



The Adventures of Full Costing Course With CA Sanjeev Mittal

- 1. All Chapters Concepts Covered
- 2. Full Course Theory Covered



USE CODE : CASANJEEV

-----PREFACE-----

It gives me immense pleasure to present this book "-----". A best way revises all concepts and formulas for CA Inter Cost and Management Accounting.

This book is prepared keeping "concept clarity and formulas" is of utmost importance. This will help the students to grasp the ocean of syllabus in a shorter span of time.

Whishing you all the very best for your Career.....!!!

Enjoy the Journey!

CA Sanjeev Mittal

About CA Sanjeev Mittal:



CA Sanjeev Mittal is a visiting faculty at multiple branches of ICAI across India and an Educator on UNACADEMY Platform. His Field of expertise are:

- *CA Intermediate Cost and Management Accounting,*
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He is a great orator and speaker and taught more than 10,000 students online and offline at both the level of CA Intermediate and CA Final. He had been an elected member of WIRC WICASA and had organized multiple national level conferences

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**Note: Special FM Formula Chart is attached
from page 174 onwards**

Chapter 2: Material Costing

Concept 1:

ECONOMIC ORDER QUANTITY (EOQ) – How Much to order in single order

- Purchase cost: it is the price paid to vendor for purchasing raw material.
- Ordering cost: it is cost of placing order with supplier till receipt of material in warehouse.
- Carrying cost: Once raw material is received in warehouse; the firm has to incur expenses to keep it safe till use in production. • Carrying Cost (%) = Insurance cost (%) + interest cost (%) + storage space cost (%) + obsolescence cost rate (%)

EOQ Formula:

$$\text{Total Ordering Cost} = \frac{\text{Annual Requirement of Raw Material}}{\text{Quantity Ordered Each Time}} * \text{Ordering Cost per Order}$$

$$\text{Total Annual Carrying Cost} = \frac{\text{Quantity Ordered Each time}}{2} * \text{Carrying cost per unit per annum}$$

$$\text{EOQ} = \sqrt{\frac{2 * \text{Annual Requirement of Raw Material} * \text{Ordering Cost per order}}{\text{Carrying Cost per unit per annum}}}$$

Concept 2: Will EOQ size shall always be optimum order size?

- Answer is —NO!.
- Order size involving minimum material cost shall be optimum order size.
- Total Material Cost = Purchase Cost + Carrying Cost + Ordering Cost

Concept 3: EOQ in range type-question Range type question are those question in purchase price per unit decreases as order size is increased from one range to another.

Step 1: Calculate EOQ for each range.

Step 2: If EOQ falls within respective range then it will be valid EOQ otherwise invalid EOQ. (We may find more than 1 EOQ size)

- Annual requirement of raw material (A) will be same in all range.
- Ordering cost per order (O) shall also remain same in all range
- Carrying cost (C) will change in each range if it will be based on as a % of purchase price.

Concept 4: Frequency of order and Lead Time

FOO is the time gap between placing two consecutive orders e.g.

$$\text{Frequency of Order} = \frac{\text{Total Number of Days in a Year}}{\text{Total Number of Orders}}$$

Lead Time: it is time gap between date of placing the order with supplier and date of receipt of ordered material.

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Concept 5: Re-order Level – When to Order

Formula: Maximum Usage X Max lead time

Concept 6: Minimum Level / Maximum Level / Average Stock Level / Danger Level

Minimum Level: it is that level of stock below which stock in hand of raw material should not be allowed to fall otherwise stock out.

Formula = Re-order Level – (Avg. Usage X Avg. Lead Time)

Maximum level: it is that level of stock above which stock in hand of raw material should not be allowed to exceed otherwise high carrying cost.

Re-order Level + Re-order quantity – Minimum Usage X Minimum Lead Time

Average Stock Level

Avg. stock held by an organization = $\frac{\text{Maximum Level} + \text{Minimum Level}}{2}$

Danger Level: It is the level at which raw material kept for emergency is used for production of Finished Goods, (Normal issues of raw material is not possible).

Danger Level = Avg. Usage X Max. Lead Time for emergency purchase

Concept 7: Material Turnover Ratio / Inventory Turnover Ratio for raw material

It is a ratio between raw material consumed during a year and average stock of raw material maintained during the year

Formula = $\frac{\text{Raw Material Consumed During the year}}{\text{Average Stock of Raw Material}}$

CHAPTER 3- Direct Labour/Employee Costing

Concept 1: Introduction

Workers are paid wages based on

1. Time basis Rs. 100 per hour
2. Piece rate basis e.g. Rs.700 per unit produced.
3. Piece rate wage system with guaranteed time wages:

Total Earning under time-based wage method = No. of hours worked x wage rate per hour.

Concept 2: Formula oriented bonus schemes as follows:

1. Halsey Plan

Total wages = hours worked x wage rate + hours saved x $\frac{50}{100}$ x hourly wage rate (Called Bonus)

2. Rowan Scheme

Total Wages = hours worked x wage rate + hours saved x $\frac{\text{time taken}}{\text{time allowed}}$ x hourly wage rate (Called Bonus)

- Direct labour cost per unit = $\frac{\text{Total wages}}{\text{Total Unit Produced}}$

- Effective Wage Rate = $\frac{\text{Total wages}}{\text{Total Actual hours worked}}$

Concept 3: (Contribution to Sales Ratio)

As the name suggest, it shows relation between contribution and sales.

Profit = Total Sales – Total Cost

Total Cost = Total variable cost + Total Fixed Cost

Contribution = sales value - total variable cost

Total variable cost = Material cost + labour cost + variable Overhead

Contribution becomes profit if there is no fixed cost then contribution is itself profit. Hence contribution to sales ratio is also called profit-volume ratio.

Concept 4: Important Ratios

All 3 formulae are time based.

$$\text{Activity Ratio} = \frac{\text{std hours for actual output obtained}}{\text{budgeted hours for budgeted production}} * 100 = \frac{S}{B}$$

$$\text{Capacity ratio} = \frac{\text{actual hours worked}}{\text{budgeted hours for budgeted production}} * 100 = \frac{A}{B}$$

$$\text{Efficiency ratio} = \frac{\text{std. hours for actual output obtained}}{\text{actual hours worked}} * 100 = \frac{S}{A}$$

$$\text{Activity ratio} = \text{Capacity ratio} \times \text{efficiency ratio}$$

Concept 5: Treatment of Overtime

Sr. No.	Cases	Treatment of overtime
1.	When overtime is required regularly as a policy due to shortage of labour.	Overtime payment is charged to product using inflated wage rate.
2.	When overtime is desired at customer request to complete the work instantly	Overtime payment to charged to job (Recovered from customer)
3.	When overtime is required to make up any shortfall in production due to abnormal situations e.g. breakdown of machine.	Overtime payment is charged as loss in costing profit and loss account.
4.	When overtime is worked irregularly to meet requirements of production	Overtime payment is treated as production overhead.

Concept 6: Labour Turnover Rate (LTR)

- Old worker resigns from company if they get better opportunity (Called Resignation / Retirement / Left).
- Old workers are fired from company if they does not perform well (Called retrenchment / discharged).
- New workers are recruited to fill in vacancy due to resignation/retrenchment (Called Replacement). It is not due to expansion plan of company.
- New workers are recruited as additional work force due to expansion plan of company (Called Fresh recruitment).

There are 4 methods of calculating labour turnover rates as follows:-

- Labour turnover under separation method

$$\frac{\text{No. of separations in a year}}{\text{Average no. of workers on the roll during the period}} \times 100$$

Separations (S) = Resignation + Retirement + left ++ retrenchment+ discharged

Note: Average no. of workers on roll = $\frac{\text{workers on the beginning of the period} + \text{workers at the end of period}}{2}$

- Labour turnover under replacement method = $\frac{\text{No. of replacements in the period}}{\text{Average no. of workers on roll during the period}} \times 100$

Replacement (R) = New workers are recruited to fill in vacancy due to resignation/retrenchment
Replacement does not include those works who are engaged due to expansion scheme.

$$\text{3. Labour turnover under accession method} = \frac{\text{No. of accessions in the period}}{\text{Average No. of workers on the roll during the period}} \times 100$$

Accession (A) = Replacement + Fresh recruitment

4. Labour turnover under Flux method

Flux 1: (If fresh recruitment due to expansion not considered) =

$$\frac{(\text{No. of separations in a year} + \text{No. of replacements in a year})}{\text{Average no. of workers on the roll during the period}} \times 100$$

We call flux as —Full just to learn formula Labour turnover under Flux method

Flux 2: (If fresh recruitment due to expansion considered) =

$$\frac{(\text{No. of separations in a year} + \text{No. of accessions})}{\text{Average no. of workers on the roll during the period}} \times 100$$

Since Accession includes both replacement and fresh recruitment.

$$\text{Equivalent annual Labour turnover rate} = \frac{\text{Turnover rate for the lesser period}}{\text{No. of days in the period}} \times 365 \text{ days}$$

Note: workers recruited and joined = Accession = Replaced + Fresh recruited

Note: workers left and discharged = S = Separation

Concept 7: Factory Act

According to factories Act a worker shall be paid overtime payment if he works for more than 9 hours in a day or if he works for more than 48 hours in a week. In India, Overtime is paid at double the normal rate of wages.

Concept 8: Treatment of Normal Idle Time & Abnormal idle Time

Idle time when worker keep on sitting without working. Idle time is categorized in 2 categories:

1. **Normal Idle Time:** Like lunch time, small 10 minutes break etc. Cost of such normal idle time is absorbed into cost of product.
2. **Abnormal idle time:** Like breakdown of machine, charged as a loss in costing P&L A/c. Cost of abnormal idle time is charged as loss to costing P&L Account.

Chapter 4: Overheads

Concept 1: Concept Overheads meaning and Recovery Rates / Overhead absorption rate: 5 Methods

a) *Percentage of direct material cost* = $\frac{\text{Amount of production overhead}}{\text{Direct material cost}} \times 100$

b) *Percentage of direct labour cost* = $\frac{\text{Amount of production overheads}}{\text{Direct Labour cost}} \times 100$

c) *Percentage of prime cost* = $\frac{\text{Amount of production overhead}}{\text{Prime Cost}} \times 100$

d) *Direct labour hours rate* = $\frac{\text{Amount of production overheads}}{\text{Direct Labour Hours}} \times 100$

e) *Machine hour rate* = $\frac{\text{Amount of production overheads}}{\text{Machine hours}} \times 100$

Concept 2:

Allocation of overheads VS apportionment of overheads:

Allocation means charging a full amount of overhead directly to a department for which this amount has been incurred.

Apportionment of overheads: when separate identification of overhead department-wise is not possible then we have to divide cost of whole overheads among all departments on logical basis then it is called apportionment of overheads.

<i>Common Expenditure</i>	<i>Basis of Apportionment</i>
1.	<i>Floor area occupied by each department</i>
(a) <i>Factory Rent, rates & taxes</i>	
(b) <i>Repairs & Maintenance of Factory Building</i>	
(c) <i>Insurance of Factory Building</i>	
(d) <i>Depreciation of Factory Building (if owned)</i>	
2.	<i>Capital cost of plant & machinery of each department</i>
(a) <i>Repairs & Maintenance of Plant & Machinery</i>	
(b) <i>Insurance of Plant & Machinery</i>	
(c) <i>Depreciation of Plant & Machinery</i>	
3.	<i>No. of workers of each department</i>
(a) <i>Supervision Salary</i>	
(b) <i>Canteen, Staff Welfare Expenses</i>	

	(c) Time Keeping & Personnel Office Expenses	
	4.	Wages of workers of each department
	(a) Compensation to Workers	
	(b) Employees' State Insurance Contribution	
	(c) Provident Fund Contribution	
	5. Lighting & Heating	No. of light points or floor area occupied by each department
	6. Power consumption	Horse power of machines or machine hours consumed in each department
	7. Rent of Factory Building	• Area of Deptt. If Area Given • Equal if area not given
	8. Factory Lighting Expenses	• Number of Light Points or • Area if light points not given
	9. Depreciation of machines	• Number of machines of each deptt if value not given • Value of machines
	10. Power for Machines	• Horse Power (HP) Rating or • HP Rating × Machine Hours • Machine hours
	11. Indirect Wages	• Direct Wages

Concept 3:

Treatment of under/over absorption (Recovery) of overheads:

Under absorption of OH means that amount of OH absorbed over products is less than the amount of actual OH incurred.

Over absorption of OH means that amount of OH absorbed over products is more than the amount of actual OH incurred

Accounting Treatment:

Under or over absorbed overheads are disposed off by any of following methods:

a. One method suggest that the under or over absorbed overheads should be charged to costing profit & loss account as loss or profit

b. Second method suggest that unabsorbed / over absorbed overheads should be charged to WIP, Finished goods- stock and units sold (Traditional break-up method) by using supplementary rate

Note1:

Supplementary Recovery Rate =
$$\frac{\text{Under absorbed overhead}}{\text{Total units of production including equivalent WIP}}$$

Absorbed OH = absorption OH = Recovered OH = Applied OH

Note 2: The under absorbed overhead relating to inefficiency or defective planning or defective production policy is abnormal loss hence it is charged to profit and loss account as loss.

Note 3: For calculation of unabsorbed / over absorption OH, Actual overhead incurred should not include nonrecurring expenses

- amount paid to worker as per court order
- previous years' expenses booked to current year
- wages paid in strike period
- obsolete stores written off

Concept 4: Re-distribution of overheads

There are 2 kinds of departments – first is production departments and second is service departments.
4 methods are used for re-distribution

1) Repeated / continuous distribution method: Following steps shall be applied under this method assuming 3 production deptt. As P1, P2, P3 and 3 service deptt. S1, S2 and S3.

S.1 Original Cost of S1 is distributed among P1, P2, P3, S2 and S3 in given %.(1:5)

S.2 Original Cost of S2 Plus shared cost from S1 is distributed among P1, P2, P3, S1, S3 in given %.(1:5)

S.3 Original cost of S3 plus shared cost from S1 & S2 is distributed among P1, P2, P3, S1 and S2 in given %.(1:5)

S.4 Repeat the above step -1, step – 2 and then step - 3 until cost of S1, S2 and S3 becomes small figure. (Rs. 100 or Rs. 200). Now distribute this small figure over P1, P2 and P3

2) Trial and error method: Following steps are applied under this method assuming 3 production deptt. As P1, P2, P3 and 3 service deptt. S1, S2 and S3.

S.1 Original Cost of S1 is distributed among S2 and S3 in given %.(1:2) (No amount shall be reduced from S1)

S.2 Original Cost of S2 along with shared cost from S1 is distributed among S1 & S3 in given %.(1:2)(No amount shall be reduced from S2)

S.3 Original Cost of S3 along with shared cost from S1 & S2 is distributed among S1 & S2 in given %.(1:2)(No amount shall be reduced from S3)

S.4 Repeat the process of distribution again beginning with S1 until the additional amount becomes small amount (Rs.1 or Rs.2)

Note: Original cost is shared only once and additional cost is shared again and again.

S.5 Now distribute the [100% - Share of other Service Deptt.] cost of S1, S2 and S3 among P1, P2 and P3 only once.

Simultaneous equation method: Following steps are applied under this method assuming 3 production deptt. As P1, P2, P3 and 2 service deptt. S1 and S2.

S.1 Make 2 equation to show the total cost of S1 & S2 including its share (%) in S2 & S1 respectively.

S.2 Solve these 2 equations to find out the cost of S1 and S2. (Called Calculated Cost)

S.3 This calculated cost of S1 and S2 is then distributed only once over production deptt and service dept. in given %.

Step ladder method: following steps are applied under this method assuming 3 production deptt. As P1, P2, P3 and 4 service deptt. S1, S2, S3 & S4

| S1 provide services to P1, P2, P3, S2, S3 & S4. (1:6)

| S2 provide services to P1, P2, P3, S3 & S4. (1:5)

| S3 provides services to P1, P2, P3 and S4. (1:4)

| S4 provides services to P1, P2 & P3. (1:3)

S.1 Original Cost of S1 is distributed among P1, P2, P3, S2, S3 & S4.

S. 2 Original Cost of S2 along with shared cost from S1 is distributed among P1, P2, P3, S3 & S4.

S.3 Original Cost of S3 along with shared cost from S1 & S2 is distributed among P1, P2, P3 and S4.

S.4 Original Cost of S4 along with shared cost from S1, S2 & S3 is distributed among P1, P2 & P3.

Concept 5: Different capacity:

Meaning	Capacity of a factory refers to its ability to produce with the available resources and facilities. It is expressed in terms of (a) Units of product e.g. 100 cars per day (b) Production Hours e.g. 8 hours per day
Types: Maximum / Rated Capacity	It refers to the maximum possible production capacity of a factory which can never be achieved practically and it is only a theoretical capacity.
2. Practical Capacity	It refers to the maximum capacity of a factory reduced by capacity lost due to Normal repairs & maintenance, Sundays, Holiday etc. Thus, Practical capacity = Maximum capacity – Normal loss of capacity
3. Normal Capacity / Average Capacity	It refers to average of capacity utilised of factory during one full business cycle which may extend over 3 to 5 years ignoring the abnormal year of highest and lowest utilisation.
4. Actual Capacity	It refers to the capacity actually utilised during a given period.

Concept 6:**Machine hour rate:** while calculating machine hour rate,

$$\text{Machine hour rate} = \frac{\text{Amount of production overheads}}{\text{Effective machine hours}}$$

All expenses related to operating of machine are divided into fixed/standing charges and running/machine expenses.

Comprehensive machine hour rate = Simple machine hour rate + direct wages per machine hour

$$\frac{\text{Total direct wages}}{\text{Total machine hours}}$$

Statement Showing The Computation Of Machine Hour Rate

Particulars	Amount (Rs.)
-------------	--------------

A. Fixed/Standing Charges:

(a) Rent & Rates	XXX
------------------	-----

(b) Heating & lighting cost	XXX
-----------------------------	-----

(c) Supervision cost	XXX
----------------------	-----

(d) Insurance cost	XXX
--------------------	-----

(e) Department & general overheads	XXX
------------------------------------	-----

(f) Sundry Shop Supplies	XXX
--------------------------	-----

(g) Depreciation of factory - building	
--	--

Total Fixed/Standing Charges	XXX
-------------------------------------	------------

B. Machine Expenses per hour:

(a) Depreciation =	$\frac{\text{Original Cost} + \text{Installation Exp.} - \text{Scrap Value}}{\text{Effective useful life (in hours)}}$
--------------------	--

(b) Power consumed cost / Electricity	
---------------------------------------	--

(c) Repair & Maintenance	
--------------------------	--

(d) Lubricating oil & Consumable stores	
---	--

(e) Other running expenses	
----------------------------	--

C. Machine Hour Rate**Calculation of Effective machine hours**

Particulars	Hours
-------------	-------

Maximum Capacity (365 days x 8 hours in a day)	XXX
--	-----

Less:- Hours spent on holidays, festivals, Sundays, repair & maintenance	(XXX)
--	-------

Practical capacity (In hours)	XXX
--------------------------------------	------------

Less:- Set up time (If unproductive)

(XXX)

Effective machine hours

XXX

Note: if set-up time is considered productive then it shall not be reduced.

Note: Depreciation of machine shall be fixed exp. if life of machine is based on Time OR Depreciation of machine shall be variable exp. if life of machine is based on machine hours. Depreciation of factory building shall always be fixed.

Chapter 5: Activity Based Costing

Concept No. 1: Under Absorption Technique: Overhead cost is allocated over products on Single recovery rate. This overhead recovery rate is calculated on the basis of:

1. Budgeted Output (Overhead Recovery Rate = $\frac{\text{Budgeted Overheads}}{\text{Budgeted Output}} * 100$)

2. Budgeted Labour hours (Overhead Recovery Rate = $\frac{\text{Budgeted Overhead}}{\text{Budgeted Labour Hours}} * 100$)

3. Budgeted machine hours (Overhead Recovery Rate = $\frac{\text{Budgeted Overhead}}{\text{Budgeted Machine Hours}} * 100$)

4. Budgeted material cost (Overhead Recovery Rate = $\frac{\text{Budgeted Overhead}}{\text{Budgeted Material Cost}} * 100$)

5. Budgeted Labour cost (Overhead Recovery Rate = $\frac{\text{Budgeted Overheads}}{\text{Budgeted Labour Cost}} * 100$)

6. Budgeted prime cost (Overhead Recovery Rate = $\frac{\text{Budgeted Overheads}}{\text{Budgeted Prime Cost}} * 100$)

This absorption technique is also called traditional / conventional method. Under ABC Costing, Overhead costs (Indirect Costs) is apportioned over different products on some reasonable basis. Overhead which is activity oriented i.e. overhead which increases or decreases on increase or decrease in number of activities i.e. set-up cost is indirect cost (OH) which will increase if number of set-ups on machine increases and vice-versa. Inspection charges will increase if inspection in factory is conducted more times.

3. Overhead which is not activity oriented i.e. overhead which is not affected by increase or decrease in number of activities e.g. factory rent, depreciation on machine on SLM. This overhead is apportioned among products using single recovery rate.

Steps in ABC system :

1. Statement of Car Pool (Car Allocation) :- Group of overhead

2. Statement of Cost

[illegible]

CHAPTER 6: COST SHEET

1. *Never break sequence*
2. *Large Scale production needed*
3. *One Format Based Chapter*
4. *Semi Variable Cost*

Basic Things

1. *This Chapter is also known as single costing / Unit Costing / Output Costing.*
2. *Under unit costing, all costs incurred under various categories like material, labour etc. are total and cost per unit is calculated by dividing total cost by the number of units produced. Hence calculation of cost per unit.*
3. *The cost which can be identified directly is known as direct cost while cost which cannot be identified with product is known as indirect cost.*

Particulars	Classification of cost involved in coaching classes
<i>Direct material cost</i>	<i>Cost of study material given to each student.</i>
<i>Indirect material cost</i>	<i>Cost of marker, cost of used pages.</i>
<i>Direct labour cost</i>	<i>Payment to teacher because it is Labour cost from coaching center point of view.</i>
<i>Indirect labour cost</i>	<i>Payment to other staff like receptionist since it is Labour cost.</i>
<i>Direct expenses</i>	<i>Hall rent charges since it is neither material cost nor Labour cost.</i>
<i>Indirect expenses</i>	<i>Electricity bill and telephone bill of coaching center place where class is conducted.</i>

4. *Indirect cost is overhead cost which may be production overhead, office & administration overhead and Selling & distribution overheads.*

First, we produce goods in factory (Factory OH incurred), then transfer these goods to showroom/shops (Admin OH incurred), then we give job to Vivek Bindra for advertisement and finally receive order through Amazon.com (Selling & distribution OH incurred).

Admin Overhead has been divided in 2 types: -

1. **Admin OH Related to production activity:** - *It includes admin cost which is incurred in factory.*
2. **General Admin Overhead:**

Special Terms:

- **Quality Control Cost:** *Cost incurred in maintaining quality of product.*
- **Research & development Cost:** *Cost incurred in improving quality of product.*

- **Admin OH:** Cost incurred which is related to production activity only.
 - **Credit for recoveries:** Sale value of scrap or waste.
 - **Primary Packing cost:** Packing Cost which is essential to hold and preserve the product for its use by customer.
5. The proforma of the Comprehensive Cost Sheet, i.e. with stocks, is as under. If we are given opening stock of raw material, WIP and finished goods.
- **Raw material:** manufacturing process not started.
 - **Finished Goods:** Final product ready to sell.
 - **WIP:** manufacturing started but not 100% completed.

Particulars	Amt (Rs.)	Total units
Opening stock of raw material		
Add: Purchase of raw material including carriage inwards (Note 1)		
Less: Closing stock of raw material		
= Direct material consumed / DMC		Units produced
Direct Labour Cost		Units produced
Direct Expenses / Chargeable Expenses		Units produced
= Prime Cost/Direct Cost		Units produced
Add: Factory/works/Manufacturing/Production overhead		
= Factory Cost/works Cost/Manufacturing Cost		
Add: Opening stock of WIP		
Less: closing stock of WIP		
= Factory Cost		Units produced
Add: Quality Control Cost		
Add: Research & Development Cost (Process Related)		
Add: Adm. Overheads (Related to Production Activity)		
Less: Credit for Recoveries / Scrap / By - Products / Misc. Income		
Add: Primary Packing Cost		
Cost of Production (For FG Produced)		Units produced
Add: opening stock of finished goods		
Less: closing stock of finished goods		
= Cost of goods Sold (For FG Sold)		Units produced
Add: Selling and distribution overhead		Units produced
Add: General Admin Overheads		Units produced

= Total cost / Cost of sales		Units produced
Add: Profit (Balancing Figure Majority Time)		
= Total Sales		

Note 1: - **Per unit Cost** = $\frac{\text{Total Cost}}{\text{Total Units}}$

Note 2: - **Unit Cost of Closing FG (per unit)** = $\frac{\text{Cost of Production}}{\text{No. of units produced}} = \frac{\text{Factory Cost} + \text{Office \& admin OH}}{\text{No. of units produced}}$

6. While preparing the cost sheet, following amounts are ignored.

- Items of financial nature e.g. income tax, cash discount, interest on loan/capital, dividend, goodwill written off.
- Abnormal expenses.

Conversion cost: It means cost incurred to convert raw material into finished goods.

Method 1: Conversion cost = direct Labour cost + direct expenses + factory overheads

Method 2: Conversion Cost = Factory Cost – Direct material cost

Concept 1: Valuation of closing stock – Absorption method & marginal cost method

Condition 1: if stocks are valued on marginal cost basis. Cost per unit of closing stock of FG shall be Sum of only variable portion till cost of production.

Note: if nothing is given in question, we will assume absorption method to be followed.

Concept 2: How to categorize a cost into variable cost & fixed cost.

A Cost, which is same on per unit basis under different production level, is variable cost per unit.

Variable Cost per unit = $\frac{\text{Total variable Cost}}{\text{Total Units}}$

Fixed portion in semi-variable cost = Total Cost – Variable portion (Units x variable portion per unit).

Concept 3: Apportionment of total cost in various products (How to calculate separate cost of 2 products if collective cost is given)

Total direct material cost of product A & B = Rs. 100000

Total direct Labour cost of product A & B = Rs. 200000

Units produced for product A is 1000 units and units produced for product B is 2000 units.

Calculate total material cost of A & B under each case?

Case 1:

Material cost ratio per unit (A:B) = 1:2

Ratio to divide total cost shall be 1:4

$A = 1000 \text{ units} \times 1 = 1000$

$B = 2000 \text{ units} \times 2 = 4000$

Case 2:

Material Cost ratio (A: B) = 1:2

Ratio to divide total cost shall be 1:2 since not given on per unit basis

Concept: Calculation of projected (Future) Cost

If previous period cost is given then future cost shall be calculated considering

- Change in production (%)
- Change in general price level (%) e.g. wage rate increased, material price increased.
- Change in efficiency level (%)

Change in production level (%) shall affect following variable cost: -

- Direct material cost
- Direct Labour cost
- Variable OHs (Factory OH, Office & admin OH, selling & dist. OH)

CHAPTER 7: Cost Accounting System

Concept No. 1:

Meaning of integrated and non-integrated Accounts

- Under non-integrated accounts - 2 sets of books are maintained. Cost records are maintained separate while financial records are maintained separate.
- Under integrated accounts, only 1 set of books is maintained & entries are made both for cost and financial records e.g. Financial entries like cash paid to creditor and cash received from debtors shall also be passed.
- Most accounts are added with word —Control Account.

Concept No. 2:

1. Raw Material / Stores – Stores Ledger Control Account.
2. Wages – Wages Control Account.
3. Factory – WIP Ledger Control Account.
4. Warehouse – Finished goods Ledger control Account.
5. Shop – Cost of Sales Account

Concept No. 3:

General Ledger Adjustment A/c (GLA A/c) OR Cost Ledger Control A/c OR Nominal ledger control A/c
Financial entries are not considered in cost sheet e.g. cash paid to creditors and cash received from customers but in real world, these transactions happens. GLA account shall be used in place of account not opened while preparing cost sheet e.g. share capital, reserve and surplus, debtors, creditors etc. For Example

PARTICULARS	LOGIC	ENTRY
On Purchase of raw material	Raw material Expense A/c Dr.	Stores Ledger Control A/c Dr.
	To Cash / creditors A/c	To GLA A/c (In place of Cash /Creditors A/c)

Concept No. 4: Treatment of under and over recovery of overheads:

Option 1 of Treatment:

- If management decides to carry forward the amount of under/over recovery of overheads in next year then current year's under-recovery shall be adjusted against overrecovery of next year and vice-versa.
- No Accounting Entry is made for this.

Option 2 of Treatment:

If management decides to charge the amount of under/over recovery of overheads in current year then current year's under/over recovery shall be transferred to current year's profit & loss account.

Journal Entry for Under – Recovery (Loss)

Costing P&L A/c Dr.

To To Factory OH / Admin OH / Selling & Dist. OH A/c

Just reverse entry for over-recovery

Concept No. 5: Journal Entries relating to Material

	Transaction Entry – Material purchased on credit / cash	Transfer Entry – Issued
Logic behind Entry	Raw material A/c Dr. To Creditors / Cash A/c	Respective A/c Dr. To Raw material A/c
Direct Material to factory	Stores ledger Control A/c Dr. To GLA A/c	WIP Ledger Control A/c Dr. To Stores ledger Control A/c (Wages incurred for production)
Indirect material at Factory / Admin. Office / Selling Office	Stores ledger Control A/c Dr. To GLA A/c	Respective OH Control A/c Dr. To Stores ledger Control A/c

Concept No.6: Journal Entries relating to wages

	Transaction Entry – Wages Paid	Transfer Entry
Logic behind Entry	Wages A/c Dr. To Cash A/c	Respective A/c Dr. To wages A/c
Direct Wages to factory	Wages Control A/c Dr. To GLA A/c	WIP Ledger Control A/c Dr. To Wages Control A/c (Wages incurred for production)
Indirect Wages at Factory / Admin. Office / Selling Office	Wages Control A/c Dr. To GLA A/c	Respective Control A/c Dr. To Wages Control A/c

Concept No.7: Journal Entries relating to direct expenses

	Transaction Entry – Direct Exp. Paid	Transfer Entry
Logic behind Entry	Direct Exp. A/c Dr. To Cash A/c	Factory A/c Dr. To Direct Exp. A/c
Direct Expenses for factory	Direct Exp. Control A/c Dr. To GLA A/c	WIP Ledger Control A/c Dr. To Direct exp. control A/c

Concept No.8: Journal Entries relating to Overheads

Particulars	Transaction Entry – Overheads Incurred	Transfer Entry – Overheads charged / Recovered
Factory Overheads	Factory OH Control A/c Dr. To GLA A/c	WIP Ledger Control A/c Dr. To Factory OH Control A/c
Office & Admin Overheads	Office & Admin OH Control A/c Dr. To GLA A/c	FG Ledger Control A/c Dr. To Admin OH Control A/c
Selling & distribution Overheads	Selling & distribution OH Control A/c Dr. To GLA A/c	Cost of Sales A/c Dr. To Selling OH Control A/c

Concept No. 9: Important control accounts maintained in following sequence as follows

1. Stores Ledger control A/c
2. Wages control A/c
3. Factory OH control A/c
4. WIP Ledger control A/c
5. Admin OH control A/c
6. FG ledger control A/c
7. Selling OH control A/c
8. Cost of Sales A/c
9. Costing P&L A/c
10. GLA A/c

Concept No. 10-**Shortage in raw material**

- When raw material balance on physical checking is found to be less than raw material balance as per books then difference is called shortage

If shortage is due to normal loss	Factory OH A/c Dr. To Stores Ledger Control A/c
If shortage is due to abnormal loss	Costing P&L A/c Dr. To Stores Ledger Control A/c
If shortage is due to nonrecording of actual consumption	WIP Ledger control A/c Dr. To Stores Ledger

CONCLUSION:

Account No. 1:

SLC Accounts is like material purchase account hence it is

Debited with opening stock of raw material and purchase of material

Credited with issue of material and closing stock of material.

Account No. 2: WC accounts is like expenditure account hence it is

Debited with wages incurred (Both direct and indirect)

Credited with charging of wages to WIP and Overheads A/c (No closing Balance)

Account No.3: F. Overhead A/c is

Debited with Overhead incurred

Credited with overhead recovered

Diff. is either —Over/Under Recovery OR —Closing Balance

Account No.4: WIP Account is

Debited with opening balance of WIP, Direct material cost, Direct labour Cost, Direct Exp. and factory Overhead recovered

Credited with —TF to warehouse and closing balance of WIP.

Account No.5: Office and Admin OH is

Debited with OH incurred

Credited with OH recovered

Diff is either —Over / Under Recovery OR —Closing Balance.

Account No.6: FG account is debited

Opening balance of FG, TF from factory and Office & admin overhead recovered

Credited with —TF to Shop and closing balance of FG.

Account No.7: Selling and distribution OH account is

Debited with OH incurred Credited with OH recovered

Diff is Either —Over/Under Recovery OR —Closing Balance

Account No.8: COS Account is

Debited with opening balance of FG and S&D OH Recovered

Credited with —TF to Costing P&L Account

Account No.9: Costing P&L Account is

▢ Debited with —TF from shop‖ and under-recovery of OH

▢ Credited with Sales and —Over-recovery of OH‖

Account No.10: GLA Account is

▢ Credited with —Opening balance of GLA‖, Payment made for material purchase / wages / all Overheads and net profit earned

▢ Debited with sales and closing balance of GLA

CHAPTER 8: JOB AND BATCH COSTING

Concept 1:

Concept Job Costing is that form of specific order costing under which each job is treated as a cost unit and costs are ascertained separately for each job. A job may consist of a job, product, a service or any other specific order. e.g. Visiting Cards

Concept 2:

Economic Batch Quantity (EBQ)

Meaning	EBQ refers to the optimum quantity batch at which Set up & Processing Costs and Carrying Costs are together minimized.
Formula	$E.B.Q = \sqrt{\frac{2 * \text{Annual Demand} * \text{Set up cost per batch}}{\text{Cost of carrying per unit of production per annum}}}$

CHAPTER 9: CONTRACT COSTING

Concept 1:

A contract is a big job which requires construction of building, road, bridges etc. A contract takes more than one year to complete but contract account is prepared at the end of each Year.

Concept 2:

There are 2 parties in a contract i.e. A contractor and A contractee. Contractor is the person who undertakes the contract and contractee is the person who gives the contract.

Concept 3:

At the end of each year, work completed till end is checked & certified by architect of contractee. Now contractee makes payment to contractor on the basis of work completed & certified. Normally contractee pays only 80% to 90% of value of work certified as completed and remaining amount is kept by contractee security money which is paid on 100% completion of contract. Concept Value of work certified: It is expressed as a % of the contract price.

Example:

If contract price is Rs. 10 Lakh & work certified is 60% then value of work certified shall be 6 lakh (contract price x work certified as %).

Concept 4:

Retention money: it is that portion of value of work certified which has not been paid by contractee and kept as security money for future defective work.

Retention money = Value of work certified – Cash received by contractor

Concept 5:

Work uncertified: it is that portion of work which has been completed by contractor but has not been certified by architect of contractee. We calculate cost here, not value

Cost of work uncertified = Total cost incurred till date – Cost of work certified

Concept 6:**Notional profit:**

Value of work certified – Cost of work certified.

% of work completed = $\frac{\text{Value of work certified}}{\text{Contract price}} \times 100$

Note: Estimated Total Profit = Total Contract Price – Estimated Total Cost

Note: Estimated Total Cost = Cost of Contract up to date + Costs to be incurred

Trick to learn Contractee A/c:

- On receiving payment at 1st year end

Bank A/c Dr.	Value of work certified * Cash Payment %
To contractee A/c	

- On receiving payment at 2nd year end

Bank A/c Dr.	Value of work certified * Cash Payment %
To Contractee A/c	

- On receiving payment in last year when 100% contract is complete

Bank A/c Dr.	Value of work certified * 100 % Minus
To Contractee A/c	All previous payment received

Concept 7: Treatment of notional loss and estimated total loss

- Notional loss shall arise when cost of work certified is more than value of work certified.
- Estimated total loss shall arise when total estimated cost of contract is more than total contract price.
- Excess of estimated total loss over and above notional loss is called anticipated loss.

Concept 8:

Escalation clause: under this clause of a contract, rise in price of material and labour beyond standard price fixed is paid by contractee as extra amount along with contract price.

Formula to Calculate escalation:

For material: Standard quantity x (Actual Price – Std. Price)

For labour: Standard labour hours x (Actual Price – Standard Price)

Escalation clause does not cover increase in cost caused due to inefficiency or wrong estimation on part of contractor. Reversely, de-escalation clause, contract price is reduced by downward trend in price of materials and rates of labour etc.

Concept 9:

Contract account and Balance sheet is prepared in the following manner:

Particulars	Rs.	Particulars	Rs.
To material issued to site	XXX	By Materials at site (Closing Stock)	
To wages incurred (Paid + O/s – Prepaid)	XXX	By Materials returned from site	
		i.e. returned to stores	
To Direct expenses (Paid + O/s – Prepaid)	XXX	By Bank A/c (Sale of Materials)	
To Depreciation on Plant & Equipment	XXX	By Costing P&L A/c (Loss on sale)	
To office & Adm. Exp. Incurred (Paid + O/s Prepaid)	XXX		
	XXX		
To Cost of Contract b/d	XXX	By Work-in-progress	
To Notional Profit c/d	XXX	— Value of Work certified (Like Sale)	
	XXX	— Cost of Work Uncertified (Like closing stock)	

Balance Sheet (Extract)			
Liabilities	Rs.	Assets	Rs.
Capital	XXX	Land & Building (Less: Depreciation)	XXX
Profit & Loss A/c	XXX	Plant & Equipment (Less: Depreciation)	XXX
Outstanding Expenses	XXX	Materials: —	
		At Stores	XXX
		At Site	XXX
		Work-in-progress:	
		Value of work certified	
		XXX	
		Value of work certified	
		XXX	
		Cost of work uncertified	
		XXX	
		Less: Contractee's Cr. Balance	
	(XXX)	
		Cash & Bank Balance	XXX
		Prepaid Expenses	XXX

Chapter 10: Process Costing

Concept: 1.

When 2 or more process are required in manufacturing a product then concepts of process costing chapter are used to calculate

- All cost incurred in each process.
- Cost of FG transferred to next process.
- Cost of FG directly sold in market & held as stock Hence a process account is prepared for each process for above purposes.

