction in Profits 4. Disharmony 5. Duplication 6. Loss of Control 7. Transfer Pricing Problems 8. Ineffective Control	5.8

FTR 6 Costing of Service Sector

Issue	Points to remember	Page
Operating Costing	Meaning: Ascertainment of the cost of rendering services or intangible products. Aspects: 1. Labour-Intensive Activities, 2. Deemed Cost-Unit and 3. Costs in Service Sector.	6.1
Methods of Costing	1. Cost Accumulation 2. Cost Classification 3. Cost Expression 4. Costing Methods – (a) Job Costing, (b) Process Costing Method, (c) Hybrid Costing, and (d) Activity Based Costing Method.	6.2

Job Costing in Service Sector	1. Identify the Job that is chosen as Cost Object. 2. Identify the Direct Cost categories for the Job. 3. Identify Indirect Costs (Overheads) associated with the Job. 4. Select the Cost Allocation Base for assigning each Indirect Cost to the Job. 5. Identify the rate per unit of the Cost Allocation Base used to allocate cost to the Job.	6.2
Special Features of Service Sector	1. Production and consumption of many services are inseparable. 2. Most services are intangible. 3. Service outputs vary from day to day. 4. Pricing strategies depend on customer.	6.3
Customer Costing	Cost Classification is as under – 1. Customer Specific Costs, 2. Customer-line Category Costs, and 3. Company Costs.	6.3
Pricing methods	1. Supply and Labour Billing 2. Pure Labour Billing 3. Cost Plus Pricing 4. Service Overhead Based Billing	6.4

FTR 7 Budgetary Control

Issue	Points to remember	Page
Planning Aspects	1. Strategic Planning = preparing long-term action plans to attain the Firm's objectives by considering the changes in external environment. 2. Budgetary Planning = preparing the short to medium term plans of the Firm, within the framework of Strategic Plans, e.g. Annual Budget. 3. Operational Planning = short-term or day-to-day planning process. It plans the utilisation of resources and will be carried out within the framework of the Budget. Each step in the Operational Planning Process is an interim step towards achieving the Budget.	7.1
Budget	1. Meaning: 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. 2. Features: (a) Financial and/or Quantitative, (b) Futuristic, (c) Goal Oriented, (d) Components – Income, Expenditure and Employment of Capital.	7.1
Steps in preparation of Budget	1. Definition of Objectives 2. Identification of Key (or Budget) Factor 3. Budget Committee and Controller 4. Budget Manual 5. Budget Period 6. Standard of Activity or Output	7.1
Budget Manual	1. Brief explanation of principles of Budgetary Control System, its objectives and benefits . 2. Procedure to be adopted in operating the system – in the form of instructions and steps. 3. Organisation Chart , and definition of duties and responsibilities of – (i) Operational Executives, (ii) Budget Committee, and (iii) Budget Controller. 4. Nature, type and specimen forms of various reports, persons responsible for preparation of the Reports and the programme of distribution of these reports to the various Officers. 5. Account Codes & Chart of Accounts used by the Company, with explanations to use them. 6. Budget Calendar showing the dates of completion, i.e. "Time Table". 7. Key assumptions to be made by Managers in budgets, e.g. inflation rates, forex rates. 8. Budget Periods and Control Periods. 9. Follow-up procedures.	7.2
Participative Budgeting	1. Participative Budgeting is a budgeting system in which all Budget Committee Members are given the opportunity to apply their own budgets in practice. 2. Participative Budgeting (using Budget Committees) is also called "bottom-up budgeting". It is different from imposed or "top-down budgets" where the ultimate budget holder does not have any say / participation in the budgeting process. 3. Advantages: (a) improved quality of forecasts to use as the basis for the budget, (b) higher levels of motivation for the participating Managers, (c) better results since the applicant and executor of the Budget are the same person.	7.2
Fixed / Flexible Budgets	Points of Differentiation – (1) Definition, (2) Rigidity, (3) Level of Activity, (4) Effect of Variance Analysis, (5) Use for Decision making, (6) Performance Evaluation.	7.2

Issue	Points to remember	Page																		
Situations where Flexible Budgets are used	- Seasonal fluctuations in sales and/or production. - Introduction of new products, product designs and versions on a frequent basis. - Industries engaged in make-to-order business like shipbuilding. - An industry which is influenced by changes in fashion. - General changes in Sales. - In case of new business venture, due to its typical nature, it may be difficult to forecast the demand of a product accurately. - In case of labour intensive industry where the production of the Firm is dependent upon the availability of labour. - Where the business is dependent upon the mercy of nature, and environment is uncertain.	7.3																		
Functional Budgets	Physical Budgets, 2. Cost Budgets, 3. Profit Budgets, and 4. Financial Budgets.	7.3																		
Budget Process / Calculations	Sales Budget (in Quantity and in Value) Production Budget (in Qty) = Budgeted Sales + Closing Stock of FG – Opening Stock of FG. Raw Materials Consumption / Usage Budget: (a) RM Usage Quantity = Budgeted Prodn of FG × RM Usage p.u. of FG, (b) Cost of RM Consumed = RM Usage Qty × Price of RM p.u. Raw Materials Purchase Budget: (a) RM Purchase Quantity = RM Usage Quantity + Closing Stock of RM – Opening Stock of RM, (b) Cost of RM Purchased = RM Purchase Quantity × Price of RM p.u. Labour Cost Budget: (a) DLH Requirement = Budgeted Prodn of FG × DLH required pu of FG, (b) Direct Labour Cost = DLH Required × Labour Rate per hour, (c) Manpower required = Total DLH Required ÷ Effective Hours per worker. OH Budgets: (a) Fixed Budget lists Fixed OH, Variable OH and Semi-Variable OH at one level of activity (i.e. one amount column only), (b) Flexible Budget lists Fixed OH, Variable OH and Semi-Variable OH at various levels of activity (i.e. different amount columns) Cost Summary Budgets – Prime Cost Budget, Cost of Production Budget, Ending-inventory Budget, Cost-of-Goods-Sold Budget. Specific Budgets – R&D Cost Budget, Capital Expenditure Budget, Cash Budget. - Budget Summaries/Master Budget – Budgeted Income Statement & Budgeted Balance Sheet.	7.3																		
Principal Budget Factor	- Principal Budget Factor = Limiting Factor, or Key Factor, or Critical Factor, is the factor that limits the activities of the functional budgets of the Firm. Some examples are Sales Demand, Raw Material Availability, Labour Hours or Machine Capacity, etc. - The early identification of this Factor is important since it indicates which budget should be prepared first. If Sales Volume is the Principal Budget Factor, Sales Budget should be prepared first based on available sales forecasts, and all other budgets should then be linked to the Sales Budget. Alternatively, if Machine Capacity is limited, then Production Budget should be prepared first, followed by other Budgets. - If the Principal Budget Factor is not identified properly and at an early stage, there could be problems of – (a) delay in the Budget Process, (b) possibility of infeasible targets, etc.	7.4																		
Budget Ratios	<table><thead><tr><th>Ratio</th><th>Time Based Formula</th><th>Output Based Formula</th></tr></thead><tbody><tr><td>Budgeted Capacity Usage Ratio</td><td>$\frac{\text{Budgeted Hours}}{\text{Practical Plant Cap (in hrs)}}$</td><td>$\frac{\text{Budgeted Output}}{\text{Practical Plant Cap (in output)}}$</td></tr><tr><td>Actual Capacity Usage Ratio</td><td>$\text{Actual Hrs} \div \text{Budgeted Hrs}$</td><td>$\text{Std Output} \div \text{Budgeted Output}$</td></tr><tr><td>Efficiency Ratio</td><td>$\text{Std Hrs} \div \text{Actual Hours}$</td><td>$\text{Actual Output} \div \text{Std Output}$</td></tr><tr><td>Calendar Ratio</td><td>$\text{Actual Days} \div \text{Budg. Days}$</td><td>$\text{Possible Output} \div \text{Budg Output}$</td></tr><tr><td>Volume or Activity Ratio</td><td>$\text{Std Hrs} \div \text{Budgeted Hours}$</td><td>$\text{Actual Output} \div \text{Budg Output}$</td></tr></tbody></table> Note: Volume Ratio = Capacity Ratio × Efficiency Ratio × Calendar Ratio.	Ratio	Time Based Formula	Output Based Formula	Budgeted Capacity Usage Ratio	$\frac{\text{Budgeted Hours}}{\text{Practical Plant Cap (in hrs)}}$	$\frac{\text{Budgeted Output}}{\text{Practical Plant Cap (in output)}}$	Actual Capacity Usage Ratio	$\text{Actual Hrs} \div \text{Budgeted Hrs}$	$\text{Std Output} \div \text{Budgeted Output}$	Efficiency Ratio	$\text{Std Hrs} \div \text{Actual Hours}$	$\text{Actual Output} \div \text{Std Output}$	Calendar Ratio	$\text{Actual Days} \div \text{Budg. Days}$	$\text{Possible Output} \div \text{Budg Output}$	Volume or Activity Ratio	$\text{Std Hrs} \div \text{Budgeted Hours}$	$\text{Actual Output} \div \text{Budg Output}$	7.4
Ratio	Time Based Formula	Output Based Formula																		
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Volume or Activity Ratio	$\text{Std Hrs} \div \text{Budgeted Hours}$	$\text{Actual Output} \div \text{Budg Output}$																		
Zero Base Budgeting	Meaning: Expenditure Control Device where each divisional head has to justify the requirement of funds for each head of expenditure and prepare the budget accordingly, without reference to the past budget or achievements. Features: 1. Wholistic, 2. Analytical, 3. Priority Based, 4. Review Based, 5. Rational, and 6. Efficiency. Steps: 1. Objectives, 2. Coverage, 3. Decision Areas, 4. Ranking, 5. Budgeting. Merits: 1. Priority Allocation, 2. Maximum Efficiency, 3. Cost Benefit Analysis, 4. Goal Congruence, 5. Management by Objectives. Demerits: 1. Lack of Co-ordination, 2. Old is Gold Attitude, 3. Time Consuming.	7.5, 7.6																		