Concept 2:

2 types of losses arise in process costing:

1. Normal loss: - loss which arise generally. Suppose 10,000 units are introduced in process & 2% is normal loss then 200 units will be normal loss units.

2. Abnormal loss: - if Actual loss is above normal loss. If in above example, 300 units are lost in processing then 100 units are abnormal loss

Sometimes actual loss is less than normal loss. If in above example, only 150 units are lost in processing then 50 units are treated as abnormal gain.

Concept 3: Following A/cs shall be prepared in process costing:

1. Process A/c
2. Finished goods A/c
3. Normal loss A/c
4. Abnormal loss A/c
5. Abnormal gain A/c
6. P&L Account
7. Any other A/c as required in question.

Process Account

Particulars	Units	Amount	Particulars	Units	Amount
To input Material			By Normal Loss		(Scrap Value per unit * Normal Loss Units)
To All expenses			By Abnormal Loss		(Cost per Normal Units * Abnormal Units)
To Abnormal Gain		(Cost per Normal Units * Abnormal Units)	By Next Process		(Cost per Normal units) * Finished Units

Finished Goods Account

Particulars	Units	Amount	Particulars	Units	Amount
To Process Ac (Transferred from process)			By Sales		
To P & L Accounts			By Balance C/D		

Normal Loss Account

Particulars	Units	Amount	Particulars	Units	Amount
To process A/c (Transferred from Process A/c)		(Scrap Value per unit * Normal Loss Units)	By Bank Account		
			By Abnormal Gain		

Abnormal Loss Account

Particulars	Units	Amount	Particulars	Units	Amount
To process A/c (Transferred from Process A/c)		(Cost per Normal Units * Abnormal Units)	By Bank Account		Scrap Realization
			By P & L		Balancing Fig

Abnormal Gain Account

Particulars	Units	Amount	Particulars	Units	Amount
To normal loss account			By Process Account (Transferred from process ac)		
To P & L		Balancing Fig			

Concept 4:

How to prepare Process A/c when output of one process is transferred to next process at an amount higher than its cost.

Inter-process profit: when output of one process is transferred to next process not at cost but at transfer price. Transfer price means cost plus some profit. In such case, transferor process makes some profit. Under inter-process profit, we shall make 3 columns in process and finished goods a/c i.e. cost, profit and total.

Under cost column, all cost is shown as incurred by company. Under profit column, profit included in opening stock, closing stock and transfer is shown Under total column, total of both cost and profit is shown. Transfer price is calculated as shown below for valuation of inventory at prime cost

Particulars	Cost	Profit	Transfer Price
Opening Stock			
Add: Direct Material			
Add: Direct Labour Cost			
Add: Direct Expense			
Cost			
Add: Cost from previous Process			
Less: Closing Raw Material			
PRIME COST			
Add: Overheads			
Process Cost			
Add: Profit & Loss			
Total			

Concept 5

How to prepare process A/c when Opening and closing work in progress (not 100% complete) is given cost item wise.

Method 1: When FIFO method is used Method

2: When average method is used

In both above methods, we have to prepare additional 3 statements in addition to process A/c, Finished goods A/c, normal loss A/c, Abnormal loss A/c etc. as follows:

Statement 1: Prepare Statement of Equivalent Production

Statement 2: Prepare Statement of Cost per Equivalent Unit

Statement 3: Prepare Statement of Evaluation

Under statement 1: St. of equivalent production (a) We calculate equivalent production units for incomplete units using following formula: Equivalent production units (EPU) = No. of units x degree (%) of completion performed in current period

EPU is calculated separately for each element of cost e.g. material, labour & OH because % of completion with regard to each element of cost is different.

Input units = Output units

Input units = Opening WIP + units introduced in current period

Output units =

Opening WIP now completed

+ units introduced in current period and completed

+ Units introduced in current period and not 100% complete till end i.e. Closing WIP

+ Normal loss units

+ abnormal loss units

– abnormal gain units

Degree (%) of completion performed in current period shall be

└ (100% - degree of completion performed in previous period) for Opening WIP.

└ 100% for units introduced in current period and completed

└ As given in question for closing WIP

└ Always ZERO for normal loss units

└ As given in question for abnormal loss units. (100% if not given in question)

└ Always 100% for abnormal gain units

Under statement 2: St. of cost per equivalent production (a) We calculate cost per equivalent unit e.g. material cost per equivalent unit, labour cost per equivalent unit and overhead cost per unit.

Cost per element = Cost Divide by Equivalent element units

Under statement 3: *St. of evaluation*

(a) *We calculate value of units completed, closing WIP, abnormal loss units and abnormal gain units.*

(b) *Formula = No. of equivalent units x cost per equivalent unit.*

Case 1: Preparation of Process A/c when opening and closing WIP is given and FIFO method is followed

(a) *FIFO means units transferred as 100% complete shall comprise all opening WIP and balance from units introduced in current period.*

Units Introduced and completed = Units Transferred - Opening WIP

Total Cost of units Transferred to next process =

Cost incurred in previous period on opening WIP

+ Cost incurred in current period on Opening WIP

+ Cost incurred in current period on units introduced & completed

Statement of Equivalent Production:

Particulars	Units	Particulars	Units	% Com	Units	% Com	Units	% Com	Units
Opening WIP		Opening WIP							
		Completed							
Add: Units Introduced		Units Introduced and Complete (Units Transferred - Op. WIP)							
		Closing WIP							
		Normal Loss							
		Abnormal Loss							
		Less: Abnormal Gain							

Statement 2: Statement of Cost per Equivalent unit

Particulars	Material	Labour	Overhead
Cost			
Less: Scrap Value of			
Normal Loss			
Total Cost			
Equivalent Units			
Cost Per Equivalent			
Unit			

Statement 3: Continued on next page

Particulars	Cost Elements	Equivalent Units	Cost per Equivalent Element	Total Cost of Each element	Total
Opening WIP					
> Cost incurred in previous period					
Cost Incurred in current period	Material				
	Labour				
	Overhead				
Units Introduced and Completed	Material				
	Labour				
	Overhead				
= Total Cost of Units Transferred to Next Process					
Closing Stock	Material				
	Labour				
	Overheads				
Abnormal Loss	Material				
	Labour				
	Overheads				

<i>Abnormal Gain</i>	<i>Material</i>				
	<i>Labour</i>				
	<i>Overhead</i>				

Process Account

<i>Particulars</i>	<i>Units</i>	<i>Amount</i>	<i>Particulars</i>	<i>Units</i>	<i>Amount</i>
<i>To input Material</i>			<i>By Normal Loss</i>		<i>(Scrap Value per unit * Normal Loss Units)</i>
<i>To All expenses</i>			<i>By Abnormal Loss</i>		<i>(Cost per Normal Units * Abnormal Units)</i>
<i>To Abnormal Gain</i>		<i>(Cost per Normal Units * Abnormal Units)</i>	<i>By Next Process</i>		<i>(Cost per Normal units) * Finished Units</i>
			<i>By Closing WIP</i>		

Case 2: Prepare Process A/c - opening and closing WIP is given and average method is followed

(a) Average method is used when it is not possible to identify opening WIP units in units transferred to next process. Hence it is not possible to bifurcate Units Transferred into opening WIP and units introduced & completed.

(b) Average cost per equivalent unit is calculated =

$$\frac{\text{Cost incurred in previous period on Opening WIP} + \text{Cost incurred in current period} - \text{Scrap value of normal loss units}}{\text{Total Equivalent units}}$$

(c) Total Cost of units Transferred to next process = Equivalent Units x Average Cost per unit

Statement 1: Statement of Equivalent Production:

<i>Particulars</i>	<i>Units</i>	<i>Particulars</i>	<i>Units</i>	<i>% Com</i>	<i>Units</i>	<i>% Com</i>	<i>Units</i>	<i>% Com</i>	<i>Units</i>
<i>Opening WIP</i>		<i>Units transferred to next process</i>		<i>100%</i>		<i>100%</i>		<i>100%</i>	
<i>Units introduced</i>		<i>Closing WIP</i>							
		<i>Normal Loss</i>							
		<i>Abnormal Loss</i>							
		<i>Abnormal Gain</i>							

Statement 2 : Statement of Cost per Equivalent per unit

Particulars	Material	Labour	Overhead
Opening WIP			
Cost incurred in current period			
Less: Scrap value of normal loss			
Total Cost			
Equivalent Units			
Cost per Element			

Statement 3: Statement of Evaluation

Particulars	Cost Elements	Equivalent Units	Cost per Equivalent Element	Total Cost of Each element	Total
Units Introduced and Completed	Material				
	Labour				
	Overhead				
= Total Cost of Units Transferred to Next Process					
Closing Stock	Material				
	Labour				
	Overheads				
Abnormal Loss	Material				
	Labour				
	Overheads				
Abnormal Gain	Material				
	Labour				
	Overhead				

Chapter 11: Joint & By Products

Concept 1:

Distribution of joint cost among the joint's products. For this purpose, following methods may be adopted:

Method 1:

Physical unit method: - Joint cost is distributed in ratio of quantity manufactured. Physical unit method: - Joint cost is distributed in ratio of quantity manufactured.

Method 2:

Sale value at separation point method: Joint cost is distributed in ratio of sales value at split off point. Sale value at split off point = No. of units produced x selling price

Method 3:

Net realizable value (NRV) method: Joint costs are apportioned in the ratio of net realizable values of joint products at separation point. NRV is calculated as follows:

<i>Sale Value after further processing</i>
<i>(units manufactured * Selling Price)</i>
<i>Less: Further Processing Cost</i>
<i>Net Realizable Value</i>

This method is used when

- 1. Sale value at split off point is not known and*
- 2. Product is sold after further processing.*

Note: No. of units manufactured = Sold units + closing stock

Method 4:

Average Unit Cost Method:

Average unit cost method: under this method, first average cost per unit is calculated using following formula:-

Average Cost per unit = $\frac{\text{Total Joint Cost}}{\text{Total No. of units of Joint Product}}$

Share of each product in joint cost = No. of units of each product X Average cost per unit

Method 5:

Contribution margin method

- Under this method, joint costs are divided into variable cost and fixed cost.
- Variable cost portion of joint cost is divided among products on the basis of physical units (Quantity / Units Ratio)
- Fixed cost portion of joint cost is divided among products on the basis of contribution ratio.

$$\text{Contribution} = \text{Sales} - \text{Total variable cost}$$

$$\text{Contribution Ratio} = \frac{\text{Contribution of Individual Product}}{\text{Total Contribution of all products}}$$

Method 6:

Constant Gross Margin Method:

Joint cost of joint products is calculated as balancing figure.

Particulars	Product A	Product B
Sale Value after further processing (No. of units manufactured * Selling Price)		
Less: Further Processing Cost		
Less: Gross Margin (Sales * Gross Margin Ratio)		
Joint Cost Allocated		

Format to Calculate Overall Gross Margin %

Sale value after further processing of all joint products
Less: joint cost and Further processing costs of all joint products
Gross Margin / Profit

$$\text{Gross Margin \%} = \frac{\text{Gross Margin}}{\text{Total Sales Value}}$$

Note: -Joint cost calculated under this method may be negative sometimes since balancing figure.

Note: -Joint cost calculated among all methods need not to be same

Concept 2:

Decision as to go for further processing or not.

Yes process if incremental sales < incremental cost i.e. if Profit increases.

Sale Value after further processing

Less: Sale Value at Split of Point

= Incremental Sale Revenue

Less: Further Processing Cost

= Profit OR Loss due to further processing
--

Decision: Go for further processing if profit increase as a result of further processing otherwise don't go for further processing.

Concept 3:

How to calculate joint cost of main products and by-products

When 2 or more products arise from same process using same raw material and almost of equal importance they are called joint products but when any product has less selling price in market. It is called by-products.

Step 1: Calculate Joint cost of by-product using following formula

Sale Value of by product

Less: Cost incurred after separation

Less: Estimated Profit

Less: Estimated Expenses

= Joint Cost

Step 2: Calculate Joint cost of main product = Total joint cost of all products - Net joint cost of all by-product.

Chapter 12: Service Costing

Concept 1:

1. Only for Service Providers: This chapter is basically related to service industries which provide services to their customers example coaching centers, hospitals, clubs and transport companies.

2. transport Service providers = Transport of Passengers + Transport of Goods

Concept 2:

Various cost per unit shall be calculated as follows:

Service Provider	Cost per unit	Cost per unit Calculation
Ola Cab / Taxi	Cost per Km.	$\frac{\text{Total Cost of Operating}}{\text{Total kms. run}}$
School Bus, Chartered Bus, Railways, Airlines	Cost per passenger	$\frac{\text{Total Cost of operating}}{\text{Total Passengers}}$
Metro, DTC Bus	Cost per passenger per km	$\frac{\text{Total Cost of operating}}{\text{Total passengers-kms}}$
Goods Transport Service providers	Cost per tonne per km	$\frac{\text{Total Cost of operating}}{\text{Total Tonnes-Kms}}$

Where, Total Passenger – Kms = Total No. of Passengers x Total Kms.

Total Tonnes Km = Total Tonnes x Total Km

Concept 3:

1. We shall divide all expenses of transport industry in following 2 categories

- Fixed Exp. / Standing Charges:** as the name suggest, these charges are fixed by nature and not dependent on running of a vehicle. Salary to driver, Insurance, Road Tax etc.
- Running Charges / Variable Exp:** as the name suggest, these charges are variable and purely dependent on running of vehicle like petrol exp. diesel, Repairs.

Note 1: On Depreciation

- Depreciation of vehicle shall be treated as Fixed expenses if life of vehicle is given in number of years.
- Depreciation shall be treated as variable expenses if life of vehicle is given in number of kilometers.
- If Nothing is given in question, we will assume depreciation to be Fixed Cost

Note 2: On Repairs & Maintenance

- R&M shall be treated as fixed expense if it is in the nature of annual maintenance contract (AMC) like in case of Air conditioner (AC) in our Home

- R&M shall be treated as variable expense if it is not in nature of AMC..
- If nothing is given in question, we will assume R&M to be variable cost.

In case of transport of goods services, we shall calculate cost per tonne-km.

Total Tonne-km = Total Tonne x Total Kms.

Concept 4

Tonne km are of 2 types:

- Absolute Tonne Km = Weight in tonne x km run
- Commercial Tonne – Km – Total Km x Avg. Tonne Km.

Note: If nothing is specified in question then absolute tonne km shall be used to calculate cost per tonne-km.

Concept 5

Total Collection for transport industry is called as total takings.

Particulars	Amount (Rs.)
Total operating Cost	XXX
Add: Profit	XXX
Net Takings	XXX
Add: Passenger Tax	XXX
Total Takings	XXX

Concept 6: SERVICE Costing for Hospital

Rent per patient day = $\frac{\text{Total operating cost} + \text{Desired profit}}{\text{Total No. of patient days}}$

Patient Days = No. of beds x No. of Days x Occupancy Rate

Break Even Points (In Number of patient Days)

1. Break Even Points means a point at which there shall be no profit no loss.

Hence Total Revenue = Total Cost

Selling Price x No. of Units sold = TFC + Variable Cost per unit x No. of Units Sold

No. of Units Sold = $\frac{\text{TFC}}{(\text{Selling Price} - \text{V. Cost})} = \frac{\text{TFC}}{\text{Contribution Per unit}}$

In case of hospital

- No. of units = No. of patient Days
- V. cost per unit = V cost per patient Day

Concept 7: CANTEEN COSTING

This is applicable for mess or canteen where all items to be served in a thali are fixed hence Objective is to calculate the cost of providing meals so that price per meal / Thali can be fixed.

$$\text{Cost per meal / Thali} = \frac{\text{Total Operating Cost}}{\text{No. of meals}}$$

Concept 8: SERVICE Costing for Lodge

$$\text{Cost per room - day} = \frac{\text{Total operating Cost}}{\text{Total number of room days}}$$

$$\text{Total Room Days} = \text{No. of Rooms} \times \text{No. of Days}$$

Concept 9: SERVICE Costing for Software Developing companies

Cost of project = Cost per project = Specific Cost involved for project + Overhead cost absorbed (Normally on the basis of salaries).

Concept 10: SERVICE Costing for Toll Roads

Government gives contract to contractor for construction of Highway. In such case Contractor incurs 2 types of expenditure:-

- Capital cost = Huge amount incurred in beginning in construction of Road
- Operating Cost = salary of persons involved in collecting tolls
- Maintenance Cost = Cost incurred in maintain repairs every year.

$$\text{Cost per vehicle} = \frac{\text{Total of capital cost + operating cost + maintainence cost}}{\text{Total Numbe of Vehicle Passiging through the toll road in a year}}$$

Concept 11: SERVICE Costing for Financial Institutions

$$\text{Processing Cost per home loan application} = \frac{\text{Total Processing cost in a year}}{\text{Total number of loan applications in a year}}$$

Concept 12: SERVICE Costing for POWER HOUSE

$$\text{Cost per unit of electricity generated} = \frac{\text{Total Cost}}{\text{Total Units Generated}}$$

CHAPTER 13: STANDARD COSTING

- Full Topic contains discussion over “should be (kitna Lagna Chiye tha)” and “Actual happened(Kitna Laga)”.
- Variance means comparison of actual and standard and their difference.
- Variance may be Favorable or Adverse (unfavorable).
- We will study mainly 5 types of variance

1. Material variances
2. Labour variances
3. Overhead variances
4. Sales variances
5. Profit variances

- Actual cost if more than standard cost then Adverse variance & vice-versa.
- Actual Sales & profit if more than standard sales & profit then favorable variance & vice-versa.
- Example A student set standard time to study each day as 8 hours while actual time studied is 6 hours then 2 hours shall be variance. In this example, variance is unfavorable.

We will follow 8 box approach for standard costing chapter formula learning. Boxes are as follows: -

1. Material Variances
2. Labour Variances (Without Idle Time)
3. Labour Variances (With Idle Time)
4. Variable Overhead Variances
5. Fixed Overhead Variances (Without Calendar Variance)
6. Fixed Overhead Variances (With Calendar Variance)
7. Sales Variances
8. Profit Variances

Budgeted Output in budgeted input	= $\frac{\text{total budget input}}{\text{budgeted input for 1 unit of output}}$
Budgeted output in actual input	= $\frac{\text{total actual input}}{\text{budgeted input for 1 unit of output}}$
Budgeted input for actual output	= Actual output x budgeted input for 1 unit of output

Trick to learn

1. Numerator shall always be same.

2. Input me divide and output me multiply arrange.

Concept 1:

Direct material variances: 5 Types

- **DMCV** = Arise when total std material cost and total actual material cost is different.
- **DMUV** = Arise when std material quantity and actually used material qty is different.
- **DMPV** = Arise when std. price per unit and actual price per unit is different.
- **DMYV & DMMV** = Arise when direct material is of 2 types or more and standard material mix ratio is not followed.

Example:

Std Qty ratio for RM1 & RM2 1:1 while Actual Qty Ratio 3:1 (Raw material mix ratio)

$$\text{DMCV} = \text{DMUV} + \text{DMPV}$$

$$\text{DMUV} = \text{DMYV} + \text{DMMV}$$

Computation of Material Variances

Particulars	SP X SQA0	SP X RSQ	SP X AQ	AP X AQ
Material A				
Material B				
Total	M1	M2	M3	M4

SP = Std Price, AP = Actual Price, AQ = Actual Quantity

consumed, RSQ = Revised Std Qty, SQA0 = Std quantity for actual output.

SQA0 = Actual output x budgeted input for 1 unit of output =

$$\text{Actual output} \times \frac{\text{Total Budgeted Material kg}}{\text{Total budgeted Output}}$$

RSQ = Revised standard quantity = it means total actual input in standard quantity ratio.

$$\text{DMCV} = M1 - M4$$

$$\text{DMUV} = M1 - M3$$

$$\text{DMPV} = M3 - M4$$

$$\text{DMYV} = M1 - M2$$

$$\text{DMMV} = M2 - M3$$

1. Production manager is responsible for DMUV thereby for DMYV and DMMV.

2. Purchase manager is responsible for DMPV

Concept 2:

Material Price Variance at time of purchase: -DMPV is computed for the actual quantity of material consumed. If AQ consumed is replaced by AQ Purchased then the result is known Direct material purchase price variance (MPPV).

Formula: -

$$MPPV = SP \times AQP - AP \times AQP \text{ Where } AQP = \text{Actual Quantity purchased.}$$

Concept 3:

ALTERNATIVE WAY TO CALCULATE DMYV

$$DMYV = \frac{\sum M1}{\text{Actual output}} * (\text{Actual output} - \frac{\text{Actual input}}{\text{budgeted input for 1 unit of output}})$$

Concept 4:

Direct Labour variances

Labour variances	
Case 1: - Workers do not sit idle (Without Idle Time)	Case 2: - Worker sometimes sit idle (With Idle Time)

Case 1: Without Idle Time

Example if a worker is paid for 10 hours but he worked only for 8 hours then difference 2 hours will be idle time. Idle time means workers kept on sitting without working but has been paid.

Labour variances is of 5 types: -

1. **DLCV** = Arise when total std labour cost and total actual labour cost is different
2. **DLEV** = Arise when labour do not work efficiently (Take more time to do work)
3. **DLRV** = Arise when std wage rate and actual wage rate is different.
4. **DLYV & DMMV** = Arise when labour is of 2 types or more and std. labour mix ratio is not followed.
Example Std Skilled & Unskilled labour for 1 job is 1 skilled labour: 2 unskilled labour while actual used was 1 skilled labour : 3 unskilled labour.

$$DLCV = DLEV + DLRV$$

$$DLEV = DLYV + DLMV$$

Computation of Labour variances

Particulars	SR X SHAO	SR X RSH	SR X AH	AR X AH
Skilled				
Semiskilled				

Unskilled				
Total	L1	L2	L3	L4

SR = Std Rate, AR = Actual Rate, AH = Actual Hours paid / Worked,

RSH = Revised std. hours, SHAO = Std hours for actual output

SHAO = Actual output x budgeted input for 1 unit of output = $\frac{\text{Total Budgeted labour hours}}{\text{Total budgeted output}}$

RSH = Total of actual hours paid in standard labour mix ratio

DLCV = L1 - L4

DLEV = L1 - L3

DLRV = L3 - L4

DLYV = L1 - L2

DLMV = L2 - L3

Case 2

When worker sometimes sit idle i.e. With idle time

Idle Time = Actual hours Paid (AHP) - Actual hours worked (AHW)

Labour variances:

Particulars	SR X SHAO	SR X RSH	SR X AH	AR X AH
Skilled				
Semiskilled				
Unskilled				
Total	L1	L2	L3	L4

AHW = Actual hours worked

AHP = Actual hours paid

DLCV = L1 - L5

DLEV = L1 - L3

IDLE TIME VARIANCE = L3 - L4 (Always Adverse)

DLRV = L4 - L5

DLYV = L1 - L2

DLMV = L2 - L3

Concept 5:

Labour Efficiency Ratio

Link to ACE (Activity, Capacity, Efficiency) ratio = SAS / BBA

Labour Efficiency Ratio = $\frac{\text{Standard hours}}{\text{Actual hours}} \times 100$

$$\text{Standard labour cost per unit} = \frac{\text{Standard cost}}{\text{No. of units produced}}$$

$$\text{Actual labour cost per unit} = \frac{\text{Actual Cost}}{\text{No. of units produced}}$$

Concept 6:

Overhead variance

- Overhead means all indirect cost. Indirect cost means cost which is not directly connected to production.
- Overhead is of 2 types
 1. Variable OH e.g. Electricity consumed on running of machine
 2. Fixed OH e.g. Factory Rent.

$$1) \text{ Budgeted OH per unit} = \frac{\text{Budget OH}}{\text{Budgeted Output}}$$

$$\text{Actual OH per unit} = \frac{\text{Actual OH}}{\text{Actual Output}}$$

$$2) \text{ Budgeted OH per hour} = \frac{\text{Budgeted OH}}{\text{Budgeted hours}}$$

$$\text{Actual OH per hour} = \frac{\text{Actual OH}}{\text{Actual hours}}$$

$$3) \text{ Standard Hour for Actual Output} = \text{Actual Output} \times \text{Std hour required for 1 unit of output}$$

$$= \text{Actual Output} \times \frac{\text{Total standard hours}}{\text{Total output(units)}}$$

$$\text{Expected output in actual hours} = \text{Actual hours} \times \text{Std output (units) produced in 1 hour}$$

$$\frac{\text{Actual hours}}{\text{Budgeted input for 1 unit of output}}$$

$$\text{Expected Output in Actual Hours} = \text{Actual hours} \times \text{Std output (units) produced in 1 hour}$$

$$\frac{\text{Actual days}}{\text{Budgeted input for 1 unit of output}}$$

Calculation of Different Amount as required in calculation of OH variance

Particulars	Formula 1	Formula 2
1. Output absorbed OH	= Actual O/P x Budgeted OH per unit	= Std Hrs. for actual O/P x budgeted OH per Hr
2. Input absorbed OH	= Actual Hrs. x Budgeted OH per Hr	= Expected O/P in Actual Hrs x Budgeted OH p. unit
3. Possible OH	= Possible Output x Budgeted OH p.u	= Possible Hrs. x Budgeted OH per Hr
4. Budgeted OH (Normally directly given in Question)	= Budgeted O/P x Budgeted OH p.u.	= Budgeted Hrs. x Budgeted OH per Hr
5. Actual OH (Normally directly given in Question)	= Actual O/P x Actual OH p.u.	= Actual Hrs. x Actual OH per unit

Overhead variances are of 2 Types

- Variable OH Variances
- Fixed OH variances

Variable OH variances**Computation of Variable Overheads variances**

Particulars	Output absorbed	Input absorbed	Actual
	V. OH	V. OH.	V. OH
	VO 1	VO 2	VO 3

$$VOCV = VO 1 - VO 3$$

$$VO \text{ Eff. V} = VO 1 - VO 2$$

$$VO \text{ Exp. V} = VO 2 - VO 3$$

$$VOH \text{ Cost Var.} = VOH \text{ Efficiency Var.} + VOH \text{ Exp. Var.}$$

VOH Cost Var = Arise when Std VOH and Actual VOH is different. (Machine hours taken)

VOH Eff. Var = Arise when VOH generating facilities e.g. electricity is utilized less or more efficiently.

VOH Exp. Var = Arise when Std Electricity rate & actual electricity rate is different.

Case 1:

Fixed OH Variances (Without calendar variance): -

Identification of calendar variance: when information about budgeted days and actual days is given in question then calendar variance is to be calculated. It is covered in case 3.

Computation of Fixed Overheads variances

<i>Output Absorbed F. OH</i>	<i>Input absorbed F. OH</i>	<i>Budgeted F. OH</i>	<i>Actual F. OH</i>
<i>FO 1</i>	<i>FO 2</i>	<i>FO 3</i>	<i>FO 4</i>

$$FOCV = FO\ 1 - FO\ 4$$

$$FOVV = FO\ 1 - FO\ 3$$

$$FO\ Exp.\ V = FO\ 3 - FO\ 4$$

$$FO\ Eff.\ V = FO\ 1 - FO\ 2$$

$$FO\ Cap.\ V = FO\ 2 - FO\ 3$$

$$FOH\ Cost\ Var. = FOH\ Volume\ Var. + FOH\ Exp.\ Var.$$

$$FOH\ Volume\ Var. = FOH\ Efficiency\ Var. + FOH\ Capacity\ Var.$$

Case 2:

Fixed OH (with Calendar Variance): -

Computation of Fixed Overheads variances

<i>Output Absorbed</i>	<i>Input absorbed</i>	<i>Possible</i>	<i>Budgeted</i>	<i>Actual</i>
<i>F. OH</i>	<i>F. OH</i>	<i>F. OH</i>	<i>F. OH</i>	<i>F. OH</i>
<i>FO 1</i>	<i>FO 2</i>	<i>FO 3</i>	<i>FO 4</i>	<i>FO 5</i>

$$FOCV = FO\ 1 - FO\ 5$$

$$FOVV = FO\ 1 - FO\ 4$$

$$FO\ Exp.\ V = FO\ 4 - FO\ 5$$

$$FO\ Eff.\ V = FO\ 1 - FO\ 2$$

$$FO\ Cap.\ V = FO\ 2 - FO\ 3$$

$$FO\ Cal.\ V = FO\ 3 - FO\ 4$$

$$FOH\ Cost\ Var. = FOH\ Volume\ Var. + FOH\ Exp.\ Var.$$

$$FOH\ Volume\ Var. = FOH\ Efficiency\ Var. + FOH\ Capacity\ Var. +$$

$$FOH\ Calendar\ Var.$$

Calendar variance: A student planned to study for 24 days in a month & actually studied for 20 days.

This is calendar variance.

Capacity variance: A student planned to study for 10 hours in a day & actually studied 8 hours. This is capacity variance.

Efficiency variance: A student studied 8 hours & completed 10 costing questions while these 10 questions must have been studied in 5 hours. This is efficiency variance.

Concept 7:

- 1) Sales Value Var. = Arise when budgeted sales value & actual sales value is different. Budget – Sale for Rs. 200 but Actual Sales for Rs. 150 then Rs. 50 is sales value var.
- 2) Sales volume var. = Arise when budgeted sales volume & actual sales volume is different. Budget – Sale for 200 units but Actual Sales for 150 units then 50 units is sales volume var.
- 3) Sales price var. = Arise when budgeted selling price & actual selling price per unit is different. Budget – selling price for a unit is Rs. 100 but Actual – selling price for a unit is Rs. 60 then Rs. 40 is sales price var.
- 4) Sales Qty & MIX var. = Arise when product sold is of 2 types or more and budgeted sales (units) ratio is not followed.

Budgeted S.P. per unit X Budgeted Qty	Budgeted S.P. per unit X Revised Std. Qty	Budgeted S.P. per unit X Actual Qty	Actual S.P. per unit x Actual Qty
S1	S2	S3	S4

$RSQ = \text{Total of Actual quantity of Sales in budgeted sales (units) ratio.}$

$$S \text{ Val. } V = S4 - S1$$

$$SPV = S4 - S3$$

$$S. \text{ Vol. } V = S3 - S1$$

$$SMV = S3 - S2$$

$$SQV = S2 - S1$$

Sales Value Var. = Sales Volume Var. + Sales Price Var.

Sales Volume Var. = Sales Qty Var. + Sales Mix var.

Concept 8:

Profit variances: - 5 Types

Profit = Margin = Selling Price per unit – cost per unit

- 1) Profit Value Var. = Arise when budgeted value of profit & actual value of profit is different.
- 2) Profit price Var. = Arise when profit changes due to difference in budgeted selling price & actual selling price p.u.
- 3) Profit Volume Var. = Arise when profit changes due to difference in budgeted sales Qty & actual sales Qty.

- 4) Profit Qty & Mix Var. = Arise when sold product is of 2 types or more and budgeted sales (units) ratio is not followed.

Budgeted Margin per unit x Budgeted Qty	Budgeted Margin per unit x Revised Std. Qty	Budgeted Margin per unit x Actual Qty	Actual Margin per unit x Actual Qty
P1	P2	P3	P4

$$P \text{ Val. V} = P4 - P1$$

$$PPV = P4 - P3$$

$$P \text{ Vol. V} = P3 - P1$$

$$P \text{ Mix V} = P3 - P2$$

$$PQV = P2 - P1$$

Profit Value Var. = Profit Volume Var. + Profit Price Var.

Profit Volume Var. = Profit Qty Var. + Profit MIX Var.

Concept 9:

Production Volume Variance

- It is that part of budgeted Fixed OH which is related to unutilized capacity of factory.
- Formula = Unutilized capacity x Budgeted FOH per unit
- Unutilized capacity = Actual capacity – budgeted capacity

Concept 10:

OH exp. Variance

- It is difference between total budgeted OH cost (Fixed & variable) and actual OH cost (Fixed & variable).
- Formula = budgeted OH – Actual OH
- Budgeted OH = budgeted FOH for budgeted production capacity + budgeted VOH for actual production capacity.

Chapter 14: Marginal Costing

Concept 1: Marginal Costing Technique says that Fixed cost is sunk cost / irrelevant cost for decision making but it shall be relevant for calculation of profit.

Concept 2: BEHAVE OF COST UNDER MARGINAL COSTING

Production / No. of Units	Variable Cost		Fixed Cost	
	Per Unit	Total	Per Unit	Total
Increase	Same	Increases	Decreases	Same
Decreases	Same	Decreases	Increases	Same

Concept 3: Meaning of Contribution

Under marginal costing, excess of selling price per unit over variable cost per unit is called contribution.

It is expressed on per unit basis and totality basis:

Formula 1: - Contribution per unit = Selling price per unit - Variable Cost per unit

Formula 2: - Total Contribution = Total Sales - Total Variable Costs

Concept 4: Concept Derivation of another formula of contribution

We know that

Sales - Variable Cost - Fixed Cost = Profit

Sales - variable Cost = Fixed Cost + Profit

Contribution = Fixed Cost + Profit

Contribution = Fixed Cost - Loss (Since there may be loss in spite of profit)

Concept 5: Concept Marginal cost Equation

Sales
Less: Variable Cost
= Contribution
Less: Fixed Cost
= Profit

Concept 6: Contribution to Sales Ratio (Generally Known as PV Ratio): $\frac{\text{Contribution}}{\text{Sales}} \times 100$ (In percentage)

Concept 7: In marginal costing, fixed cost is ignored for decision making. Hence If there is no fixed cost then all contribution shall be profit so contribution to sales ratio is called Profit-volume ratio or P/V ratio.

Contribution = Sales x P/V Ratio

PV RATIO = $\frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} \times 100$ OR $\frac{\text{Fixed Cost} + \text{Profit}}{\text{Sales}} \times 100$ OR $\frac{\text{Fixed Cost} - \text{Loss}}{\text{Sales}} \times 100$

Concept 8: Break Even Sales means sales at which there is no profit no loss to the company.

$$\text{Units Sold [BEP (In units)]} = \frac{\text{Fixed Cost}}{\text{Contribution per Unit}}$$

$$\text{Sales in Rupees} = \frac{\text{Fixed Cost}}{\text{PV Ratio}}$$

Concept 9: How calculate P/V Ratio when break-even sales given

$$\text{P/v ratio} = \frac{\text{Fixed Cost} + \text{Profit}}{\text{Sales}} * 100$$

Since at Breakeven point profit shall be zero and sales shall be called break even sales

$$\text{P/v ratio} = \frac{\text{Fixed Cost}}{\text{Break Even Sales}} * 100$$

Concept 10: How calculate P/V Ratio when profit and sales volume of 2 periods are given.

$$\text{P/V Ratio} = \frac{\text{Difference in Profit}}{\text{Difference in Sales}}$$

Concept 11: Margin of safety sales

- Margin of safety sales means sales generating profit
- MOS sales means excess of actual sales over break-even point sales

$$\text{MOS Sales units} = \frac{\text{Profit}}{\text{Contribution per unit}}$$

$$\text{Mos (In Rupee)} = \frac{\text{Profit}}{\text{PV Ratio}}$$

Concept 12: Break Even Sales Ratio and MOS Sales Ratio

$$100\% = \text{Break Even Sales ratio} + \text{MOS Sales Ratio}$$

$$\text{Concept 13: Variable cost to sales ratio} = \frac{\text{Variable Cost}}{\text{Sales}} * 100$$

$$\text{Concept 14: P/V Ratio} + \text{variable cost to sales ratio} = 100\%$$

Concept 15: Calculate sales level to earn desired profit given in question

$$\text{Desired level of Sales (In units)} = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution Per Unit}}$$

$$\text{Desired Level of Sales (In Rupee)} = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}}$$

Concept 16: Cost indifference point(also called cost BEP)

It is the level of production at which total production cost (including both fixed and variable cost) under labour intensive and capital-intensive method of production is same.

$$\text{Cost Indifference Point} = \frac{\text{Difference in Fixed Cost}}{\text{Difference in Variable Cost Per Unit}}$$

Concept 17: Cash Break Even Point:

It means that level of sales at which company is able to recover out fixed cost incurred in cash.

$$\text{Cash BEP in units} = \frac{\text{Cash Fixed Cost}}{\text{Contribution Per Unit}}$$

$$\text{Cash BEP in Rupees} = \frac{\text{Cash Fixed Cost}}{\text{PV Ratio}}$$

Note1: Cash fixed cost = Total FC – Non-FC

Note2: Non-cash FC are those which do not involve cash outflow e.g. depreciation

Concept 18: BEP for multiple products – Together

A company is selling more than one product hence contribution of all products can be calculated separately but FC is in total. In such situation BEP is required to be calculated for individual product or all products together

Concept 19: Shut down Point

Suppose a company is selling 2 products i.e. product A and B. Company is making profit in product A while company is making loss in product B. So, company wants to decide the level of sales below which it is not beneficial to produce and sale product B.

In such situation, FC is divided in 2 categories: -

1. Avoidable FC: - FC which need to be incurred if item is not produced.

2. Unavoidable FC: - FC which has to be incurred whether or not item is produced.

A company has taken on rent a commercial space for 2 departments i.e. Dept. 1 & Dept. 2. Product A is manufactured in dept. 1 and product B is manufactured in dept. 2. Rent given for whole commercial space is Unavoidable FC while salary paid to manager of each department is avoidable FC

$$\text{Shut down point Sales (units)} = \frac{\text{Avoidable Fixed Cost}}{\text{Contribution Per Unit}}$$

$$\text{Shut down point Sales (In Rupees)} = \frac{\text{Avoidable Fixed Cost}}{\text{PV Ratio}}$$

Note1: Avoidable FC = Total FC – Unavoidable FC (minimum FC)

Note2: Decision making about shut down point: -

1. If actual sales are equal to or more than SDP Sales then it is better to continue production

2. If actual sales are more than SDP sales then it is better to shut down the production.

Concept 20: Absorption Vs Marginal costing: -

- Absorption costing is used to calculate per unit cost of item manufactured while marginal costing is costing used to take future decision in launching a new product in market. Marginal costing is determination of future P/v ratio, Future BEP, Future desired sales etc.
- Income calculated under both approaches is always difference. The reason behind this is valuation of opening and closing stock.
- In absorption costing, stocks are valued at all variable manufacturing costs and fixed production overheads. Variable manufacturing costs = Direct material cost + Direct labour cost + Direct expenses + Variable production OH
- In marginal costing, stocks are valued at only variable manufacturing cost hence fixed production overheads are not included in this. This is the reason why valuation of stock under both approaches differs.
- And if stock valuation differs then profit figure also differs.

Income Statement under Marginal Costing

Sales:

Less: Variable Direct Material

Less: Variable Direct Labour

Less: Variable Direct Expenses

Less: Variable Factory Overheads

Less: Variable Office and Admin Oh

Less: Less: Variable Selling & Dis Oh

= Contribution

Less: Fixed Factory Oh

Less: Fixed Office & Admin Oh

Less: Fixed Selling & Distribution Oh

= Profit

Income statement under Absorption costing approach*Variable (Direct Material Cost)**Variable (Direct Labour Cost)**Variable (Direct Expenses)**Variable Factory OH**Fixed Factory OH absorbed units produced x standard rate per unit**= Total manufacturing cost of Quantity Produced**Add: - Opening FG**Less: - Closing FG**= Total manufacturing cost of Quantity Sold**Add: - Variable Office & Admin OH**Add: Fixed Office and Admin OH**Add: Variable Selling & Distribution OH**Add: Fixed Selling & Distribution OH**Add:- Under absorbed OH (Actual OH incurred – OH absorbed)**Less:- Over absorbed OH (OH absorbed – Actual OH incurred)**= Cost of Sales**Add: Profit**= Sales*

Chapter 15: Budget and Budgetary Controls

Concept 1: Budget: - it means the establishment of future targets on the basis of past experience and other relevant factors.

Concept 2: All 3 formulae are time based

Activity Ratio = $\frac{\text{Standard Hours for Actual Output}}{\text{Budgeted Hours for Budgeted Production}}$ OR Capacity Ratio * Efficiency Ratio

Capacity Ratio = $\frac{\text{Actual Hours Worked}}{\text{Budgeted Hours for Budgeted Production}}$

Efficiency Ratio = $\frac{\text{Standard Hours for Act Output}}{\text{Standard Hours Worked}}$

Concept 3: Sales Budget:

This budget shows the sales target to be achieved by the business organisation. It shows the quantity and amount of sales which is to be achieved during the budgeted period.

Concept 4: Production Budget:

1. This budget shows the production which should have been obtained in the budgeted period.
2. This budget is prepared with the help of following equation Budgeted production = budgeted Sales + closing stock of finished goods – opening stock of finished goods
3. Raw material to be purchased = budgeted production x raw material requirement per unit

Concept 5: Production Cost Budget

This budget shows the cost which should have been incurred for the budgeted production level. In future, this budgeted production cost is compared with actual production cost to compute variances.

Concept 6: Zero Based Budgeting

1. Under conventional budgeting, the target of next year are established on the basis of past performance however under ZBB, the future target are established purely on the basis of future projection and completely ignoring the past performance. In other words, there is no base in the establishment of future targets.

Concept No. 7 Flexible Budget

1. This budget is prepared at different level of production. We divide all types of expenses into 3 categories while making this budget
 - a. Variable expense = Feature (variable cost remains same at per unit at all levels)
 - b. Fixed expenses = Feature (Fixed cost in totality remain same at all levels)

c. *Semi-variable expenses = Variable portion in semi-variable cost =* $\frac{\text{Difference in Total Semi Variable Cost}}{\text{Difference in Units}}$

Fixed portion in semi variable cost = Total semi variable cost – Total variable portion in semi-variable cost.

Concept 8: Budgeted Advance Ratios

(i) *Efficiency Ratio* = $\frac{\text{Standard Hours}}{\text{Actual Hours}} \times 100$

(ii) *Activity Ratio* = $\frac{\text{Standard Hours}}{\text{Budgeted Hours}} \times 100$

(iii) *Calendar Ratio* = $\frac{\text{Available working days}}{\text{Budgeted working days}} \times 100$

(iv) *Standard Capacity Usage Ratio* = $\frac{\text{Budgeted hours}}{\text{Max.possible Budgeted hours in the budgeted period}} \times 100$

(v) *Actual Capacity Usage Ratio* = $\frac{\text{Actual Hoursworked}}{\text{Max.possible working in a period}} \times 100$

(vi) *Actual Usage of Budgeted Capacity Ratio* = $\frac{\text{Actual Hours worked}}{\text{Budgeted Hours}} \times 100$

Concept 9: Formats

Production Budget

Sales
Add: Closing Stock
Less: Opening Stock
= Production

Raw material Purchase Budget

Production * Quantity of Raw Material
Add: Closing Stock of Raw Material
Less: Opening Stock of Raw material
= Raw Material Purchase

Costing full theory- CHAPTER 1: INTRODUCTION TO COST AND MANAGEMENT ACCOUNTING

Question: 1:

Write short notes on

(i) Conversion Cost

(ii) Sunk Cost

(iii) Opportunity Cost

(May 2018, Nov 2016, May 2003)

Solutions:

(i) **Conversion cost:** It is the cost incurred to convert raw materials into finished goods. It is the sum of direct wages, direct expenses and manufacturing overheads.

Formula:

$\text{Conversion Cost} = \text{Direct Labour Cost} + \text{Direct Expenses} + \text{Manufacturing Overhead}$

Or

$\text{Conversion Cost} = \text{Factory Cost} - \text{Direct Materials Cost}.$

(ii) **Sunk Costs:** Sunk costs are the historical costs which are incurred in the past. They play no role in decision making in the current period.

(iii) **Opportunity Costs:** Opportunity costs refers to the value of sacrifice made or benefit of opportunity foregone in accepting alternative course of action. For e.g. a company accepts an expansion plan and for financing, withdraws money¹ from its bank deposits. Then, the loss of interest on the bank deposits is the opportunity cost for carrying out the expansion plan. This cost plays an important role in managerial decision making process although these costs are not recorded in books of accounts

Question: 2:

Identify the methods of costing where:

(i) all costs are directly charged to a specific job.

(ii) all costs are directly charged to a group of products.

(iii) the nature of the product is complex and method cannot be ascertained.

(iv) cost is ascertained for a single product.

(Nov 2017)

Solutions:

(i) Where all costs are directly charged to a specific job - Job Costing.

(ii) Where all costs are directly charged to a group of products - Batch Costing.

(iii) Where nature of the product is complex and method cannot be ascertain - Multiple Costing.

(iv) Where cost is ascertained for single product.

→ Unit Costing / Single Costing/Output Costing.

Question: 3:

Explain 'Cost Unit' and 'Cost Centre'.

(May 2017)

Solutions:

Cost Unit:

It is a unit of product, service or time (or combination of these) in relation to which costs is ascertained or expressed. It is unit of measurement. For example the cost of carrying a passenger in terms of km, cost of hotel room expressed as cost per day etc.

Cost Centre:

It is a location, person or an item of equipment (or group of these) for which cost is ascertained and used for the purpose of cost control. The main purpose of ascertaining cost centre is to control the cost and to fix responsibility of the person in charge of a cost centre.

Cost Centres are of two types:

1. Personal Cost Centre.

2. Impersonal Cost Centre.

Cost centres in a manufacturing concern:

1. Production Cost Centre

2. Service Cost Centre.

Question: 4:

State the difference between Cost Accounting and Management Accounting.

(May 2017)

Solutions:

Basis

Cost Accounting

Management

Accounting

1. **Nature**

It records the quantitative aspect only.

It records both qualitative and quantitative aspect.

	2. Objective	It records the cost of producing a product and providing a service.	It provides information to management for planning and co-ordination.
	3. Area	It only deals with cost Ascertainment.	It is wider in scope as it includes F.A., budgeting, Tax, planning.
	4. Recording of Data	It uses both past and present figures.	It is focused with the projection of figures for future.
	5. Development	It's development is related to industrial revolution.	It develops in accordance to the need of modern business world.
	6. Rules and Regulation	It follows certain principles and procedures for recording costs of different products.	It does not follow any specific rules and regulations.
	Question: 5:		
	Narrate the essential factors to be considered while designing and installing a Cost Accounting System. (May 2017, Nov 2010, Nov 1999, May 1996)		
	Solutions:		
	Essential Factors for installing a Cost Accounting System:		
	1. Objective	The objective of cost system should be considered before installation. Whether to fix selling prices or control costs or both.	
	2. Nature of Business	The costing system, which is suitable to the business organisation, should be introduced.	
	3. Organisational Hierarchy	Costing system should fulfill the requirement of different level of management. Organisation structure should be studied to determine the manner in which costing system should be introduced.	
	4. Knowing the Product	Nature of Product determines the type of costing system to be implemented. The product which has by-products requires costing system which account for by-products as well.	
	5. Knowing the production process	A good costing system can never be established without the complete knowledge of production process.	
	x Method of Maintenance of cost records	The manner in which Cost and Financial accounts could be inter-locked into a single integral accounting system and in which	

results of separate sets of accounts, cost and financial, could be reconciled by means of control accounts.

Question: 6:

What is meant by 'Cost Centre'? What are the different types of cost centres.

(Nov 2016, May 2016, May 2015, Nov 2002, May 1997)

Solutions:

Cost Centre

Meaning

It is defined as a location, person, or an item of equipment (or group of these) for which cost may be ascertained and used for the purpose of cost control. It is a part of an organization that does not produce direct profits and adds to the cost of running a company.

Eg. R&D, marketing departments, help desk and customer services.

Cost Centre are of two types:

(i) Personal (ii) Impersonal

A personal cost centre consists of a person and an impersonal Cost Centre of a location or item of equipment.

1. Production Cost Centre

It is cost centre where raw material is handled for conversion into finished product. Here both direct and indirect expenses are incurred. Machine shops, welding shops and assembly shops are examples of production Cost Centre.

2. Service Cost Centre

It is Cost Centre which serves as an ancillary unit to a production cost centre. Power house, gas production shop, material service centres, and plant maintenance centres are examples of service Cost Centre.

3. Profit Centre

Centres, which have the responsibility of generating and maximizing profits are called profit centres The profit centre's revenues and expenses are kept separate from the main company's profit in order to maintain the profit centre's profitability.

4. investment Centres

Investment centres are similar to profit centres but they have additional decision rights in terms of capital expenditure and investment. The manager is assumed to have better knowledge of input and output markets but also investment opportunities.

Question: 7:

What is meant by 'Profit Centre'?

(May 2016, Nov 1997)

Solutions:

A profit centre is the centre whose performance is measured in terms of income earned and cost incurred. Its main responsibility is to generate and maximise profit.

Profit Centres is a branch or division of a company that is accounted for on a standalone basis for the purpose of profit calculation. A profit center is responsible for generating its own result and earnings, and as such, its managers generally have decision making authority related to product pricing and operating expenses. Profit centres are crucial in determining which units are the most and least profitable within an organisation.

Question: 8:

State the method of costing and also the unit of cost for the following industries:

(i) Hotel

(ii) Toy-making

(iii) Steel

(iv) Ship Building

(Nov 2015)

Solutions:

(i) Hotel:

•Method of costing used in hotel is Operating Costing.

•The rate for unit of cost used is per room, per day or per half day or per bed for costing.

(ii) Toy - Making:

•Method of costing used in toy making industry is Unit Costing/Batch Costing

•The unit of cost used in toy making industry is per unit of output of toy or per batch.

(iii) Steel:

•The method of costing used in steel company is Process Costing.

•The unit of cost used in costing is the percentage of output on the basis of the some factory administrative overhead etc.

(iv) Ship Building:

•The method of costing used in ship buildings is Contract Costing.

•The unit cost or per unit used for ship building is Project or Unit.

Question: 9:

Identify the methods of costing for the following:

- (i) Where all costs are directly charged to a specific job.
 - (ii) Where all costs are directly charged to a group of products.
 - (iii) Where cost is ascertained for a single product.
- (Nov 2014)

Solutions:

Methods of costing are as follows:

- (i) Job costing
- (ii) Batch costing
- (iii) Single / Output costing
- (iv) Multiple costing.

Question: 10:

Distinguish Between Cost Control and Cost Reduction.

(May 2016, May 2014, Nov 2011)

Solutions:

Sl. No.	Basis of Difference	Cost Control	Cost Reduction
1.	Meaning	Cost control is the guidance and regulation by executive action of the cost of operating an undertaking.	Cost reduction is the achievement of real and permanent reduction in the unit cost of goods and services without impairing their suitability.
2.	Emphasis	It emphasises on past performance and variance analysis.	It emphasises on present and future performance without considering the past performance.
3.	Approach	It is a conservative approach which stresses on the conformity to the set norms.	It is a dynamic approach where in every function is analysed in view of its contribution.
4.	Focus	It is a short term review with focus on reducing cost in a particular period.	It seeks to reduce unit cost on a permanent basis based on a systematic approach.

5. Nature of Function It is a preventive function. it is a corrective function.

Question: 11:

Define Explicit costs. How is it different from Implicit costs?

(May 2014, May 2005, May 2001)

Solutions:

Explicit Cost: Explicit costs refers the cost, involving immediate payment of cash, such as - Salary, wages, commissions etc. Such costs are easily measurable it is also known as out of pocket cost.

Implicit Costs: It do not involved any immediate cash payment. It is also known an economic costs.

The main difference between Explicit cost and Implicit costs are:

(i) Explicit costs involves immediate outflow of cash where as implicit costs do not involve immediate cash payment.

(ii) Explicit costs are entered in the books of accounts. Where as implicit costs are not recorded in the book of account.

Question: 12:

State the unit of cost for the followings :

1. Transport

2. Power

3. Hotel

4. Hospital

(May 2014)

Solutions:

Unit of Cost:

1. Transport	Passenger km., Tonne km.
2. Power	Per kilowatt – hours
3. Hotel	Per room, per day
4. Hospital	Patient per day, room per day or per bed, per operation, etc.

Question: 13:

Cost of a product or service is required to be expressed in suitable cost unit. State the cost units for the following industries:

(i) Steel

(ii) Automobile

(iii) Transport

(iv) Power

(May 2003)

Solutions:

- | | |
|---------------|--|
| 1. Steel | Tonne |
| 2. Automobile | Numbers |
| 3. Transport | Passenger Kilo-meter//Tonne Kilo-meter |
| 4. Power | Kilo-watt hour (Kwh) |

Question: 14:

State the types of cost in the following cases:

(i) Interest paid on own capital not involving any cash outflow.

(ii) Withdrawing money from bank deposit for the purpose of purchasing new machine for expansion purpose.

(iii) Rent paid for the factory building which is temporarily closed.

(iv) Cost associated with the acquisition and conversion of material into finished product.

(May 2012)

Solutions:

Type of costs

(i) Imputed Cost

(ii) Opportunity Cost

(iii) Shut Down Cost

(iv) Product Cost

Question: 15:

What are the essentials of a good Cost Accounting System.

Solutions:

To be successful, a good cost accounting system should possess the following essential features:

- | | |
|-------------------------------|---|
| 1. Simple and easy to operate | The system to be simple practical, flexible & capable of meeting the requirements of a concern. |
|-------------------------------|---|

2.	Accuracy	The data to be used by the cost accounting system should be exact & accurate otherwise the output of the system will not be correct.
3.	Cost-effective	The cost of installing and operating the system should justify the results. The benefit from the system should exceed the amount to be spent on it.
4.	Management's Role	The top management should have full faith in the costing system and should provide help towards its development and success.
5.	Relevance of Data	The system should handle and report relevant data for use of managers for decision making. It should not sacrifice its utility by introducing meticulous and unnecessary details.
6.	Participation by executives	Necessary co-operation and participation of executives from various deptts. of the concern is essential for developing a good system of cost accounting.
Question: 16:		
Distinguish between cost units and cost centres.		
Solutions:		
Difference between Cost Unit and Cost Centre:		
Cost Unit: It is a unit of production, service, time or a combination of these, in relation to which costs may be ascertained or expressed, it should be one with which expenditure can be most readily associated or ascertained. Cost Unit differs from one business to another. They are usually units of physical measurement like weight, area, volume, number, time, length and value.		
Some illustrations of cost unit are as follows:		
	Industry/Product/Input	Cost Unit
	Cement	Tonne
	Power	Kilo watt hour
	Transport Tonne	Km. or Passenger Km.
	Sugar	Quintal/Tonne
	Nuts and Bolts	Gross or Kilogram

	Construction or interior	Each contract
	Decoration	
	Automobiles	Number
	Cost Centre:	
	It is defined as:	
	(a) A location e.g. Noida plant, Hyderabad factory etc.	
	(b) A person e.g. Area sales officer, Manager etc.	
	(c) An item or equipment e.g. Machine 1, 2, or Process A, B, etc.	
	Or a group of these, for which cost can be ascertained and used for the purpose of cost control. Cost centres are of two types viz. Personal and Impersonal.	
	Personal cost centre	
	A Personal cost centre consists of a person or a group of persons while Impersonal cost centre consists of a location or an item of equipment or group of all these. In a Manufacturing concern there are 2 types of cost centres:	
	Production Cost Centre	
	It is a cost centre where raw material is processed and converted into finished goods. E.g. Machinery shops, welding shops and assembly shop etc.	
	Service Cost Centre	
	It is a cost centre which serves as an ancillary unit and renders services to a production cost centre. E.g. Fuel house, gas production shop, plant maintenance and material service centres etc.	
	Question: 17:	
	State the method of costing that would be most suitable for:	
	(a) Oil refinery	
	(b) Bicycle manufacturing	
	(c) Interior decoration	
	(d) Airlines company	
	(Nov 2018)	
	Solution:	
	1. Oil Refinery	Process costing
	2. Bicycle manufacturing	Multiple costing
	3. Interior decoration	Job costing but if on a larger basis then Contract costing

4. Airlines company

Operating costing

Question: 18:

(i) Define the following :

(a) Imputed cost

(b) Capitalised cost.

(Nov 2009)

Solution:

(a) **Imputed Cost:** Imputed costs are notional costs which do not involve any cash outlay. Examples of imputed cost are Interest on capital, the payment for which is not actually made, these costs are similar to opportunity costs.

(b) **Capitalised Cost:** Capitalised costs are costs which are initially recorded as assets and subsequently treated as expenses.

Question: 19:

Discuss cost classification on the basis of Controllability.

(May 2018, Nov 2004, May 2003, Nov 2001, May 2001)

Solution:

Classification on the basis of Controllability:

On the basis of controllability cost is classified into two types:

1. Controllable cost

2. Non-controllable cost

1. Controllable cost: CIMA defines controllable cost as "Cost chargeable to a cost centre, which can be influenced by the action of the person in whom control of the centre is vested."

In practice all variable cost are controllable cost.

Example: Direct cost i.e. direct material cost, direct labour cost.

2. Non-Controllable Cost: CIMA defines non-controllable cost as a "Cost chargeable to a cost centre which cannot be influenced by the action of the person in whom control of the centre is vested."

In practice all fixed costs are non-controllable cost. Therefore such cost cannot be controlled by the responsibility manager.

Example: Expenditure on any service department is controlled by the manager of that service department but if such expenditure is apportioned to production on dept, then manager of that production dept, cannot control the expenditure of the service department.

Question: 20:

Distinguish between the following:

(i) Profit Centres and Investment Centres

(ii) Product Cost and Period Cost

(May 2009, May 2006)

Solution:

(i) Distinguish between Profit Centres and Investment Centres :

Profit centre is an organisational sub-units for which both cost and profit can be traced which are engaged mainly on maximization of profit where as investment centre is an organisation sub-unit for which both profit and investment are considered for performance appraisal which are mainly engage to earn return on investment.

(ii) Difference between Product Cost and Period Cost:

Product costs are associated with the purchase and sale of goods. In the production scenario, such costs are associated with the acquisition and conversion of materials and all other manufacturing inputs into finished product for sale. Hence under absorption cost, total manufacturing costs constitute inventoriable or product cost.

Periods costs are the costs, which are not assigned to the products but are charged as expense against revenue of the period in which they are incurred. General Administration, marketing, sales and distributor overheads are recognized as period costs.

Question: 21:

Discuss cost classification based on variability.

(Nov 2004)

Solution:

Classification on the basis of Variability:

On the basis of variability, cost are classified into three types:

1. Fixed cost

2. Variability cost

3. Semi-variable cost.

1. Fixed Cost: CIMA defines fixed cost as "A cost which accrues in relation to the passage of time and which when certain output or turnover limits, tends to be unaffected by fluctuation in volume of output or turnover."

Characteristics of Fixed Cost:

(i) Amount of fixed cost remains constant for every level of output.

(ii) Average fixed cost (i.e. fixed cost per unit) will decrease with increased output.

(iii) Fixed cost is generally managed and controlled by the higher management.

Example of F.C.: Insurance, salary, rent etc.

2. Variable Cost: CIMA defines variable cost as "A cost which in aggregate tends to vary in direct proportion to change in the volume of output or turnover."

Characteristic of Variable Cost:

(i) Variable cost varies directly with output/Sales.

(ii) Variable cost is easily chargeable to output or department.

(iii) Variable cost is generally managed and controlled by the department heads.

Examples of V. C.: Direct materials cost Direct Labour Cost.

3. Semi Variable Cost: CIMA defines semi variable cost as "A cost containing both fixed and variable elements, which is, therefore, partly affected by fluctuations in the output or turnover."

Characteristics of Semi-Variable Cost:

(i) Amount of semi-variable is neither fixed nor varies directly along with the output.

(ii) Semi-variable expenses are generally managed by various levels of management jointly.

Example of semi variable cost: Telephone bill, electricity bill etc.

Question: 22:

Discuss the four different methods of costing along with their applicability to concerned industry.
(Nov 1997)

Solution:

The various methods of costing can be summarized as under:

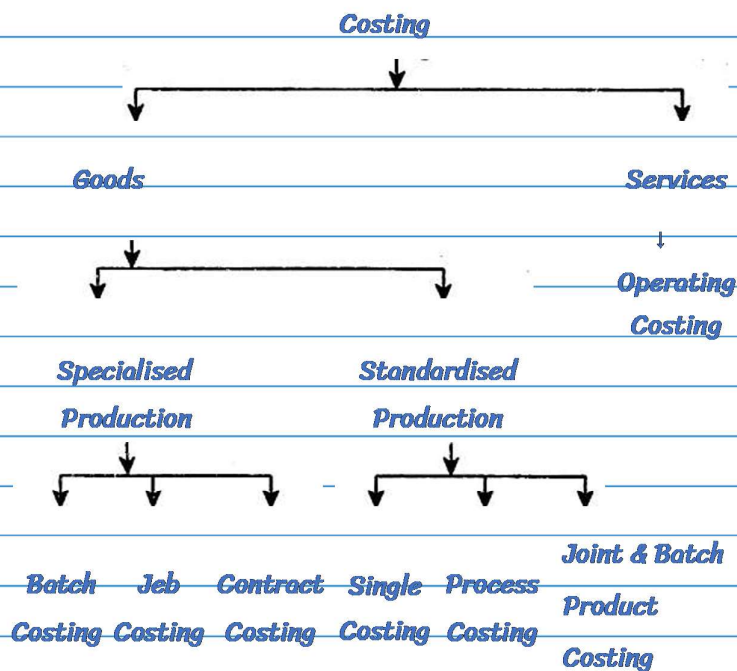
1. Batch Costing: This costing is based on the concept of contract costing. This method is used to determine the cost of a group of identical or similar products. The batch costing of similar products is

the unit and not single item within the Batch. This method can be applied for the production of nuts and bolts, medicines and other items which are manufactured in distinct batches.

2. Job costing: This method is used in those concerns where production is carried out as per specific orders and specifications. Each job is separate and distinct from other jobs and products. This method is popular in enterprises engaged in house building, ship-building, machinery production and repairs etc.

3. Contract costing: This method of counting, based on the principle of job costing, is used by house builders and civil contractors. The contract becomes the cost unit for which relevant cost are accumulated.

4. Single or unit costing: This method is used when • a single item is produced and the final production is composed of homogeneous units. The per unit cost is obtained by dividing the total cost by the total number of unit of units manufactured.



5. Process costing: Under this method of costing, the cost of completing each stage of work is ascertained, like cost of making pulp and cost of making paper from pulp. This method is used in those industries where manufacturing is done continuously like chemicals, oil, gas paper etc.

6. Multiple costing: This method is used in those industries where the nature of product is complex such as motor cars, aeroplanes etc. In such cases costs are accumulated for different component making the final product and then totaled to ascertain total cost of product.

7.Operating costing: Ascertainment of cost of rendering or operating a service is called "service or operating costing". It is used in case of concerns rendering services like transport, cinema, hotels etc. where there is no identifiable tangible cost limit.

Question: 23:

Specify the methods of costing and cost units applicable to the following industries:

- (i) Toy making
 - (ii) Cement
 - (iii) Radio
 - (iv) Bicycle
 - (v) Shipbuilding
 - (vi) Hospital.
- (Nov 1998)

Solution:

Industry	Method	Cost unit
Toy making	Batch	Per batch
Cement	Unit	Per tonne or per bag
Radio	Multiple	Per radio or per batch
Bicycle	Multiple	Per bicycle
Ship building	Contract	Per ship
Hospital	Operating	Per bed per day or per patient per day

Question: 24:

A factory manufactures only one product in one quality and size. The owner of the factory states that he has a sound system of financial accounting which can provide him with unit cost information and as such he does not need a cost accounting system. State your arguments to convince him the need to introduce a cost accounting system.

(Nov 1999)

Solution:

Reasons for installing a cost accounting system in a single product manufacturing factory:

1. Management of a manufacturing unit needs information to draw plans for the future, to control the working of the unit and for making day-to-day decisions. All these information are not available from financial accounts which provides two documents viz profit and loss a/c and balance sheet at the end of the financial year. These two documents take about 13-14 months to reach the executives but the executives even then cannot set right anything that has gone wrong in the past. Therefore, in order to facilitate executives to perform well the functions of planning, control and decision making the use of cost accounting system is a must.

2. In financial accounting system no attempt is generally made to record data by jobs, processes, products, departments etc. It only provides information in terms of income, expenses, assets and liabilities for the company as a whole thus the available information is not quite useful for the ascertainment of price, control of costs, ascertainment of products profitability etc. Cost accounting records data in the manner that helps the ascertainment of price and profitability and also the control of costs by using variances.

3. Government in its efforts to protect consumers, often resorts to statutory price control, cost accounting can help by providing enough cost information which could be utilized to press upon the govt, to convince for price and to arrive at a suitable price before their arbitrary fixation.

4. A sound system of cost accounting will highlight the capacity utilization and efficiency which will be beneficial in taking suitable decisions for the improvement of operational results.

5. It also helps the management for the periodic assessment of the performance of its executives. This can be done by establishing standards and presenting reports to appropriate authority.

CHAPTER 2: MATERIAL**Question: 1:***Distinguish clearly between Bin Cards and Stores Ledgers.**(Nov 2017, Nov 2004, May 2003, May 2002, May 2002, May 1999)***Solution:***Both bin cards and stores ledgers are perpetual inventory records. None of them is a substitute for the other. These two records can be distinguished on the basis of following view point:*

Sl. No	Basis	Bin cards	Stores ledger
1.	Maintained	Bin card is maintained by store keeper	Stores ledger is maintained by cost accounting department
2.	Nature	It is the stores recording document	It is an accounting record
3.	Information	It contains information as records to quantities i.e. their receipts, issue and balance.	It contains both quantitative and value information in respect of their receipts, issue and balance.
4.	Time of recording	In bin card entries are made at the time when transaction takes place.	In stores ledger entries are made only after the transaction has taken place.
5.	Recording	Bin cards records each transaction.	Stores ledger records the same information in a summarized form.
6.	inter departmental transfer	Inter departmental transfers of materials does not appears.	Inter departmental transfers of materials appears here.

Question: 2:*Differentiate between "scrap" and "defectives" and how they are treated in cost accounting**(Nov 2015, Nov 2008)***Solution:**

Sr. No.	Basis	Scrap	Defectives
1.	Meaning	Scrap is the incidental residue from certain types of manufacture, usually of small amount and low value, recoverable without further processing.	Defective work signifies those units of production which can be rectified and turned out as good units by the application of

(i) **Cash discount:** It should be excluded from cost accounts because it is an item of purely financial nature. It is not deducted from purchase price.

(ii) **Subsidy Grant/Incentive.** It should be reduced from the material cost.

(iii) **GST:** it is excluded from purchase price if credit for same is available.

(iv) **Commission or brokerage paid:** Commission and Brokerage paid is added with cost of purchase.

Question: 4:

Distinguish between Bill of Material, Material Requisition note.

(May 2012, May 1997)

Solution:

Sr. No.	Basis	Bill of Material	Material Requisition Note
1.	Preparation	It is document by the drawing office & Production planning department.	It is prepared by the foreman of the consuming department.
2.	Scope	It is a complete schedule of component parts and raw materials required for a particular job or work order:	It is a document authorizing Store-Keeper to issue Material to the consuming department.
3.	Purpose	It often serves the purpose of a 'Store Requisition as it shows the complete schedule of materials required for a particular job i.e. it can replace stores requisition.	It cannot replace a bill of material.
4.	Usefulness	It can be used for the purpose of quotation.	It is useful in arriving at historical cost only.
5.	Benefit	It helps in keeping a quantitative control on materials drawn through stores Requisition,	It shows the materials actually drawn from stores.

Question: 5:

Write notes on: Bill of Material.

(May 1998)

Solution:

1. BOM is a schedule of standard quantities of materials required for any job or other units of production.
2. It is also known as Material Specification list or just material list.
3. It contains code, description and quantity of materials and other stores items required for carrying out a particular work or job order.
4. It also acts as an authorization for issue of materials and stores items mentioned in it. Use of BOM saves paper work and also ensures requisition of the exact quantity of materials.
5. It is prepared by Engineering/Planning deptt in a standard form, in quadruplicate to be used as follows:
 - (a) Stores Department: For verification against request for issue of materials.
 - (b) Cost Accounts Department: For accounting of standard cost.
 - (c) Production Control Department: For control purpose.
 - (d) Engineering/Planning Department: For record, reference and control purpose.

Bill of Materials

MNP Company				
Bill of Materials				
Job/Work Order No:				BOM No:
				Date:
Sl. No.	Materials & Parts	Description	Quantity	Remarks
Prepared by:			Chief,	
Checked by:			Drawing Office/Planning Dept.	

Question: 6:

At the time of physical stock taking, it was found that actual stock level was different from the clerical or computer records. What can be possible reasons for such differences? How will you deal with such differences?

(May 1999)

Solution:

When it was found that actual stock level was different from that of the clerical or computer records, possible reasons for difference arising may be as follows:

1. Wrong entry might have been made in stores ledger account or bin card.
2. The items of materials might have been placed in the wrong physical location in the store.
3. Arithmetical errors might have been made while calculating the stores balances on the bin cards or stores ledger when a manual system is operated.
4. Theft of stock.

When a discrepancy is found at the time of stock taking, the individual stores ledger account and the bin card must be adjusted so that they are in agreement with the actual stock. For example, if the actual stock is less than the clerical or computer record the quantity and value of the appropriate store ledger account and bin card (quantity only) must be reduced and the difference in cost be charged to a factory overhead account for store losses.

Question: 7:

Explain 'Just In Time' (JIT) approach of inventory management.
(May 2018, May 1999)

Solution:

Just-In Time Purchasing: JIT purchasing is the purchase of materials and supplies in such a manner that delivery immediately precedes the demand of use. This will ensure that stock are as low as possible or nearly cut to a minimum. Considerable saving in material handling expenses is made by requiring suppliers to inspect materials and guarantee their quality. This improved service is obtained by giving more business to fewer suppliers, who can provide high quality and reliable delivery. Encouragement is given to employees to render good service by placing with them long term purchasing order companies which implements JIT, purchasing substantially reduces their investments in raw materials and WIP stocks.

The features of JIT purchasing which plays important role are

- Long term stable relationship with suppliers.
- Simple purchase agreements
- Small but frequent deliveries.

Advantages of JIT Purchasing: The advantages of JIT Purchasing are :~

1. It results in considerable savings in material handling expenses.
2. It results in savings in factory space.

3. Investment in raw materials and WIP is substantially reduced.

4. Last quantity discounts can be obtain and paperwork is reduced because of using of blanket long term orders to fewer suppliers instead of purchase orders.

5, JIT purchasing are now attempting to extend daily deliveries to as many areas as possible so that the goods spend less time in warehouse or on store shelf before they are exhausted.

Question: 8:

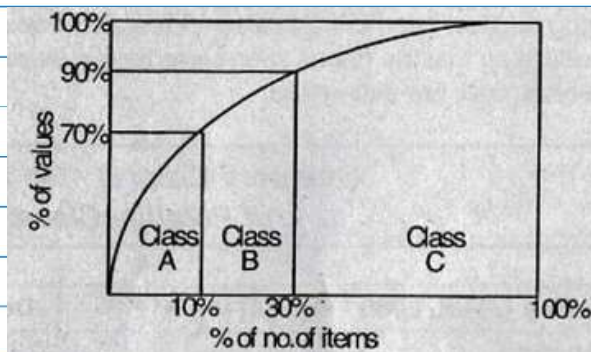
What is ABC Analysis.

(May 2017, Nov 2011, May 2008, Nov 2005, May 2000)

Solution:

ABC Analysis: It is an important technique of inventory control on selective basis. Large manufacturing units have such a large number of items in their stores for which it is often not possible for the management to pay the same attention to each and every stock item. A system is therefore required by which these items are classified according to their importance and then selective control is exercised.

ABC analysis or 'selective control' is a technique whereby the measure of control over an item of inventory varies directly with 'its usage value'. In other words, the high value items are controlled more closely than the items of low value.



ABC Analysis of Inventory

This figure shows ABC analysis of inventory. Class 'A' is made up of items which are either very expensive or used in massive quantities. Thus, these items though few in number contribute a high proportion of the value of inventories. Class 'B' items are not so few in numbers but also they are not too many either, value wise also, they are neither very expensive nor very cheap.

Class 'C' contains a relatively large numbers of items, but they are either cheap items or used in very small quantities so that they do not constitute more than a negligible portion of the total inventory value.

This method is known as “Always Better Control or the Alphabetic Approach.” ABC concept of classifying goods in an inventory is very commonly used for exercising effective inventory control. Under this technique the items in inventory are classified according to the value of usage. Analysis and Control: The three categories are classified & differential control is established as under:

Category	% in total value	% in total quantity	Extent of control
A	70%	10%	Constant and strict control through budgets, ratios, stock levels, EOQ etc.
B	20%	20%	Need based selective control - periodic review not strict as excessive.
C	10%	70%	Little control - Focus on saving associated costs.

Advantages of ABC: The advantages are :

- 1. Smooth Flow** This method ensures that minimum investment will be made in inventories of stock of materials or stocks to be carried, without any danger of interruption of production for want of materials or stores, requirement.
- 2. Cost Savings** The cost of placing orders, receiving goods & maintaining stocks is minimized.
- 3. Control by exception** Management's time is saved since attention need be paid only to some of the items rather than all the items.
- 4. Standardization of work** With the introduction of ABC system, much of the work connected with purchase can be systematised on a routine basis.

Limitation of ABC:

- 1.** In order to be fully cost effective, ABC analysis should be carried out with standardization and codification.
- 2.** The result of ABC analysis should be reviewed periodically & should be up dated.

Question: 9:

How is slow moving and non-moving item of stores detected and what steps are necessary to reduce such stocks?

(Nov 2001)

Solution:

Slow moving and non-moving items of stores can be detected in the following ways :-

- 1. By preparing & scanning periodic reports showing the status of different items of stores.*
- 2. By calculating the stock holding of various items in terms of numbers of days/months of consumption.*
- 3. By computing ratios periodically, relating to the issues as a percentage of average stock held.*
- 4. By implementing the use of a well designed information system.*

Steps to reduce stock of slow moving and non-moving items of stores

- 1. Proper procedures and guidelines should be laid down for the disposal of non-moving items, before they further deteriorates in value.*
- 2. Diversity in production to use up such materials.*
- 3. Use these materials as substitute in place of other materials.*

Question: 10:

Describe perpetual inventory records and continuous stock verification.

(May 2001)

Solution:

Perpetual Inventory Taking:

- 1. Stock verification takes place at the end of a financial period say a year.*
- 2. All items of stocks are covered in a single stretch of verification, say over 2-3 days.*
- 3. Regular stores procedures like material receipts, issues etc. may have to be stopped to facilitate stock taking.*
- 4. Discrepancies can be known only at the end of the period. Responsibility cannot be easily fixed.*
- 5. Inventory records may also be updated periodically, say weekly or monthly, in fact, at any time before physical verification.*
- 6. This does not facilitate or help the quick computation of interim or final financial results.*

Continuous stock verification :

- 1. Stocks are verified at regular intervals during the year, Since Stock taking takes place regularly, it is called continuous stock taking.*

2. In each verification, 2-3 items are covered. In the entire period, all items are covered on rotation basis.
3. There is no interference with regular work flow.
4. Discrepancies are ascertained immediately in order to take corrective action and avoid re-occurrence.
5. Due to surprise element involved, inventory records must be maintained upto date at all times. This is called perpetual Inventory Records.
6. It provides stock figures on real-time basis. Hence, final accounts can be completed quickly, interim results can be prepared conveniently.

Question: 11:

Discuss the use of perpetual inventory records and continuous stock verification, and its advantages.
(Nov 2006)

Solution:

Use of Perpetual Inventory Records

Under this system, a continuous record of receipt and issue of materials is maintained by the stores deptt. and the information about the stock of materials is always available. In this method stock records are maintained in such a way as to make an entry in the records, the physical movement of stock on receipts and issue of materials and to indicate the balance of each item of material in the stores at any point of time.

In this system, the entries are made in bin cards and stores ledger as and when the receipts and issue of materials take place and the balance is ascertained after every receipt or issue of materials. The stocks as per dual records viz. bin cards and stores ledgers are reconciled on a continuous basis.

Advantages:

1. This system facilitates production planning and inventory control.
2. It helps in having a detailed and more reliable check on the stores.
3. The stock records are more reliable and stock discrepancies are investigated and immediate actions are taken.

Use of Continuous Stock Taking:

Under this system, physical stock verification is made for each item of stock on continuous basis. It is physical checking of stock records with actual stock on continuous basis.

It is a method of verification of physical stock on a continuous basis instead of at the end of the accounting period. It is a verification conducted round the year, thus covering each item of stores twice or thrice. Valuable items are checked more frequently than the stocks with lesser value.

Advantages:

1. Any discrepancies, irregularities or changes are detected at early stage and brought to the notice of management.
2. It acts as a moral check on stores staff.
3. It insists on upto date maintaining of stock records.
4. The disruption in production caused by periodic stock taking is eliminated.