	Traditional Budgeting	ZBB	
Traditional vs ZBB	1. Accounting-oriented 2. Reference made to the past period levels. 3. Routine and direct approach. 4. Top Mgmt decides on cost allocation. 5. Comparatively rigid. 6. Managers may deliberately inflate their Budget Cost Request.	Decision-oriented. No reference to past period levels. Analytical approach. Manager of each Division should justify his budget. Flexible and responsive to environmental changes. Managers cannot have an adhoc approach for Cost Budgets.	7.6
Performance Budgeting	1. Performance Budget is one which presents – (a) purposes and objectives for which funds are required, (b) costs of the programmes proposed for achieving those objectives, and (c) quantitative data measuring the accomplishments & work performed under each programme. 2. Performance Budgeting is a technique of presenting budgets for costs and revenues, in terms of functions. In this technique, programmes and activities are correlated with the physical and financial aspect of individual items comprising the budget. 3. Steps in Performance Budgeting: (a) Establish a meaningful functional Programme and Activity Classification of operations, (b) Bring the system of Accounting and Financial Management, in accordance with the above classification, (c) Establish suitable norms, yardsticks, work units of performance and unit costs, wherever possible, under each programme and activity, for their reporting and evaluation. (d) Monitor and evaluate performance on the basis of Performance Reports. 4. Pre-requisites: (a) Define objectives, (b) Translate objectives into specific functions, programmes, activities and tasks, for different levels of Management, (c) Quantify realistic and acceptable standards or performance indicators, (d) decentralized responsibility structure and flexible management style, (e) suitable Accounting and Reporting System. 5. Advantages: Performance Budgeting – (a) lays immediate stress on the achievement of specific goals over a period of time. (b) provides a meaningful relationship between estimated inputs and expected outputs, (c) aims at a continuous growth of the Firm,, (d) enables the Firm to be sensitive and adaptive,, (e) requires the preparation of periodic Performance Reports, to find out existing variances. 6. Traditional vs Performance Budgeting: Traditional Budgeting – (a) focusses on financial aspect, and (b) aims at expenditure control. Performance Budgeting – (a) focusses on performance, and (b) aims at functions and not their expenditure.		7.7, 7.8
Performance Reports	1. Considerations: (a) Significance, (b) Timeliness, (c) Accuracy, (d) Appropriateness, (e) Discrimination, and (f) Presentation. 2. Reports given to: (a) Top Management, (b) Sales Management, (c) Production Management, (d) Works Managers, (e) Special Reports.		7.8, 7.9

FTR 8 Activity Based Cost Management

Issue	Points to remember			Page
Changes in nature of Mfrg Costs	1. Cost Pool Identification, 2. Activity Related Costs, 3. Standard Costing System, 4. Design of Cost Accounting System.			8.1
ABC – Meaning	Identification of cost with each cost driving activity and making it as the basis for apportionment / assignment of costs over different cost objects / jobs / products / customers / services.			8.1
Cost Object & Cost Driver	1. Cost Object – Item for which cost measurement is required. 2. Cost Driver: Factor that causes a change in the cost of an activity. Cost Drivers are classified as – (a) Resource Cost Driver: Measure of quantity of resources consumed by an activity & used to assign the cost of a resource to an activity/ cost pool. (b) Activity Cost Driver: Measure of frequency and intensity of demand, placed on activities by cost objects & used to assign activity costs to cost objects. Note: Selection of Cost Drivers is dependent upon – (a) Degree of Correlation, (b) Cost of Measurement, and (c) Behavioural Effects.			8.1, 8.5
Stages in ABC	Step	Particulars		8.2
	1	Identify various activities within the Firm into – Primary & Secondary.		
	2	Relate the Overheads to activities using Resource Cost Drivers.		
	3	Apportion costs of Support activities over Primary activities.		
	4	Determine Activity Cost Drivers for each Activity/ Cost Pool.		
	5	Compute ABC Rate = Total Cost of Activity (Cost Pool) ÷ Activity Cost Driver		
	6	Assign Costs to Cost Objects using formula– Resources Consumed × ABC Rate		
Traditional Absorption Costing & ABC	Particulars	Traditional Absorption Costing	Activity Based Costing	8.3
	OH related to	Places / Cost Centres / Departments.	Activities grouped into Cost Pools.	
	Activity Ascertainment	Only – (a) Unit Level Activities (Variable), and (b) Facility Level Activities (Fixed) may be identified.	4 levels of activities, (a) Unit Level, (b) Batch Level, (c) Product Level, and (d) Facility Level, are identified.	
	Cost related to	Costs related to Places / Cost Centres.	Activities and Causal Factors.	
	Cost Drivers	Time (Hours) is assumed as the only “causal factor” governing cost.	Activity-wise Cost Drivers identified.	
	Single & Multiple Cost Drivers	Only Single Cost Driver for each dept.	Multiple Cost Drivers can be identified. Most dominant is chosen.	
	Recovery Rates	Either multiple rates (for each department)/ single rate (for the entire factory) may be used.	Specific activity-wise recovery rates are used. There is no “single” or “overall” ABC Rate.	
	Cost Assignment	Costs are assigned to Cost Units , i.e. to products, or jobs or hours.	Costs are assigned to Cost Objects .	
	Cost Control	Not suitable for cost control.	Suitable for Cost Control.	
Emergence of ABC in Mfring Firms	1. Production Overheads are high in relation to Direct Costs. 2. Products use different amounts of overhead resources. 3. More Support Service Costs. 4. Need for Better Cost Estimate to face competition. 5. Better Tools for Cost Tracing.			8.5
Purposes / Benefits of ABC	1. To link the cost to its causal factor, i.e. the Cost Driver, 2. To identify costs of activities rather than Cost Centres, 3. To ascertain product costs with greater accuracy by relating Overheads to activities, and 4. To overcome inherent limitations of traditional absorption costing & use of blanket OH Rates.			8.5
Steps in installation of ABC System	1. Specification of Objectives, 2. Identification of Costs for ABC, 3. Process Specification, 4. Activity Definition,		5. Activity Driver Selection, 6. Costing, 7. Staff Training, 8. Review & Follow-up	8.5

Issue	Points to remember		Page
Areas of ABC used	1. TQM, 2. Product Profitability Decisions,	3. Facility & Resource Expansion, 4. HR Decision	8.6
Use of ABC in decision Making	1. Pricing, 2. Market Segmentation & Distribution Channels, 3. Make-or-Buy decisions and outsourcing, 4. Transfer Pricing,	5. Plant close down decisions, 6. Evaluation of offshore production, 7. Capital Investment decisions, 8. Product line profitability, etc.	8.6
VA vs NVA Activities	Value-Added Activities (VA)	Non-Value-Added activities (NVA)	8.7
	Activities necessary for the utility or performance of the product.	Additional and extraneous activities , not fully necessary for product performance / utility.	
	Customers perceive as adding usefulness to the product or service that they purchase.	If eliminated, this will not reduce the actual or perceived value that customer obtain by using the product or service.	
	Work that is valued by the external or internal customer.	Work that is not valued by the external or internal customer.	
	They improve or maintain the quality or function of a product. VA activities result in "costs" and not in losses.	NVA activities do not improve the quality or function of a product or service, NVA activities create waste, result in delay of some sort.	
	Making product more versatile for certain other uses.	Expediting due to work delays, cost of re-work of defectives, etc.	
	Management aims to simplify VA Activities and thereby manage "costs".	Management should focus on elimination of NVA Activities and thereby avoid "losses".	
ABM	1. The use of ABC as a costing tool to manage costs at activity level is known as Activity Based Cost Management (ABM). ABM utilises cost information gathered through ABC. 2. Through various analyses, viz. (a) Cost Driver Analysis, (b) Activity Analysis, and (c) Performance Analysis, ABM manages activities rather than resources. It determines what drives the activities of the Firm & how activities can be improved to increase profitability. 3. ABM seeks to satisfy the following customer needs while making fewer demands for resources – (a) Lower Costs, (b) Higher Quality, (c) Faster Response Time, and (d) Greater Innovation. 4. Stages: (a) Identification of the activities that have taken place in the Firm. (b) Assigning Costs to Cost Pool for each activity. (c) Spreading of Support Activities Costs across the Primary Activities. (d) Determining Cost Driver for each activity. (e) Assigning the costs of Activities to Products, according to product demand for Activities.		8.7, 8.8
Business Applications of ABM	1. Cost Reduction, 2. Activity Based Budgeting, 3. Business Process Re-engineering (BPR),	4. Benchmarking, 5. Performance Measurement	8.10
Benefits of ABM	1. Cost Reduction, 2. Budget Implementation, 3. Cost Definition,	4. Management Decision Making & 5. Efficient Resource Utilisation.	8.10
ABC Vs. ABM	ABC	ABM	8.10
	Technique of determining cost of activities & cost of output produced.	Focusses on planning, execution & measurement of activities as the key to competitive advantage.	
	Aims to generate improved cost data for use in managing activities.	Aims to use information given by ABC, for effective business processes and profitability.	
	It is the operational segment of ABM.	It is a conceptual aspect.	
ABB	1. Activity Based Budgeting (ABB) is a process of planning and controlling the expected activities of the Firm, to derive a cost-effective budget, that meets forecast workload and agreed strategic goals. 2. Concept of ABB: ABB focusses on activity / business processes. Resources required are determined on the basis of expected activities and workload. Expenses necessary to perform these activities are estimated, with a focus on overall efficiency. 3. Key Elements are – (a) Type, (b) Quantity, and (c) Cost of work / activity to be performed. 4. Advantages: (a) Better Cost Analysis, (b) Better Cost Control, (c) Management Focus, (d) Resource Management, and (e) Realistic Approach.		8.10