Question: 12:

"Perpetual inventory system comprises Bin Card and Stores Ledger, but the efficacy of the system depends on continuous stock taking." Comment.
(May 2013)

Solution:

- Perpetual Inventory system represents a system of records maintained by the stores department.
- Records comprise of (i) Bin Cards and (ii) Stores Ledger.
- Bin Card maintains a quantitative record of receipts, issues and closing balances of each item of stores. Like a bin card, the Stores Ledger is maintained to record all receipt and issue transactions in respect of materials. It is filled up with the help of goods received note and material requisitions.
- But a perpetual inventory system's efficacy depends on the system of continuous stock taking. Continuous stock taking means the physical checking of the records i.e. Bin cards and store ledger with actual physical stock.
- Perpetual inventory is essentially necessary for material control. It incidentally helps continuous stock taking.

The main advantages of continuous stock taking are as follows:

1. Quick compilation of Profit and Loss Accounts (for interim period) due to prompt availability of stock figures.
2. Discrepancies are easily located and thus corrective action can be promptly taken to avoid their recurrence.
3. Physical stocks can be counted and book balances adjusted as and when desired without waiting for the entire stock-taking to be done.
4. Fixation of the various levels and check of actual balances in hand with these levels assist the Storekeeper in maintaining stocks within limits and in initiating purchase requisitions for correct quantity at the proper time.
5. A systematic review of the perpetual inventory reveals the existence of surplus, dormant, obsolete and slow-moving materials, so that remedial measures may be taken in time.

Question: 13:

Explain, why the Last in First out (LIFO) has an edge over First in First out (FIFO) or any other method of pricing material issues.

(Nov 2007)

Solution:

*Under **LIFO method**, production is charged with current market prices and hence pricing of the production is facilitated.*

*Whereas in case of **FIFO method**, production is charged with old price (i.e. low price under inflationary trend). In the same way, under weighted price method, the rise in prices is spread over a large number of units and therefore its effect is much reduced. The average price is always less than the current market price. However, determination of the average price requires a lot of clerical work.*

Therefore we prefer to use LIFO method so the product cost is near to market price.

Question: 14:

Discuss the accounting treatment of defectives in cost accounts.

(May 2009, May 2007, May 2005, May 2003)

Solution:

Treatment of Spoilage in Costing:

Normal If the cost of spoilage is normal & inherent in the process or operation, then the cost of spoilage is absorbed by charging either to the specific production order or the product overheads.

Abnormal If the cost of abnormal spoilage arises in the process then it is charged to costing Profit & spoilage Loss A/c. If spoiled units are reused as raw materials in the same process no separate accounting treatment is required. But if, spoilage is used for any other process or job, a proper credit should be given to relevant process A/c or job A/c.

Treatment of Defective in costing:

Normal Defective Charged to Good Output The entire cost of rectification of normal defective is charged to good units.

Charged to General overhead If the responsible department is not identified correctly, then the rectification costs are charged to general overheads.

1. It is the excess of actual loss over the normal loss (Note: Above normal = abnormal)
2. Cost of abnormal materials shortage is a loss and should be charged to costing profit & loss A/c.
3. If the losses or surpluses arise from errors in documentation, posting etc. they are not abnormal. Such errors should be rectified through appropriate adjustment entries.

CHAPTER 3: EMPLOYEE COST AND DIRECT EXPENSES

Question: 1:

Distinguish between "Direct and Indirect labour costs".

(Nov 2001)

Solution:

Direct and Indirect Labour cost:

Direct labour cost is the labour cost that is specifically incurred for or can be readily charged to a person identified with a specific job, contract, work order or any other unit of cost.

Indirect labour cost is the labour cost which cannot be readily identified with products or services but is generally incurred in carrying out production activity.

The importance of the distinction lies in the fact that whereas direct labour cost can be identified with and charged to the job, indirect labour costs cannot be so charged & is therefore, to be treated as part of the factory O/H and it is to be included in the cost of production.

Question: 2:

What do you mean by time and motion study? Why is it so important to management ?

(May 1999)

Solution:

Time study:

Under this study, a standard time is assigned for the performance of a given job on the basis of the measurement of work required under a prescribed method. In this study proper allowance is provided for fatigue natural needs (for nature's call) and unavoidable delay.

The main object of this study is to establish a standard time for a specific job, through a specific method under a normal working condition by the average workers. The main object of this study means to eliminate the wastage and minimise the labour cost.

Advantages:

- 1. It is helpful for the fixation of an incentive plan.*
- 2. It is helpful for the calculation of production cost.*
- 3. It is helpful for establishing the process of production, budgeting, scheduling, etc.*
- 4. It is helpful for establishing standard cost under the standard costing system.*

Motion Study: Every operation requires certain body of motion and every motion has it's own time and own fatigue. So, by improving the operation we can eliminate unnecessary motion and as a result of which productivity will increase by which cost per unit will decrease.

Advantages:

1. *Faster and better working*
 2. *Planning of operation*
 3. *Better distribution of work.*
 4. *Better working condition*
- So, the ultimate result is high productivity at low cost.*

Question: 3:

*Enumerate the various methods of Time booking.
(May 2007)*

Solution:

The various methods of Time Booking are:

1. *Piece work card*
2. *Daily time sheet*
3. *Weekly time sheet*
4. *Clock card*
5. *Time ticket*
6. *Job ticket*
7. *Combined Time and Job ticket.*

Question: 4:

*Discuss accounting treatment of idle capacity costs in cost accounting.
(May 2009)*

Solution:

Idle Capacity: *It represents the difference between practical capacity and the capacity based on long term sales expectancy.*

If the actual capacity is different from the capacity based on sales expectancy, then the idle capacity is the difference between the practical capacity and the actual capacity.

Idle capacity represents a part of practical capacity which has not been utilized due to regular interruptions and which may not be avoided.

Idle capacity cost can be determined as:

Idle capacity cost = (Total OH related to plant)/(Normal capacity) × Idle capacity

It may be normal or abnormal.

The treatment can be done in the following ways:

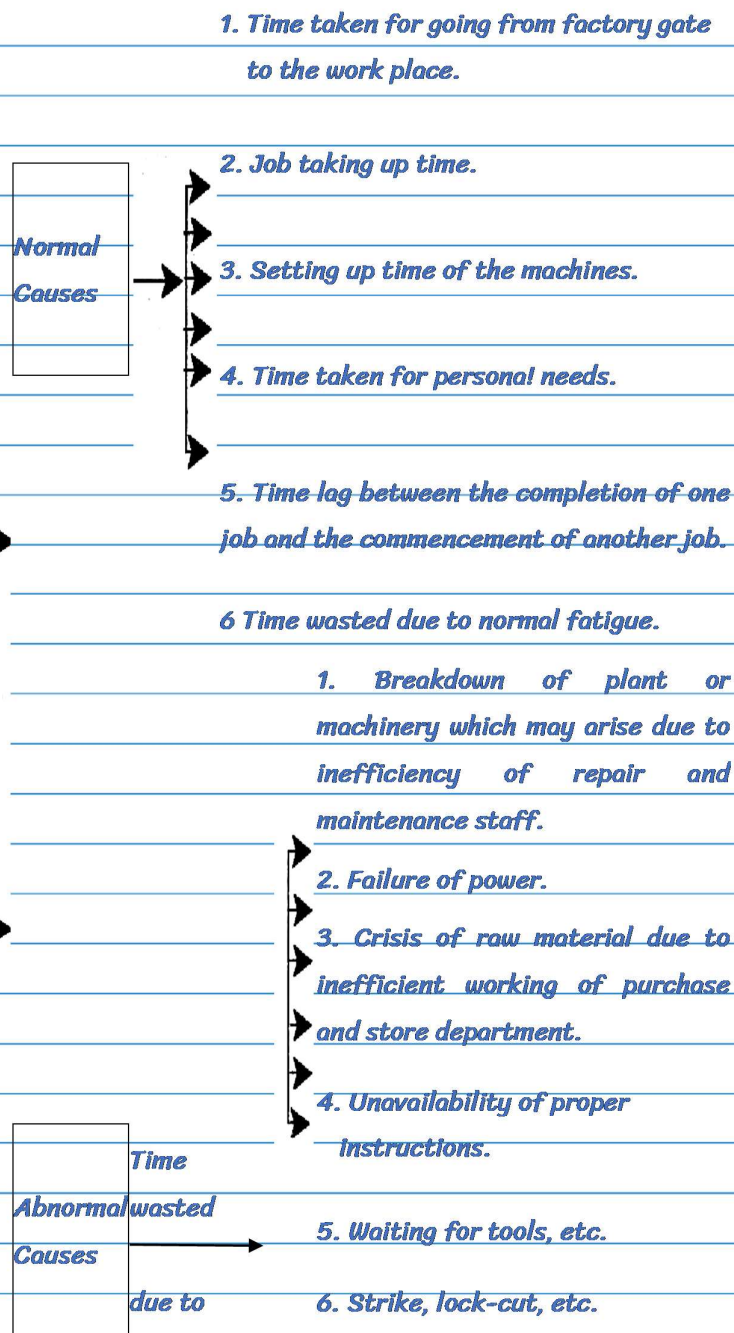
- | | | |
|----|---|---|
| 1. | Arising due to unavoidable reasons (Normal idle capacity) | Generally arises due to lack of demand or due to seasonal nature of the product. Production OHs are absorbed into the cost of production either by the inflated OH absorption rate or by the supplementary OH rate. |
| 2. | Arising due to avoidable reasons (Abnormal idle capacity) | It may arise due to lack of proper planning control or due to lack of managements forecasting. The cost of such idle treatment capacity should be charged to costing Profit and Loss A/c. |
| 3. | If arises due to trade depression or any other external factors | Then it being normal in nature. The cost should, be charged to costing P/L A/c. |

Question: 4:

What is idle time? Explain the causes leading to idle time and its treatment in cost accounts.
(May 2000)

Solution:

Idle time represents a loss of time for which the enterprise pays wages to the employees but secures no benefit or work from such employees. It increases the labour cost without any increase in the output. Idle time may arise due to some normal reasons which cannot be avoided or abnormal reasons which can be avoided if proper precautions are taken at proper time.



Treatment in cost accounts :

If idle time arises due to normal causes:

The labour cost of the normal idle time is to be borne by the cost of production. It can be further segregated in 2 parts

1. If it is paid to direct labour:

Treated as part of direct labour cost by inflating the hourly rate.

2. if it is paid to indirect workers :

Becomes a part of production overhead expense.

If idle time arises due to abnormal causes :

It cannot be recovered from the cost of product. So such loss can be transferred to costing Profit & Loss A/c.

Another approach can be used under which entire labour cost of normal idle time can be charged to production OH. In such circumstances, it can be absorbed by the output or production. Therefore, proper control is required in order to minimise the idle time.

Question: 5:

*Discuss the accounting treatment of the following in cost-accounts: Idle time and Over-time wages.
(May 2006, May 2003)*

Solution:

Idle Time:

Please refer 2000 - May [5] (b) on page no.

Over time:

Accounting treatment of overtime premium depends upon the circumstances of the work :

Case 1: *If the overtime is worked on customer's instruction in order to complete the work at the earliest then it should be directly charged to the job as a part of direct wages.*

Case 2: *If the overtime is worked due to shortage of the labour or any other reason- then it is treated as a part of the labour cost and such overtime premium is appointed on the basis of total hours work on different jobs.*

Case 3 : *If the overtime is worked to make-up the lost time due to unavoidable reason it means it is a cost incurred for normal time and it should be treated as part of the production OH and it can be' recovered from the job completed during the accounting period.*

Case 4 : *If the overtime is worked to make-up the time lost due to avoidable reasons i.e. abnormal idle time - then it is charged to costing Profit/Loss A/c.*

Case 5: *If overtime is worked due to its management fault then it should be charged to that particular department.*

Question: 6:

*Discuss the effect of overtime payment on productivity.
(Nov 2001)*

Solution:

Effect of overtime payment on productivity : Overtime work should be resorted to, only when it is extremely essential because it involves extra cost.

The overtime payment increases the cost of production in the following ways:

1. The overtime premium paid is an extra payment in addition to the normal rate.
2. The efficiency of operators during overtime work may fall and thus output may be less than normal output.
3. In order to earn more, workers may not concentrate on work during normal idle time and thus the output during normal hours may also fall.
4. Reduced output and increased premium of overtime will bring about an increase in costs of production.
5. Gives rise to associated costs like lighting etc.
6. Adversely affects the health of workers in long run.
7. Increases the wear and tear of machinery.
8. Promotes dissatisfaction among the workers who do not get the opportunity of overtime.
9. Create difficulty in discontinuance of the practice of overtime work if it is once allowed.
10. Promotes a tendency among the workers to keep the work pending so that overtime work is necessitated.

Question: 7:

State the circumstances in which time rate system of wage payment can be preferred in a factory.
(Nov 2001)

Solution:

Circumstances in which time rate system of wage payment can be preferred is as follows:

1. Persons whose services cannot be directly or tangibly measured, e.g. general helpers, supervisory and clerical staff etc.
2. Workers engaged on highly skilled jobs on sending skilled services, e.g. tool making, inspection and testing.
3. Where the pace of output is independent of the operation e.g., automatic chemical plants.

Question: 8:

Which is better plan out of Halsey 50 percent bonus scheme and Rowan bonus scheme for an efficient worker ? In which situation the worker get same bonus in both schemes?

(May 2010)

Solution:

- Rowan Bonus Scheme pays more bonus if the time saved is below the 50 percent of time allowed and if the time saved is more than 50 percent of time allowed then Halsey bonus scheme pays more bonus.
- Normally, time saved by a worker is not more than 50 percent of time allowed.
- Therefore, the Rowan bonus scheme is better for an efficient worker. When the time saved is equal to 50 percent of time allowed then both plans pay same bonus to a worker.

Bonus under Halsey Plan

$$= \text{Standard wage rate} \times 50/100 \times \text{Time saved} \text{ -----(i)}$$

Bonus under Rowan Plan

$$= \text{Standard wage rate} \times (\text{Time taken})/(\text{Time allowed}) \times \text{Time Saved} \text{ -----(ii)}$$

Bonus under Halsey Plan will be equal to the Bonus under Rowan Plan when the following condition holds good

$$= \text{Standard wage rate} \times 50/100 \times \text{Time saved}$$

$$= \text{Standard wage rate} \times (\text{Time taken})/(\text{Time allowed}) \times \text{Time saved}$$

$$\text{or } 1/2 = (\text{Time taken})/(\text{Time allowed})$$

$$\text{or Time taken} = 1/2 \text{ of time allowed.}$$

Hence, when the time taken is 50% of the time allowed, the bonus under Halsey and Rowan Plans is equal.

Question: 9:

Discuss the two types of cost associated with labour turnover.

(Nov 2003, Nov 1997)

Solution:

The two types of costs associated with labour turnover are :

1. Preventive costs: These are costs incurred to keep the labour turnover at a low level, e. g. cost of medical services, welfare schemes and pension schemes. If the firm incurs high preventive costs, its rate of labour turnover is usually low.

2. Replacement costs: These are costs arising due to high labour turnover and represents the amount spent on new workers. Some examples are cost of employment, training and induction, abnormal breakage and scrap, extra wages and overheads due to inefficiency of new workers. The company will incur high replacement costs if its rate of labour turnover is high.

Hence every company must work out an optimum level of labour turnover keeping in view its personnel policies and behaviour of replacement and preventive costs at various levels of labour turnover rates.

Question: 10:

What do you understand by labour turnover? How is it measured?

(May 2003)

Solution:

Meaning : Labour turnover refers to "the rate of change in the composition of labour force during a particular period measured against suitable index ". It arises because an organisation is a dynamic entity and not a static one.

Definition : Prof. B Banerjee has therefore defined labour turnover as "The rate of change in the labour force of an organisation during a specified period."

Measurement of Labour Turnover: Three important methods are available to measure labour turnover. The company may use any one of these methods for the purpose of measuring the rate of labour turnover. But for the purposes of facilitating both the trend analysis (e.g. company's labour turnover rate during the year just ended with the preceeding years) and the inter firm comparison (e.g. comparing the rate of labour turnover of a company with that of others), it is necessary to use the method selected consistently year after year. Since each method lays emphasis on a particular aspect and therefore, no useful and meaningful comparison can be made if there is a change or difference in the method of measuring labour turnover. The three methods are :

1. Separation method
2. Replacement method
3. Flux method

1. Separation Method: Under this method, labour turnover is measured by . dividing the total number of separations during a period by the average no. of employees on the pay roll. The result is to be multiplied by 100 to express it in the form of percentage. Therefore,

$$LTO = (\text{No.of separations during a period})/(\text{Avg.no.of employees during the period}) \times 100$$

Where,

$$\text{Avg. no. of employees} = ([\text{No.of employees at the beginning of period} + \text{No,of employees at the end of the period}])/2$$

2. Replacement Method: Under this method labour turnover is measured by dividing the number of replacements made, irrespective of number of separations, during a period by the average number of

employees on the payroll. The important point to be noted is that only the replacements made to fill the vacancies caused by the separations are to be considered for measuring labour turnover under this method. Therefore,

$$LTO = (\text{No. of replacement made during a period}) / (\text{Avg. no. of employees during the period}) \times 100$$

3. Flux Method: Under this method, both the number of separations and replacements are considered. Hence, labour turnover is computed by dividing the aggregate of no. of separations & replacements during a period by the average number of employees. Therefore,

$$LTO = (\text{No. of separations during a period}) / (\text{Avg. no. of employees during the period}) \times 100$$

Question: 11:

Discuss the three methods of Calculating labour turnover.

(Nov 2010, Nov 2004)

Solution:

Meaning : Labour turnover' refers to "the rate of change in the composition of labour force during a particular period measured against suitable index". It arises because an organisation is a dynamic entity and not a static one.

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3. Flux Method: Under this method, both the number of separations & replacements are considered. Hence, labour turnover is computed by dividing the aggregate of no. of separations & replacements during a period by the average number of employees.

Therefore, $LTO = ([\text{No of separations during a period}] + [\text{No. of replacements during a period}]) / (\text{Average no. of employees during the period})$

Question: 12:

Enumerate the remedial steps to be taken to minimise the labour turnover.

(Nov 2007)

Solution:

The following remedial steps may be adopted to minimise labour turnover:

1. Exit interview with each outgoing employee to ascertain the reasons for his leaving the organisation.
2. Job analysis and evaluation carried out even before recruitment to ascertain the requirement of each job.
3. Scientific system of recruitment, placement and promotion, by fitting the right person in the right job.
4. Use of committee, comprising of members from management and workers to handle issue concerning workers grievance, requirements etc.
5. Enlightened attitude of management - Mental revolution on the part of management by taking workers into confidence and acting a healthy working atmosphere, with measures such as :
 - (i) Training service rules after discussion between management and workers union.
 - (ii) Provision of facilities for education, training and development of workers.
 - (iii) Introduction of procedures for settlement of workers grievances.

Question: 13:

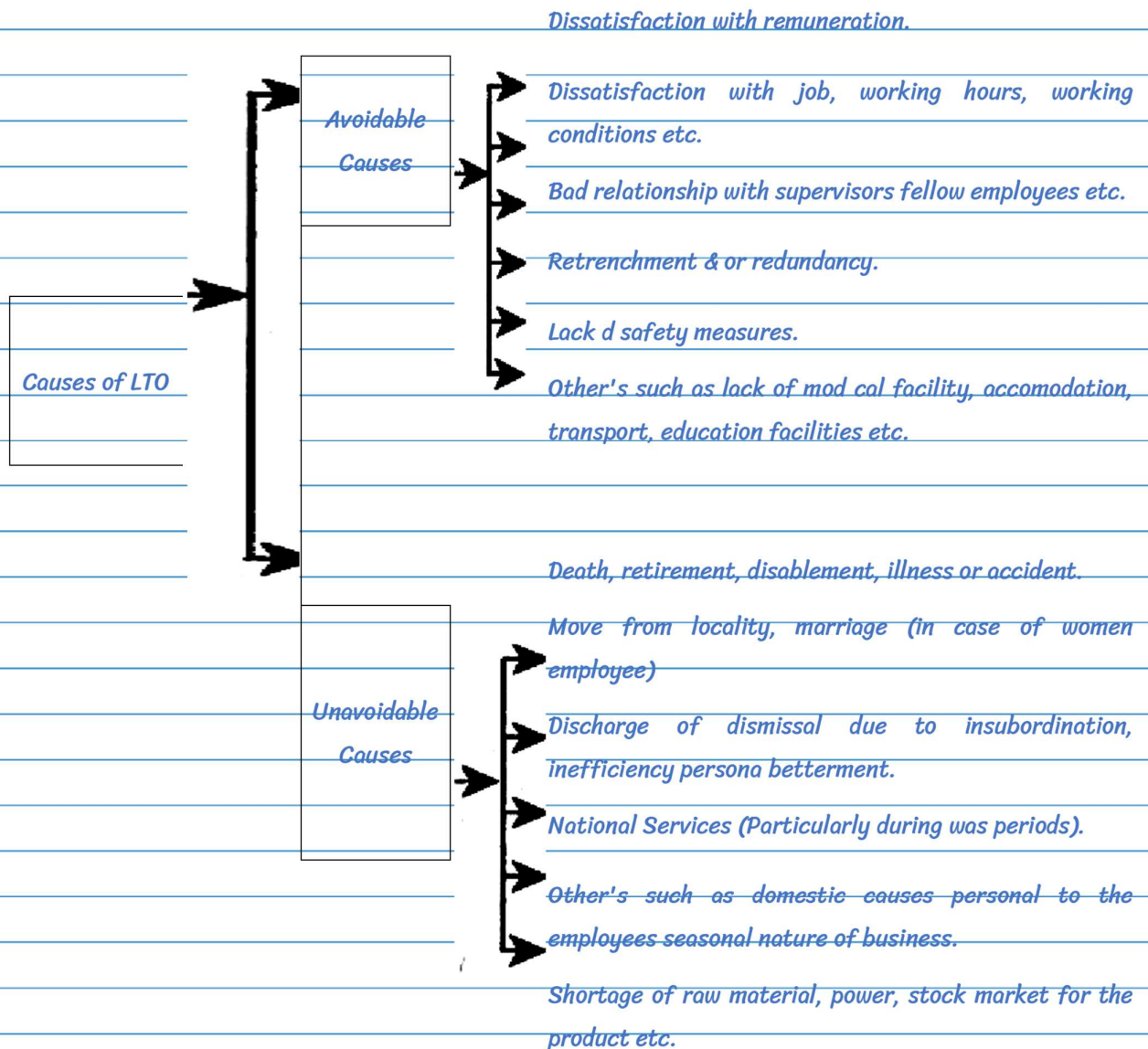
Enumerate the causes of labour turnover.

(Nov 2007)

Solution:

In order to keep the labour turnover rate at the minimum level, it is necessary to understand the various reasons as to why the people leave the organisation. Though it is a very strenuous task to list all the reasons for or causes of LTO, an attempt has been made in the following paragraph to identify some of the important & usual causes which can be classified into two broad categories:

Causes of Labour Turnover



CHAPTER 4: OVERHEADS

Question: 1:

Distinguish between Fixed overheads and Variable overheads.

(May 2010)

Solution:

Fixed Overheads Vs. Variable Overheads

Fixed overheads are not affected by any variation in the volume of activity, e.g., managerial remuneration, rent etc. These remain the same from one period to another except when they are deliberately changed. Fixed overheads are generally variable per unit of output or activity e.g Rent, insurance, Depreciation, Audit fees etc.

Whereas, the variable overheads that change in proportion to the change in the volume of activity or output, e.g., power consumed, consumable stores etc. The variable overheads are generally constant per unit of output or activity, e.g. direct material, direct labour, commission on sale.

Question: 2:

Distinguish between cost allocation and cost absorption.

(May 2013)

Solution:

Cost allocation: It is defined as the process of allotment or identification or assignment of whole items to cost centers or costs units. Thus the charging of direct cost to a cost centre or a cost unit is the process of allocation of costs.

Cost absorption : It is the process of absorbing all indirect costs (or Overheads) allocated or apportioned over particular cost centre or production deptt. by the units produced.

Question: 3:

Discuss the difference between allocation and apportionment of overhead.

(May 2014, May 2008)

Solution:

Cost allocation:

The term 'allocation' implies relating overheads directly to the various departments. The estimated amount of various items of manufacturing overheads should be allocated to various cost centers or departments.

Cost apportionment:

Those items of estimated overheads (like the salary of the works manager) which cannot be directly allocated to the various departments and cost centers are apportioned. Apportionment implies "the allotment of proportions of items of cost to cost centres or departments." It implies that the unallocable expenses are to be spread over the various departments or cost centres on an equitable basis.

The differences between Allocation and Apportionment are as follows:

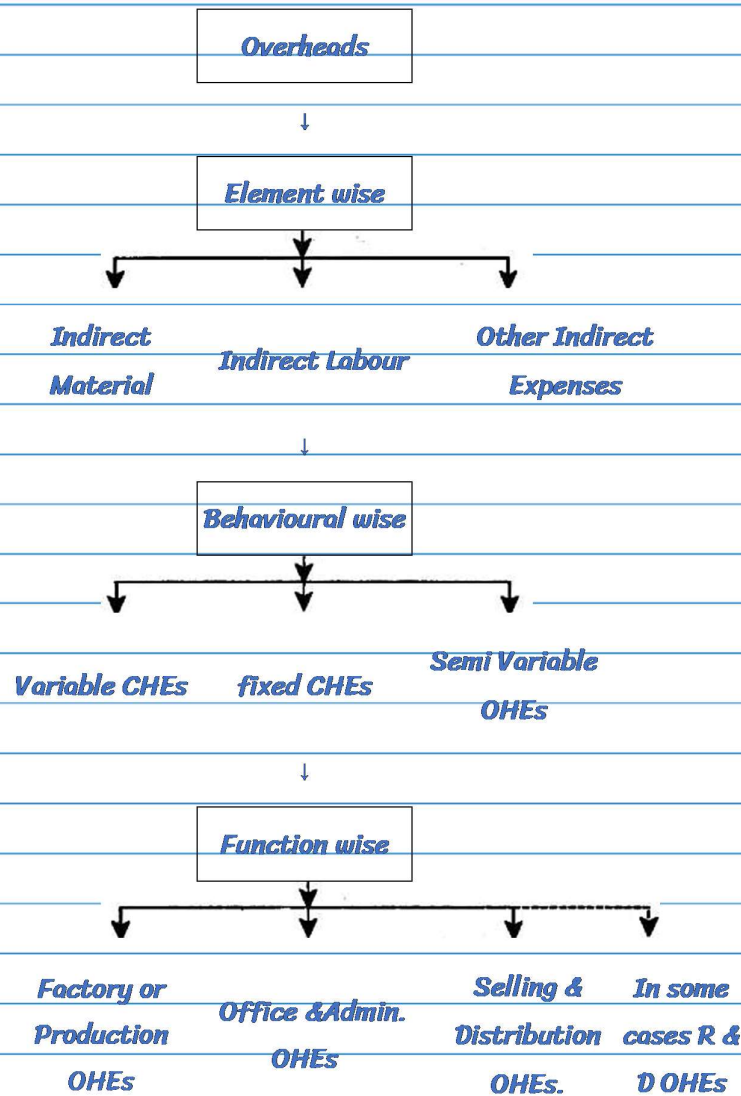
Basis of Difference	Allocation	Apportionment
Meaning	Identifying a cost centre and charging its expenses in full.	Allotment of pro-portions of common cost to various cost centre.
Nature of expenses	Specific and identifiable	General and common
Number of centre (Deptt.)	One	Many
Basis	Allocate directly	Allocate Indirectly
Amount of overhead	Charge in full	Charge in proportion- able
Assumption	Not required	Required

Question: 4:

Write a note on 'classification', 'allocation' and 'absorption' of overheads. How does it help in controlling overheads?
(May 1998)

Solution:

On the basis of a common base or characteristic features overheads are grouped into two or more classes: This is known as classification of OHEs. There are no. of bases for classification. But the selection of a particular base for classification depends upon a no. of factors such as nature and size of the business, nature of product etc. However the following 3 bases are generally used for classification:



Function wise classification:

1. Factory or Production O/H: It includes :

- (i) Stores overhead (expenses connected with purchasing and handling of materials).
- (ii) Labour overhead (costs related to labour).
- (iii) Factory and administration overheads (expenses connected with administration of the factory).

2. Office and Administration overhead: It includes :

- (i) Office expenses (expenses on routine office work).
- (ii) Administration expenses (expenses on managerial personnel whether form in of salary or facilities).

3. Selling and distribution overhead: it includes :

- (i) Selling expenses (expenses incurred to persuade customers and maintenance and expansion of market).
- (ii) Distribution expenses (expenses incurred to execute the orders.)

Behavioural wise classification:

If costs are classified on the basis of tendency to change with change in production volume or sales volume or activity level, costs are classified as:-

1. **Fixed costs:** Fixed cost is one whose total amount remains fixed irrespective of change in level of activity. It is also known as "Period cost" or policy cost".

e.g.: Rent, insurance, depreciation, audit fees, salaries and allowances, direct labour (if paid on time rate basis).

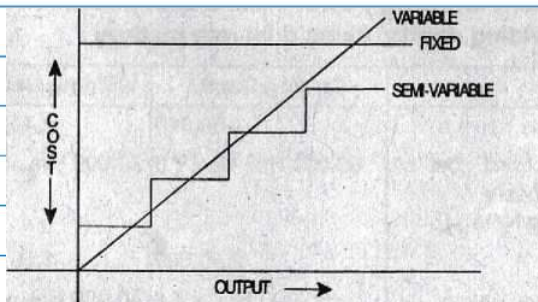
2. **Variable Cost:** Variable costs are the costs whose total amount changes in proportion to the output activity level.

e.g. : Direct material, direct labour (if paid on piece rate basis), sales representatives, commission.

3. **Semi Variable Costs:** Semi variable costs containing both fixed and variable elements which is thus partly affected by fluctuations in the activity level.

Fixed cost element remains constant for the activity level while variable cost element varies proportionately with the activity level, e.g.: Costs of electric power, telephone expenses etc.

Graphically these 3 types of expenses are shown as below:



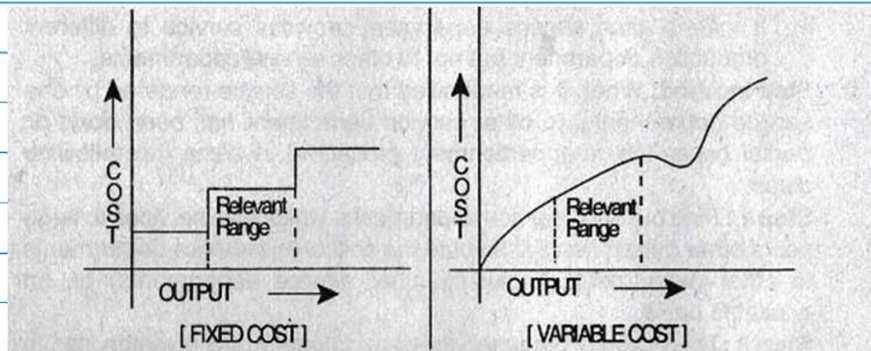
Note:

The amount of fixed cost times remains constant for a particular range of level of activity upto a specific period. This is known as "Relevant Range" and "Relevant period" respectively. The concept of relevant range is applicable to fixed cost as well as variable costs.

For Fixed Cost: It is related to the plant capacity or range of production level means after a certain range of production it can be hiked.

For Variable cost: Per unit variable cost will behave differently outside the relevant range of production. It means it is constant upto that Relevant Range.

e.g.: Quantity discount available on the basis of certain limit.



Allocation of costs:

Allocation is the process of identification of O/H with cost centre. If an expenses which is directly identifiable with a specific cost centre is known it is allocated to the same e.g.:

1. Power if separate meter for each cost centre is there.
2. Wage to indirect workers
3. Depreciation of plant and machinery
4. Insurance of plant and machinery
5. Fuel oil for boiler, generation, ovens etc.

Absorption of OH : Absorption is an exercise by which OH is properly spread over to production for the period. After OH is collected, a basis for absorption of OH is found out for each departments so that each product gets due share of OH. Thus OH absorption involves apportionment of OH relating to a department among units produced in that department.

Role of classification, allocation and absorption of overheads in controlling overheads:

The classification, allocation and absorption of overhead costs over different cost centres helps in two ways. Firstly, the overhead costs assigned to cost centres are used for cost control and performance evaluation purpose. These assigned costs are periodically totaled and listed on performance report which also has the figures of budgeted costs differences between budgeted and actual cost for each item of expenditure are highlighted in the performance reports and provide feedback information for performance evaluation and cost control purposes. Secondly, the accumulated production cost centre O/H costs are assigned in the second stage of the procedure to products to satisfy financial accounting requirements for inventory valuation.

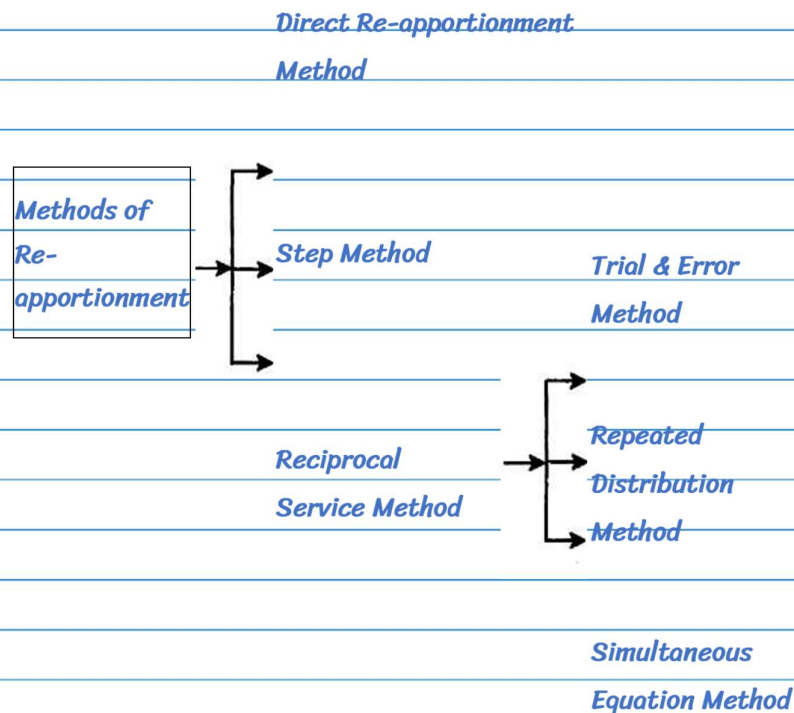
Question: 5:

2010 - Nov [7] (a) (4 marks)

What are the methods of re-apportionment of service department expenses over the production departments? Discuss.

Solution:

The following methods are generally used for re-apportionment according to the specified circumstances:



These are explained in detail as follows :

1. Direct Re-apportionment method:

- This method is used when cost of service departments are apportioned only to the production department directly.
- Therefore, number of re-apportionment will be equivalent to the number of service departments.
- It means each service department provides service to different production department but not to other service departments.

2. Step method: When it is recognised that the service rendered by one service departments, to other service department has been done on partial basis, the re-apportionment procedure involves the following steps:

Step 1: Find out such service departments, which give services to large no. of other departments Distribute the cost of this service departments to other departments (including other service departments) on an equitable basis.

Step 2 : Then identify other service departments which give services to next largest number of departments After that, distribute the cost of such service departments, to other departments (excluding the service department whose cost has already been apportioned) on some equitable basis.

Step 3 : Continue the distribution process till the cost of service departments, is apportioned fully.

Note: If all the service departments, provide service to equal no. of other departments, then it will be difficult to re-apportion the cost of service departments In such case, it is apportioned on the basis of largest amount to lowest one. It means first apportion largest amount, then the next largest and so on:

3. Reciprocal service method: This method is used when one service department renders services to other department and vice-versa in addition to the services provided to the production departments That is on reciprocal basis, it means, before determining the cost of each service department, they should recognise the cost of inter service departmental services. ,

This method is generally used for the dealing of such problems :

(i) Trial and Error Method,

(ii) Repeated Distribution Method

(iii) Simultaneous Equation Method

Question: 6:

Discuss the step method and reciprocal service method of secondary distribution of overheads.

(Nov 2004)

Solution:

Step Method: When it is recognised that the service rendered by one service department to other service department has been done on partial basis, the re-apportionment procedure involves the following steps:

Step 1 : Find out such service deptts., which gives services to large no. of other deptts. Distribute the cost of this service deptt. to other deptts. (including other service deptts.) on an equitable basis.

Step 2 : Then identify other service deptts. which gives services to next largest number of deptts. After that, distribute the cost of such service deptt. to other deptts. (excluding the service deptt. Whose cost has already been apportioned) on some equitable basis.

Step 3 : Continue the distribution process till the cost of service deptts., cost is apportioned fully.

Note: If all the service deptts. provide service to equal no. of other deptts., then it will be difficult to re-apportion the cost of service deptts. In such case, it is apportioned on the basis of largest amount to lowest one. It means first apportion largest amount, then the next highest and so on.

Reciprocal Service Method:

This method is used when one service deptt. renders services to other deptt. and vice-versa in addition to the services provided to the production deptts. That is reciprocal basis it means before determining the cost of each service deptt, they should recognise the cost of inter service departmental services.

This method is generally used for the dealing of such problems

(i) Trial and Error Method,

(ii) Repeated Distribution Method

(iii) Simultaneous Equation Method

(i) Trial and Error Method:

Under this method, the total cost of each service deptt. will be determined as per primary distribution and the percentage of services rendered to each other:

After such process, total cost of each service deptt. is determined by adding the above amounts (i.e. as per step 1 + step 2 + step 3).

(ii) Repeated distribution Method:

Under this method, the total overhead cost of all the deptts. (i.e production and service) as per primary distribution summary are put on a line.

(iii) Simultaneous Equation Method:

This method is recommended where there are only two service deptts. . If no. of service deptt is more than two then for finding out the unknown figures may possess problems in computation.

Question: 7:

Explain, how under-absorption and over-absorption of overheads are treated in Cost Accounts.

(Nov 2015, Nov 2014, Nov 2010, May 2010)

Solution:

There are varieties of methods used for over or under absorption of OHEs in the accounts. However in the corporate sector 3 important methods are widely used for accounting of over & under absorption of POHEs:

1. Use of supplementary OH absorption rates.

2. Write off to costing P&L A/c.

3. Carry over to the next period accounts.

1. Use of Supplementary OH Absorption Rates: This method is used when it is caused due to normal or avoidable reasons. When the amount of over & under absorbed POHEs is significant (i.e. more than 10% of total OH incurred), supplementary absorption rates are computed by way of addition or deduction. This rate may be called Negative Supplementary Rate if over absorbed amount is to be deducted, on the other hand, the supplementary rate may be called positive supplementary rate if under absorbed amount is to be added,

$\therefore \text{Negative Supplementary Rate} = (\text{Over Absorbed POHEs}) / (\text{Actual value of the Base output})$

$\text{And Positive Supplementary Rate} = (\text{Under absorbed POHEs}) / (\text{Actual value of Base output})$

This method is preferred when:

(i) There are serious estimational errors.