Issue	Points to remember	Page
DPP	1. Benefits: (a) Better Cost Analysis, (b) Better Pricing Decisions, (c) Better Management of Stores and Warehouse Space, and (d) Rationalisation of Product Ranges. 2. DPP Indicators: (a) DPP as % of Sales, (b) DPP per unit of Time, (c) DPP per unit of Space.	8.11
Customer Profitability Analysis	Using ABC, profitability can be analysed customer group-wise, since ABC creates cost pools for activities. Customers use some activities but not all, and different groups of customers have different 'Activity Profiles'. Hence analysis of relative profitability based on customer category and related decision-making is called Customer Profitability Analysis.	8.12

Format of DPP Statement

Particulars / Product	A	B	C	D	Total
Selling Price per unit	XX	XX	XX	XX	XX
Less: Bought-in-Price per unit	XX	XX	XX	XX	XX
Gross Margin per unit	XX	XX	XX	XX	XX
Less: Directly Attributable Product Costs	XX	XX	XX	XX	XX
1. Warehousing and Storage Costs – e.g. space, insurance	XX	XX	XX	XX	XX
2. Transport Costs – e.g. fuel, vehicle maintenance, labour	XX	XX	XX	XX	XX
3. Product Batch Costs	XX	XX	XX	XX	XX
4. Inventory Financing Costs	XX	XX	XX	XX	XX
Direct Product Profit per unit	XX	XX	XX	XX	XX
Less: Indirect Costs and Common Overheads					XX
Net Profit					XX

FTR 9 Target Costing and Cost Reduction Aspects

Issue	Points to remember		Page
Steps in Target Costing	Step	Particulars	9.1
	1	Identify market requirements and product qualities / attributes.	
	2	Set Target Selling Price = customers' willingness to pay.	
	3	Set Target Production and Sales Volumes .	
	4	Establish Target Profit Margin for each product.	
	5	Set Target Cost (or Allowable Cost) per unit, for each product. Target Cost = Target Selling Price Less Target Profit Margin.	
	6	Determine Current Cost of producing the new product.	
	7	Set Cost Reduction Target in order to reduce Current Cost to Target Cost.	
	8	Analyse Cost Reduction Target into various components and identify cost reduction opportunities using VE & VA (for Direct Costs), and ABC (for Indirect Costs).	
	9	Achieve Cost Reduction & Target Profit by Effective Implementation of cost reduction strategies and decisions.	
10	Focus on further possibilities of cost reduction and maintaining the quality of product, i.e. Continuous Improvement program.		
Kaizen Costing	1. Ongoing continuous improvement program that focusses on waste reduction in the production process, thereby further lowering costs below the initial targets specified during design phase. 2. Small but significant cost reductions achieved during implementation stage, on account of workers' involvement. 3. Kaizen Costing is intended to repeat many of the Value Engineering steps, continuously and constantly refining the process, thereby eliminating out extra costs at each stage.		9.3
Steps in implementing Target Costing	1. Customer – Product Design Specification 2. Market – Target Selling Price and Production Volume 3. Profitability – Target Profit Margin	4. Setting Target Costs 5. Computing Current Costs 6. Setting Cost Reduction Targets 7. Identifying Cost Reduction Opportunities	9.2

Issue	Points to remember	Page
Target Cost Merits	1. Competitive Advantage, 2. Real Cost Reduction 3. Innovation, 4. Market Driven Management	9.4
Target Cost – Demerits	1. Time Factor, 2. Responsibility for Cost Reduction, 3. Co-ordination	9.5
Role of Cost Accountant in Target Cost	1. Cost Estimation, 2. Permissible Cost Ranges, 3. Capital Budgeting Analysis, 4. Cost Principles Explanation, 5. Review of Cost Reduction Targets, 6. Final Review and Feedback	9.5
Target Costing Data	Features: 1. Non-Traditional, 2. Futuristic, 3. Poorly defined, and 4. Unorganised. Sources: 1. Market and Competitor Information, 2. Competitor Cost Information, 3. Data from Past Analysis, 4. Engineering Data, and 5. Supplier Data.	9.5
Control Points	1. Principal Control Point, 2. Decision Point, i.e. Point of Go or No Go Decision, 3. Milestones	9.6
Target Costing in Service Sector	1. In Service Sector, the Target Costing Team can observe and analyse the actual provision of services to customers, and provide suggestions for cost reduction, by re-configuring / streamlining the activities performed by employees in the course of rendering the service. 2. Application of Target Costing at the "Production" phase in Service Sector, will – (a) lead to cost and wastage reduction, (b) improve productivity of employees, and (c) enhance the quality of services provided to customers.	9.7
Cost Reduction	1. Meaning: Cost Reduction is defined as achievement of real and permanent reduction , in the unit cost of goods manufactured or services rendered, without impairing their suitability for the use intended or diminution in the quality of the product. 2. Focus: Reduction in expenditure and Increased Productivity. 3. Advantages: (a) Individual Firm – Improvement in profits and enhancement in value of shares, (b) Society – Availability of goods and services of proper quality at reasonable prices, and (c) Country as a whole – Reduction in cost, Increase of Market Share in Exports and increased Forex Savings, and Increase in Government's Tax Revenue.	9.7
Cost Control vs Reduction	Refer Q.No.16	9.7
Cost Redn Plan – Steps	Step 1: Definition of Targets, Step 2: Formulation of Program, Step 3: Implementation, Step 4: Control and Review	9.9
Value Engineering (VE) and Value Analysis (VA)	Value Engineering: Searching for opportunities to modify the design of each component or part of a product, to reduce cost, but without reducing product's functionality or quality. Value Analysis: Studying the activities involved in producing the product to detect NVA activities that may be eliminated or minimized to save costs, but without reducing the functionality or quality of the product.	9.9
VA / NVA Costs	VA Costs: If eliminated, this would reduce the value or utility (usefulness) customers obtain from using the product or service. NVA Costs: If eliminated, this would not reduce the value or utility (usefulness) customers obtain from using the product or service.	9.9
Issues analysed in VA & VE	1. Elimination of unnecessary functions from the production process, 2. Elimination of unnecessary product qualities, 3. Design Minimisation, 4. Better product design to suit manufacturing process, 5. Substitution of Parts (Component Part Analysis), 6. Combination of steps (Process Centering), 7. Search for better way of doing things.	9.9
Cost Reduction Aspects	- Cost Reduction Aspects in Material Cost – (1) General Control Procedures, (2) Working with Suppliers, (3) Material Movement, (4) Product Design - Cost Reduction Aspects in Plant / Production Areas – (1) Plant Layout, (2) Production Planning, (3) Accident Prevention, (4) Automation, (5) Quality Control, (6) Production Control, (7) Operating Efficiency. - Cost Reduction Aspects in Labour Cost – (1) Reporting by Cost Accountant, (2) Job Evaluation, (3) Time and Motion Study, SIMO Charts, etc. - Cost Reduction Aspects in Other Areas – (1) Works Services, (2) Operations Research Techniques, (3) Organisation Structure, (4) Co-ordination	9.10–9.14

FTR 10 Life Cycle Costing

Issue	Points to remember					Page
Product Life Cycle – Phases	Particulars	Introduction	Growth	Maturity	Decline	10.1
	Phase	I	II	III	IV	
	Sales Volumes	Low.	Rise at increasing rates.	Rise at decreasing rates.	Constant & then start decreasing.	
	Prices of products	High levels.	Retention of high level prices	Prices fall closer to Cost.	Gap between Price & Cost is reduced.	
	Sales Values	Low, due to low sales quantities.	Rise in Sales Values at increasing rates.	Rise in Sales Values at decreasing rates.	Sales Value starts decreasing.	
	% of SOH to Sales	Highest	Total Expenses remain same, while ratio of S&D OH to Sales is reduced.	Ratio reaches a normal % of sales, which becomes industry standard.	Reduced sales promotional efforts.	
	Competition	Negligible & insignificant.	Entry of large no. of competitors.	Fierce Competition.	Starts disappearing.	
	Profits	Nil.	Increase at a rapid pace.	Normal rate of profits.	Declining profits.	
	Major Cost Items	R&D, Design Costs, Promotional Costs, Capacity Costs	Manufacturing Costs, Distribution Costs, Product Support Costs	Manufacturing Costs, Distribution Costs, Product Support Costs	Plants re-used / sold / scrapped / related costs	
Product Life Cycle – Features	1. Finite lives, 2. Follow predictable courses, 3. Profit p.u varies for each product,			4. Different opportunities and threats, 5. Functional emphasis in each phase, 6. Extend life of the product		10.2
Product Life Cycle – Stages	1. Market Research, 2. Specification, 3. Design, 4. Prototype manufacture,		5. Development, 6. Tooling, 7. Manufacture, 8. Selling,		9. Distribution, 10. Product support, 11. Decommissioning or Replacement	10.3
Product Life Cycle – Importance	1. Time based analysis, 2. Overall Cost Analysis, 3. Pre-production costs analysis, 4. Effective Pricing Decisions,			5. Better Decision Making, 6. Long Run Wholistic view, 7. Life Cycle Budgeting, 8. Review		10.3

FTR 11 Total Quality Management

Issue	Points to remember		Page
Steps in TQM	Step	Description	11.1
	1	Identification of customers / customer groups.	
	2	Identification of customer expectations.	
	3	Identification of customer decision-making requirements and product utilities.	
	4	Identification of perceived problems in decision making process and product utilities.	
	5	Comparison with other organisations and Benchmarking.	
	6	Customer Feedback.	
	7	Identification of improvement opportunities.	
	8	Quality Improvement Process through – (a) Determination of new strategies, (b) Elimination of deficiencies, and (c) Identifying solutions.	
PRAISE	1. Problem Identification, 2. Ranking, 3. Analysis, 4. Innovation, 5. Solution, 6. Evaluation For smooth PRAISE implementation, – (a) Move from Small to Big Issues, (b) Take Solvable Problems, and (c) Recognise Participants		11.2

Issue	Points to remember			Page	
6 C's	1. Commitment, 2. Culture,	3. Continuous improvement, 4. Co-operation,	5. Customer Focus, 6. Control	11.4	
4 P's	1. People,	2. Process,	3. Problem,	4. Preparation	11.4
Cost of Quality	1. Costs of Quality Compliance: (a) Prevention Costs, (b) Appraisal Costs, 2. Costs of Quality Non-Compliance: (a) Internal Failure Costs, (b) External Failure Costs			11.4	
Conti. Process Imprv ment	1. Continuous Process Improvement believes in encouraging every member of the Firm to continuously strive to efficiently serve their customers, who may either be external or internal. 2. The challenge is in promoting activities that continuously modify processes, procedures, task, content and process interfaces to achieve complete customer satisfaction as well as to reduce costs and to increase product quality.			11.5	
TQM Principles	1. Clear exposition of benefits of project. 2. Total Employee involvement (TEI). 3. Process measurement. 4. Involvement of all customers & contributors. 5. Elimination of irrelevant data.	6. Understanding the needs of the whole process. 7. Use of graphical & pictorial techniques to achieve understanding. 8. Establishment of performance specifications & targets. 9. Use of errors to prompt continuous improvement. 10. Use of statistics to tell people how they are doing.		11.5	
TQM Benefits	1. Increased awareness of Quality Culture in the Firm, 2. Commitment to Continuous Improvement, 3. Greater focus on Customer Satisfaction, 4. Greater emphasis on Team Work, and 5. Better Control over processes, operations and costs.			11.5	
Control in TQM	1. Process Definition, 2. Database, 3. Quality Manual, 4. Improved decisions, 5. Control and Continuous Improvement, and 6. Use of Control Reports			11.5	
Focus lost in TQM	1. Focus on documentation of process and ill-measurable outcomes, 2. Emphasis on quality assurance rather than improvement, and 3. Internal focus which is at odds with the alleged customer orientation.			11.6	
TEI	Reviving the Customer Focus with Total Employee Involvement (TEI), oriented towards organisational goals, will involve the following areas of thrust – 1. Loyalty to the vision of the Company through the pursuit of tough, visible goals. 2. Recognition of satisfied customers and motivated employees as true assets of a Company. 3. Delegation of decision-making to the point of responsibility by eliminating hierarchical tiers of authority to allow direct and speedy response to customer needs. 4. Decentralisation of Management to make best use of the creative energy of the workforce.			11.6	

FTR 12 Theory of Constraints

Issue	Points to remember	Page
Optimised Production Technology (OPT)	1. OPT is based on the principle that profits are expanded by increasing the Throughput of the Plant, i.e. rate at which Raw Materials are turned into Sales. So, Throughput Contribution = Sales Revenue less Direct Materials Cost. 2. The OPT Approach determines what prevents Throughput being higher, by distinguishing between – (a) Bottleneck, and (b) Non-Bottleneck Resources. 3. The most widely recognised management accounting system developed for this purpose is known as Throughput Accounting (TA).	12.1
Theory of Constraints	1. TA Concept assumes that a Firm has a given set of resources available (e.g. Buildings, Capital Equipments and Labour Force). The Operating Costs of these resources (i.e. Labour and Overheads) are considered as Fixed Cost. 2. Using these resources, purchased materials and components should be processed to generate Sales Revenue. To achieve this, the Firm has to maximise Throughput Contribution (i.e. Sales Revenue Less Direct Materials), subject to – (a) Production Capacity (Supply Constraints), and (b) Sales Demand (Demand Constraints).	12.1
TOC – Key Measures	1. Throughput Contribution, 2. Investments (Inventory) & 3. Other Operating Costs	12.1
Bottleneck	Activity within the Firm where the demand for that resource is more than its capacity to supply.	12.1

Issue	Points to remember	Page
Constraint	It is a situational factor, which makes the achievement of objectives/throughput more difficult than it would otherwise be.	12.1
Key Steps in Managing Bottlenecks	1. Identify System Bottlenecks, i.e. highest TA Ratio = $\frac{\text{Resource Requirement}}{\text{Resource Availability}} \times 100$. 2. Describe how to exploit the bottlenecks 3. Sub-ordinate decisions 4. Bottleneck Removal or Improvement – (a) Remove the bottleneck, (b) Increase bottleneck efficiency and capacity.	12.2

FTR 13 JIT, MRP and Production Concepts

Issue	Points to remember	Page
JUST IN TIME CONCEPT		
JIT in Finished Goods	1. Standardisation of Finished Products, 2. Identification of Sales and Production capacities, 3. Finalisation of Despatch Schedule, 4. Simplification of Process Cycle, 5. Finalisation of Production Schedule, 6. JIT Stores Requisition	13.1
JIT in Raw Materials – Additional Steps	1. Standardisation of Raw Materials & Components 2. Make or Buy decision 3. Standardisation of Supplier List 4. Streamlining Purchase process 5. Firm Contracts 6. Supplier Assistance 7. Supplier Information System 8. Reviewing Logistics 9. JIT Ordering 10. Direct Delivery	13.2
JIT in WIP	1. Affects Cost – (a) Piling up of WIP Inventory, (b) Delayed Tracing of Defectives 2. Ways to Resolve – (a) Kanban Card, (b) Working Cells	13.2
JIT – Objectives	1. Waste Reduction, 2. Time Reduction, 3. Elimination of NVA activities, 4. Zero Inventory, 5. Zero Defects, 6. Zero Break-downs, 7. Economical Batch Sizes, 8. Product Quality, 9. Timely delivery to Customer.	13.3
JIT – Benefits	1. Reduction in Inventory Levels, 2. Reduction in Wastage of Time, 3. Reduction in Scrap Rates, 4. Reduction in OH Costs	13.3
JIT – Time Reduction	1. Storage Time, 2. Inspection Time, 3. Handling Time, 4. Queue Time	13.3
JIT Effect on OH	1. Thorough reduction in Overhead Costs, 2. Shift between Overhead Costs and Direct Costs, due to introduction of Machine Cells, and 3. Scientific Allocation of common Overheads based on Machine Cells and Cost Drivers.	13.4
JIT Other Effects	1. Lower Inventories and Associated Costs. 2. Better Product Pricing (Customers' Needs and Competitors' Effect) 3. Reduced Capital Requirements.	13.5
Performance Measurement Criteria	1. Inventory Turnover, 2. Setup Time Reduction, 3. Customer Complaints, 4. Scrap, 5. Cost of Quality, 6. Customer Service, 7. Ideas generated	13.6
Backflushing	• Meaning: Backflush Costing is a costing system that omits recording some or all of the journal entries relating to the cycle from purchase of Direct Materials to the sale of Finished Goods. The Journal Entries for the subsequent stages use normal or standard costs to work backward to flush out the costs in the cycle for which Journal Entries were omitted earlier. • Issues: 1. Production Reporting, 2. Scrap Reporting, 3. Lot Tracing, 4. Inventory Accuracy	13.7
MATERIAL REQUIREMENTS PLANNING (MRP-I)		
MRP Meaning	Computerised Production Scheduling System providing a basis for production decisions. Involves Input (RM) Planning based on Output (FG) Budget.	13.8
Aims / Objectives / Benefits of MRP	1. Determine quantity & timing of FG production. 2. Ascertain quantity of Raw Materials, sub-assemblies & Components required. 3. Compute inventories, WIP, batch sizes & manufacturing & packaging lead Times. 4. Control inventory by ordering bought-in Components & Raw Materials. 5. Forecast inventory position period-by-period.	13.8

Issue	Points to remember		Page
	6. Serve as Inventory Information System. 7. Generate Purchase Requisition Notes and Purchase Orders.		
Pre-requisites	1. Production Schedule, 2. Standard Material Input,	3. Workers co-operation, 4. Accuracy of data	13.8
Reqments for MRP Operation	1. Master Production Schedule, 2. Bill of Materials (BOM), 3. Inventory File/Stores Ledger,	4. Routing File, 5. Master Parts File	13.9
OTHER PRODUCTION CONCEPTS			
MRP-II	When the scope of MRP-1 is developed further to include – (a) planning for Raw Materials, Components and Sub-Assemblies, (b) computation of other resources, e.g. Machine or Labour Capacity, and (c) creation of a full integrated plan for Management, then it is known as Manufacturing Resources Planning (MRP-2 or MRP-II).		13.10
Computer Aided Manu-facturing	1. When the manufacturing process is carried out by a range of machinery that, together with its concomitant software, comes under the collective heading of Computer-Aided Manufacturing (CAM). 2. Elements of CAM are – (a) Computer Numerical Control (CNC), and (b) Robotics. 3. CNC Machines are Programmable Machine Tools. These are capable of performing a number of machine tasks, e.g. cutting, grinding, moulding, bending, etc. CNC offers greater flexibility, and reduces set-up times.		13.10
Synchronous Manu-facturing	Synchronous Manufacturing Philosophy requires Managers to focus on those areas of operations where potential global improvements exist. Its Principles are – 1. Do not focus on balance Idle Capacities. Focus on synchronizing the Production Flow. 2. Marginal Value of Time at a Bottleneck Resource = Throughput Rate of the Products processed by the Bottleneck. 3. Marginal Value of Time at a Non-Bottleneck Resource is negligible. 4. The level of utilization of a Non-Bottleneck Resource is controlled by other constraints within the system. 5. Resources must be utilized , not simply activated. 6. A Transfer Batch may not, and many times should not, be equal to the Process Batch. 7. A Process Batch should be variable both along its route and over time.		13.10
BPR	Meaning: Business Process Re-Engineering refers to the analysis and re-design of workflows and processes both within and between business Firms. It is a total deconstruction and re-thinking of a business process in its entirety, unconstrained by its existing structure and pattern. Purpose: The aim of BPR is to improve key business processes in a Firm by focussing on – (a) Simplification, (b) Cost Reduction, (c) Improved Quality, and (d) Enhanced Customer Satisfaction.		13.11