(ii) When there is a substantial change in the level of activities.

(iii) When there is a major change in the production method.

(iv) In case of contract on cost plus basis.

2. Writing off to Costing P&L A/c: When the amount of over and under absorbed POHEs is not so significant, it may be written off to costing P&L A/c. But if it is significant (sizeable) and it arises due to:

(i) Some uncontrollable & abnormal factors.

(ii) Estimation of output is contingent.

Then such over or under absorbed POHEs may be written off to costing P&L A/c. But it suffers from some limitation like it cannot be adjusted in the value of WIP, unsold stock or sold unit (it means pricing policy cannot be adjusted).

3. Carry-forward to next Periods Accounts: This method is used when:

(i) Balance amount is comparatively small.

(ii) In case of new product whose output is low in initial years due to lack of demand.

(iii) Normal business cycle is of more than one accounting period.

Over under absorbed O/H is carried over to next period in the hope that the same will automatically be adjusted or absorbed. But under this method comparability of the performance is not properly feasible.

Question: 8:

Why is the use of an overhead absorption rate based on direct labour hours generally preferable to a direct wages percentage rate for a labour incentive operation?

(Nov 1995)

Solution:

A method of overhead absorption is considered appropriate if the total amount of overhead absorbed in a period does not fluctuate materially from the actual expenses incurred in the period direct wage % rate method do not possess the aforesaid feature. In other words, the O/H charged varies from period to period due to changes in direct wages.

In fact, O/H expenses are generally a function of time. Therefore, a time based O/H absorption rate method is always preferred over any other method. In the case of labour incentive operations. It is advisable to use labour hour method for O/H absorption.

Question: 9:

*What is blanket overhead rate? In which situations, blanket rate is to be used and why?
(Nov 2007, Nov 1999)*

Solution:

Blanket OH Rate: Is also known as "Single" or "Plant" "wide OH absorption Rate".

It is calculated as under:

Blanket rate = (OH cost for the entire factory)/(Total quantity of the base selected)

This method is used when the size of the company is small or when the burden of O/H is more or less uniform among all the production deptts.. These rates are easy to compute and require clerical cost but have a very limited use. The limitations of such rates are as under.

- 1. Such rates may give misleading results where several products are manufactured and are required to be passed through various production departments.*
- 2. As the performance of the individual deptt. cannot be assessed properly with this rate, so no satisfactory managerial control is possible.*
- 3. Such rate may render the valuation of WIP erroneous.*

Question: 10:

*Discuss the accounting of Selling and Distribution overheads.
(May 2005)*

Solution:

CIMA England defines selling cost as "the cost seeking to create and stimulate demand and of securing order" and Distribution cost as "The cost of the sequence of operation which begins with making the packed product available for dispatch and ends with making the reconditioned returned empty package, if any, available for reuse." Accounting Treatment: Selling and distribution OHE's are recovered either on the basis of products or channels of distribution or by territories' or zones or by any other means. It is a very crucial decision what type of expenses relating to selling and distribution is recovered on what basis?

Since S & DOH are incurred for the benefit of many cost centres so a suitable base it to be established for apportioning it to the various cost centres, for e.g.

- 1. Direct selling expenses: Apportioned on the basis of sales revenue.*
- 2. Cost of storage: Apportioned on the basis of sales volume, or size or weight, etc.*
- 3. Advertisement and sales promotion: Apportioned on the basis of sales value or volume.*

4. Transportation cost: Apportioned on the basis of sales volume, or weight or distance, or weight-distance.

5. Credit collection cost: Apportioned on the basis of credit sale or no of invoices, etc.

After the allocation and apportionment they are absorbed on the basis of either the sales revenue or on the basis of sales volume.

Question: 11:

What is 'Idle Capacity'? How should this be treated in cost accounts?

(Nov 2015, Nov 2001)

Solution:

Idle Capacity Cost:

• Idle capacity is that part of capacity of a plant, machine or equipment which cannot be used due to different reasons which may be avoidable or unavoidable. It is the difference between practical capacity and capacity based on sales expectancy.

Accounting for idle capacity in Cost Accounting:

• Normal idle capacity cost cannot be avoided and it should be absorbed in cost by inflating the rate. But if it is due to un-avoidable reasons, it may be charged to Profit and Loss Account.

Question: 12:

How do you deal with the following in Cost Accounts?

(i) Research and Development Expenses

(May 2005, Nov 2001)

Solution:

Research and Development Cost: R&D expenditures is a differed expenditure because it is incurred not for benefitting a certain period, but for benefitting several accounting periods. Such expenditure is incurred for innovating a new product or improving the existing product or developing new methods of production.

Research Cost:

Research cost are incurred under 2 heads :

1. Basic research cost which is incurred for improving the existing scientific and/or technical knowledge.
2. Applied research cost applied research is done for the purpose of achieving some particular practical motto or objectives.

Treatment in Cost A/cs:

1. Basic Research Cost: It should be treated as prod. OH for a particular period and absorb it in product cost. Because it is related to all existing products or methods or techniques of production etc.

2. Applied Research Cost: It is further classified into 2 parts for the costing purpose. They are :

(i) If it is incurred for the improvement of the existing product and methods of production it should be treated as POH and absorbed accordingly.

(ii) If it is incurred for innovating new products or methods then such cost is absorbed on the basis of amortisation.

If whole of such expenditure is so huge, then it should be absorbed in subsequent years in which some benefit is received by the producer. If applied research work becomes a failure, then such research expenditure is charged against profit in costing P&L A/c. If size of such amount is heavy, then such amount is speared over in subsequent year also.

3. Development Cost: Development cost is the cost incurred during the implementation of the decision to produce a new product or improved new products or use new or improved methods.

Treatment of Development Cost: Cost incurred for development is treated similar as the treatment of applied research cost.

Question: 13:

How do you deal with the following in Cost Accounts?

(i) Fringe benefits.

(ii) Bad debts

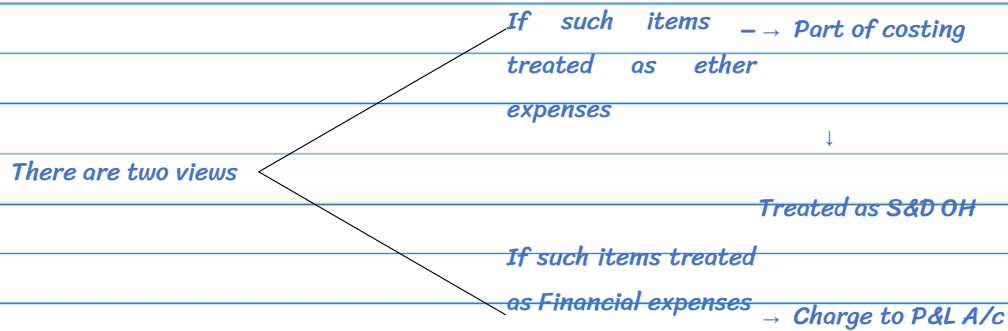
(Nov 1999)

Solution:

(i) Fringe Benefits: If any fringe benefits are incurred for factory workers, it should be treated as Factory OH or Production. OH and apportioned among all the production or service department on the basis of number of workers in each department.

Fringe benefits relating to office, selling and distribution staff should be treated as Office and Administration OH and Selling and Distribution OH and recovered accordingly.

(ii) Bad Debts:



If any bad debt arises due to exceptional circumstances, then such expenses are excluded from cost A/c and charged to P&L A/c.

Question: 14:

Explain:

(iii) Research and Development Costs

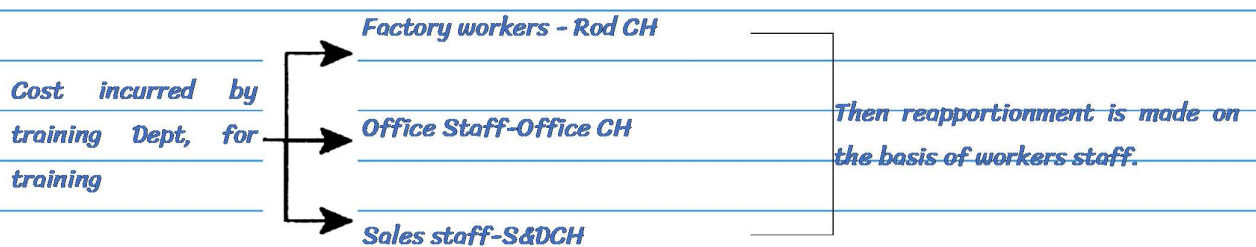
(iv) Training Costs.

(Nov 2000)

Solution:

(iii) Please refer 1998 - Nov [7] (d) (i) on page no. 276

(iv) Training Expenses :



If labour turnover rate is very high (i.e. abnormally high) training cost in such case will also be very high. In such case over and above the normal limit cost should be excluded from the total training cost and transferred to costing P&L A/c.

Question: 15:

How do you deal with the following in cost accounts?

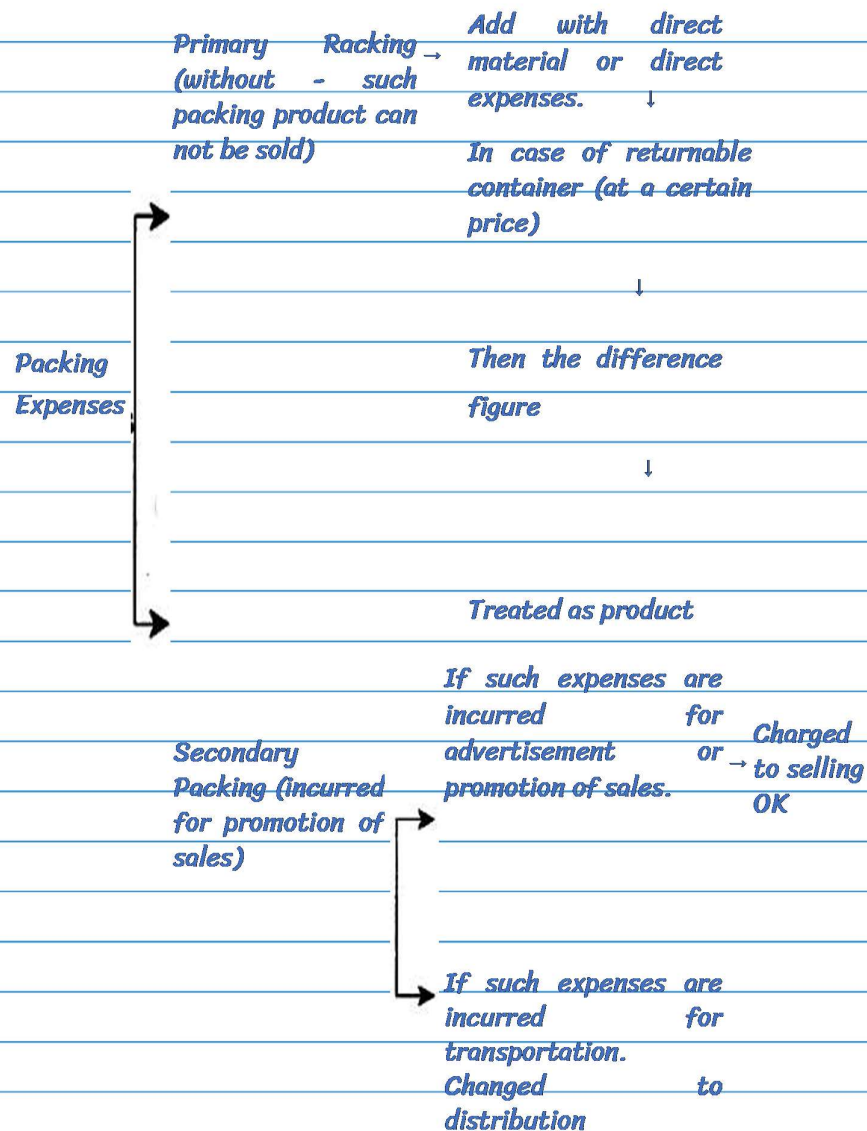
(i) Packing Expenses

(ii) Fringe benefits

(May 2011)

Solution:

(i) Packing Expenses:



OR

(ii) **Fringe Benefits:** If any fringe benefits are incurred for factory workers, it should be treated as Factory OH or Production. OH and apportioned among all the production or service department on the basis of number of workers in each department.

Fringe benefits relating to office, selling and distribution staff should be treated as Office and Administration OH and Selling and Distribution OH and recovered accordingly.

CHAPTER 5: ACTIVITY BASED COSTING**Question: 1:**

What is the fundamental difference between Activity Based Costing System (ABC) and Traditional Costing System? Why more and more organisations in both the manufacturing and non-manufacturing industries are adopting ABC?

(Nov 2007)

Solution:

Fundamental difference between ABC and Traditional costing system are as follows:

Sr. No.	Particulars	Activity Based Costing	Traditional Absorption Costing
1.	Cost	OH are related to activities (work performed) or grouped into Cost Pools.	OHs are related to places/ cost centres/ departments.
2.	Identification	All four levels of activities and related costs, viz. (a) Unit Level, (b) Batch Level, (c) Product Level, and (d) Facility Level, are identified.	Only-(a) Unit Level Activities (Variable), and (b) Facility Level Activities (Fixed) may be identified. [Sometimes, Semi-Variable Costs are also ascertained.]
3.	Activity and Cost	Costs are assigned to Cost Objects, e.g. customers, customer segments, services, distribution channels, products, departments, etc.	Cost are assigned to Cost Units, i.e. to products, or jobs or hours.
4.	Ascertainment	Activity-wise Cost Drivers are identified. Time may also be a (but not the only) Cost Driver.	Time (Hours) is assumed as the only "causal factor" governing cost in all departments.
5.	Cost	Multiple Cost Drivers may be identified for each activity. However, for fixing ABC rate, the most relevant/ dominant Cost Driver will be considered.	Only one Cost Driver (either Labour Hours or Machine Hours) is identified for each Department.
6.	Assignment	Specific activity-wise recovery rates are used. There is no concept of "single" or "overall" ABC Rate.	Either Multiple Rates (for each department) or Single Rate (also called Blanket or Overall or Factory Rate may be used.

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CHAPTER 6 COST SHEET – No Theory Questions**CHAPTER 7 COST ACCOUNTING SYSTEM****Question: 1:**

Write short notes on:

Cost Ledger Control Account

(Nov 1996)

Solution:

This control account is popularly known as 'General Ledger Adjustment Account' or 'Financial Ledger Control Account' and is opened in cost ledger to complete double entry. All items of income and expenditure taken from financial accounts and all transfers from cost account to financial books are recorded in this account since the purpose of this account is to complete double entry in the cost ledger, therefore all transactions in the cost ledger must be recorded through the 'Cost Ledger Control Account'. The balance in this account will always be equal to the total of all the balances of the impersonal accounts. If a transaction is of interval nature affecting cost accounts only i.e., transfer from stores ledger control account to WIP control account. Then no entry is necessary in General Ledger Adjustment Account, because double entry is possible without recourse to this balancing account.

Question: 2:

Write short notes on: Integrated Accounts.

(May 1999, May 1998)

Solution:

CIMA defines that "Integrated accounting system refers to the interlocking of the Financial & Cost Accounting system to ensure all relevant expenditure is absorbed into the Cost accounts. Under this system transactions are classified both according to their production and nature."

Features:

Typical features of Integrated accounts are as follows:

- (i) Control accounts for stores, WIP and finished goods are maintained in the General Ledger itself.
- (ii) Wages & O/H accounts are maintained in the usual maintenance. At the year end analysis of these accounts is made and transfer are made to WIP, service deptts. and production deptt.
- (iii) Accruals and prepaid expenses are brought into accounts for each period, instead of at the time of making final payment.

*Under **integrated accounting system**, both financial and cost accounting records are maintained in one set of books to meet the requirements of financial accounting and cost accounting purposes. In other words, it can be said that cost accounting is integrated into the financial accounting system.*

Integrated accounting records provide the necessary information for ascertainment of cost of each unit, batch or job or any other cost unit and simultaneously financial statements viz. Profit & Loss A/c & Balance Sheet can be prepared without any distortion of the Financial Accounting information. In this system transactions are recorded based on double entry book-keeping and costs are classified on the basis of function which enables the firm to ascertain product cost for e.g. the purchase of raw material is analysed by its nature and instead of posting it to the purchase accounts as in Financial accounts, directly posted into stores ledger control account or overhead account. Similarly, the payment of direct wages instead of posting into Direct Wages account, posting is directly made into wages control account or overhead control account.

Question: 3:

*State the essential pre-requisites of Integrated Accounting System.
(Nov 2007, Nov 2001)*

Solution:

The success of an integrated system of accounting depends upon certain pre-requisites which should be ensured before the system is introduced. These are:

- 1. Deciding the extent of integration of the two sets of books. Some companies find it useful to integrate upto the stage of primary cost or factory cost while others prefer an integration of the entire accounting records.*
- 2. A suitable coding system must be developed to serve the purpose of both financial and cost accounts.*
- 3. To lay down the procedure for the treatment of provision for accruals prepaid expenses, other adjustments necessary preparing interim accounts.*
- 4. Perfect coordination should exist between the staff responsible for financial aspects and cost aspects of the accounts. An efficient processing of accounting documents is to be ensured.*
- 5. Under this system there is no need for a separate cost ledger of course, there will be a number of subsidiary ledgers; in addition to the useful customers ledgers & the bought Ledgers, there will be: ...*
 - (a) Stores ledger*
 - (b) Stock ledger, &*
 - (c) Job ledger.*

Question: 4:

What are the advantages of integrated accounting?

(May 2010, May 2005)

Solution:

Advantages: The main advantages of Integrated Accounts are as follows:

(i) Economical process: It is economical also as it is based on the concept of "Centralisation of Accounting function."

(ii) Less Time consuming: No delay is caused in obtaining information as it is provided from books of original entry.

(iii) No need for Reconciliation: The question of reconciling costing profit and financial profit does not arise, as there is one figure of profit only.

(iv) Less efforts: Due to use of one set of books, there is a significant extent of saving in efforts made. Efforts in duplicate recording of entries and to maintain separate set of books are saved. Thus, there is saving of time and labour.

(v) Complete details available: Complete details of all receipts and payments in cash and complete details of all assets and liabilities are kept and this system does not use notional account to represent impersonal accounts.

(vi) No delay: Costing data are available from books of original entry and hence, no delay is caused in obtaining information.

(vii) Complete analysis: Complete analysis of cost and sales is kept. Since financial books are subject to a rigorous accuracy, checking integrated accounts ensures similar checks for cost account.

Question: 5:

Discuss the reconciliation of Profits as per Cost Accounts and Financial Accounts. (6 marks)

(May 2006, May 2005)

Solution:

Problem of reconciliation arises where cost and financial accounts are maintained independent of each other.

Reconciliation between the results of the two sets of books is necessary due to following reasons :

(i) To find out the reasons for the difference in the profit or loss in cost and financial accounts.

(ii) To contribute to the standardisation of policies regarding stock valuation depreciation and overheads.

(iii) To facilitate co-ordination and promote better co-operation between the activities of financial and cost sections of accounting department.

(iv) To place management in better position to acquaint itself with the reasons for the variation of profit.

Reason for disagreement in profit Following are the reasons of disagreement of profit between two sets of books :

(i) Item shown only in financial accounts.

(ii) Purely financial charge.

(iii) Appropriation of profit.

(iv) Writing of intangible and fictitious assets.

(v) Purely financial income.

(vi) Item shown only in cost accounts.

(vii) Over or under absorption of overheads.

(viii) Different basis of stock valuation

(ix) Different method of changing depreciation.

Question: 6:

List the Financial expenses which are not included in cost.

(Nov 2009)

Solution:

Financial expenses which are not included in cost accounting are as follows:

1. Preliminary expenses

2. Underwriting Commissions

3. Discount on issue of Share

4. Income Tax

5. Interest on debentures and deposit

6. Bonus of Employee

7. Pension

8. Gratuity

Question: 7:

When is the reconciliation statement of Cost and Financial accounts not required?

(Nov 2009)

Solution:

Circumstances where reconciliation statement can be avoided is as follows:

When the Cost and Financial Accounts are integrated - there is no need to have a separate reconciliation statement between the two sets of accounts.

Integration means that the same set of accounts fulfill the requirement of both i.e., Cost and Financial Accounts.

Question: 8:

Solution the following:

"Is reconciliation of cost accounts and financial accounts necessary in case of integrated accounting system?"

(May 2013)

Solution:

• *Under integrated accounting system, cost and financial accounts are kept in the same set of books.*

Such a system will have to afford full information required for Costing as well as for Financial Accounts.

• *In other way we can say, information and data should be recorded in such a way so as to enable the firm to ascertain the cost (together with the necessary analysis) of each product, job, process, operation or any other identifiable activity. It also ensures the ascertainment of marginal cost, variances, abnormal losses and gains. In fact all information that management requires from a system of Costing for doing its work properly is made available.*

• *The integrated accounts give full information in such a manner so that the profit and loss account and the balance sheet can be prepared according to the requirements of law and the management maintains full control over the liabilities and assets of its business.*

Since, only one, set of books is kept for both cost accounting and financial accounting purpose so there is no necessity of reconciliation of cost and financial accounts.

Question: 9:

What are the motivational factors for adopting a reconciliation process? Explain.

(Nov 2017)

Solution:

When the cost and financial accounts are kept separately, it is imperative that these should be reconciled, otherwise the cost accounts would not be reliable. The reconciliation of two set of accounts can be made, if both the sets contain sufficient detail as would enable the causes of differences to be

located. It is therefore, important that in the financial accounts, the expenses should be analysed in the same way as in cost accounts. Motivation for reconciliation is:

- To ensure reliability of cost data
- To ensure ascertainment of correct product cost
- To ensure correct decision making by the management based on Cost & Financial data.

CHAPTER 8: UNIT AND BATCH COSTING**Question: 1:***Distinguish between "Job costing and batch costing".**(May 2006, Nov 2005)***Solution:***Difference between Job Costing and Batch Costing*

1.	Nature	Job costing is a specific order costing.	Batch costing is a special type of job costing.
2.	Applicability	It is undertaken in such industries where work is done as per the customers requirement.	It is undertaken in such industries where production is of repetitive nature.
3.	Similarity	No two jobs are alike.	The articles produced in a batch are alike.
4.	Cost determination	The cost is deter-mined on job basis.	The cost is determined on batch basis.
5.	Output quantity	The output of a job may be 1 unit, 2 units of a batch.	The output of a batch is usually a large quantity.
6.	Cost estimation	The cost is estimated before the production.	The cost is determined after completion of production.
7.	Examples	Industries where job costing is undertaken are repair workshop, furniture, general engineering works.	Industries where batch costing is undertaken are pharmaceuticals, garment manufacturing, radio, T. V. manufacturing etc.

Question: 2:*Describe Job Costing and Batch Costing giving examples of industries where these are used. (3 marks)**(May 2018, May 2001)***Solution:***Job Costing :*

Meaning: It is a method of costing which is used when the work is undertaken as per the customer's special requirement. When an inquiry is received from the customer costs expected to be incurred on the

job are estimated and on the basis of this estimate a price is quoted to the customer. Actual cost of materials, labour and overhead are accumulated and on the completion of job, these actual costs are compared with the quoted price and thus the profit or loss on it is determined.

Job Costing is applicable in printing press, hardware foundry, ship building, heavy machinery, general engineering works, machine tools, interior decoration, repairs and other similar work.

Batch:

A batch is a group of similar and identical product which is produced in a factory and is treated as a single cost unit.

Batch Costing:

Batch costing is a specific type of job costing and is used in industries whose production are of repetitive nature and where articles are produced in definite batches and held in stock. It is that form of job costing where in cost is ascertained collectively for a batch and then cost per unit is determined.

The salient features of Batch Costing are as follows:

- (i) Batch costing is applied in industries where identical products are produced.
- (ii) The output of a batch consists of a number of units and it is not economical to ascertain cost of every unit of output independently.
- (iii) Certain physical characteristics like size colour, taste, quality etc. are required uniformly over a collection of units e.g. garments of same size, pharmaceuticals etc.

Batch Costing is usually undertaken in the following industries:

Pharmaceuticals, garment manufacture, manufacture of spare parts, Radio, T.V, Computer manufacture etc.

Computation :

Batch costing is but a specific type of job costing. Hence cost of each batch is ascertained in the same way as that of an individual job.

Under batch costing a unit cost is ascertained by dividing the batch cost by the no. of units in a batch as follows.

$\text{Cost/Unit} = (\text{Total cost of the batch}) / (\text{No. of units produced in the batch})$

Question: 3:

:::4.12000 - May [4] (c) (2 marks)

Discuss the concept of Economic Batch Quantity (EBQ).

Solution:

Economic batch quantity (EBQ) is the optimum size of a batch to be produced. It represents that number of units to be produced in a batch which will keep the aggregate of set up cost and carrying cost to its minimum.

The determination of EBQ is important because if batch size is kept low the per unit set up cost increases. If the batch, size is increased it results in accumulation of inventory which increases the carrying cost. Thus to minimize the set up cost per unit the batch size is to be increased and to minimize the total carrying cost the batch size is to be lowered. Thus it is necessary to strike a balance between these two costs to minimize the aggregate of these two costs and this balance is brought about by EBQ.

Question: 4:

*In Batch Costing, how is Economic Batch Quantity determined?
(May 2001)*

Solution:

The determination of EBQ involves:

(i) Set up cost

(ii) Carrying cost

(i) Set up cost: Production of each batch of output necessitates the setting up of machine and tools at the commencement of production and again its disassembling on completion of production. The set up cost is the cost of setting up and disassembling of the machines and tools.

The cost remains fixed irrespective of the batch size. Thus if the batch size is low the set up cost per unit is high and vice-versa.

(ii) Carrying cost: The cost associated with the holding the inventory is called carrying cost. It includes rent of the space occupied by the inventory, interest on capital etc. It is a variable cost and is dependent on the batch size.

If the batch size is increased the carrying cost increases and vice-versa.

Thus to keep the aggregate of set up costs and carrying cost to a minimum EBQ is determined with the help of the following formula

$$EBQ = \sqrt{(2AS/C)}$$

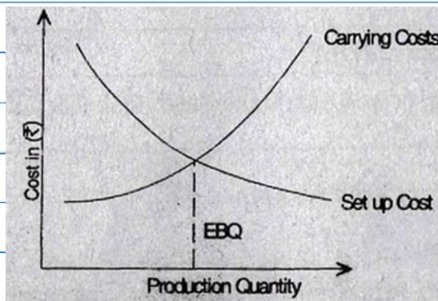
Where A = Annual demand for the product

S = Set up cost per batch

C = Carrying cost per unit of production

*If the rate of interest (I) and unit cost of production (C) are given,
then $EBQ = \sqrt{(2AS/IC)}$*

EBQ can also be determined graphically as under :



CHAPTER 9: JOB AND CONTRACT COSTING**Question: 1:**

What is meant by Job Costing? Give examples of (any four) industries where it is used.

(Nov 2016, May 2001)

Solution:**Job Costing :**

Meaning: It is a method of costing which is used when the work is undertaken as per the customer's special requirement. When an inquiry is received from the customer costs expected to be incurred on the job are estimated and on the basis of this estimate a price is quoted to the customer. Actual cost of materials, labour and overhead are accumulated and on the completion of job, these actual costs are compared with the quoted price and thus the profit or loss on it is determined.

Job Costing is applicable in printing press, hardware foundry, ship building, heavy machinery, general engineering works, machine tools, interior decoration, repairs and other similar work.

Question: 2:

Solution the following:

Explain the terms notional profit and retention money in contract costing.

(Nov 2011)

Solution:

Notional Profit Notional Profit is the excess of income till date over expenditure till date on a contract.

Since actual profit can be computed only after the contract is complete, notional profit is used to recognise profit during the course of contract.

The notional profit is computed as follows:

Value of work certified XXX

Add; Cost of work uncertified XXX

Less: Costs incurred till date XXX

Notional profit XXX

Retention Money The contractor gets money on the basis of work completed as certified by the certificate of work done. Sometimes the customer does not pay the whole value of work done. As per the agreement, a certain percentage of the value of work done is retained by the customer. This is called Retention Money.

The objective behind Retention Money is to place the customer in a favourable position as against the contractor. It safeguards the interest of the customer as against failure of

the contractor to fulfill any of the clause of the agreement or against the defective work found later on.

Question: 3:

Solution the following :

Explain 'Retention Money' and 'Progress payment' in contract.

(Nov 2017)

Solution:

Retention Money in Contract Costing:

A contractor does not receive the full payment of the work certified by the surveyor. Contractor retains some amount to be paid after some time, when it is ensured that there is no default in the work done by the contractor. If any deficiency or defect is noticed, it is to be rectified by the contractor before the release of the retention money. Thus, the retention money provides a safeguard against the default risk in the contracts.

Progress Payment:

Contractors receive payments based on the certificate issued by the architect.

PP = Value of Work Certified - Retention Money.

Question: 4:

What are the main features of 'Cost-Plus-Contracts'?

(Nov 1996)

Solution:

Cost Plus Contract: *A cost plus contract is one in which the contract price is ascertained by adding a percentage of profit to the total cost of contract. In such a contract the, contract gets re-imbursement from the contractor, of all allowable or specifically defined costs incurred, plus a percentage of these expenses or a fixed amount as profit.*

Main features of Cost-Plus Contract:

- 1. The cost-plus-contract is adopted in those contracts where the probable cost of contract can not be estimated with reasonable accuracy.*
- 2. It is adopted in those contracts which may take a long duration to complete.*
- 3. It Is preferred in case of those contracts whose cost of material and labour cost is unsteady and is likely to change in future.*

4. Such a contract is beneficial for both contractor as well as customer. On one hand, it offers a fair price to the customer, and a reasonable profit to the contractor on the other hand.

5. The contract price is ascertained by adding a fixed and predetermined percentage of profit to the total cost of contract.

6. The different costs to be included in the contract are pre-decided so that no dispute arises in future.

7. The customer is allowed to scrutinize the concerned books, documents and accounts of the contractor.

Question: 5:

Write note on 'Escalation Clause'.

(May 2015, Nov 2000)

Solution:

Escalation :

clause Is a stipulation in the contract that the contract price will be increased by an agreed amount or percentage if the price of raw material, wages etc. rises beyond a certain limit. The object of this clause is to safeguard the interest of both sides against unfavourable change in price. By this clause, the contractor's interests are safeguarded as his percentage of profit is not reduced. The customer's interest is safeguard as quality is ensured because due to the escalation clause the contractor does not use materials of low quality.

Accounting Treatment

Step 1 : The increased contract price is determined with reference to the escalation clause.

Step II: The amount due from the customer is recorded in contract A/c by passing the following journal entry.

Customer's A/c ---Dr.

To Contract A/c

CHAPTER 10: PROCESS COSTING

Question: 1:

"The value of scrap generated in a process should be credited to the process account". Do you agree with this statement? Give reasons.

(Nov 1995)

Solution:

The statement is incorrect. The treatment of scrap depends on the condition under which the scrap is generated.

If scrap is generated out of normal loss then the value of scrap should be credited to the respective process account.

If the scrap is generated out of abnormal loss or abnormal gain then the value of scrap should be credited to the abnormal loss A/c or Abnormal gain A/c.

Thus the value of scrap generated in a process is not always credited to the process account.

Question: 2:

Explain normal wastage, abnormal wastage and abnormal gain and state, how they should be dealt within Process Cost Accounts.

(Nov 1998)

Solution:

Normal Process Loss :

The loss, which is unavoidable and is expected during the course of production, is called normal process loss. Normal process loss may arise due to evaporation, chemical reaction, shrinkage, etc.

Accounting treatment of normal process loss :

No separate account is maintained for normal process loss. This is because the cost of normal loss is to be borne by the good units produced in the process. The cost of normal loss is ascertained and charged to respective process account.

If normal loss is disposed off for some price, then the realisable value from the sale of normal process loss is credited to the concerned process account. Thus, in this type of situation, only the difference between the cost of normal process loss and its realisable value is to be borne by the good units.

Abnormal Process Loss :

There are certain losses, which are caused by unexpected or abnormal reasons such as fire, theft, breakage, negligence etc. Such losses are known as abnormal process loss from accounting point of view.

$\text{Abnormal process loss} = \text{Actual process loss} - \text{Normal process loss}.$

Accounting treatment of abnormal process loss :

A separate account is maintained for abnormal process loss as Abnormal Process Loss Account. This is so because, since the abnormal losses are avoidable and can be controlled, it is not fair to charge the cost of abnormal loss to the good units.

All the costs of abnormal loss are ascertained and transferred to the Abnormal loss account.

The following formula is used to ascertain the cost of abnormal loss.

$\text{Cost of abnormal loss} = \frac{[\text{Total Process Cost}] - [\text{Realisable value of normal loss if any}]}{(\text{Normal Output})} \times \text{Number of units of Abnormal loss}$

Where,

$\text{Normal output} = \text{Total input} - \text{Normal process loss}$

$\text{Unit of Abnormal loss} = \text{Total or Actual Process Loss} - \text{Normal Process Loss}$

The cost and units of abnormal process loss computed as above are credited to the concerned process account and debited to the Abnormal Process Loss A/c.

The abnormal process loss A/c is closed by transferring the balance to costing profit & loss A/c i.e. debiting Costing P&L A/c and crediting Abnormal Loss A/c.

If the abnormal loss has some scrap value and is disposed off accordingly, then only the balance abnormal loss is debited to Costing P&L A/c and credited to Abnormal loss A/c.

Abnormal process Gain :

It is quite natural that certain amount of material will be lost, or scrapped during the course of production. It is an expected loss, which cannot be avoided. Such a loss is anticipated in advance and is termed as normal process loss. If the actual loss is lower than the anticipated normal loss, then there arises abnormal gain.

Thus, $\text{Abnormal gain} = \text{Actual process loss} - \text{Normal process loss}.$

Accounting treatment of Abnormal Gain.

The accounting treatment of abnormal gain is similar to that of abnormal process loss.

A separate account Abnormal gain A/c is maintained.

The cost of abnormal gain is ascertained and this cost is debited to the respective process account and credited to the Abnormal gain Ac.

The Abnormal gain A/c is debited with the figure of reduced normal loss both in units as well as costs.

The Abnormal gain A/c is closed by transferring the balance of abnormal gain A/c to costing P&L A/c.

Question: 3:

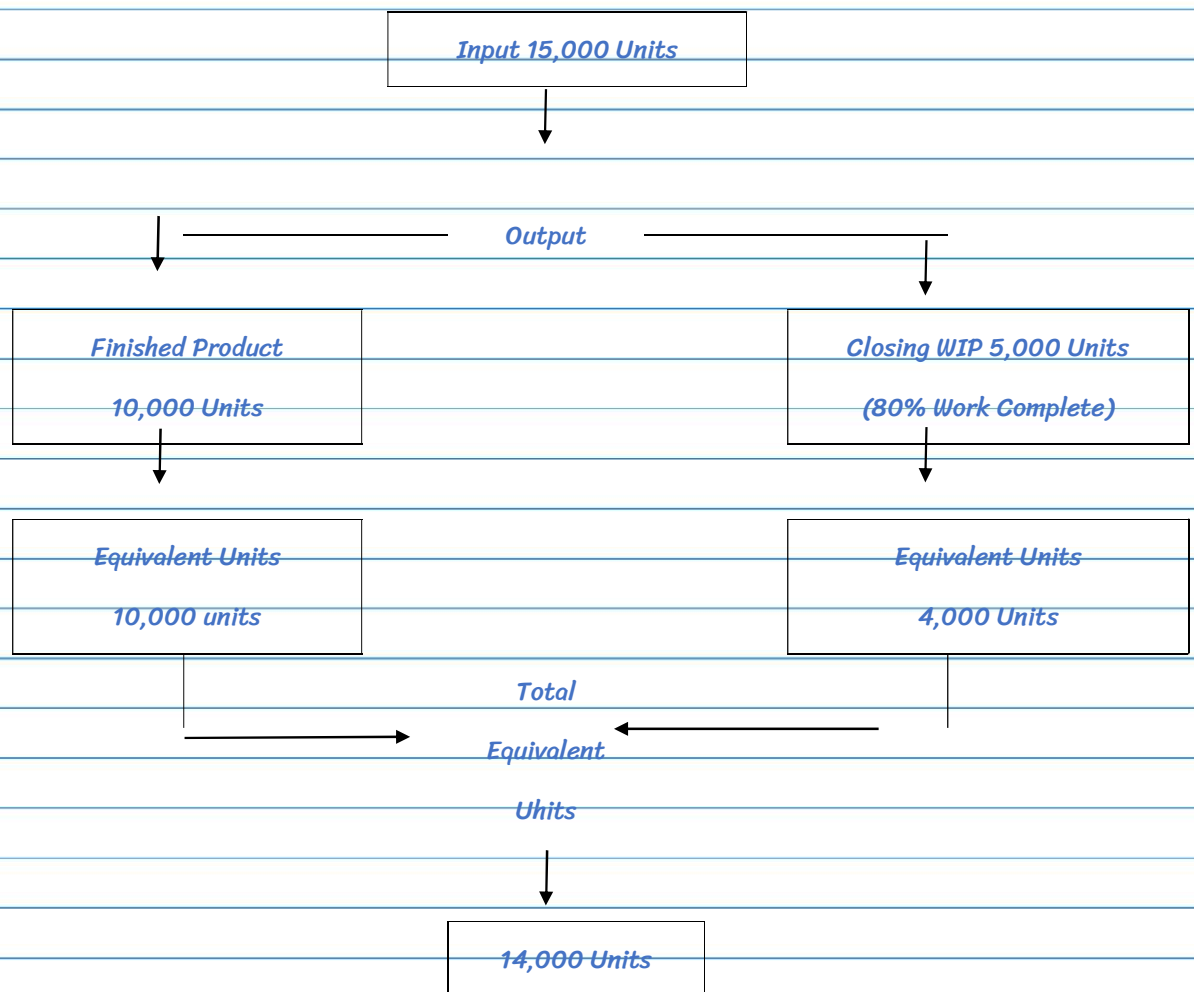
Explain "Equivalent Production".