FTR 14A Value Chain Analysis

Issue	Points to remember		Page
Activity Classification	1. Primary or Line Activities – (a) Material Handling, (b) Conversion, (c) Order Processing and Distribution, (d) Communication, pricing and Channel Mgmt, (e) Installation, Repair, Service. 2. Support Activities – (a) Procurement, (b) Technology Development, (c) HR Mgmt, (d) Admn.		14.1
Forms of Competitive Advantage	Differentiation Advantage	Low-Cost Advantage	14.3
	Occurs when customers perceive a Firm's product is of higher quality, involves less risk and / or outperforms competing products.	A Firm enjoys a relative low-cost advantage if its total costs are lower than the market average.	
	Offer customers better value for equivalent price.	Offer customers equivalent value for lower price.	
	Gained by – 1. Ability to deliver goods in a timely manner, 2. Better quality, 3. Provision of after-sales support services 4. Offer wide range of goods & services.	Gained by – 1. Access to low-cost raw materials, 2. Innovative process technology, 3. Low-cost access to distribution channels 4. Economies of scale, 5. Superior Operating Management, etc.	

Issue	Points to remember		Page
	Exploited by – 1. Increasing prices until it offsets improvement in customer benefits, or 2. Pricing below the 'full premium' level to build market share.	Exploited by – 1. Pricing the products lower than its competitors' to gain market share & maintain current profitability, or 2. Matching with the price of competing products and increase its profitability.	
Steps in VCA	1. Internal Cost Analysis, 2. Internal Differentiation Analysis, 3. Vertical Linkage Analysis		14.3
Internal Cost Analysis – Steps	1. Identify the Firm's value-creating processes. 2. Determine portion of Total cost of product/ service attributable to each value creating unit. 3. Identify the cost drivers of each process 4. Identify the links between processes. 5. Evaluate the opportunities for achieving relative cost advantage.		14.4
Internal Differentiation Analysis	1. Identify the Customers' value-creating processes 2. Evaluate Differentiation Strategies for enhancing Customer Value 3. Determine the best sustainable differentiation strategies		14.5
Vertical Linkage Analysis – Steps	1. Identify the Industry's Value Chain and assign Costs, Revenues and Assets to value-creating processes. 2. Diagnose the Cost Drivers for each value-creating process. 3. Evaluate the opportunities for sustainable competitive advantage.		14.5
Industry Structure Analysis	1. Bargaining Power of Buyers 2. Bargaining Power of Suppliers 3. Threat of Substitute Products or Services	4. Threat of New Entrants 5. Intensity of Competition	14.6
Core Competencies Analysis	1. Created by superior integration of technological, physical & human resources. 2. Represent distinctive skills, intangible, invisible, intellectual assets & cultural capabilities. 3. Core Competence-based diversification reduces risk & investment, & increases the opportunities for transferring learning & best practice across business units. 4. Core Competence is identified by – Leverage Test, Value Enhancement Test, Imitability Test. 5. Steps in VCA approach for competitive advantage includes the following – (a) Validate core competencies in current businesses. (b) Export or leverage Core Competencies to the Value Chains of other existing businesses. (c) Use Core Competencies to reconfigure the Value Chains of existing businesses. (d) Use Core Competencies to create new Value Chains.		14.6
Segmentation Analysis – Steps	1. Identify segmentation variables and categories 2. Construct a Segmentation Matrix 3. Analyse Segment Attractiveness 4. Identify Key Success Factors for each segment 5. Analyse attractiveness of Broad versus Narrow Segment Scope		14.7
Limitations of VCA	1. Non-availability of data, 2. Identification of Stages, 3. Ascertainment of Costs, Revenues & Assets,	4. Identification of Cost Drivers, 5. Resistance from Employees, 6. Science Vs. Art	14.8
Role of Mgmt Accountant in VCA	1. Need for Education, training & awareness, 2. Exploring for information, 3. Creativity,	4. System Design, 5. Cooperation	14.8
VCA Vs. Traditional Accounting Systems	Traditional Mgmt A/cing		
	1. Internal Focus 2. Seeks cost reduction in "Value Added" process. 3. Use of Single Cost Driver 4. Application at overall Firm level 5. Seeks adhoc cost reduction solutions for Cost Containment. 6. Focus on control of manufacturing costs. 7. Internal Information is used. 8. Inter-Firm comparison partially present.	Value Chain Analysis External Focus Seeks "Competitive Advantage" based on entire set of linked activities. Multiple Structural & Executional Drivers used. Unique Cost Drivers for each value activity. Cost Containment as a function of the cost drivers regulating each value activity. Focus on gaining competitive advantage. External and internal information are used. Focus on full-fledged benchmarking.	14.9

FTR 14B Performance Measurement

Issue	Points to remember			Page
Responsibility Centre	1. Meaning: (a) Activity centre of a business organisation entrusted with a special task, (b) Unit of function of a business organisation headed by an executive responsible for its performance. 2. Types: (a) Cost, (b) Revenue, (c) Profit, and (d) Investment Centres.			14.9
Responsibility Accounting	1. Control system of management accounting and reporting. 2. Involves the creation / recognition of various responsibility centers. 3. Standards of performance are clearly defined. 4. Furnishing of performance report at periodical intervals. 5. Actuals compared with standards to identify deviations & initiate appropriate action.			14.10
Pre requisites for Resp. Accounting	1. Area of responsibility and authority of each Responsibility Centre 2. Set of goals	3. Performance Report 4. Items which may require Management's attention		14.10
Limitations	1. Difficulty in preparation of an organisation chart. 2. Conflict of individual interest with organisational interest. 3. Passive resistance to the reporting system.			14.10
Responsibility Budgeting	1. Meaning: Budgetary Control System wherein a budget is prepared for each responsibility centre, showing the performance expected of the Responsibility Centre Manager. 2. Principles: (a) Goal Congruence, (b) Autonomy, and (c) Performance Appraisal.			14.10
Balanced Score Card (BSC)	Set of financial and non-financial measures relating to a Company's critical success factors. Objective – to provide a comprehensive framework for translating a Firm's strategic objectives into a coherent set of performance measures.			14.10
Advantages of BSC	1. Wholistic approach 2. Overall Agenda 3. Objectivity	4. Management By Objectives 5. Feedback and Learning 6. System Approach		14.11
Perspectives of BSC	1. Customer Perspective 2. Internal Perspective	3. Innovation and Learning Perspective 4. Financial Perspective		14.11
Process of creating BSC	1. Identify the Firm's Vision 2. Identify the Firm's Strategies 3. Define Critical Success Factors and Perspectives	4. Identify Measures to ensure everything is as planned. 5. Evaluation of Balanced Score Card 6. Create Action Plans 7. Follow up and Manage		14.11
Failure of BSC	1. Non-financial Aspects 2. Need for Trade-offs 3. Objective and Subjective Measures	4. Non Consideration of IT and R&D 5. Performance Evaluation		14.12
BENCHMARKING				
Meaning	Process of identifying and learning from the best practices anywhere in the world.			14.13
Types	1. Competitive 2. Strategic 3. Global	4. Process 5. Functional 6. Internal	7. External 8. Intra-Group 9. Inter-Industry	14.13
Stages	1. Planning 2. Collection of Data and Information 3. Analysis of findings based on data collected in St. 2		4. Formulation and implementation of recommendations 5. Constant monitoring and reviewing	14.14
Pre requisites	1. Commitment 2. Clarity of Objectives 3. Appropriate Scope		4. Resources 5. Skills 6. Communication	14.15
Difficulties	1. Time consuming 2. Lack of Management support 3. Resistance from Employees		4. Paper Goals 5. Copy-Paste attitude	14.15
Code of Conduct	1. Principle of Legality 2. Principles of Exchange 3. Principle of Confidentiality 4. Principle of Use		5. Principle of first Party Contact 6. Principle of Third Party Contact 7. Principle of Preparation	14.15