(Nov 2015, May 2002)

Solution:

Equivalent Production:

The presence of opening or closing WIP poses an accounting problem as to the evaluation of inventory as well as ascertainment of cost per unit of output. To solve this problem, the WIP or incomplete units are expressed in terms of complete units, which are termed as equivalent units of production. Thus, equivalent production refers to a systematic procedure of expressing the output of a process in terms of completed units. It is, therefore, the conversion of uncompleted production into its equivalent completed units.



Equivalent units of production means converting the uncompleted production into its equivalent completed units. To compute the equivalent units, in each process, an estimate is made of the percentage completion of the closing WIP. The WIP is inspected and an estimate is made of the degree of completion, usually on a percentage basis.

Then the equivalent units of WIP can be computed by the following formula:

Equivalent units of production.

= Actual no. of units in WIP \times Percentage of work completed.

E.g.

If the units in WIP be 200 and 60% work is completed then

Equivalent Units = $200 \times 60\%$

= 120 units.

Question: 4:

Explain briefly the procedure for valuation of Work-in-process.

(Nov 2002)

Solution:

Presently WIP is valued in two ways, depending upon the assumption made regarding the flow of costs:

1. FIFO (First-in-first out) method

2. Average cost method.

When the prices of raw material and rate of labour and overhead are more or less stable WIP is valued by FIFO method.

Under this method it is assumed that the raw materials issued to WIP pass through the finished goods in a progressive cycle i.e. what comes out first goes out first.

The closing WIP is valued at costs during the new period while opening WIP is valued at costs of the old period.

When the prices of raw material and rate of labour and overhead fluctuate from period to period, WIP is valued by "Average cost method." Under this method the closing WIP in old period is added to the cost of new period and an average rate is obtained which tries to even out price fluctuations.

Question: 5:

What is inter-process profit? State its advantages and disadvantages.

(Nov 2013, Nov 2012)

Solution:

Inter Process Profit

Meaning: We know that in processing units the output for one process becomes the input for the next process. The price at which the output of one process is transferred to another, is called interprocess price. In some processing units the output from one process is transferred at cost plus a percentage for profit. This profit (transfer price-cost) is called inter process profit. Thus, inter-process profit is the profit made by the transfer of output from one process to another.

Advantage :

Inter-process profit facilitates to evaluate the performance of each process, from the cost effectiveness point of view and also from the profit point of view.

Disadvantage:

However, it poses a problem especially for the valuation of closing WIP. This is because, for financial statement purpose closing WIP should be valued at cost or market value whichever is lower. Whereas under this system, WIP should be valued at cost plus profit.

Question: 6:

"Operation costing is defined as refinement of Process costing." Explain it.
(May 2007)

Solution:

Operation costing is used for establishing cost of services rendered or service offered for sale and no items are produced. It is also applied to the operations concerned within an organisation which provides services to production departments. It is solely concerned with the determination of the cost of each operation rather than the process costing.

Operation costing provides better control and facilities, the computation of unit operation cost at the end of each operation. So, it can be said that the method of operation costing is similar to output costing but not as process costing.

CHAPTER: 11 JOINT PRODUCT & BY PRODUCT**Question: 1:**

Describe briefly, how joint costs upto the point of separation may be apportioned amongst the joint products under the following methods:

- (i) Average unit cost method*
- (ii) Contribution margin method*
- (iii) Market value at the point of separation*
- (iv) Market value after further processing*
- (v) Net realizable value method*
- (May 2009)*

Solution:

Methods of apportioning joint cost among the joint products :

(i) Average Unit Cost Method

- *In this method, total process cost (upto the point of separation) is divided by total units of joint products produced.*
- *On division average cost per unit of production is obtained. The effect of application of this method is that all joint products will have uniform cost per unit.*

(ii) Contribution**Margin Method:**

- 1. In this method joint costs are segregated into two parts - variable and fixed. The variable costs are apportioned over the joint products on the basis of units produced (average method) or physical quantities.*
- 2. When the products are further processed, then all variable cost incurred be added to the variable cost determined earlier.*
- 3. After that contribution is calculated by deducting variable cost from their respective sales values.*
- 4. The fixed costs are then apportioned over the joint products on the basis of contribution ratios.*

(iii) Market Value at the Time of Separation:

- 1. This method is used for apportioning joint costs to joint products upto the split off point.*
- 2. This method is difficult to apply if the market value of the products at the point of separation are not available.*
- 3. The joint cost may be apportioned in the ratio of sales values of different joint products.*

(iv) Market Value after Further Processing:

1. Under this method the basis of apportionment of joint costs is the total sales value of finished products at the further processing.

2. The use of this method is unfair where further processing costs after the point of separation are disproportionate or when all the joint products are not subjected to further processing.

(v) Net Realisable Value Method :

1. Under this method joint costs are apportioned on the basis of net realisable value of the joint products,

Net Realisable Value = Sale value of joint products (at finished stage)

(-) estimated profit margin

(-) selling & distribution expenses, if any

{-) post split-off cost

Question: 2:

How apportionment of joint costs upto the point of separation amongst the joint products using market value at the point of separation and net realizable value method is done? Discuss.

(Nov 2010)

Solution:

Apportionment of Joint Cost amongst Joint Products using:

Market value at the point of separation

Under this method, the market value of the joint products at the separation point is ascertained and the total cost is ascertained in the ratio of the value.

It is difficult to apply if the market value of the product at the point of separation are not available. It is useful method where further processing costs are incurred disproportionately.

Net realizable value Method

Under this method from the sales value of joint products (at finished stage) are deducted:

Estimated profit margins Selling distribution expenses, if any Post split off costs.

The resultant figure so obtained is known as net realizable value of joint products. Joint costs are apportioned in the ratio of net realizable value.

Question: 3:

How would you account for by-product in cost accounting:

(i) When they are of small total value.

(ii) When they are of considerable total value.

(iii) When they require further processing.

(May 1997)

Solution:

From cost accounting point of view by products may be classified as under:

(a) By-products of small total value

(b) By-products of considerable total value

(c) By-products which require further processing

Treatment of by products of small total value: When the by products are of small total value then the amount realised from its sale may be either:

(a) Credited to P & L A/c as miscellaneous income or as additional sales revenue.

Or

(b) Deducted from either the cost of production or from cost of sales.

Treatment of by products of considerable total value: When the by products are of considerable total value then they are considered some as joint products and treated in the same way as that of joint products.

Treatment of by products which require further processing : When the by products require further processing, the net realisable value at split off point is computed as under:

Final sales value of product		XXXX
Less: Profit Margin	XXXX	
further processing cost	XXXX	
Selling overhead	XXXX	XXXX
Net Realisable value		XXXX

If NRV is a small value then it is credited to P&L A/c.

If NRV is a considerable value it is considered as a joint product and is treated like wise.

CHAPTER 12: SERVICE COSTING**Question: 1:***Distinguish between the Absolute ton-kms and Commercial ton-kms.**(Nov 2006)***Solution:***When goods are transported, the cost unit is tonne kilometres or quintal kilometres which are computed as:*

- 1. Absolute (weighted average) tonne-kilometres*
- 2. Commercial (simple average) tonne-kilometres*

*Absolute (weighted average) tonne- kilometres: It is the sum total of tonnes-kilometre which is determined by multiplying various distances by respective load quantity carried.**or**Numerically, Absolute tonne-kilometres = \sum (Distance covered between two stations local carried)**Commercial (simple average) tonne-kilometres: It is the sum total of tonnes-kilometre which is determined by multiplying total distance by average load quantity carried.**or, Numerically, Commercial tonne Km = Avg. Load \times Distance covered.***Question: 2:***Write Short Notes on Operating Costing.**(May 1997)***Solution:**

- Operating costing is one of the methods of costing used to ascertain the cost of generating and rendering services such as transport, hospitals, canteens, electricity etc.*
- It is undertaken in industries which provides services such as canteens, hospitals, electricity, transport etc.*
- Operating Costing aims at ascertaining the operating costs.*
- The cost incurred to generate and render services such as hospital, canteen, electricity, transport etc. is called operating cost.*

Question: 3:*State the unit of cost for the following industries : '**(a) Transport*

(b) Power

(c) Hotel

(d) Hospital

(Nov 2008)

Solution:

The unit of cost for various industries are as follows :

Industry	Unit of Cost
(a) Transport	(i) Goods - Per ton km. or per tonne km. (ii) Passengers - per passenger km.
(b) Power	Per kilo-watt hour (Kwh) or Horse Power (HP)
(c) Hotel	Per Room-day or Per Service-day
(d) Hospital	Per Patient-day or Per Bed-day or per Operation

Question: 4:

"The more kilometers you travel with your own vehicle, the cheaper it becomes". Comment briefly on this statement.

(Nov 1995)

Solution:

The cost per kilometre is arrived at by dividing the total cost incurred by the total kilometres travelled. Since the majority of cost for running and maintaining vehicles are fixed in nature, the fixed cost per kilometre decreases with increase in kilometre. Thus as more kilometres is travelled it becomes cheaper.

CHAPTER 13: STANDARD COSTING

Question: 1:

Mention the causes that give rise to labour rate variance.

(Nov 1996)

Solution:

Labour variance arises due to the difference between standard labour hour rate specified and the actual labour, hour rate paid. It is computed by multiplying the actual hours taken by workers on a job by the difference between the standard and actual wage rate per hour.

Main causes which contribute for the occurrence of labour rate variance are as below:

- 1. Increase in actual wage rate per hour paid to workers.*
- 2. Payment of special increments or allowances to workers.*
- 3. Resorting to excessive overtime.*
- 4. Using a gang or mix different from that used for setting labour standard.*
- 5. Use of wrong type of labour i.e. for a job requiring the use of non-skilled labour uses skilled labour. Since the wages of skilled labour are more than that of non-skilled labour, therefore this increased wage rate per hour of skilled labour force accounts for the occurrence of labour rate variance.*
- 6. Non-anticipated wage increase at the time of setting standards.*

Question: 2

"Overhead variances should be viewed as interdependent rather than independent". Explain.

(May 2006)

Solution:

Overhead variances occur due to the difference between actual overheads and absorbed overheads.

Therefore, if we have to calculate an overhead variance, we have to know the amount of the actual overheads and that of absorbed overheads.

The actual overheads can be known only at the end of the accounting period when the expense accounts are finalized.

The absorbed overheads are the overheads charged to each unit of production on the basis of a predetermined overhead rate.

Such pre-determined rate is also known as standard overhead recovery rate, or standard overhead absorption rate or standard burden rate.

To calculate the standard overhead recovery rate, we have to first make an estimate of the likely overhead expenses for each department for the next year.

The estimate of budget of the overheads is to be divided into fixed and variable elements.

An estimate of the level of normal capacity utilization is then made either in terms of production or machine hours or direct labour hours.

The estimated overheads are divided by the estimated capacity level to calculate the pre-determined.

Overhead absorption rate as shown below:

Std. Fixed Overhead Rate = (Budgeted fixed overheads)/(Normal volume)

Std. Variable Overhead Rate = (Budgeted variable overheads)/(Normal volume)

Question: 3

How are cost variances disposed off in a standard costing system? Explain.

(Nov 1998)

Solution:

There is no difference of opinion among the Cost Accountants regarding the disposition of variances.

The following are the commonly used methods by them for the disposition of variance.

1. Transfer all variances to Profit and Loss Account, Under this method, stock of work-in-progress, finished stock and cost of sales are maintained at standard cost and variances arising are transferred to profit and loss account.

2. Distributing variances on pro-rata basis over the cost of sales, work-in- progress and finished goods stocks by using suitable basis.

3. Write off quantity variance to profit and loss account and spread price variance over to cost of sales, work in progress and finished goods. The reason behind apportioning price variance to inventories and cost of sales is that they represent costs although they are derived as variances.

Question: 4

"Calculation of variances in standard costing is not an end in itself, but a means to an end." Discuss.

(May 1999)

Solution:

The gist of standard costing lies in variance analysis. Standard costing is the technique whereby standard costs are predetermined and subsequently compared with the recorded actual costs. It is a technique of cost ascertainment and cost control. It establishes predetermined estimates of the cost of products and services based on management's standards of efficient operation. It lays emphasis on "what the cost should be". These costs should be then compared with the actual costs. The difference between standard cost and actual cost of actual output is defined as the variance. The calculation of variances is simple. A variance may be favourable or unfavourable. If the actual cost is less than the

standard cost, the variance is favourable but if the actual cost is more than the standard cost, the variance will be unfavourable. These costs should be then compared with the actual costs. The difference between standard cost and actual cost of actual output is defined as the variance. The calculation of variances is simple. A variance may be favourable or unfavourable. If the actual cost is less than the standard cost, the variance is favourable but if the actual cost is more than the standard cost, the variance will be unfavourable. They are easily expressible and do not provide detailed analysis to enable management to exercise control over them. It is not enough to know the figures of these variances from month to month. Standard costing is required to trace their origin and cause of occurrence for taking necessary remedial steps to reduce/ eliminate them.

Variances help the management to ascertain:

(1) the amount of a variance.

(2) the factors or causes of their occurrence.

(3) the responsibility to be laid on executives and departments.

(4) corrective actions which should be taken to obviate or reduce the variances.

The success of variance analysis depends upon how quickly and effectively the corrective actions can be taken on the analysed variances. Variances give only information. The manager needs to act on the information provided for taking corrective action. Information is the means and action taken on it is the end.

Therefore, we can say that the calculation of variances in standard costing is not an end in itself, but a means to an end.

Question: 5

Describe three distinct group of variances that arise in standard costing.

(May 2005)

Solution:

The three distinct groups of variances that arise in standard costing are :

1. Variances of efficiency: These are the variances, which arise due to efficiency or inefficiency in use of material, labour etc.

2. Variances of prices and rates : These are the variances, which arise due to changes in procurement, price and standard price.

3. Variances due to volume : These represent, the effect of difference between actual activity and standard level of activity.

The above can be summarised as follows:

Element of cost	Variance of efficiency	Variance of price	Variance due to volume
Materials	Usage, mixture, Yield	Price	Revision

	Labour	Efficiency, Idle time	Rate of pay	-
	Overheads			Revision
	Variable.	Efficiency	Expenditure	Revision.
	Fixed	Efficiency	Expenditure	Capacity
				Calender
	Question: 6			
	<p><i>"Standard costing variances centre around comparison of Actual Performance with the standard and the standards or plans are normally based on the environment anticipated when the targets are set and if the current environment is different from that anticipated, such analysis cannot measure managerial performance/" Comment on the statement and how will you deal with the situation with reference to material, labour and sales variances.</i></p> <p><i>(Nov 2000)</i></p>			
	Solution:			
	<p><i>The statement given in the question shows a practical problem faced by our enterprises :</i></p> <p><i>When the current circumstances are different from the anticipated circumstances, the use of routine analysis of variance for measuring managerial performance is not desirable/suitable.</i></p> <p><i>Variance analysis can be useful for measuring managerial performance if the variances computed are determined on the basis of revised targets/standards based on current actual environmental conditions.</i></p> <p><i>In order to deal with the above situation i.e. to measure managerial performance with reference to material, labour and sales variances, it is necessary to proceed and compute the following variances.</i></p> <p><i>Material variances :</i></p> <p><i>In the case of material purchase price variance, suppose the standard price of raw material determined was Rs. 50 per unit, the general market price per unit at the time of purchase was Rs. 55 and actual price paid per unit was Rs. 53 on the purchase of say 1,000 units of raw material.</i></p>			
	<p><i>In this case the variances to be computed should be :</i></p> <p><i>Uncontrollable material purchase price planning variance :</i></p> <p><i>= (Standard price p.u. - General market price p.u.) Actual quantity purchased</i></p> <p><i>= (Rs. 50 - Rs. 55) 1,000 units . = 5,000 (Adverse)</i></p> <p><i>Controllable material purchase price efficiency variance :</i></p> <p><i>= (General market price p.u. - Actual price paid p.u.) Actual quantity purchased</i></p> <p><i>= (Rs. 55 - Rs. 53) 1,000 units = 2000 (Favourable)</i></p>			

Labour Variances: As in the case of material variances, here also, labour efficiency and wage rate variances should be adjusted to reflect changes in environmental conditions that prevailed during the period. The labour efficiency variance would be equivalent to the following two variances :

(a) Uncontrollable labour efficiency planning variance

(b) Controllable labour efficiency variance

The above variances would arise when unskilled labour is substituted for skilled labour.

Sales variances: The conventional sales volume variance reports the difference between actual and budgeted sales, priced at the budgeted contribution per unit. Such variance merely indicates whether sales volume is greater or less than expected. It does not indicate how well actual sales volume should be compared with an expert estimate that reflects the market conditions prevailing during that period.

Total sales margin variance (planning element) :

$$= \{ \text{Expert's budgeted sales volume} \times (\text{Expert's selling price} - \text{Standard cost}) - \text{Original budgeted sales volume} \times (\text{Budgeted selling price} - \text{Standard cost}) \}$$

Total sales margin variance (appraisal element):

$$= \{ \text{Actual sales volume} \times (\text{Actual selling price} - \text{Standard cost}) - \text{Expert's budgeted sales volume} \times (\text{Expert's selling price} - \text{Standard cost}) \}$$

The amount of "Expert's budgeted sales volume" for a particular product can be determined by estimating the total market sales volume for the period and then multiplying the estimate by the target percentage of market share.

Question: 7

State the features of Partial Plan of Standard Cost Accounting procedure.

(May 2001)

Solution:

Features of Partial Plan of Standard Cost Accounting procedure :

Standard cost operations can be recorded in the books of account by using partial plan.

Features of partial plan are as follows

1. Partial plan system uses current standards in which the inventory will be valued at current standard cost figure.

2. The analysis of variance is done after the end of the month.

3. The closing balance of WIP is also shown at standard cost. The balance after making the credit entries represent the variance from standard for the month.

4. Under this method, WIP account is charged at the actual cost of production for the month and is credited with the standard cost of the month's production of finished product.

Question: 8

"Standard costing system is not compatible with Activity Based Costing System." Do you agree with this statement? Explain your Solution.
(May 2002)

Solution:

It is not correct to say that standard Costing system is not compatible with Activity Based Costing System.

Standard costing system is a tool for cost control. In this, standards are established for each cost element. Variances between standard cost and actual costs are reported periodically to managers, who use the information of remedial measures or for revision of standards.

Under 'Activity Based Costing System' costs are collected around activity pools and are assigned to products and services using appropriate cost drivers. Standards can be established for costs for carrying out each type of activity.

Question: 9

How the opportunity cost for inefficient use of scarce resources be presented in variance reports under a standard costing system?
(May 2007)

Solution:

Opportunity cost arises from failure to use scarce resources efficiently, such as:

1. Inefficient capacity utilisation results in loss of production and consequently loss of contribution.
2. Inefficient use of scarce material results in lower production and loss of contribution.

So, it is appropriate to include contribution loss in reporting material usage variance or labour efficiency variance, in case the material is scarce or labour hours is scarce. As a general rule, loss of contribution should be included in the variance report and should be assigned to the manager, whose below standard performance has caused the loss.

Question: 10

Under the single plan, record the journal entries giving appropriate narration, with indication of amounts of debits or credits alongside the entries, for the following transactions using the respective control A/c.

(i) Material price variance (on purchase of materials)

(ii) Material usage variance (on consumption)

(iii) Labour rate variance.

(Nov 2006)

Solution:

Under the single plan, Journal entries are :

(i) Material price variance (on purchase of materials)

Material Control A/c Dr.

Material price Variance A/c Dr or Cr. (Bal. Fig)

To Creditor A/c

(Being price variance during purchase of materials)

(ii) Material usages variance (on consumption)

WIP Control A/c Dr.

Material usage variance Dr or Cr. (Bal fig).

To Material Control A/c

(Being recording of usage variance at Standard cost of over/under utilised quantity).

(iii) Labour Rate Variance

Wage Control A/c Dr,

Labour Rate variance Dr. or Cr. (Bal. Fig)

To Cash

(Being entry to record wages at standard rate)

Question: 11

: : : 6.9.2015-Nov [7] (b) (4 marks)

Solution the following:

Describe the various steps involved in adopting standard costing system in an organisation.

Solution.:

Standard costing is an accounting technique the breaks overspending and underspending on material labour and overhead cost into their price and quantity Components. For e.g. a manager may notice that the company spent too much on material last month. By implementing a standard costing system, the manager will be able to determine how much of the overage is relating to the cost of materials and how much is related to overuse. Understanding the first step of standard costing, implementing can help you design a standard costing system for your small business.

Steps:

- Practical or ideal standards

- Material standards

- Labour standards

- Variable standards

CHAPTER 14: MARGINAL COSTING**Question: 1***Highlight the basic differences between Differential costing and Marginal costing.**(Nov 2000)***Solution:*****Difference between Differential Costing and Marginal Costing:****The basic differences between differential costing and marginal costing are as below:*

- 1. Differential cost analysis is possible in both absorption costing and marginal costing.*
- 2. The technique of marginal costing requires a clear distinction between variable costs and fixed costs whereas no such distinction is made in the case of differential costing. In differential costing all total relevant costs irrespective of the fact whether they are fixed or variable are considered whereas in the case of marginal costing only variable costs are taken into account.*
- 3. Marginal costs may be incorporated in the accounting system whereas differential costs are worked out separately as analysis statements.*
- 4. In marginal costing margin of contribution and contribution ratio are the main yardsticks for performance evaluation and for decision making. In differential costs analysis, differential costs are compared with the incremental or decremental revenues as the case may be, and then arrive at a decision.*

Question: 2*Distinguish between absorption costing and marginal costing.**(Nov 2003, Nov 2001)***Solution:*****Difference between Absorption Costing and Marginal Costing***

<i>Sl. No.</i>	<i>Basis</i>	<i>Absorption Costing</i>	<i>Marginal Costing</i>
<i>1</i>	<i>Calculation of Manufacturing Overhead rates</i>	<i>In this, absorption rate includes, both fixed and variable * manufacturing overheads.</i>	<i>Marginal costing rate includes only variable manufacturing overhead.</i>
<i>2</i>	<i>Valuation of Inventory</i>	<i>In Absorption costing, valuation is on Product cost i.e. Prime cost + applied fixed and variable manufacturing overheads.</i>	<i>Marginal costing will be at Prime cost + applied variable manufacturing overhead.</i>

3	Classification of Overhead	In Absorption costing, the overhead may be classified as factory, administrative, selling and distribution.	In marginal costing, overheads are classified as variable and fixed.
4	Operating Profit	Under absorption costing Gross Profit = Net Sales - Manufacturing costs = Prime cost + Fixed and variable manufacturing overhead.	In Marginal costing, Marginal income or contribution = net sales - variable manufacturing cost of goods sold - variable administrative, selling and distribution over-head.
5	Net Operating Profit	Under absorption costing, net operating profit = Gross profit administrative selling and distribution overheads (Fixed and variable combined).	Under Marginal costing, Net Operating Profit = Marginal income or contribution Fixed manufacturing overhead - fixed administrative over-head - fixed selling and distribution overhead.
6	Effect of Stock Valuation	The difference in the magnitude of opening and closing stock affects the unit cost of production due to the impact of the related fixed cost.	The difference in the magnitude of opening and closing stock does not affect the unit cost of production.
7	Decision Making	It distorts decision making	It aids decision making.
8	Profitability	Fixed costs are charged to the cost of production. Each product bears reasonable share of fixed costs and thus the profitability of a product is influenced by an apportionment of fixed asset.	Fixed costs are regarded as period costs. The profitability of different products are judged by their P/V ratio.
Question: 3			
2002 - May [2] (a) Distinguish			
Differentiate between 'cost indifference point' and 'break-even point'.			
(4 marks)			
Solution:			
Cost indifference point: Is the point at which total cost lines under the two alternatives intersect each other.			

Cost indifference point is calculated as under:

$(\text{Difference in fixed costs})/(\text{Difference in variable costs})$ or $(\text{Difference in fixed costs})/(\text{Difference in PV costs})$

Whereas, Break-even point is the point where the total cost line and total revenue line for a particular alternative intersect each other.

Breaks even point is calculated as under:

$(\text{Fixed costs})/(\text{Contribution per unit})$ or $(\text{Fixed costs})/(\text{PV ratio})$

The following are the main points of distinction between cost indifference point and break-even point:

1. The cost indifference point is the activity level at which total cost two alternatives are equals, whereas break-even point is the activity level at which the total revenue from a product or product mix is equal to its cost.
2. Cost indifference point is used to choose between two alternative processes for achieving the same objective. The choice depends on the estimated activity level. Break-even point is used for profit planning.

Question: 4:

Write short notes on the following :

Angle of Incidence

(May 2012)

Solution:

Angle of incidence

- Angle of incidence is formed by the intersection of sales line and total cost line at the break-even point.
- This angle shows the rate at which profits are being earned once the break-even point has been reached.
- The wider the angle the greater is the rate of earning profits. A large angle of incidence with a high margin of safety indicates extremely favourable position.

Question: 5

Indicate any five circumstances under which you will permit to fix a price, which is less than the marginal cost of the product.

(May 1998)

Solution:

Circumstances under which a firm may fix a price less than the marginal cost of the product are as under:

- 1. When goods are of perishable nature.*
- 2. When the concern had already purchased huge quantities of raw materials and the prices of these materials is falling considerably in the market.*
- 3. When competitors are to be eliminated from the market,*
- 4. When a new product is to be introduced in the market.*
- 5. To obviate shut-down costs*

Question: 6

"Use of absorption costing method for the valuation of finished goods inventory provides incentive for over-production." Elucidate the statement.

(May 2002)

Solution:

If absorption costing method is used, production fixed overheads are charged to product and are included in product costs. Consequently, the closing stocks are valued on total costs (including fixed overheads) basis. The net effect is that the charge of fixed overheads to P/L account gets reduced, if the closing stock is greater than the opening stock. This situation has the effect of inflating the profit for the period.

When stock levels are likely to fluctuate significantly, profits may be distorted if calculated on absorption costing basis. If marginal costing is used, since the fixed costs are charged off to P/L account as period cost, such a situation will not arise. The impact of using absorption costing on profits can be summarized as under:

- 1. When sales are equal to production, profits will be the same under absorption costing and marginal costing.*
 - 2. If production is higher than sales, the absorption costing will poster higher profit than marginal costing.*
 - 3. If sales are in excess of production, absorption costing will show lower profits than marginal costing.*
- Since profit calculation in absorption costing can produce strange result, the managers may deliberately alter the stock levels to influence the profits if absorption costing is used. Hence, it is true to say that if absorption costing method is used managers have the incentive to over-produce to show better result.*

Question: 7

"The use of Absorption Costing method in decision-making process leads to anomalies.: Discuss.

(May 2006)

Solution:

The statement is given in the question: : :: is correct in the following ways:

1. In this method all fixed costs are not charged against the revenue of the year in which they are incurred. It is an unsound practice.
2. Behavioural pattern of costs is not given importance.
3. Absorption costing produces a means of determining selling prices, but in most cases accuracy cannot be achieved due to the nature of overheads included in the calculations.
4. Assigning product cost with a reasonable share of fixed overhead obscures cost-volume-profit relationship. When there are different types of cost units, the attribution of overheads to them is bound to be arbitrary to some extent. If sales pricing decisions are based on total unit costs there is a danger that some products will be over-priced and others under-priced, and total revenue and/or profit will not be maximised.
5. This method employs highly arbitrary way of apportionment of overheads which reduces the utility of cost data for control purposes. Neither the actual nor the predetermined method of absorption distinguishes clearly the extent to which total unit costs are affected by volume changes and other causes respectively. Thus, there is no one unit cost that may be used as a guide to decision-making when the decision involve a change in volume.
6. In reporting enterprise results, the profit of a particular period will be affected by the amount of overheads absorbed into closing inventories or work-in-progress or finished stock or charged against the period when opening inventories are sold.
7. The decision-maker needs to know the costs that will vary as a result of his decision, and the costs that will remain unchanged. Absorption costing does not provide a convenient basis for making such calculations. Its main purpose is to provide cost information for stock valuation and the measurement of reported profits.
8. The complaint is sometimes made that absorption costing often deals only with production costs and ignores selling and administration costs.

Question: 8

What are the limitations of marginal costing? Explain.

(Nov 1998)

Solution:

1. Marginal costing technique is not useful for valuation of inventory.
2. Marginal costing cannot be successfully applied in cost plus contract unless a proper percentage over marginal cost is charged to cover the fixed cost and profit.

3. Marginal costing technique excludes fixed cost for decision making which some times leads to wrong conclusion. It may create difficulty in inter-firm comparison, higher demand of salaries, large tax payment etc.
4. Marginal costing assumes that all costs can be classified into fixed and variable. But it is not so, as there are costs which are neither fixed or variable. For example, various amenities provided to workers may have no relation either to volume of production or time factor.
5. Contribution of a product itself is not a guide for optimum profitability unless it is linked with the key factor.
6. Marginal Costing ignores time factor and investment. For example, the marginal cost of two jobs may be the same but the time taken for their completion and the cost of machines used may differ. The true cost of a job which takes longer time and uses costlier machine would be higher. This factor is not disclosed by marginal costing.
7. The overheads of fixed nature cannot altogether be excluded particularly in large contracts while valuing work-in-progress. In order to show the correct position, fixed overheads have to be included in work-in- progress.
8. In the long run, the selling prices should be based on total cost, i.e, inclusive of fixed cost also. In the short run or in special, situations when a product is sold below the total cost, customers may insist on the continuation of reduced prices forever which may not be possible in all cases. Further, sales staff may mistake marginal cost for total cost and sell at a price which will result in loss or low profit. Hence, sales staff should be cautioned while giving marginal cost.
9. The main assumptions regarding behaviour of costs are not true. The variable costs do not remain constant per unit of output. There may be changes in the prices of raw materials, wage rates, etc., after a certain level of output has been reached due to shortage of material, shortage of skilled labour, concessions of bulk purchases, etc. Similarly, the fixed costs does not remain static. They may change from one period to another. For example, salary bill may go up because of annual increments or due to change in pay rate etc.

Question: 9

What is contribution? How is it related to profit?

(May 1998)

Solution:

The excess of selling price over variable costs is known as contribution.

Contribution = Sales - Variable Cost.

Or

Contribution is also known as the gross margin. It indicates the amount of sales revenue which is available to cover fixed costs and profits. Once fixed costs have been fully received by the contribution, every rupee of additional sale is a net addition to profits. Entire marginal costing is based on this concept.

Contribution helps the management in solving the following problems:

1. Fixation of selling price.
2. Pricing in depression .
3. Accepting a special offer from a new market.
4. Level of activity planning.
5. Evaluation of profitability of various products, departments etc.
6. Selection of an optimum sales mix..
7. Alternative methods of production.
8. Operate or shut down decisions.

Question: 10

Explain, how Cost Volume Profit (CVP)-based sensitivity analysis can help managers cope with uncertainty.

(Nov 2000)

Solution:

Sensitivity analysis focuses on how a result will be changed if the original estimates of the following assumptions has changed.

Cost Volume Profit (GVP)-based sensitivity analysis can help managers to provide Solutions to the following question: : ::s to cope up with uncertainty.

1. What will be the profit if the sales mix changes from that originally predicted?
2. What will be the profit if fixed costs increase by 10% and variable cost decline by 5%?

The use of spread sheet packages has enabled managers to develop CVP computerised models which can Solution the above question.

Managers can now consider alternative plans by keying the information into a computer, which can quickly show changes both graphically and numerically.

Therefore, managers can study various combinations of change in selling prices, fixed costs, variable costs and product mix, and can react quickly without waiting for formal reports from the accountant.

In such a way the use of CVP based sensitivity analysis can help managers to cope up with uncertainty.

Question: 11

What is Cost-volume-profit analysis and what are it objectives

(May 2001)

Solution:

Cost-volume-profit analysis: It is the analysis of three variables, viz., cost, volume and profit, which explores the relationship existing amongst costs, revenue, activity levels and the resulting profit. Profit, as a variable, is the reflection of a number of internal and external conditions which exert their influence on sales revenue and costs. Revenue depends upon selling prices, costs, volume of sales, demand, competition, etc. Although none of these can be singled out as the most important, the volume is considered to be a dominant factor. This is probably because changes in volume are more frequent, takes place rapidly and are outside the purview of management control. Further costs rarely vary in direct proportion to the volume and hence, a small change in the volume may have a more than proportionate effect on profits than the other factors outlined above. It is thus, the volume which is perhaps the largest single factor which influences costs. As such, an intimate relationship exists amongst costs, volume and profit.

The cost-volume-profit analysis is an extension of marginal costing it makes use of the principles of marginal costing. It is an important tool of short term planning and is more relevant where the proposed changes in the level of activity are relatively small. It is useful in making short run decisions.

Objectives of cost-volume-profit analysis :

The main objectives of cost volume-profit analysis are as below :

- (i) It aims at measuring variations in cost with volume.
- (ii) It enables business managers to fulfill the objective of profit planning.
- (iii) It facilitates in making short-run tactical decisions such as acceptance of special order, shift working; choice of sales mix etc.

Question: 12

Briefly discuss on curvilinear CVP analysis.

(Nov 2001)

Solution:

In CVP analysis, the usual assumption is that the total sales line and variable cost line will have linear relationship, that is, these lines will be straight lines. However, in actual practice it is unlikely to have a linear relationship for two reasons, which are :

1. After the saturation point of existing demand, the sales value may show a downward trend.

2. The average unit variable cost decline initially, reflecting the fact that, as output increases the firm will be able to obtain bulk discounts on the purchase of raw materials and can also benefit from division of labour. When the plant is operated at further higher levels of output, due to bottlenecks, and breakdowns, the variable cost per unit will tend to increase. Thus the law of increasing costs may operate and the variable cost per unit may increase after reaching a particular level of output. In these cases, the contribution will not increase in linear proportion, i.e., based on the phenomenon of diminishing marginal productivity, the total cost line will not be straight as assumed but will be of curvilinear shape. This situation will give rise to two break-even points. The optimum profit is earned at the point where the distance between sales and total cost is the greatest.

Question: 13

State the assumptions of cost-volume-profit analysis.
(May 2012, May 2003)

Solution:

CVP Analysis: Assumptions

1. Changes in the levels of revenues and costs arise only because of changes in the number of products (or service) units produced and sold.
2. Total cost can be separated into two components: Fixed and variable
3. Graphically, the behaviour of total revenues and total cost are linear in relation to output level within a relevant range.
4. Selling price, variable cost per unit and total fixed costs are known and constant.
5. All revenues and costs can be added, subtracted and compared without taking into account the time value of money.
6. Only one product is considered for entire analysis.

Question: 14

List out the assumptions of break even analysis.
(Nov 1998)

Solution:

Assumptions of Break-even Analysis:

1. All costs can be separated into fixed and variable.
2. Variable costs vary in proportion to output and fixed costs remain constant.
3. Costs and revenues are linear over the range of activity under consideration.
4. Costs and revenues are influenced only by volume.

5. There will be no change in general price level.
6. The state of technology, methods of production and efficiency remain unchanged.
7. Stocks are valued at marginal cost.
8. Both revenue and cost functions are linear over the range of activity under consideration.
9. Productivity of the factors of production will remain the same.
10. There will be no significant change in the levels of inventory.
11. The company manufactures a single product.
12. In the case of a multi-product company, the sales mix will remain unchanged.

Question: 15

Solution the following:

Explain and illustrate cash break even chart.

(May 2008, May 2001)

Solution:

A Cash Breakeven Chart records cash costs and revenues on the vertical axis and the level of activity on the horizontal axis. In this chart, variable costs are assumed to be payable in cash. Beside this, the fixed expenses are divided into two groups viz.

(i) Those expenses which involve cash outflow, e.g. rent, insurance, salaries etc. and

(ii) Those expenses which do not involve cash outflow, e.g. depreciation, bad debts etc.

The making of the cash breakeven chart would require us to select appropriate axes. Subsequently, we will mark costs/revenues on the Y axis whereas the level of activity shall be traced on the X axis. Lines representing (i) Cash Fixed costs, (ii) Total costs at maximum level of activity and (iii) Revenue at maximum level of activity (joined to the origin) shall be drawn next. The cash breakeven point is that point where the sales revenue line intersects the total cash cost line. Other measures like the margin of safety and profit can also be measured from the chart.

It is computed as under:

$$\text{Cash BEP (units)} = (\text{Cash Fixed Cost}) / (\text{Contribution Per Unit})$$

Question: 16

Differentiate between 'cost indifference point' and 'break-even point'.

(May 2002)

Solution:

Cost indifference point: Is the point at which total cost lines under the two alternatives intersect each other.

Cost indifference point is calculated as under:

$(\text{Difference in fixed costs})/(\text{Difference in variable costs})$ or $(\text{Difference in fixed costs})/(\text{Difference in PV costs})$

Whereas, Break-even point is the point where the total cost line and total revenue line for a particular alternative intersect each other.

Breaks even point is calculated as under:

$(\text{Fixed costs})/(\text{Contribution per unit})$ or $(\text{Fixed costs})/(\text{PV ratio})$

The following are the main points of distinction between cost indifference point and break-even point:

1. The cost indifference point is the activity level at which total cost two alternatives are equals, whereas break-even point is the activity level at which the total revenue from a product or product mix is equal to its cost.
2. Cost indifference point is used to choose between two alternative processes for achieving the same objective. The choice depends on the estimated activity level. Break-even point is used for profit planning.

Question: 17

What are the limitations of a break-even chart?

(May 1999)

Solution:

The limitations of Break-even Chart are as follows :

1. While preparing a break-even chart, it is assumed that revenue and costs can be represented with the help of straight lines. It may not always be true.
2. The preparation of a break- even chart requires the segregation of semi-variable costs into fixed and variable components. It may not always be possible to segregate semi-variable costs cannot be split.
3. A break-even chart assumes that selling price and variable cost per unit are constant at all levels of activity. It may not always be true. Selling price as well as variable cost may either increase or decrease with the change in volume. Fixed costs also tend to vary beyond a certain output.
4. When a firm produces a number of products the apportionment of fixed expenses, over various products may be difficult and often it may be done arbitrarily.
5. A break-even chart assumes that business conditions will not change. This is hardly so.
6. A break-even chart does not consider the amount of capital employed in the business, a very important factor for determining profitability of a concern.

Question: 18

What is margin of Safety? How can margin of safety be improved?