FTR 15 Uniform Costing & Inter Firm Comparison

Issue	Points to remember	Page
UNIFORM COSTING		
Meaning	Adoption of common costing principles, techniques, methods and/or practices by various Firms in the same industry. Basic purpose is to facilitate better cost comparison, cost reduction and control.	15.1
Purposes	1. Standardisation, 2. Healthy Competition, 3. Inter-Firm Comparison, 4. Production Capacity, 5. Cost Information to Government, and 6. Cost Control.	15.1
Pre-conditions	1. Standardisation, 2. Willingness to share data, 3. Exchange of developments, 4. Experience and Leadership Roles, 5. Trust and Co-operation.	15.1
Areas of uniformity	1. Size, 2. Accounting Method, Principles and Procedures, 3. Production Method	15.2
Advantages	1. Costing System based: (a) Implementation, (b) Savings in individual effort. 2. Benefits to Industry: (a) Efficiency, (b) Sharing of Cost, (c) Sharing Know-how, (d) Reduction of Labour Turnover, (e) General Industry Representations. 3. Benefits to Individual Firms: (a) Performance Analysis, (b) Elimination of Unhealthy Competition, (c) Inter-Firm Comparison. 4. Other Benefits: (a) Fair Prices, (b) Price Determination.	15.2
Limitations	1. Mis-use, 2. Impracticable to small Firms, 3. Confidentiality Loss, 4. Standardisation shortage	15.3
Uniform Cost Manual Contents	1. Statement of Objectives and purpose of the system, scope of the system, advantages and extent of co-operation necessary. 2. General principles of accounting, nature of coding, terminology to be followed, classification and description of accounts. 3. Details of Stock, Labour, OH – methods of cost collection & procedures of cost control. 4. Essential cost data and various ratios to be computed for comparison of performance and efficiency in the operation of the participating units. 5. Mode, format and time for presenting cost data and reports to the Management. 6. Guidelines on treatment of depreciation, interest on capital, wastage, scrap, by-product, etc.	15.3
INTER FIRM COMPARISON		
Meaning	Inter-Firm Comparison is a technique of evaluating – (1) Performance, (2) Efficiency, (3) Costs, and (4) Profits, of various Firms in an industry.	15.3
Pre-conditions	1. Creation of a centre for Inter-Firm Comparison, 2. Grant of Membership to all Firms, 3. Nature of information, 4. Method of collection and presentation of information	15.3
Advantages	1. To Industry, 2. To Individual Firm, 3. To Others	15.4
Limitations	1. No Utility, 2. Unreliability of data, 3. Lack of Basis for Comparison, 4. Loss of Confidentiality	15.4

FTR 16 Assignment

1	Ensure Objective = Minimisation . If not, convert into Opportunity Loss Matrix , by subtracting each element from the highest element from the Maximisation Matrix.
2	Ensure Data is balanced (i.e. No. of Rows = No. of Columns). If not, insert Dummy Row or Column with Zero entries.
3	Perform Row Operations , i.e. Subtract smallest element of each Row from all elements of that Row.
4	Perform Column Operations , i.e. Subtract smallest element of each Column from all elements of that Column.
5	Draw minimum number of horizontal and vertical lines to cover all Zeroes in the Matrix. Optimal Assignment possible only if No. of lines = Order of Matrix.
6	When No. of Lines < Order of Matrix, identify Least Open Element (LOE). Re-write Matrix as under – (a) Open Elements: Previous Element Less LOE, (b) Covered Elements: No change, (c) Junction Elements: Previous Element + LOE. Repeat Step 5 for such Revised Matrix till Number of Lines = Order of the Matrix.
7	Optimal Assignment : Identify row with one zero, draw a box around that zero, cancel all zeroes in that column, repeat procedure with columns and complete the assignment.

Special Cases and Treatment

Maximisation Objective	Convert into Opportunity Loss Matrix.
Unbalanced Matrix	Introduce Dummy Row or Column with all entries equal to zero.
Prohibited Assignment (Restrictive Condition)	Such routes are given a high cost "M", where M = Infinity Cost. Restrictive Condition means that such assignment is not possible, i.e. should not be made.
Condition Assignment (Facilitative condition)	Delete that Row and Column and reduce the matrix and continue the procedure. Facilitative Condition means that such assignment should be made only as given / specified.

FTR 17 Transportation

I	1. Ensure Objective = Minimisation. If not, convert into Opportunity Loss Matrix, by subtracting each element from the highest element from the Maximisation Matrix. 2. Ensure Data is balanced (i.e. Row Qty = Column Qty). If not, insert Dummy Row or Column with Zero entries.
II	Determine Initial Basic Feasible Solution (IBFS) by – (a) Northwest Corner Rule, (b) Least Cost Cell Method, or (c) Vogel's Approximation Method (VAM). VAM consists of the following steps – 1. Compute Cost Differences for each Row and Column. In case of tie, Cost Difference = 0. 2. Ascertain the maximum of Cost Differences and select that Row or Column for allocation. 3. Choose the Least Cost Cell in the selected Row or Column for allocation. 4. Compare availability and requirement for that cell, and allocate whichever is less, to that cell. 5. Cancel the Row or Column where availability or requirement condition is satisfied. 6. Compute Cost Differences for the resultant matrix and repeat the above procedure till all row availability and column requirements are satisfied.
III	Optimality Test consists of preparing the following tables – Table 1: U + V for Allocated Cells: Computation of margin numbers, 'U' and 'V' for all rows and columns such that $U + V = \text{Cost of Allocated Cells}$. Table 2: U + V for Unallocated Cells Table 3: Net Evaluation Table (NET) = Δ_{ij} Table or Decision Table = Table 1 minus Table 2.

Interpretation of Solution:

NET Entries	Nature of solution
• If all numbers are positive (i.e. > 0)	IBFS is optimal and unique .
• If all numbers are non-negative (i.e. ≥ 0) i.e. one or more of the cells contains zero .	IBFS is optimal but not unique . As many zeroes, that many alternative solution(s) exist. (Total number of solutions = Number of Zeroes + 1)
• If any one number is negative	Solution is not optimal. Re-allocation (Loop Procedure) should be made to determine Alternative Basic Feasible Solution (ABFS).

Loop Procedure for Re-Allocation and ABFS:

1. Identify the **worst negative** in Table 3. If there is a tie, choose the Least Cost Cell. (Call this as "Origin")
2. Draw a **Loop** with the following principles –
 - (a) Loop should commence from and end in the selected worst negative cell, i.e. the Origin.
 - (b) It should have only Allocated Cells as its other Corners. (But the Loop can cross over Allocated/ Unallocated Cells.)
 - (c) Only horizontal and vertical lines (not diagonal) can be used.
 - (d) Loop should result in an even-sided figure.
3. Put positive (+) sign and negative (–) sign to the corners of the loop alternatively, with origin as +ve corner.
4. Re-allocation is done as under –
 - (a) Identify the allocations to the negative corners of the loop (i.e. corners marked with (–) sign).
 - (b) Select the minimum quantity out of the above allocations. Let this Quantity be called **Selected Quantity**.
 - (c) Add this Selected Quantity to (+) corners and subtract this Selected Quantity from (–) corners. Other Allocated and Unallocated Cells will remain unaffected.

Special Cases and Treatment

Situation	Treatment
Unbalanced Data	Introduce Dummy Row or Column to balance availability and requirement.
Maximisation Objective	Convert into Opportunity Cost Matrix with Minimisation Objective, for allocation procedure.

Situation	Treatment
Degeneracy	- Optimality Test can be done only if number of allocations = [No. of Rows + No. of Columns – 1] (i.e. $m + n - 1$) - If Number of Allocations < ($m + n - 1$), all U and V numbers cannot be computed. This situation is called Degeneracy. - If IBFS is degenerate, introduce a dummy allocation (e), a small number very close to zero, in the Least Cost Independent Unallocated Cell. (where $e = 0.000\ldots001$)
Existence of Zeroes in the Net Evaluation Table	- Indicates the availability of alternative solutions (provided all other numbers are positive) - The alternative optimal solution(s) can be determined by drawing a loop commencing from such cell having zero in Net Evaluation Table. - Re-allocation will be based on the loop drawing procedure.
Prohibited Routes	Prohibited routes are identified with a high cost represented by " ∞ " or "M", M = Infinity Cost.

FTR 18 Linear Programming

Issue	Points to remember			
Meaning & conditions	Mathematical Model dealing with the use or allocation of certain scarce resources (i.e. Key Factor) in the best possible manner in order to maximize profit or minimize cost. Conditions: 1. Objective Function (Z) should be defined by use of a linear function involving the decision variables. 2. Decision Variables must be non-negative . 3. Constraints denoted by inequations .			
Application Areas	1. Industrial Applications 2. Product Distribution 3. Marketing Applications 4. Financial Applications	5. Administrative Applications 6. Agriculture Applications. 7. Operational Scheduling Applications		
Disadvantages	1. Existence of non-linear equations 2. Interaction between variables	3. Fractional Values 4. Knowledge of co-efficients of the equations		
Methods	1. Graphical, 2. Trial & Error Method/Algebraic Approach & 3. Simplex Method			
Slack, Surplus and Artificial Variables	Particulars	Slack	Surplus	Artificial
	1. Meaning	Idle or Unused Resources.	Excess Amount of resources utilized.	No physical or economic meaning. It is fictitious.
	2. When Used	' $\leq$ ' inequality	' $\geq$ ' inequality	' $\geq$ ' and '=' constraints
	3. Co-efficient in the constraint	+1	-1	+1
	4. Co-efficient in the Obj. Function Z	0	0	+M for Minimization and -M for Maximization.
	5. Use as Initial Program Variable	Used as Starting Point (Initial Table).	Cannot be used since Unit Matrix condition is not satisfied.	Initially used but later eliminated.
	6. Presence in the Optimal Table	Helps to interpret Idle & Key Resources.	-	Indicates "No Feasible Solution."
Primal vs Dual	For any LPP Model called the Primal Model, there exists a companion model called the Dual Model . The relationship between Primal and Dual LPP are – - The Objective of the Dual will be the opposite of the Primal. Constraints in Dual LPP will be in tune with the Dual's Objective, e.g. Max Obj with '$\leq$' constraints. - The Dual of the Dual problem is the Primal problem itself. - If Primal has "m" Variables and "n" Constraints, then Dual has "n" Variables and "m" Constraints. - Objective Functions of the Optimal Tables of Primal and Dual will have identical values. [Note: NER of Optimal Table of Primal LPP will be reflected in the Quantity Column of Optimal Table of Dual LPP, and vice-versa.] - If the Primal LPP has no optimal solution because of infeasibility, then the Dual LPP will also have no optimal solution because of unboundedness, and vice-versa.			