(May 1999)

Solution:

Margin of Safety:

Margin of safety is the excess of sales over the break-even sales, it may also be considered as the excess of production over break -even point. It can be expressed in value as well as in percentage. The size of margin of safety shows the strength of the business. Small size of margin of safety indicates that the firm has large fixed expenses and is more vulnerable to changes in sales. In other words, if the margin of safety is large, a slight fall in sales may not affect the business very much but when it is small then a slight fall in sales may adversely affect the business.

The margin of safety is calculated by using the following formula:

Margin of safety = Actual Sales - Break -even sales

Margin of safety = Profit/(PV ratio)

Or

= Profit/((Contribution/Sales))

Margin of safety is also immensely useful for making inter-firm comparison. This is being done by calculating their margin of safety ratio. This ratio can be calculated by using the following formula:

Margin of safety ratio = (Margin of safety)/Sales × 100

Or

= (Actual Sales - Breakeven Sales)/Sales × 100

Measures for improving margin of safety :

Margin of safety can be improved by taking the following measures:

- 1. Increasing the selling price, provided the demand is inelastic so as to absorb the increased prices.*
- 2. Reduction in fixed expenses.*
- 3. Reduction in variable expenses.*
- 4. Increasing the sales volume provided capacity is available.*
- 5. Substitution or introduction of a product mix such that more profitable lines are introduced.*

Question: 19

Solution the following:

What is the meaning of Margin of Safety (MOS)? State the relationship between Operating Leverage and Margin of Safety Ratio.

(Nov 2013)

Solution:

Margin of Safety:

Please refer 1999 - May [1] {C} (a) on page no. 878

Relationship between Operating Leverage and MOS:

Operating leverage is calculated as Contribution + Operating profit and contribution margin plays an important role in it. If sales are expected to increase, higher operating leverage will result in higher profit. When sales are expected to decrease, lower operating leverage will result in higher profit, Higher variable cost and lower fixed cost will result into higher MoS and risk will be lower and vice versa.

So like Operating leverage, MoS is a measure of risk as to what extent an organisation is exposed to change in sales volume.

Question: 20

Explain briefly angle of incidence and margin of safety in Break Even Analysis.
(May 1999)

Solution:

Angle of incidence (Refer to above diagram)

The point P where the sales line cuts the total cost line is known as a break-even -point and the angle formed by these lines is called angle of incidence. This angle tells us about the rate at which profits are being made. The larger angle of incidence indicate higher rate of profit or versa.

Margin of safety:

The difference between total sales and sales at break-even-point represents the margin of safety. It is the amount of sales above the break-even point. If there is a fall in the sales to the extent of margin of safety, this situation would indicate that firm is operating at break-even-point.

Margin of safety can be expressed in absolute terms and also in terms of percentage.

In absolute terms :

Margin of safety = Actual sales - Sales at break even point

In terms of percentage, it is computed as under:

Margin of safety ratio = (Margin of safety in absolute terms)/(Actual sales) × 100

Question: 21

Discuss the relationship between Angle of Incidence, Break-even Level and Margin of Safety.
(Nov 1999)

Solution:

1. If the break-even point is low and angle of incidence is large, the margin of safety is large and the business enjoys financial stability. A low break-even point indicates that the business could be run profitably even if there is a fall in sales, unless the sales are very low.
2. If the break-even point is low and angle of incidence is small, the conclusions are the same as in 1 above except that the rate of profit earning capacity is not so high as in 1.
3. If the break-even point is high and the angle of incidence is small, the margin of safety is low. The business is very vulnerable, even a small reduction in activity may result in a loss.
4. If the break-even point is large and the angle of incidence is large, this shows that the margin of safety is low. The business is likely to incur losses through a small reduction in activity. However after the break-even point, the business makes the profit at a high rate.

Question: 22

What are the important decision-making areas where marginal-costing technique is used?
(May 2001)

Solution:

Marginal costing is a useful technique of decision making, used by the management of most of the manufacturing concerns. Some of the important decision making areas where marginal costing technique is used by these concerns are:

1. Fixation of selling price.

(i) Under normal circumstances

(ii) For special market (export market) or for a special customer*

(iii) During recession

(iv) At marginal cost or below marginal cost.

2. Decision relating to the most profitable product mix

(i) Selection of optimal product mix

(ii) Substitution of one product with another

(iii) Discontinuing or dropping of a product line

3. Decision relating to make or buy

4. Shut down or continue of determination or output level in period of recession or depression.

5. Retaining or replacing a machine

6. Selling in the home or in the export market

7. Change vs. Status quo

8. Expanding or contracting

9. Decision relating to price-mix.

Question: 23

Elaborate the practical application of Marginal Costing.

(Nov 2013)

Solution:

Practical Application of Marginal Costing:

Marginal costing is a useful technique of decision making, used by the management of most of the manufacturing concerns. Some of the important decision making areas where marginal costing technique is used by these concerns are :

1. Fixation of selling price:

(i) Under normal circumstances

(ii) For special market (export market) or for a special customer

(iii) During recession

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5. Retaining or replacing a machine

6. Selling in the home or in the export market

7. Change vs. Status quo

8. Expanding or contracting

9. Decision relating to price-mix.

Question: 24

Solution the following:

What do you understand by Key factor ? Give two examples of it.

(May 2010)

Solution:

Key factor is a factor which at a particular time or over a period limits the activities of an undertaking.

It may be the level of demand for the products or service or it may be the shortage of one or more of the productive resources.

Examples of key factors are :

1. Shortage of raw material.

2. Shortage of Labour.

3. Plant capacity available.

4. Sales capacity available.

5. Cash availability.

CHAPTER 15: BUDGET AND BUDGETARY CONTROL**Question: 1***Distinguish between "Fixed and flexible budet**(May 2016, Nov 2011)***Solution:**

Fixed Budgets: A budget prepared for a particular level of activity is called fixed budget. It presents the cost details for a specific level of activity, Consequently, budgeted costs for budgeted level of activity are compared with the actual costs for actual level of activity. Therefore, fixed budget is not going to highlight the cost variances due to the difference in the levels of activity.

Flexible Budgets: A budget prepared for a range of activities rather than a single level of activity is called flexible budget. It is capable of furnishing the budgeted cost at any level of activity. It recognises the behaviour of costs and classifies them into variable, fixed and semi-variable. On the basis of this, the budget is designed to change (i.e., flex) in relation to the level of activity attained. Therefore, it is able to compute and compare the budgeted costs for actual level of activity attained. In order to prepare the flexible budgets, tabular method is normally used.

Question: 2*Write a short note on "Key Factor".**(May 1998)***Solution:**

Every businessman aims to produce and sell unlimited units of the product manufactured by him. But it is not possible due to some factor. There is always a factor which may limit the activity level of a firm such a factor is known as the key factor. In most of the cases 'sales' is the key factor. It determines the volume of output to be produced. Sometime sales may not be the key factor but some other factor such as labour; machine capacity, material, finance etc. When may not be available in requisite quantity will be a key factor. In other words, key factor is a factor that limits the quantum of activity of a firm at a particular time or over a period of time. Key factor governs the decision "how much to produce" In case, sales being the key factor, the profit ability of the product is measured by computing its profit volume ratio. When any other factor is the key-factor, the most profitable product will be that which would yield maximum contribution per unit of key factor.

Question: 3*Write a short note on "Budget Manual".**(Nov 2000)*

Solution:

CIMA London defines budget manual as "a document schedule or booklet which sets out. inter alia, responsibilities of the persons engaged in, the routine of, and the forms and records required for budgetary control,"

Therefore budget manual should consist of responsibilities and duties of each executive, methods of preparation of various budget etc.

The budget manual should include following:

- 1. Introduction, benefits principles and objectives of budgetary control system.*
- 2. Organisation chart explaining the responsibilities of each executive.*
- 3. Budgeting programme including the time table for periodical reporting.*
- 4. Purpose, specimen form and number of copies to be used for each report.*
- 5. The method of accounting, the account code and classification used by the company.*
- 6. The budget period showing the date of completion of each part of budget and submission of reports.*
- 7. The follow up procedure.*

Question: 4

Write short note on 'Zero Base Budgeting as an approach towards productivity improvement.'
(Nov 2005)

Solution:

Zero Base Budgeting approach plays key role in productivity improvement. It is beneficial in this regard in the following manner:

- 1. ZBB ensures that the various functions adopted by the organisation are important and critical for the achievement of its objectives and are being performed in the best possible way.*
- 2. ZBB gives an opportunity to the management to allocate resources for different activities only after proper cost benefit analysis.*
- 3. In this approach, 'chances of arbitrary cuts and enhancement are. thus avoided.*
- 4. Department budgets are closely linked with corporate objectives.*
- 5. It provides a systematic approach for the evaluation of different activities and rank them in order of preference for the allocation of scarce resources.*
- 6. Wasteful expenditures can be easily identified and eliminated.*

Question: 5

State four limitations of the budgetary control system.
(Nov 1998)

Solution:

Limitations of Budgetary Control are :

- 1. Budgetary control is not suitable in rapidly changing conditions because it requires frequent revision. Which is very costly and time taking process for organisation.*
- 2. Sometimes budget can serve as constraints on managerial effectiveness because every executive tries only to achieve budgeted target.*
- 3. The budgetary control system is expensive for small organisations.*
- 4. For application of budgetary control system, proper organisational structure should be followed which is not possible in all the firms.*

Question: 6

*Discuss the components of budgetary control system.
(May 2009)*

Solution:

Components of Budgetary Control System:

There are a number of bases for classifying the budgets into two or more categories. But the most important and widely used bases are functional classification and classification according to flexibility. The policy of a business for a defined period is represented by the master budget the details of which are given in a number of individual budgets called functional budgets.

The functional budgets are broadly grouped under the following heads:

- 1. Physical Budgets: This budget contains information in terms of physical units e.g. Sales Qty, Product Qty, Inventory, Manpower budget.*
- 2. Cost Budgets: Manufacturing Cost, Administration Cost, Sales and Distribution cost, Ft & D Cost.*
- 3. Profit Budget: A budget which enable in the ascertainment of profit, e.g. Sales Budget, Profit & Loss Budget etc.*

On the other hand, budgets may be classified into two categories on the basis of flexibility as fixed budgets and flexibility budgets.

Question: 7

*Essentials of budget
(Nov 2011)*

Solution:

Essential of Budget:

1. Budget establishes the objective of the organisation and enables the management to conduct business in the most efficient manner.
2. Budget is helpful in allocating scarce resources in most optimal way.
3. Budget identifies the areas of in-efficiencies within the organisation.
4. Budget is the most important tool of controlling because it provides a yardstick against which the performance of organisation can be evaluated.
5. Budget is a basis for management by exception by comparing actual and budgeted results.
6. Budget ensures effective utilisation of men, machine, material and money.

Question: 8

Describe the steps involved in the budgetary control technique.
(Nov 2013)

Solution:

Steps involved in the Budgetary Control Technique

1. Definition of objectives: A budget being a plan for the achievement of certain operational objectives, it is desirable that the same are defined precisely. The objectives should be written out; the areas of control demarcated; and items of revenue and expenditure to be covered by the budget stated.
2. Location of the Key (or budget) Factor : There is usually one factor (sometimes there may be more than one) which sets a limit to the total activity. Such a factor is known as key factor. For proper budgeting, it must be located and estimated properly.
3. Appointment of Controller : Formulation of a budget usually requires whole time services of a senior executive known as budget controller; he must be assisted in this work by a Budget Committee, consisting of all the heads of department along with the Managing Director as the Chairman.
4. Budget Manual: Effective budgetary planning relies on the provision of adequate information which are contained in the budget manual. A budget manual is a collection of documents that contains key information for those involved in the planning process.
5. Budget Period: The period covered by a budget is known as budget period. The Budget Committee determines the length of the budget period suitable for the business. It may be months or quarters or such periods as coincide with period of trading activity.
6. Standard of Activity or Output: For preparing budgets for the future, past statistics cannot be completely relied upon, for the past usually represents a combination of good and bad factors. Therefore, though results of the past should be studied but these should only be applied when there is a likelihood of similar conditions repeating in the future.

Question: 9

Explain briefly the concept of 'flexible budget'.

(Nov 2017, Nov 2008)

Solution:

Flexible Budget

Flexible Budgets show the expected results of a responsibility center unless for several activity levels.

It is a budget which by recognising the difference between fixed, semi-variable and variable costs is designed to change in relation to level of activity attained. It is not rigid as it can be recasted on the basis of activity level to be achieved. It consists of services of static budgets for different levels of activity. Variance analysis through flexible budget provides useful information as each cost is analysed according to its behavior.

It facilitates the ascertainment of cost, fixation of selling price and submission of quotations. Flexible budgets provide a meaningful basis of comparison of the actual performance with the budgeted targets. Such budgets are especially useful in estimating and controlling factory costs and operating expenses. Flexible Budgeting may be resorted to in the following situations:

1.New Business:

In case of new business venture, due to its typical nature, it may be difficult to forecast the demand of a product accurately.

2. Uncertain Environment:

Where the business is dependent upon the vagary of nature.

3. Factor Market Conditions:

In the case of Labour intensive industry where the production of the concern is dependent upon the availability of labour.

Question: 10

What is Sales Budget? How is it prepared?

(Nov 1998)

Solution:

Sales budget: *It is the foundation upon which the other functional budget are built. Sales forecast is the commencement of budgeting and as such, the sales budget is of primary importance.*

In fact when sales forecast is presented in monetary value, it takes the form of a sales budget. It provides a basis for the production department to produce the required quantity of products.

The sales budget may be prepared according to products, sales territories, types of customers, salesmen etc. While preparing the sales budget, the following factors are to be taken into consideration:

1. Past sales volume

2. General economic and industry conditions

3. Relative product profitability
4. Market research studies
5. Pricing policies
6. Advertising and other sales promotion efforts
7. Competition
8. Production capacity
9. Long term sales trends for various products
10. Reports of salesmen.

Question: 11

List the eight functional budgets prepared by a business.
(Nov 2009)

Solution:

A functional budget is prepared according to the various functions of the organization e.g.: Sales, Production, Administration Research & development etc.

Following are the most popular functional budgets:

1. Sales budget
2. Production budget
3. Materials budget
4. Labour budget
5. Manufacturing overhead budget
6. Administrative cost budget
7. Plant utilisation budget
8. Research and Development budget
9. Capital expenditure budget
10. Cash budget.

Question: 12

State the considerations on which capital expenditure budget is prepared.
(Nov 2012)

Solution:

The preparation of Capital Expenditure Budget is based on the following considerations:

1. Overhead on production facilities of certain departments as indicated by the plant utilisation budget.
2. Future development plans to increase output by expansion of plant facilities.
3. Replacement requests from the concerned departments.

4. Factors like sales potential to absorb the increased output, possibility of price reductions, increased costs of advertising and sales promotion to absorb increased output, etc.

Question: 13

State the considerations on which capital expenditure budget is prepared.
(Nov 2012)

Solution:

The preparation of Capital Expenditure Budget is based on the following considerations:

1. Overhead on production facilities of certain departments as indicated by the plant utilisation budget.
2. Future development plans to increase output by expansion of plant facilities.
3. Replacement requests from the concerned departments.
4. Factors like sales potential to absorb the increased output, possibility of price reductions, increased costs of advertising and sales promotion to absorb increased output, etc.

Question: 14

State, how is Zero base Budgeting superior to Traditional Budgeting.
(May 2018, Nov 2002)

Solution:

ZBB is superior than traditional budgeting because :

1. ZBB provides a systematic base for evaluation of different activities.
2. ZBB gives an opportunity for management to allocate resources to various activities after a proper cost benefit analysis.
3. ZBB assigns that the functions undertaken are critical for the achievement of the objectives.
4. ZBB provides a base for a system of management by objectives.
5. ZBB provides a base for a system of management by objectives.
6. ZBB provides a close relationship between departmental budget and corporate objectives & budget.
7. ZBB helps in identification of wastage and then their elimination.

Question: 15

What are the advantages and limitations of Zero base Budgeting?
(Nov 2004)

Solution:

Advantages of ZBB:

1. ZBB process identifies inefficient operation and considers every time alternative ways of performing the same task.
2. ZBB is used in identification of wastage and obsolescent items of expenditure.
3. ZBB is very much useful for the staff and support areas of an organisation such as research & development, quality control, pollution control, legal and technical staff etc.
4. The core resources will be allocated more efficiently according to the priority of programme.
5. ZBB provides an opportunity to the management to allocate resources for various activities only after having a thorough cost-benefit analysis.
6. Departmental budgets are closely linked with corporate objectives.
7. ZBB ensures that the various functions undertaken by the organisation are critical for the achievement of its objectives and are being performed in the best way.
8. The technique can also be used for the introduction of the system of management by objective (MBO).

Limitation of ZBB:

1. ZBB requires skilled and trained managerial staff.
2. ZBB is time consuming as well as costly.
3. ZBB faces various operational problems during the implementation of such technique.
4. ZBB requires full support of top management.

Question: 16

Write short note on 'Zero Base Budgeting as an approach towards productivity improvement.'
(Nov 2005)

Solution:

Zero Base Budgeting approach plays key role in productivity improvement. It is beneficial in this regard in the following manner:

1. ZBB ensures that the various functions adopted by the organisation are important and critical for the achievement of its objectives and are being performed in the best possible way.
2. ZBB gives an opportunity to the management to allocate resources for different activities only after proper cost benefit analysis.
3. In this approach, 'chances of arbitrary cuts and enhancement are. thus avoided.
4. Department budgets are closely linked with corporate objectives.
5. It provides a systematic approach for the evaluation of different activities and rank them in order of preference for the allocation of scarce resources.
6. Wasteful expenditures can be easily identified and eliminated.

Question: 17

Write short Note on:

Performance Budgeting.

(RTP)

Solution:

Meaning:

Performance Budgeting is a technique of presenting budgets for costs and revenues, in terms of functions. So, programmes and activities are correlated with the physical and financial aspect of individual items comprising the budget.

It aims at a continuous growth of the Firm, and meet the dynamic needs of its growing clientele and customers. It enables the Firm to be sensitive and adaptive, preventing it from developing rigidities which may affect its growth and requires the preparation of periodic performance Reports, to compare budget and actuals to find out existing variances.

Focus:

Focus of Performance Budgeting is on functions, and not the cost of functions as such, The functions, programmes, activities and tasks, are reported, along with costs thereof.

Steps in Performance Budgeting

- 1. Establishing a meaningful functional Programme and Activity Classification of operations,*
- 2. Bringing the system of Accounting and Financial Management, in accordance with the above classification,*
- 3. Establishing suitable norms, yardsticks, work units of performance and unit costs, wherever possible, under each programme and activity, for their reporting and evaluation.*
- 4. Monitoring and evaluate performance on the basis of performance Reports.*

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TOPIC - RISK ANALYSIS IN CAPITAL BUDGETING

CONCEPT - 1 Probability Distribution Approach

→ Expected NPV/ Expected Cash Flow / Expected Value = $\sum ENCF / NPV * probability$	
→ Standard Deviation = $\sigma = \sqrt{\sum [probability * (Given\ NPV - Expected\ NPV)^2]}$	Higher the S.D, Higher the risk & Vice-versa
→ Co-efficient of Variation = (CV) $CV = \frac{Standard\ Deviation}{Expected\ NPV}$	Higher the CV, higher the risk & vice-versa

CONCEPT - 2 Calculation of Risk Adjusted NPV

Risk Adjusted NPV

Certainty Equivalent Approach (CEC Approach)	Risk Adjusted Discount Rate Method (RADR)
Risk of project would be adjusted in "Cash Flow"	Risk of project would be adjusted in "Discount Rate"
It involves discounting of certain Cash Flows instead of Total Cash Flows.	$(1 + RADR) = (1 + \text{Risk-free rate}) (1 + \text{Risk Premium})$
Steps involved: Step 1: Calculate all cash flows arising from the project.	Note: > Under this method, Project should be discounted using risk-adjusted discount rate rather than risk-free discount rate.
Step 2: Calculate certain cash flow by using CEC (Certainty Equivalent Co-efficient) Certain Cash Flow = Cash Flow x CEC	> Project having higher risk should be discounted with higher rate. > Higher the risk of project, higher should be the discount rate.
Step 3: Compute NPV by taking certain risk-free Cash Flow and risk-free discount rate.	> NPV calculated by using RADR is known as "Risk Adjusted NPV"
Note: Higher the CEC, lower the risk and vice-versa. CEC of cash flow arising in year 0 will always be One.	> CV is a measure of risk, higher the CV, higher the risk. > Imagine the firm to be market portfolio, K_o can be treated as R_m $RADR = R_f + Risk\ Index\ (K_o - R_f)$

CONCEPT - 3 Scenerio Analysis

Scenario Analysis is an analysis of the NPV of a project under a series of specific. Scenarios (worst, most likely and best scenario) based on macro-economics, industry and firm-specific facto Under this, all inputs are set at their most optimistic or pessimistic or most likely levels and NPV is computed. Decision is based on the NPV under all scenarios

CONCEPT - 4 Sensitivity Analysis

> Also known as "What if" Analysis.
 > Sensitivity Analysis is one of the methods of analyzing the risk surrounding the capital expenditure. Decision and enables an assessment to be made of how responsive the project's NPV is to changes in those variables based on which NPV is computed.
 > Sensitivity Analysis is a tool in the hand of firms to analyze change in the project's NPV for a given change in one of the variables.
 > Under this analysis we try to measure risk of each factor taking NPV=0.

Key factors which are used to calculate NPV are as follows :

	Inverse Effect
Cash Inflows	Decrease
Cash Outflows	Increase
Discount Rate	Increase
Life of the Project	Decrease

Decision Rule :

Management should pay maximum attention towards the factor where minimum percentage of adverse changes causes maximum adverse effect

Example : If NPV is to become Zero with 5% change in initial investment relative to 10% change in cash inflows, project is said to be more sensitive to initial investment than to cash inflows.

Note : Sensitivity Analysis is calculated for each factor separately, keeping other factors constant.

4A - Method 1 : Margin of Safety Approach (MOS)

Set NPV = 0 & Calculate the Break Even Values and Margin of Safety for Each Factor

$$\text{Sensitivity } (\%) = \frac{\text{Change}}{\text{Base}} * 100$$

Decision : Most critical / Sensitive Factor is that Factor for which MOS is least

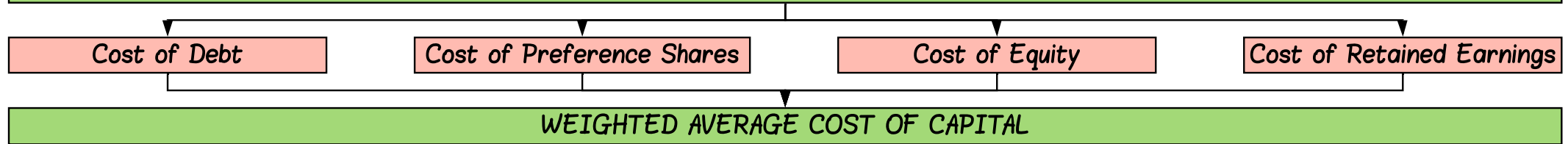
4B - Method 2 : Shock Approach

Shock each Risk Factor in the adverse direction like 10% / 20% & Find out the Revised NPV or %age fall in NPV

$$\% \text{ fall in NPV} = \frac{\text{Revised NPV} - \text{Original NPV}}{\text{Original NPV}} * 100$$

Decision : Most critical / Sensitive Factor is that Factor for which results in Maximum Fall in NPV.

TOPIC - COST OF CAPITAL



CONCEPT - 1 Cost of Capital

Cost of capital refers to the discount rate that is used in determining the present value of the estimated future cash proceeds of the business/new project and eventually deciding whether the business/new project is worth undertaking or not.

It is also the minimum rate of return that a firm must earn on its investment which will maintain the market value of share at its current level. It can also be stated as the opportunity cost of an investment, i.e. the rate of return that a company would otherwise be able to earn at the same risk level as the investment that has been selected.

CONCEPT - 2 Components of Cost of Capital

The cost of capital can be either explicit or implicit. The explicit cost of any source of capital may be defined as the discount rate that equals the present value of the cash inflows that are incremental to the taking of financing opportunity with the present value of its incremental cash outflows.

Implicit cost is the rate of return associated with the best investment opportunity for the firm and its shareholders that will be foregone if the project presently under consideration by the firm was accepted.

CONCEPT - 3 Measurement of Specific Cost of Capital for each source of Capital

The first step in measurement of the cost of the capital of the firm is the calculation of the cost of individual sources of raising funds. From the viewpoint of capital budgeting decisions, the long term sources of funds are relevant as they constitute the major sources of financing the fixed assets. In calculating the cost of capital, therefore the focus is on long-term funds and which are:

1. Long term debt (including Debentures)
2. Preference Shares
3. Equity Capital
4. Retained Earnings

CONCEPT - 4 Weighted Average Cost of Capital

WACC (weighted average cost of capital) represents the investors' opportunity cost of taking on the risk of putting money into a company. Since every company has a capital structure i.e. what percentage of funds comes from retained earnings, equity shares, preference shares, debt and bonds, so by taking a weighted average, it can be seen how much cost/interest the company has to pay for every rupee it borrows/invest. This is the weighted average cost of capital.

Cost of capital is the return expected by the providers of capital (i.e. shareholders, lenders and the debt-holders) to the business as a compensation for their contribution to the total capital.

CONCEPT - 5 Cost of Long Term Debt

External borrowings or debt instruments do not confers ownership to the providers of finance. The providers of the debt fund do not participate in the affairs of the company but enjoys the charge on the profit before taxes.
Long term debt includes long term loans from the financial institutions, capital from issuing debentures or bonds etc.

Features of debentures or bonds

A. Face Value	Debentures or Bonds are denominated with some value; this denominated value is called face value of the debenture. Interest is calculated on the face value of the debentures. E.g. If a company issue 9% Non- convertible debentures of Rs. 100 each, this means the face value is Rs. 100 and the interest @ 9% will be calculated on this face value.
B. Interest (Coupon) Rate	Each debenture bears fixed interest (coupon) rate (except Zero coupon bond and Deep discount bond). Interest (coupon) rate is applied to face value of debenture to calculate interest, which is payable to the holders of debentures periodically.
C. Maturity period	Debentures or Bonds has a fixed maturity period for redemption. However, in case of irredeemable debentures maturity period is not defined and it is taken as infinite.
D. Redemption Value	Redeemable debentures or bonds are redeemed on its specified maturity date. Based on the debt covenants the redemption value is determined
E. Benefit of tax shield	The payment of interest to the debenture holders are allowed as expenses for the purpose of corporate tax determination. Hence, interest paid to the debenture holders save the tax liability of the company.
E1. Cost of Irredeemable Debentures	$K_d = \frac{\text{Interest}(I)}{NP} (1 - t)$ <div>Where, K_d = Cost of debt after tax, I = Annual interest payment, NP = Net proceeds of debentures or current market price, t = tax rate </div>
E2. Cost of Redeemable Debentures	$K_d = \frac{\text{Interest}(1-t) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$ <div>Where, NP = Net proceeds from debentures in case of new issue of deb or Current market price in case of existing debt. RV = Redemption value of debentures, t = Tax rate applicable to the company, n = life of debentures </div>
	$K_d = \frac{\text{Interest} + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}} (1 - t)$ <div>If discount on issue and/ or premium on redemption are tax deductible, the following formula can be used to calculate the cost of debt.</div>

E3. Cost of Debt using Present value method [Yield to maturity (YTM) approach]/ IRR Technique

The cost of redeemable debt K_d is also calculated by discounting the relevant cash flows using Internal rate of return (IRR). Here YTM is the annual return of an investment from the current date till maturity date. So, YTM is the internal rate of return at which current price of a debt equals to the present value of all cashflows.

The relevant cash flows are as follows :

Year	Cash Flows	Steps to calculate relevant cash flows: Step-1: Identify the cash flows Step-2: Calculate NPVs of cash flows as identified above using two discount rates (guessing). Step-3: Calculate IRR
0	Net proceeds in case of new issue/ Current market price in case of existing debt (NP or P0)	
1 to n	Interest net of tax $[I(1-t)]$	
n	Redemption value (RV)	

Note :

Amortisation of Bond

A bond may be amortised every year i.e. principal is repaid every year rather than at maturity.

In such a situation, the principal will go down with annual payments and interest will be computed on the outstanding amount. The cash flows of the bonds will be uneven.

The formula for determining the value of a bond or debenture that is amortised every year is as follows:

$$V_b = \frac{C_1}{(1+K_d)^1} + \frac{C_2}{(1+K_d)^2} + \dots + \frac{C_n}{(1+K_d)^n}$$

Note :

Cost of Convertible Debenture

Holders of the convertible debentures has the option to either get the debentures redeemed into the cash or get specified numbers of companies shares in lieu of cash. The calculation of cost of convertible debentures are very much similar to the redeemable debentures. While determining the redeemable value of the debentures, it is assumed that all the debenture holders will choose the option which has the higher value and accordingly it is considered to calculate cost of debt.

> Converted into equity shares after certain period.

> Conversion Ratio = No. of share Received per Convertible Bond

> When Conversion Value > Bond value, option can be exercised otherwise not.

$$K_d = \frac{\text{Interest}(1-t) + \frac{(RV-NP)}{n}}{\frac{(RV+NP)}{2}}$$

CONCEPT - 6 Cost of Preference Shares

The preference share capital is paid dividend at a specified rate on face value of preference shares. Payment of dividend to the preference shareholders are not mandatory but are given priority over the equity shareholder. The payment of dividend to the preference shareholders are not charged as expenses but treated as appropriation of after tax profit. Hence, dividend paid to preference shareholders does not reduce the tax liability to the company. Like the debentures, Preference share capital can be categorised as redeemable and irredeemable. Accordingly cost of capital for each type will be discussed here.

6a - Cost of Irredeemable Preference Shares

Preference shares issued by a company which are redeemed on its maturity is called redeemable preference shares. Cost of redeemable preference share is similar to the cost of redeemable debentures with the exception that the dividends paid to the preference shareholders are not tax deductible.

Cost of Redeemable Preference Share

$$K_p = \frac{PD + \left(\frac{RV - NP}{n} \right)}{\left(\frac{RV + NP}{2} \right)}$$

Where,

PD = Annual preference dividend

RV = Redemption value of preference shares

NP = Net proceeds on issue of preference shares

n = Life of preference shares.

6b - Cost of Redeemable Preference Shares

Cost of Redeemable Preference Share $K_p = \frac{PD}{P_o}$

Where,

PD = Annual preference dividend, PO = Net proceeds in issue of preference shares

CONCEPT - 7 Cost of Equity Share Capital

a) Dividend Price Approach

b) Earning Price Approach

c) Realized Yield Approach

d) Capital Asset Pricing Model (CAPM) Approach

7a - Dividend Price Approach

a) Dividend Price Approach/Dividend Valuation Approach

(i) Dividend Price Approach with Constant Dividend: In this approach dividend is constant, which means there is no-growth or zero growth in dividend. The cost of equity can be calculated as follows:

$$K_e = \frac{D}{P_o}$$

Where, K_e = Cost of equity, D = Expected Dividend, PO = Market price of equity (ex- dividend)
This model assumes that dividends are paid at a constant rate to perpetuity.

(ii) Dividend Price Approach with Constant Growth: As per this approach the rate of dividend growth remains constant. Where earnings, dividends and equity share price all grow at the same rate, the cost of equity capital may be computed as follows:

$$K_e = \frac{D_1}{P_o} + g$$

Where, $D_1 = [D_0 (1+g)]$ i.e. next expected dividend, PO = Current Market price per share,
g = Constant Growth Rate of Dividend.

(iii) In case of newly issued equity shares where floatation cost is incurred, the cost of equity share with an estimation of constant dividend growth is calculated as below:

$$K_e = \frac{D_1}{P_o - F} + g$$

where, F = Flotation cost per share.

7b - Earning/ Price Approach

(i) Earnings/ Price Approach with Constant Earnings

The cost of equity share capital would be based upon the expected rate of earnings of a company

$$K_e = \frac{EPS}{P_o}$$

Where,

EPS = Current earnings per share, P_o = Market share price

(ii) Earnings/ Price Approach with Growth in Earnings:

$$K_p = \frac{EPS_1}{P_o} + g$$

Where, EPS_1 = Expected earnings per share, P_o = Market price per share, g = Annual growth rate of earnings.

Estimation of Growth Rate

The calculation of 'g' (the growth rate) is an important factor in calculating cost of equity share capital. Generally two methods are used to determine the growth rate, which are discussed below:

Method 1 : Average Method

It calculated as

$$D_0 = D_n (1 + g)^{n-1}$$

Where,

D_0 = Current dividend, D_n = Dividend in n years ago

Example: The current dividend (D_0) is Rs. 16.10 and the dividend 5 year ago was Rs. 10.

Method 2 : Gordon's Growth Model

This model takes Earnings retention rate (b) & rate of return on investments (r) into account to estimate the future growth rate.

It can be calculated as :

$$\text{Where, Growth } (g) = b * r$$

r = rate of return on fund invested

b = earnings retention ratio

7c - Realized Yield Approach

According to this approach, the average rate of return realized in the past few years is historically regarded as 'expected return' in the future. It computes cost of equity based on the past records of dividends actually realised by the equity shareholders.

7d - Capital Asset Pricing Model (CAPM) Approach

CAPM model describes the risk-return trade-off for securities. It describes the linear relationship between risk and return for securities. Thus, the cost of equity capital can be calculated under this approach as:

$$K_e = R_f + \beta (R_m - R_f)$$

Where, K_e = Cost of equity capital, R_f = Risk free rate of return, β = Beta coefficient, R_m = Rate of return on market portfolio, $(R_m - R_f)$ = Market premium

CONCEPT - 8 Cost of Retained Earnings

Like another source of fund, retained earnings involve cost. It is the opportunity cost of dividends foregone by shareholders. sometime cost of retained earnings remains below the cost of equity due to saving in floatation cost and existence of personal tax. In absence of any information on personal tax (tp):

Cost of Retained Earnings (K_r) = Cost of Equity Shares (K_e)

If there is any information on personal tax (tp): $K_r = K_e - tp$

Note : 1) K_e of new equity will always be greater than K_e of existing equity/retained earnings.

2) Floatation Cost is only applicable in case of new equity and not on existing equity (or retained earnings).

CONCEPT - 9 WEIGHTED AVERAGE COST OF CAPITAL (WACC)

Weighted average cost of capital is the weighted average after tax costs of the individual components of firm's capital structure. That is, the after tax cost of each debt and equity is calculated separately and added together to a single overall cost of capital. The steps to calculate WACC is as follows :

Step 1: Calculate the total capital from all the sources.

(i.e. Long term debt capital + Pref. Share Capital + Equity Share Capital + Retained Earnings)

Step 2: Calculate the proportion (or %) of each source of capital to the total capital.

$$\frac{\text{Equity share capital (for example)}}{\text{Total capital (as calculated in step 1 above)}}$$

Step 3: Multiply the proportion as calculated in Step 2 above with the respective cost of capital.

(i.e. $k_e \times \text{Proportion (\%)} \text{ of equity share capital (for example) calculated in Step 2 above}$)

Step 4: Aggregate cost of capital as calculation Step 3 above. This is WACC. i.e. $k_e + k_d + k_p + k_s$ as calculated in Step 3 above

Example - Calculation of WCC

Capital Component	Cost of capital	% of total capital structure	Total
Retained Earnings	10% (k_r)	25% (w_r)	2.50% ($k_r \times w_r$)
Equity Share Capital	11% (k_e)	10% (w_e)	1.10% ($k_e \times w_e$)
Preference Share Capital	9% (k_p)	15% (w_p)	1.35% ($k_p \times w_p$)
Long term debts	6% (k_d)	50% (w_d)	3.00% ($k_d \times w_d$)
Total (WACC)			7.95%

The cost of weighted average method is preferred because the proportions of various sources of funds in the capital structure are different. To be representative, therefore, cost of capital should take into account the relative proportions of different sources of finance.

CONCEPT - 10 Choice of weights

There is a choice weights between the book value (BV) and market value(MV).

i) Book Value(BV): Book value weights is operationally easy and convenient. While using BV, reserves such as share premium and retained profits are included in the BV of equity, in addition to the nominal value of share capital.

ii) Market Value(MV): Market value weight is more correct and represent a firm's capital structure. It is preferable to use MV weights for the equity. While using MV, reserves such as share premium and retained profits are ignored as they are in effect incorporated into the value of equity.

CONCEPT - 11 Marginal cost of capital

The marginal cost of capital may be defined as the cost of raising an additional rupee of capital. Since the capital is raised in substantial amount in practice, marginal cost is referred to as the cost incurred in raising new funds. Marginal cost of capital is derived, when the average cost of capital is calculated using the marginal weights.

TOPIC - INVESTMENT DECISION

CONCEPT - 1 Introduction

>> Capital Budgeting is the process of Identifying & Evaluating capital projects i.e. projects where the cash flows to the firm will be received over a period longer than a year.

>> Any corporate decisions with an **IMPACT ON FUTURE EARNINGS** can be examined using capital budgeting framework.

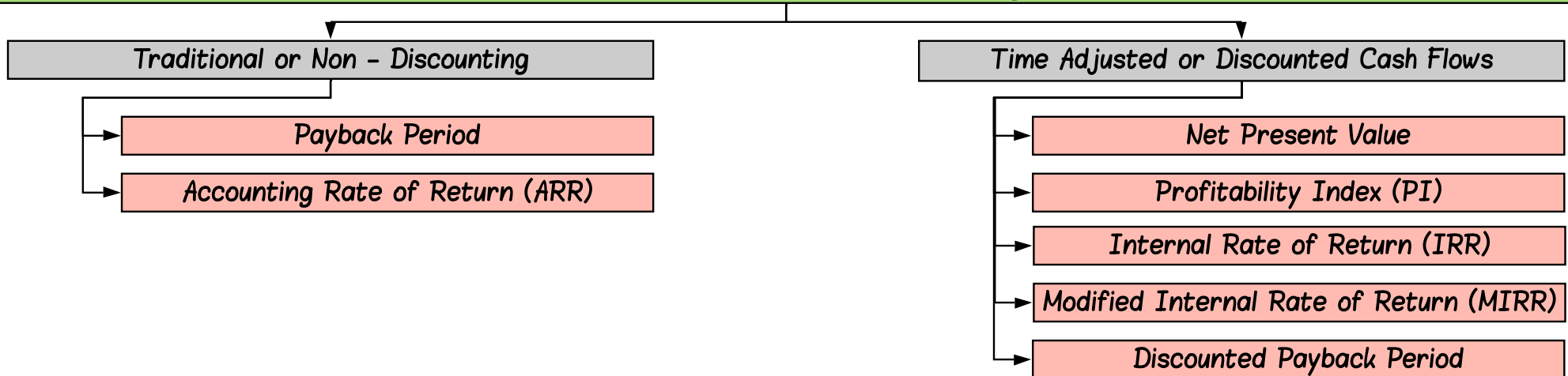
Categories of Capital Budgeting Projects:

- a) Replacement projects to maintain the business
- b) Replacement projects for cost reduction
- c) Expansion projects
- d) New product or market development/Diversification decisions
- e) Mandatory projects

CONCEPT - 2 Types of Capital Budgeting Proposals

Mutually Exclusive Proposals	→	when acceptance of one proposal implies the automatic rejection of the other proposal
Complementary Proposals/Contingent decisions	→	when the acceptance of one proposal implies the acceptance of other proposal complementary to it, rejection of one implies rejection of all complementary proposals.
Independent Proposals/Accept-Reject decisions	→	when the acceptance/rejection of one proposal doesn't affect the acceptance/rejection of other proposal.