- Feasible Solutions to the Primal and Dual Problem are both optimal, if the complementary slackness conditions hold, i.e. –
 - (Value of a Primal Variable) $\times$ (Value of the corresponding Dual Surplus Variable) = 0, or
 - (Value of a Primal Slack Variable) $\times$ (Value of the corresponding Dual Variable) = 0
- Note:** When this relationship does not exist, then either primal or dual solution or both are non-optimal.

Steps in Simplex Method

Step 1: Objective: Determine the Objective Function (denoted by Z). [either Maximisation or Minimisation]

Step 2: Constraints: List the Constraints applicable for the objective. For Maximisation Objective, atleast one Constraint should bear $\leq$ sign. For Minimisation Objective, atleast one Constraint should bear $\geq$ sign.

Step 3: Conversion of Inequalities into Equalities: Convert Inequalities into Equalities as below:

Nature of Inequality	Introduce	Co-efficient of such Variable in the Objective Function
$\leq$	A Slack Variable	Zero for all Slack Variables
$\geq$	A Surplus Variable and Artificial Variable	Zero for all Surplus Variables +M, for all Artificial Variables in case of Minimisation Objective – M, for all Artificial Variables in case of Maximisation Objective

Step 4: Revised Objective: Re-draft the Objective Function by including the variables in this order – (a) Regular Variables as given in the objective, (b) Slack Variables with Zero Co-efficient, (c) Surplus Variables with Zero Co-efficient, and (d) Artificial Variables with + M Co-efficient (depending upon the Objective) [**Note: M = Infinity Cost.**]

Step 5: Initial Simplex Table: The format of the Simplex Table is as under –

Fixed Ratio	Program	Profit/Cost	Quantity	Variables Columns				Replacement Ratio (RR)
				A	B	S ₁	S ₂	
	Row 1							
	Row 2, etc.							
			Z (= Objective Value)					
			C (= Computed Value)					
			NER (Net Evaluation Row) = Z – C					

- Select Slack Variables as **Initial Program** for Maximisation Objective. In case of Minimisation Objective, Slack and Artificial Variables constitute the Initial Program, forming a Unit Matrix of Co-efficients.
- Fill up Profit/ Cost of the Program Variables as per Objective Function.
- Fill up Quantity = RHS of Constraints.
- Fill up Co-efficients of various variables as per the Constraints, in the respective columns.
- Fill up Z Row (i.e. Objective Value) against each Variable, as per Objective Function.
- Compute C = Profit $\times$ Co-efficient of each Variable.
- Compute Net Evaluation Row (NER) = Z – C.
- Select **maximum positive** NER (Z – C) for Maximisation Objective and circle **Key Column**. Corresponding Variable is called as the Incoming Variable. In case of Minimisation Objective, select **worst negative** NER (Z – C).
- Compute Replacement Ratio (RR) = $\frac{\text{Quantity}}{\text{Key Column Element}}$.
- Select **minimum non-negative** Replacement Ratio (RR) and **Circle Key Row**. In case RR = 0, it shall be selected as minimum non-negative. In case of tie in RR, arbitrary selection can be made.
- Identify **Pivot Element**, i.e. Junction of Key Row and Key Column.
- Compute **Fixed Ratio** (FR) for **Non-Key Rows** = $\frac{\text{Key Column Element}}{\text{Pivot Element}}$. For Key Row, FR is Not Applicable.
- Determine Replacement Decision: (a) Incoming Variable = Key Column, and (b) Outgoing Variable = Key Row.

Step 6: Second and Subsequent Table:

- Fill up Program Variables by Replacement Decision as per earlier Table.
- Fill up Profit / Cost of the program variables based on Objective Function.

- (c) Update **Key Row** by the Transformation Rule = $\frac{\text{Previous Table Key Row Element}}{\text{Pivot Element}}$.
- (d) Update **Non-Key Rows** by the Transformation Rule = (Previous Table Corresponding Row Element) **Less** (Key Row Element $\times$ Fixed Ratio)
- (e) Fill up Z Row (i.e. Objective Value) against each Variable, as per Objective Function.
- (f) Compute C = Profit $\times$ Co-efficient of each Variable.
- (g) Compute Net Evaluation Row (NER) = Z – C.
- (h) Repeat the selection and re-allocation procedure [Step (h) to (m) as given above] till all Z – C $\leq$ 0 for Maximization Objective, and all Z – C $\geq$ 0 for Minimisation Objective.

Note/ Check Points:

- Program Elements always form a **Unit Matrix**, but need not be adjacent.
- In every Table for all Program Variables, NER = Z – C = "0" (Zero)
- Retain fractions in all computations.

Procedure for Minimisation Objective:

- (a) Introducing Surplus Variables, the constraint functions are to be re-written and converted into equalities.
- (b) However, since Surplus Variables when introduced as Initial Program, violate the non-negativity assumption, Artificial Variables "M" of heavy cost (close to infinity) are introduced and the constraints and objective functions are re-written.
- (c) Initial Program is commenced using Artificial Variables only (since it satisfies the unit matrix condition).
- (d) An Artificial Variable once eliminated (i.e. selected as Key Row) will be removed, and will not re-enter the Simplex Table in the subsequent iterations.
- (e) If Artificial Variable exists in the "Optimal Table", the solution is not optimal. There is no feasible solution in that case.

Special Cases and Treatment

Situation	Treatment
Degeneracy	• It occurs if there is a tie in the minimum non-negative Replacement Ratio. • In case of Degeneracy, the Outgoing Variable (Key Row) should be selected on an arbitrary basis. • The Variable not selected as Outgoing, will bear "0"(Zero) in the Quantity Column in the next Table. (Note: This zero need not continue till the Optimal Table)
Equality Constraints	• The given Equality Constraint is split into two inequalities in opposite directions, '$\leq$' and '$\geq$' signs. • The regular procedure like introduction of Slack, Surplus and Artificial Variables will be adopted thereafter. [Note: Alternatively, an Artificial Variable can be introduced in an equality constraint.]
Multiple Optimal Solutions	• For any Optimal Solution, NER = Z – C = 0 for all Program Variables (i.e. Basic Variables). • LPP has alternative solution(s) if in the Optimal Table, a Non-Program Variable has NER = 0. • The Alternative Solution(s) can be obtained by identifying such Non-Program Variable (bearing NER = 0) as the Incoming Variable.(i.e. Key Column)
No Feasible solution	• Artificial Variable, once eliminated, should not re-enter subsequent iterations (tables). • If Artificial Variable exists in the "Optimal Table", the solution is not optimal. There is no feasible solution in that case.
Unbounded Solution	• Outgoing Variable is selected on the basis of minimum non-negative Replacement Ratio. • If all Replacement Ratios are negative, the Outgoing Variable cannot be identified. • The LPP is said to have unbounded solution in such cases, when all RR are negative.

Interpretation of existence of Slack Variables in the Optimal Table of a maximization LPP

Nature of Slack	Nature of NER	Nature of Resource	Interpretation / Remarks
Non-Program Variable	NER < 0 (i.e. negative)	Key Resource	This means that for every reduction in the RHS of that Constraint, the Profit will be reduced by the NER. Thus, the value of NER represents the Contribution Loss per unit of RHS of that Constraint / Key Resource. [Note: This Contribution Loss is also called Shadow Price (or) Marginal Value of that Resource.]
Program Variable	NER = 0	Idle Resource	This means that the Resource has no Contribution Loss, and is hence not fully utilized. The extent of Slackness / Idleness / Unused Resources is equal to the "Quantity Column" of the concerned Program Slack Variable.

Interpretation of Peculiarities in the Graph (Note: Number of Variables = 2 only)

1. Degeneracy	The feasible region may be defined by a single point which satisfies all conditions.
2. No Feasible Solution	There is no feasible region which satisfies all the constraints given in the LPP.
3. Unbounded Solution	The Feasible Region is not finite . The upper bound (in case of Maximisation LPP) or the lower bound (in case of Minimisation LPP) is not identifiable.
4. Multiple Optimal Solution(s)	The Iso-Profit (or Iso-Cost) Line has the same Slope as that of a Constraint, i.e. the Objective Function and any one of the Constraints have the same Slope. [Note: Slope = Ratio of Co-efficient of the Variables.]

FTR 19 Network Analysis

Issue	Points to remember	Page
Project	- Project = Set of Activities and Events that are performed in a certain sequence, to achieve specific objective(s). - Each of the activities requires time, consumes other resources, and involves cost. - Features: (1) Objective, (2) Activity Sequence, (3) Scale, (4) Time, (5) Cost, (6) Uncertainty.	19.1
Steps in Network Analysis	- Analyse and break down the Project in terms of specific activities and / or events. - Determine inter-dependence and sequence of specific activities, & prepare Network Diagram. - Assign estimates of time, cost or both to all the activities of the Network. - Identify the longest or critical path through the Network. - Monitor, evaluate and control the progress by re-planning, re-scheduling and re-assignment of resources.	19.1
Critical Path	Critical Path = Longest Path through the Network. The length of the Critical Path determines the minimum duration in which the Project can be completed. Importance: (a) Start and Finish Times, (b) Activities for Crashing, (c) Activity Monitoring, and (d) Resource Allocation and Smoothing. Advantages: (a) Comprehensive view, (b) Better Control, (c) Management by Exception, and (d) Dynamism.	19.1, 19.3
Network Diagram	- Network Diagram is a graphical representation of a Project, depicting the flow as well as the sequence of well-defined activities and events, and their inter-relationships. - When arrows in a Network Diagram are drawn to a time scale (i.e. proportional to the duration), it is called as a Time-Scaled Diagram. - Common Errors in a Network Diagram are – (a) Looping, (b) Dangling, and (c) Duplication.	19.3, 19.4
Activity	Portion of a Project / Network, which consumes time or resources and has a definite beginning and ending. Activities are jobs are denoted by Arrows in the Diagram.	19.3
Events	- Events are the beginning and ending points of an activity or a group of activities. - Activities in a Network must commence from some event called Tail Events. (LHS = Tail) - Activities in a Network must have terminal points called the Head Event. (RHS = Head) Merge Events: Represents the joint completion of more than one activity. Burst Events: Represents the joint initiation / commencement of more than one activity.	19.3
Forward and Backward Pass Computations	Forward Pass Computations - For the Initial (i.e. Starting) Event, $E = 0$ (zero). - For any subsequent Event, $E = E$ of Tail Event (LHS Event) + Activity Duration. - In case of Merge Event on the Forward Pass, highest (i.e. maximum) "E" shall be considered.	19.4
	Backward Pass Computations - For the Terminal (i.e. Last) Event, $L = E$ as per Forward Pass. - For any Preceding Event, $L = E$ of Head Event (RHS Event) + Activity Duration. - In case of Burst Event on the Backward Pass, least "L" shall be considered.	
Dummy Activity	Hypothetical Activity, which consumes no resources and time, and involves no cost. It is represented by dotted lines in the Network Diagram. Purposes of Dummy Activity are – - To make activities with common starting and finishing events distinguishable, - To identify and maintain precedence rel'ship bet'n activities which are not connected, - To clarify the relationship bet'n dependent and independent activities, - To avoid "dangling" or unconnected events in the network.	19.5

Issue	Points to remember	Page										
Slack and Float	Slack: Difference between L & E values as derived by the scheduling computations. Float: Total Float: [LST – EST] or [LFT – EFT]. For all CP Activities, Total Float = Zero. Free Float: Total Float Less Head Event Slack. If a negative value is obtained, then the Free Float is taken to be Zero. Independent Float: Free Float Less Tail Event Slack. If negative value is obtained, the Independent Float is taken to be Zero.	19.5										
PERT Features	1. 3 Time Estimates: Optimistic (t_o), Pessimistic (t_p), and Most Likely (t_m) 2. Expected Time = $t_e = \frac{t_o + 4t_m + t_p}{6}$ 3. Range = $t_p - t_o$ 4. Standard Deviation = $SD = \frac{t_p - t_o}{6}$ 5. Variance = $SD^2 = \left[\frac{t_p - t_o}{6} \right]^2$ 6. Due to uncertainty in time estimates, the probability or chance that the project will be completed within the expected duration / critical path duration is only 50% .	19.6										
Probability Analysis in achieving completing date	1. Compute the Expected Time $t_e = \frac{t_o + 4t_m + t_p}{6}$ for each activity. 2. Draw the Network Diagram and update t_e for each activity. 3. Identify the Critical Path and compute T_{cp} , i.e. Duration of the Critical Path. 4. Compute Variance (as per Q.16 above), of all the activities on the Critical Path . 5. Compute Total Variances of all CP activities, (say V) and compute, Std Deviation (SD) = $\sqrt{V}$ 6. Find Standard Normal Variate (Z) = $\frac{T_r - T_{cp}}{SD}$, where T_r = Duration in which the project is required to be completed, T_{cp} = Duration of CP and SD = Std Deviation of the Critical Path 7. Obtain the value of Standard Normal Variate from the Normal Tables. Call this as NT (Z) 8. Compute Probability of completing the Project within the Required Duration = $0.5 \pm NT(Z)$	19.7										
PERT vs CPM	<table><thead><tr><th>CPM</th><th>PERT</th></tr></thead><tbody><tr><td>1. Activity Oriented.</td><td>Event Oriented.</td></tr><tr><td>2. Deterministic Model.</td><td>Probabilistic Model.</td></tr><tr><td>3. Dual Emphasis on Time and Cost.</td><td>Emphasis on Time.</td></tr><tr><td>4. Useful for projects of repetitive nature.</td><td>Useful for New Projects.</td></tr></tbody></table>	CPM	PERT	1. Activity Oriented.	Event Oriented.	2. Deterministic Model.	Probabilistic Model.	3. Dual Emphasis on Time and Cost.	Emphasis on Time.	4. Useful for projects of repetitive nature.	Useful for New Projects.	19.7
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Project Crashing	Network Technique where the focus is on reducing the Project Duration to the Optimum Level, i.e. time that corresponds to the minimum costs.	19.8										
Resource smoothing	Network Technique used for smoothening peak resource requirement during different periods / activities of the Project Network.	19.9										
Resource Levelling	Network Technique used for determining the Project Duration, when there are restrictions on the availability of resources.	19.9										
Network Table	Columns Order for CPM: 1. Activity, 2. Duration, 3. EST, 4. LST, 5. EFT, 6. LFT, 7. Total Float, 8. Free Float, 9. Independent Float. Columns Order for PERT: 1. Activity, 2. t_o , 3. t_m , 4. t_p , 5. t_e Duration, 6. EST, 7. LST, 8. EFT, 9. LFT, 10. Total Float, 11. Free Float, 12. Independent Float, 13. Variance.											

FTR 20 Learning Curve

(Pages 20.1 to 20.3)

Issue	Points to remember						
Learning Effect	Phenomenon of improvement in the performance of a job because of the skill acquired by a person in doing that job repeatedly.						
Learning Curve	Geometrical progression, which reveals the steadily decreasing costs for the accomplishment of a given repetitive operation, as the identical operation is increasingly repeated.						
Application in Cost & Mgmt Accounting	<table border="1"> <tbody> <tr> <td>1. CVP Analysis</td><td>4. Product Design</td></tr> <tr> <td>2. Budgeting and Profit Planning</td><td>5. Contract negotiations</td></tr> <tr> <td>3. Pricing Decisions</td><td>6. Setting Standards</td></tr> </tbody> </table>	1. CVP Analysis	4. Product Design	2. Budgeting and Profit Planning	5. Contract negotiations	3. Pricing Decisions	6. Setting Standards
1. CVP Analysis	4. Product Design						
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Issue	Points to remember	
Uses of Learning Curve	1. Areas of Application: (a) Aircraft Industry, (b) Manufacturing Industry with Labour-oriented Operations, (c) Jobs which are repetitive in nature particularly with same Machinery and Tools. 2. Impact on Costs: Direct Labour Cost, Variable Overhead Cost, and sometimes Material Cost. 3. Management Accounting Areas: (a) Analysis of Variable Overheads, (b) Standard Costing and Variance Analysis, (c) Pricing Decision for Incremental Orders, (d) Output Capacity and Impact on Costs, (e) Preparation of Direct Labour Budget.	
Limitations	1. Non pervasive 2. Differential Rates of decrease	3. Non-Availability of data 4. Differential circumstances
Learning Ratio	$\frac{\text{Average Labour Time(or) Costs for first 2N units}}{\text{Average Labour Time(or) Costs for first N units}}$	
Learning Curve Equation	1. $Y = AX^B$ where – Y = Cumulative Average Time (or) Cost of 'X' Units or Lots X = Cumulative Number of Units or Lots produced A = Average Time (or) Cost of the first Unit or Lot B = Learning Co-efficient (or) Index of Learning = $\frac{\text{Logarithm of Learning Ratio}}{\text{Logarithm of 2}}$ When written as a Linear Equation in its logarithmic form, the Equation is Log Y = Log A + B Log X. 2. The above two equations define the Cumulative Average Cost. Either of them can be converted to a formula for the Total Labour Cost of all units produced upto a given point. Total Cost can be found out by the formula – Total Cost = X (units) × Y (Avg Cost pu) = $AX^B \times X = AX^{B+1}$	

FTR 21 Simulation

(Pages 21.1 – 21.3)

Issue	Points to remember	
Meaning	Quantitative procedure, which describes a process by developing a model of that process and then conducting a series of organised trial & error experiments to predict the behaviour of the process over time.	
Steps	1. Define the problem or system intended to be simulated. 2. Formulate the model intended to be used. 3. Test the model and compare its behaviour with the behaviour of the actual problem environment. 4. Identify and collect the data needed to test the model. 5. Run the simulation. 6. Analyse the results of the simulation and, if desired, change the solution that is being evaluated. 7. Return the simulation to test the new solution. 8. Validate the simulation, i.e. increase the chances that any inferences that may be drawn about the real situation from running the simulation will be valid.	
Appli-cations	1. Analysis of mathematical models of real-life systems 2. Making a location analysis 3. Planning military strategy, traffic control, management games & role playing, medical diagnosis, hospital emergency facilities, etc.	4. Learning about operating features of a new airplane, similar equipments, etc. 5. Study of electronic or hydraulic analog models of production processes or economic systems.
Merits and Demerits	Advantages	
	1. Easy understanding 2. Permits Model Experimentation 3. Allows Time Factor 4. Suitability 5. Cost Savings	Disadvantages 1. Lack of precision 2. Only Evaluation, Not generation of solutions 3. Time-consuming and long exercise. 4. Naïve approximations for major decisions. 5. Expensive, etc.
Models	1. Mathematical Models, 2. Physical Models.	
Monte Carlo Technique	Use in Inventory Control: Monte Carlo Simulation has the following applications in Inventory Control – (a) Determination of ROQ & ROL, (b) Computation of Stock-Out Costs and impact on profit, (c) Analysis of value of storage facilities for avoiding stock-outs and impact on profit, and (d) Analysis of demand distribution during lead time, etc.	