CONCEPT - 3 Capital Budgeting Techniques



CONCEPT - 4 Net Present Value (NPV)

NPV = PV of Cash Inflows – PV of Cash Outflows		$NPV = -CFO + \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \dots + \frac{CF_n}{(1+k)^n}$
Decision : If NPV is		
+ve	Accept the project - increase shareholder's wealth	Where, CFO = the initial investment outlay; CF _t = after- tax cash flow at time t; k = required rate of return for project
-ve	Reject the project - decrease shareholder's wealth	
Zero	Indifferent - No effect on shareholder's wealth	

	Total Fund Approach / Overall Project Approach
Discount Rate	k ₀
Initial Cash Outflows	Total Cost of New Asset Add: Installation / Set-up Cost Add: Investment in Working Capital
Operating	Future Cash flows after tax
Terminal Cash flows	SV adjusted for Tax Release of Working Capital
NPV	NPV of a project

CONCEPT - 5 Calculation of Future Cash Flows (CFAT)

Calculation of Future Cash Flows (CFAT)		Note 1 : Treatment of Depreciation		
Sale Price Per Unit	xxx	> [EBDIT - Depreciation] [1 - Tax Rate] + Depreciation; Or		
Less : Variable Cost Per Unit	xxx	> EBDIT (1 - Tax Rate) + Tax saving on Depreciation		
Contribution Per Unit	xxx	Note 2 : Treatment of Interest Cost / Finance Cost		
× No. of Unit	xxx	> Finance Cost are already reflected in Projects required rate of return /WACC / k ₀		
Total Contribution	xxx	> This shows that Interest on Long Term Loans as well as its Tax Saving is already considered by k ₀		
Less : Fixed Cost	xxx			
EBDIT	xxx	Note 3 : Treatment of Working Capital		
Less : Depreciation	xxx			
Annual PBT	xxx			Time
Less : Tax	xxx	Introduction of Working Capital	Outflow	Year 0
Annual PAT	xxx	Release of Working Capital	Inflow	End of project life
Add : Depreciation	xxx	Working Capital should never be adjusted for tax as it is a balance sheet item. Working capital is also not subject to depreciation.		
CFAT	xxx			

Note 4 : Treatment of Tax

If we have loss in a particular year, there are two adjustments

1. Set-off : assumed the firm as other profitable business, Loss in a year generate tax savings in that year.
2. Carry Forward : The company has an individual business or a new business having no other operations, loss in a year will be carried forward to future years for the purpose of Set-off.

Note 5 : Key Points to Remember

1. Decisions are based on cash flows, not accounting income:

Consider INCREMENTAL CASH FLOWS, the change in cash flows that will occur if the project is undertaken.

2. Sunk costs should not be included in the analysis.

These costs are not effected by the accept/reject decisions. Eg. Consulting fees paid to a marketing research firm to estimate demand for a new product prior to a decision on the project.

3. Externities / Cannibalization

When considering the full implication of a new project, loss in sales of existing products should be taken into account & also consider positive effects on sale of a firm's other product line.

4. Cash flows are based on Opportunity Costs.

Opportunity costs should be included in projects costs.

5. The timing of cash flows is important.

Cash flows received earlier are worth more than cash flows to be received later.

6. Cash flows are analyzed on an after-tax basis.

CONCEPT - 6 Profitability Index (PI)/ Benefit cost Ratio/ Desirability Factor/Present Value Index

Where different investment proposals each involving different initial investments and cash inflows

$$PI = \frac{PV \text{ of Cash Inflows}}{CF_0 \text{ or present value of outflows}}$$

CFO = Initial Cash Out Flows

Note:

NPV = - CFO + PV of future Cash In Flows

CFO + NPV = PV of Future Cash In Flows

If NPV is given, then

Add Initial outlay in NPV to get, PV of Cash inflows.

Decision :

If NPV is Positive, the PI will be greater than one.

If NPV is Negative, the PI will be Less than one.

Rule :

If

PI > 1	Accept the project
PI < 1	Reject the project
PI = 1	Indifferent

CONCEPT - 7 Simple Pay-Back Period Method (PBP)

The pay- back period (PBP) is the number of years it takes to recover the initial cost of an investment. It is the period at which total cash inflows from the project equals to the cost of investment in the project.

Case I : When cash inflows are constant/ equal

$$\text{Payback period} = \frac{\text{Total initial capital investment}}{\text{Annual expected after tax net cash flows}}$$

Case II: When Cash inflows are unequal		Payback period =
Steps Involved:		$\text{Full years until recovery} + \frac{\text{Unrecovered cost}}{\text{Cash flow during next year}}$
a) Determine the initial investment of the project.		
b) Determine the CFAT from project for various years.		
c) Compute the cumulative CFAT at end of each year.		
Decision	→	Shorter the PBP, better the project.
Drawback	→	PBP does not take into account the time value of money and cash flows beyond the payback period.
Benefit	→	The main benefit of the pay-back period is that it is a good measure of project liquidity.

CONCEPT - 8 Discount pay-back period

The discounted payback period uses the present value (PV) of project's estimated Cash flows.
It is the number of years it takes a project to recover its initial investment in present value terms.
Discounted pay-back period must be greater than simple pay-back period.

CONCEPT - 9 Payback Reciprocal

It is the reciprocal of Payback Period. It is computed as :

$$\text{Payback Reciprocal} = \frac{\text{Annual expected after tax cash inflows}}{\text{Total initial capital investment}}$$

The Payback Reciprocal is considered to be an approximation of Internal Rate of Return, if:

- The life of the project is at least twice the payback period, and
- The Project generates equal amount of the annual cash inflows.

Example:

A project with an initial investment of Rs. 50 lakhs and life of 10 years, generates CFAT of Rs.10 lakhs per annum. Its Payback Reciprocal will be 10 lakhs/ 50 lakhs = 20%

CONCEPT - 10 IRR Techniques (Internal Rate of Return)

IRR is the discount rate that makes PV of a project's estimated cash inflows equal to PV of the project's estimated cash outflows.

i.e. IRR is the discount rate that makes the following relationship:

PV (Inflows) = PV (Outflows)

IRR is also the discount rate for which the NPV of a project is equal to ZERO.

$$\text{IRR} = \text{Lower rate} + \frac{\text{Lower rate NPV}}{\text{Lower rate NPV} - \text{Higher rate NPV}} * \text{Difference in Rate (HR - LR)}$$

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How to find the starting rate for calculation of IRR:

Step 1: Calculate Fake Pay-back period

$$\text{Fake payback period} = \frac{\text{Initial investment}}{\text{Average annual cash flow}}$$

Step 2: Locate the above figure in Present Value Annuity Factor Table and take this discount rate to start the calculation of IRR.

Accept/Reject Criteria:

IRR > Cost of Capital	Accept the Proposal
IRR = Cost of Capital	Indifferent
IRR < Cost of Capital	Reject the Proposal

CONCEPT - 11 Accounting Rate of Return

$$ARR = \frac{\text{Average annual net profit}}{\text{Initial Investment}}$$

$$\text{Average Net Profit} = \frac{NP_1 + NP_2 + NP_3 \dots NP_n}{n}$$

1. It ignores time value of money.
2. It takes into account accounting profits rather than cash flows.

CONCEPT - 12 Net Profitability Index or Net PI

$$\text{Net PI} = \frac{NPV}{\text{Initial Investment or Present value of outflows}} ; \text{ Decision} = \text{Higher the Better}$$

Techniques		For Independent Project	For Mutually Exclusive Projects
Non - Discounted	Payback	(i) When Payback period \leq Maximum Acceptable Payback period: Accepted (ii) When Payback period \geq Maximum Acceptable Payback period: Rejected	Project with least Payback period should be selected
	Accounting Rate of Return (ARR)	(i) When $ARR \geq$ Minimum Acceptable Rate of Return: Accepted (ii) When $ARR \leq$ Minimum Acceptable Rate of Return: Rejected	Project with the maximum ARR should be selected
Non - Discounted	Net Present Value (NPV)	(i) When $NPV > 0$: Accepted (ii) When $NPV < 0$: Rejected	Project with the highest positive NPV should be selected
	Profitability Index (PI)	(i) When $PI > 1$: Accepted (ii) When $PI < 1$: Rejected	When Net Present Value is same project with highest PI should be selected
	Internal Rate of Return (IRR)	(i) When $IRR > k$: Accepted (ii) When $IRR < k$: Rejected	Project with the maximum IRR should be selected

CONCEPT - 13 Modified NPV/ IRR

When Cost of Capital & Re-investment rate are separately given, then we calculate Modified NPV.

Modified IRR : It is the discount rate at which Modified NPV is Zero.

$$\text{i.e. Modified NPV} = \frac{\text{Terminal value}}{(1+K_0)^n} - PV \text{ of cash outflow} \quad \text{"or"} \quad PV \text{ of Cash Outflows} = \frac{\text{Terminal value}}{(1+K_0)^n}$$

TOPIC - LEASE FINANCING

CONCEPT - 1 Introduction

Finance Decision	→	From the point of view of "Lessee" Whether to purchase the Asset on Loan vs Whether to take the Asset on Lease	→	From the point of view of "Lessor" Whether to purchase the Asset or Give it on Lease or not ?
Investing Decision	→	Outflow Decision Decision : Select option which gives least outflow	→	NPV/ Inflow Decision Decision : If NPV is +ve then Accept it If NPV is -ve then Reject it

Leasing is an important source of medium-term financing or leasing is the process of financing the cost of an asset. It is an arrangement under which an asset is financed and owned by one party but possessed and used by the other

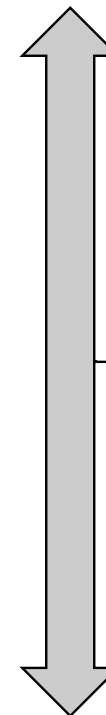
CONCEPT - 2 Parties to the lease agreement

Lessor	→	The OWNER of the asset is known as lessor-who gives assets on lease.
Lessee	→	The USER of the asset is known as lessee-who takes asset on lease.

The lease agreement details out the specified period and timing of the sequential payments to be made by the lessee to the lessor as consideration for the use of the asset. It also incorporates repayment schedule.

CONCEPT - 3 Evaluation from the Point-of-view of Lessee/ Lease or Borrow & Buy Decision (A Financing Decision)

Loan Option	Lease Option
<u>Outflows</u>	<u>Outflows</u>
Interest Net of Tax	Lease Rentals Net of Tax
Principal	Repair & Maintenance Net of Tax
Expense Net of Tax	
Repair & Maintenance Net of Tax	
<u>Inflows</u>	<u>Inflows</u>
Tax Saving on Depreciation	Nil
Salvage Value adjusted for tax	
Calculation of Discount Rate	Calculation of Discount Rate
k_d = Interest Net of Tax	k_d
	Leasing is an alternative of Loan Option
k_e	k_e
k_o	k_o
Present Value of Outflow under loan option	Present Value of outflow under lease option



Decision:
Select the option which
gives the least outflow.

Adjustment No. 1

Common items under lease option and loan option can be ignored.

Exception to this rule:

1. Timing Difference.
2. If discount rate is different in both options.

Note :

Repair and Maintenance Expenses are always borne by the user of the Asset unless otherwise specifically stated.

Insurance expenses are always borne by the owner of the Asset unless otherwise specifically stated.

Adjustment No. 2

Loan / Principal Repayment

1. Bullet Payment: Principal will be repaid in one shot at the end of Loan term, in this case interest is calculated for each year.
2. Principal amount of loan repayment: Interest is calculated on Balance amount.
3. Equated Annual Installment: It includes Interest and Principal both.

Adjustment No. 3 : Equated Annual Installment (EAI)

(When installment is paid at the end of each year)

Step 1 : Equated annual loan repayment inclusive of interest (paid at the end of each year)

$$EAI = \frac{\text{Amount of loan}}{PVAF(r\%, n \text{ years})} \quad \text{Where, } r\% = \text{rate of interest before Tax (Charged by bank); } n = \text{Period of Loan}$$

Step 2 : Calculate Principal Repayment amount and interest amount from the total equated Annual Installment

Step 3 : Calculate Interest Net of Tax.

When installment is paid from beginning of each year/ annuity due

$$EAI = \frac{\text{Amount of loan}}{PVAF(r\%, (n-1) \text{ years})}$$

If silent, we will assume those rentals are paid at the end of each year.

CONCEPT - 4 Evaluation from the point of view of Lessor (Investment Decision)

Decision: "Whether to purchase asset and give asset on lease rent or Not"

Step 1: Calculate all cash inflows and all cash outflows of lessor. TABLE

Inflows of Lessor

- i) Lease Rent received net of Tax
- ii) Tax Saving on Depreciation
- iii) Salvage Value adjusted for Tax

Outflow for Lessor

- i) Cost of Asset Purchased
- ii) Expenditure net of Tax, if any relating to lease.

Step 2 : Compute a suitable Discount Rate.

K_0 = Cost of Capital; or

$$K_0 = WACC = K_e W_e + K_d W_d + K_r W_r + K_p W_p$$

Step 3 : Compute NPV (Net Present Value)

Decision: If NPV is Positive, lessor should lease the asset.

CONCEPT - 5 Treatment of Depreciation

Depreciation is always charged by the owner of the Asset.

In case of Loan Option, depreciation is charged by borrower.

Depreciation is a non-cash item, it should not be considered while calculating cash flows.

Tax savings on depreciation should be taken as cash inflows

$$\text{Tax Saving on Depreciation} = \text{Depreciation Amount} \times \text{Tax Rate}$$

CONCEPT - 6 Methods of Depreciation

1. Straight- line Depreciation Method:

Straight-line depreciation allocates an equal amount of depreciation each year over the asset's useful life.

$$\text{Depreciation (p.a)} = \frac{\text{Original cost} - \text{Salvage value/Residual Value}}{\text{Life of the asset}}$$

Note : If question is silent, always use straight-line method of depreciation.

2. Written-down value Depreciation Method :- WDV Depreciation = [Cost - Accumulated Depreciation] x % of Depreciation

Note : If Rate of Depreciation is given use WDV Method

We recognize more depreciation expense in early years of the asset's life and less depreciation expense in the later years of life.

CONCEPT - 7 Treatment of Salvage Value Adjusted for tax - (WDV Depreciation)

1. In Case of Profit = Salvage Value - Tax Paid on Profit on Sale

2. In Case of Loss = Salvage Value + Tax Saved on Loss on Sale

CONCEPT - 8 Treatment of Salvage Value Adjusted for tax - (SLM Depreciation)

When SLM method is used, Salvage Value should not be adjusted for tax purpose, we only considered SV as inflow unless there is a adjustment related to SV.

Confusion regarding SV

1. If question states that Profit/Loss on sale of assets should be ignored then no need to adjust SV for Tax purpose.

2. Use words like "Net SV" then no need to adjust SV for Tax purpose.

3. If SV is not given in the question then do not assume SV = 0, accordingly no adjustment of SV.

CONCEPT - 9 Treatment of Tax

> Cash inflows & Cash outflows should be taken Net of Tax provided cash inflows & outflows are part of the profit & loss account (Tax Saving or Tax Paid only on revenue items not on Capital items).

> Tax savings should be taken as cash inflows like tax savings on depreciation, tax savings due to loss on sale of asset.

> Treatment of Tax when Cash inflow & Cash outflow arises from the Beginning of each year.

Example : Training expense incurred at the beginning of the Year 1 or in Year 0 Rs. 10,000. Tax Rate @ 40%.

Calculate Inflow & outflow for each year

Alt - 1 (Adjust Tax in year 0 itself)

Year	Cash Flow
0	- 10000 + 4000 = -6000
1	Nil

Alt 2 - (Preferred by CA Institute) (Adjust Tax at year end 1)

Year	Cash Flow
0	- 10000
1	+ 4000

Note: There will be difference in answer under both alternatives

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1

6

CONCEPT - 10 Break-even lease rentals (From the point of view of LESSEE)

Break-even lease rentals are those rentals at which:

$PV \text{ of outflow under Loan Option} = PV \text{ of outflow under Lease Option}$

CONCEPT - 11 Break Even Lease Rentals (From the point of view of LESSOR)

$PV \text{ of Inflow} = PV \text{ of Output}$

$PV \text{ of Lease Rentals Net of Tax} + PV \text{ of Tax Savings on Depreciation} = \text{Cost of Asset}$

$+ PV \text{ of SV Adjusted for Tax} - PV \text{ of Expense Net of Tax}$

CONCEPT - 12 Concept of Block of Assets

Block of Assets means a group of assets falling within a particular class of assets.

No depreciation shall be charged in the year in which asset is sold.

Tax Benefit/ Loss on Short Term Capital Loss/ Gain shall be calculated on previous year WDV.

CONCEPT - 13 Confusing regarding Discount Rate

$K_d = \text{Interest} (1 - \text{Tax})$, even if cost of capital is separately given in the question.

$\text{Lessor } K_O = \text{Cost of Capital} / \text{Discount Rate} / \text{Desire Rate of Return} / \text{Target rate of return}$

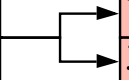
Note:

K_O , K_d , discount rate & Desire rate of return given in the question are always Net of Tax.

Pending two points
please refer org pdf

TOPIC - DIVIDEND DECISION

CONCEPT - 1 Introduction

Total Earnings		Total Earnings	Note: Total Earnings mean Earnings available to equity share holders
		Dividend	

Income Statement	Two types of decision are taken in Dividend Policy
<p>Sales</p> <p>Less: Variable cost</p> <p>Contribution</p> <p>Less: Fixed cost excluding Dep.</p> <p>EBITDA</p> <p>Less: Depreciation and Amortization</p> <p>EBIT</p> <p>Less: Interest</p> <p>EBT</p> <p>Less: Tax</p> <p>EAT</p> <p>Less: Preference Dividend</p> <p>Earnings Available to Equity Share holders</p> <p>Less: Equity Dividend</p> <p>T/F to R&S</p>	<div>1. Long-term financing decision</div> <div>2. Wealth maximization decision</div>

Internal Financing & External Financing
<p>> Internal source of financing means using own funds i.e. Retained Earnings.</p> <p>> External source of financing means taking funds from outside i.e. Equity Share Capital, Preference Share Capital, Debentures, Bonds, etc.</p> <p>> Internal financing is generally less expensive because firm doesn't incur any floating cost to obtain it i.e. $k_r < k_e$</p>

Factors Effecting Dividend Policy
<div>1. Financial needs of the company</div> <div>2. Desire of Share Holders</div> <div>3. Industry Trend</div> <div>4. Legal Constraints</div> <div>5. Cost of Equity (k_e) & Rate of Return (r)</div> <div>6. Ownership/Control</div> <div>7. Discretion of Management</div> <div>8. Liquidity needs of Company</div>

CONCEPT - 2 Define Cash Dividends, Stock Dividend, Stock Split

Cash Dividends : As the name implies, are payments made to shareholders in cash. They come in 3 forms:

Regular Dividends	Occurs when a company pays out a portion of profits on a consistent basis. E.g. Quarterly, Yearly, etc
Special Dividends	They are used when favourable circumstances allow the firm to make a one-time cash payment to shareholders, in addition to any regular dividends. E.g. Cyclical Firms
Liquidating Dividends	Occurs when company goes out of business and distributes the proceeds to shareholders.

Stock Dividends (Bonus Shares) : Stock Dividend are dividends paid out in new shares of stock rather than cash. In this case, there will be more shares outstanding, but each one will be worth less.

Stock dividends are commonly expressed as a percentage. A 20% stock dividend means every shareholder gets 20% more stock

Stock Splits : Stock Splits divide each existing share into multiple shares, thus creating more shares. There are now more shares, but the price of each share will drop correspondingly to the number of shares created, so there is no change in the owner's wealth.

> Splits are expressed as a ratio. In a 3-for-1 stock split, each old share is split into three new shares.

> Stock splits are more common today than stock dividends

CONCEPT - 3 Some Basic Ratios

EPS	→	(Total Earning available to equity shareholders) / (Total number of equity shares)
DPS	→	(Total dividend paid to equity shareholders) / (Total number of equity shares)
MPS	→	(Total market value or Market Capitalization or Market Cap) / (Total number of equity shares)
REPS	→	(Total Retained Earnings) / (Total number of equity shares)
	→	REPS = EPS - DPS
Dividend Yield	→	(Dividend Per Share) / (Market Price Per Share) x 100
Dividend Pay - Out Ratio	→	(Dividend Per Share) / (Earning Per Share) x 100
Dividend Rate	→	(Dividend Per Share) / (Face Value Per Share) x 100
Earning Yield	→	(Earning Per Share) / (Market Price Per Share) x 100
P/E Ratio	→	MPS / EPS
Retention Ratio	→	(Retained Earning Per Share) / (Earning Per Share) x 100
	→	(EPS - DPS) / EPS x 100
	→	1 - Dividend Payout Ratio

Note :

Relationship Between DPR & RR:
 $RR + DPR = 100\% \text{ or } 1$

- > Dividend yield and Earning Yield is always calculated on annual basis.
- > Dividend is 1st paid to preference share holder before any declaration of dividend to equity shareholders.
- > Dividend is always paid upon FV(Face Value) not on Market Value

CONCEPT - 4 Theories of Dividends

Dividend (Models/ Theory)	→	Relevant Theory Walter's Model Gordon's Model	→	Relevant Theory: Dividend played an important role in determination of market price of share.
	→	Irrelevant Theory MM Approach	→	Irrelevant Theory: Dividend do not play any role in determination of market price of share/ Market value of the firm.

4A - Walter's Model

Walter's supports the view that the dividend policy plays an important role in determining the market price of the share. He emphasis two factors which influence the market price of a share:-

- Dividend Payout Ratio.
- The relationship between Internal return on Retained earnings (r) and cost of equity capital (k_e)

Walter classified all the firms into three categories:-

a) Growth Firm:

If ($r > k_e$), In this case, the shareholder's would like the company to retain maximum amount i.e. to keep payout ratio quite low.
In this case, there is negative correlation between dividend and market price of share.
If $r > k_e$, Lower the Dividend Pay-out Ratio Higher the Market Price per Share & vice-versa.

b) Declining Firm:

If ($r < k_e$), In this case, the shareholder's won't like the firm to retain the profits so that they can get higher return by investing the dividend received by them.
In this case, there is positive correlation between dividend and market price of share.
If $r < k_e$, Higher the Dividend Pay-out Ratio, Higher the Market Price per Share & vice-versa.

c) Constant Firm:

If rate of return on Retained earnings (r) is equal to the cost of equity capital (k_e) i.e. ($r = k_e$). In this case, the shareholder's would be indifferent about splitting off the earnings between dividend & Retained earnings.
If $r = k_e$, Any Retention Ratio or Any Dividend Payout Ratio will not affect Market Price of share. MPS will remain same under any Dividend Payout or Retention Ratio.

Note : Walter concludes:-

The optimum payout ratio is NIL in case of growth firm.

The optimum payout ratio for declining firm is 100%

The payout ratio of constant firm is irrelevant.

Category of the Firm	r Vs. k_e	Correlation between MPS & DPS	Optimum Payout Ratio	Optimum Retention Ratio
Growth	$r > k_e$	Negative	0%	100%
Constant	$r = k_e$	No Correlation	Every Payout is Optimum	Every retention is Optimum
Decline	$r < k_e$	Positive	100%	0%

Valuation of Equity as per Walter's

Current market price of a share is the present value of two cash flow streams:-

a) Present Value of all dividend.

b) Present value of all return on retained earnings.

In order to testify the above, Walter has suggested a mathematical valuation model i.e.,

$$P_0 = \frac{DPS}{K_e} + \frac{\frac{r}{K_e}(EPS - DPS)}{K_e}$$

When

P_0 = Current price of equity share (Ex-dividend price)/Fair or Theoretical or Intrinsic or Equilibrium or present Value Price per Share

DPS = Dividend per share paid by the firm

r = Rate of return on investment of the firm/ IRR/ Return on equity

k_e = Cost of equity share capital/ Discount rate/ expected rate of return/opportunity cost/ Capitalization rate

EPS = Earnings per share of the firm

EPS - DPS = Retained Earning Per Share

Assumptions :

- | | |
|---|------------------------------|
| 1) DPS & EPS are constant. | 2) k_e & r are constant. |
| 3) Going concern assumption, company has infinite life. | 4) No external Finance |

4B - Gordon's Model/Growth Model/ Dividend discount Model

Gordon's Model suggest that the dividend policy is relevant and can effect the value of the share.

Dividend Policy is relevant as the investor's prefer current dividend as against the future uncertain Capital Gain.

Current Market price of share = PV of future Dividend, growing at a constant rate

$$P_0 = \frac{D_0(1+g)}{K_e - g_c} \text{ or } P_0 = \frac{D_1(\text{next expected dividend})}{K_e - g_c} \text{ or } P_0 = \frac{EPS_1(1-b)}{K_e - b_r}$$

P_0 = Current market price of share.

k_e = Cost of equity capital/ Discount rate/ expected rate of return/ Opportunity cost/Capitalization rate.

g = Growth rate

D_1 = DPS at the end of year / Next expected dividend / Dividend to be paid

D_0 = Current year dividend / dividend as on today / last paid dividend

EPS_1 = EPS at the end of the year

b = Retention Ratio

$1-b$ = Dividend payout Ratio

Note:

Watch for words like 'Just paid' or 'recently paid', these refers to the last dividend D_0 and words like 'will pay' or 'is expected to pay' refers to D_1 .

Assumptions:

(i) No external finance is available.

(ii) k_e & r are constant.

(iii) 'g' is the product of its Retention Ratio 'b' and its rate of return 'r' $g = b * r$ or $g = RR * ROE$

(iv) $k_e > g$ (v) g & RR are constant. (vi) Firm has an infinite life

Applications

1. $EPS_1(1-b) = DPS_1$

Proof :

$EPS_1(1-b) = EPS_1 \times \text{Dividend Payout Ratio}$

$$= EPS_1 * \frac{DPS_1}{EPS_1}$$

= DPS_1

We know that $DPR + RR = 1$ or 100%

2. If $EPS = DPS$, $RR = 0$ then $g = 0$

$$P_0 = \frac{D_0(1+g)}{K_e - g}$$

$$P_0 = \frac{D_0}{K_e} \text{ as } g = 0$$

$$P_0 = \frac{EPS}{K_e} \text{ Therefore, } EPS = DPS$$

3. Calculation of P_1 (Price at the end of year 1)

Price at the beginning = PV of Dividend at end + PV of market price at end

$$P_0 = \frac{D_1 + P_1}{(1+K_e)}$$

4.

$$K_e = \frac{1}{P.E \text{ Ratio}}$$

Calculate P/ E Ratio at which Dividend payout will have no effect on the value of the share.

When $r = k_e$, dividend payout ratio will not affect value of share

Example

If $r = 10\%$ then $k_e = 10\%$ and $k_e = \frac{1}{PE \text{ Ratio}} \Rightarrow 0.10 = \frac{1}{PE \text{ Ratio}} \Rightarrow P/E \text{ Ratio} = 10 \text{ times}$

4C - MM Approach (IRRELEVANCE THEORY)

Dividends do not play any role in determination of market value. Market value is rather affected by earnings and investment.

Formulae:

$$nP_0 = \frac{(n+m)*P_1 + E_1 - I_1}{(1+K_e)^1}$$

n = Existing number of equity shares at the beginning of the year
m = New number of equity shares, issued at year end market price
P₀ = Current market price as on today
P₁ = Market price per share at the end of year one
E₁ = Total earning at the end of year one
I₁ = Total investment at the end of year one
K_e = Cost of equity
nP₀ = Market value of the company as on today
n+m = Total no of equity share at the end (old + new share)
(n + m)P₁ = Total market value of the company at the end.

Amount raised by issue of new equity shares = Investment - [Earning - Dividend]

Assumption:

Funds can raise only by equity & retained earnings.

Note:

The Market Price of a share = PV of dividend paid at end + PV of market price at the end at the beginning of a period

$$P_0 = \frac{P_1 + D_1}{(1+K_e)^1}$$

Calculate *P₁* from this formulae

New number of equity share

$$m = \frac{I_1 - (E_1 - nD_1)}{P_1} \text{ or } m = \frac{\text{Investment}_1 - (\text{Earnings}_1 - n * \text{DPS}_1)}{\text{Market price at the end}(P_1)}$$

CONCEPT - 5 Graham & Dodd Model (Traditional Approach)

$$P_0 = m * \left[\text{DPS} + \frac{\text{EPS}}{3} \right] \text{ or } P_0 = m * \left[\frac{4\text{EPS}}{3} \right] + m * \left[\frac{\text{REPS}}{3} \right] \text{ where } m = \text{multiplier}$$

CONCEPT - 6 Linter's Model

We will calculate dividend to be paid by any Company.

Assumption:

Dividend should not fall. It may remain constant or may increase but can't fall.

Formula:

$$D_1 = D_0 + [\text{EPS} \times \text{Target Dividend Payout} - D_0] \times \text{AF}$$

Where

AF = Adjustment factor; *D₀* = Dividend in Previous Year or Dividend Paid; *D₁* = Dividend to be paid/ declared

TOPIC - TYPES OF FINANCING

TOPIC - 1 External Commercial Borrowing

1. ECBs refer to commercial loans (in the form of bank loans, buyer's credit, suppliers credit, securitised instruments (e.g. floating rate notes and fixed rate bonds) availed from non-resident lenders with minimum average maturity of 3 years.
2. Borrowers can raise ECBs through internationally recognised sources like (i) international banks, (ii) international capital markets, (iii) multilateral financial institutions (iv) export credit agencies, (v) suppliers of equipment, (vi) foreign collaborators and (vii) foreign equity holders.
3. External Commercial Borrowings can be accessed under two routes viz (i) Automatic route and (ii) Approval route.
4. Under the Automatic route there is no need to take the RBI/Government approval whereas such approval is necessary under the Approval route.
5. Company's registered under the Companies Act and NGOs engaged in micro finance activities are eligible for the Automatic Route where as Financial Institutions and Banks dealing exclusively in infrastructure or export finance and the ones which had participated in the textile and steel sector restructuring packages as approved by the government are required to take the Approval Route

TOPIC - 2 Euro Bonds

1. The name Eurobonds can be misleading because from the word, you'd think either Eurobonds were about the European bond markets, or about the European currency, Euros.
 2. Eurobonds are actually bonds that are denominated in a currency other than that of the country in which they are issued. They are usually issued in more than one country of issue and traded across international financial centres.
 3. Corporations, including banks and multinational entities issue Eurobonds for many purposes including financing for capital and other projects.
 4. Eurobonds are not regulated by the country of the currency in which they are denominated.
- Eurobonds are so-called "bearer bonds", they are not registered anywhere centrally, so whomever holds or bears the bond is considered the owner.
5. Their "bearer" status also enables Eurobonds to be held anonymously.

TOPIC - 3 Foreign Bonds

1. These are debt instruments issued by foreign corporations or foreign governments.
2. Such bonds are exposed to default risk, especially the corporate bonds.
3. These bonds are denominated in the currency of the country where they are issued, however, in case these bonds are issued in a currency other than the investors home currency, they are exposed to exchange rate risks. An example of a foreign bond 'A British firm placing Dollar denominated bonds in USA'

TOPIC - 4 Medium Term Notes

1. Certain issuers need frequent financing through the Bond route including that of the Euro bond.
2. However it may be costly and ineffective to go in for frequent issues. Instead, investors can follow the MTN programme.
3. Medium-term note ("MTN") programs enable companies to offer debt securities on a regular and/or continuous basis.
4. Notes range in maturity from one to 10 years. By knowing that a note is medium term, investors have an idea of what its maturity will be when they compare its price to that of other fixed-income securities.
5. All else being equal, the coupon rate on medium-term notes will be higher than those achieved on short-term notes.

TOPIC - 5 Certificate of Deposit (CD)

1. A certificate of deposit is a promissory note issued by a bank. It is a time deposit that restricts holders from withdrawing funds on demand. Although it is still possible to withdraw the money, this action will often incur a penalty.
2. CDs can be issued by (i) scheduled commercial banks {excluding Regional Rural Banks and Local Area Banks}; and (ii) select All-India Financial Institutions (FIs) that have been permitted by RBI to raise short-term resources within the umbrella limit (prescribed in paragraph 3.2 below) fixed by RBI.
3. Minimum amount of a CD should be Rs.1 lakh, i.e., the minimum deposit that could be accepted from a single subscriber should not be less than Rs.1 lakh, and in multiples of Rs. 1 lakh thereafter.
4. The maturity period of CDs issued by banks should not be less than 7 days and not more than one year, from the date of issue.
5. CDs in physical form are freely transferable by endorsement and delivery

TOPIC - 6 Floating Rate Bonds

1. This as the name suggests is bond where the interest rate is not fixed and is allowed to float depending upon the market conditions.
2. This is an ideal instrument which can be resorted to by the issuer to hedge themselves against the volatility in the interest rates.
3. This has become more popular as a money market instrument and has been successfully issued by financial institutions like IDBI, ICICI etc.

TOPIC - 7 Floating Rate Notes

1. A debt instrument with a variable interest rate. Also known as a "floater" or "FRN,"
2. Floaters are mainly issued by financial institutions and governments, and they typically have a two-to five-year term to maturity.
3. Interest rates are adjusted to reflect the prevailing exchange rates.
4. They provide cheaper money than foreign loans.
5. An FRN's interest rate can change as often or as frequently as the issuer chooses, from once a day to once a year. The "reset period" tells the investor how often the rate adjusts. The issuer may pay interest monthly, quarterly, semi-annually or annually. FRNs may be issued with or without a call option.

TOPIC - 8 Deep Discount Bonds

1. Deep Discount Bonds is a form of zero-interest bonds.
2. These bonds are sold at a discounted value and on maturity face value is paid to the investors.
3. In such bonds, there is no interest payout during lock in period.
4. IDBI was the first to issue a deep discount bond in India in January, 1992. The bond of a face value of ₹1 lakh was sold for ₹2,700 with a maturity period of 25 years. The investor could hold the bond for 25 years or seek redemption at the end of every five years with a specified maturity value as shown below.

The investor can sell the bonds in stock market and realise the difference between face value (Rs. 2,700) and market price as capital gain.	Holding period (years)	5	10	15	20	25
	Maturity Value	5,700	12,000	25,000	50,000	1,00,000
	Annual rate of interest	16.12	16.09	15.99	15.71	15.54

Note that Deep Discount Bond may have interest rates which can be lower than the usual rate.

TOPIC - 9 Zero Coupon Bonds

1. A zero-coupon bond (also discount bond or deep discount bond) is a bond bought at a price lower than its face value, with the face value repaid at the time of maturity.
2. It does not make periodic interest payments, or have so-called "coupons", hence the term zero-coupon bond. When the bond reaches maturity, its investor receives its par (or face) value.
3. Some zero coupon bonds are inflation indexed, so the amount of money that will be paid to the bond holder is calculated to have a set amount of purchasing power rather than a set amount of money, but the majority of zero coupon bonds pay a set amount of money known as the face value of the bond.
4. Zero coupon bonds may be long or short term investments. Long-term zero coupon maturity dates typically start at ten to fifteen years. The bonds can be held until maturity or sold on secondary bond markets. Short-term zero coupon bonds generally have maturities of less than one year and are called bills. The U.S. Treasury bill market is the most active and liquid debt market in the world

TOPIC - 10 Double Option Bonds

1. These have also been recently issued by the IDBI. The face value of each bond is Rs. 5,000.
2. The bond carries interest at 15% per annum compounded half yearly from the date of allotment. The bond has maturity period of 10 years.
3. Each bond has two parts in the form of two separate certificates, one for principal of Rs. 5,000 and other for interest (including redemption premium) of Rs. 16,500.
4. Both these certificates are listed on all major stock exchanges.
5. The investor has the facility of selling either one or both parts anytime he likes.

TOPIC - 11 American Depositary Receipts

1. Shares of many non-US companies trade on US stock exchanges through ADRs.
2. ADRs are denominated and pay dividends in US dollars and may be traded like regular shares of stock.
3. This is an excellent way for the public in US to buy shares in a non US company while realizing any dividends and capital gains in U.S. dollars.
4. One ADR may represent a portion of a foreign share, one share or a bundle of shares of a foreign corporation.
5. If the ADR's are "sponsored," the corporation provides financial information and other assistance to the bank and may subsidize the administration of the ADR.
6. "Unsponsored" ADRs do not receive such assistance.
7. Fees associated with the creating or releasing of ADRs from ordinary shares, charged by the commercial banks with correspondent banks in the international sites.

TOPIC - 12 Global Depositary Receipts

1. A bank certificate issued in more than one country for shares in a foreign company.
2. The shares are held by a foreign branch of an international bank.
3. The shares trade as domestic shares, but are offered for sale globally through the various bank branches.
4. Several international banks issue GDRs, such as JP Morgan Chase, Citigroup, Deutsche Bank, The Bank of New York Mellon.
5. GDRs are often listed in the Frankfurt Stock Exchange, Luxembourg Stock Exchange and in the London Stock Exchange, where they are traded on the International Order Book (IOB).

TOPIC - 13 Indian Depository Receipts

1. An Indian Depository Receipt (IDR) is a financial instrument denominated in Indian Rupees in the form of a depository receipt created by a Domestic Depository against the underlying equity of issuing company to enable foreign companies to raise funds from the Indian securities Markets.
2. The foreign company IDRs will deposit shares to an Indian depository.
3. The depository would issue receipts to investors in India against these shares.
4. The benefit of the underlying shares (like bonus, dividends etc.) would accrue to the depository receipt holders in India.

TOPIC - 14 Seed Capital Assistance

1. The Seed capital assistance scheme is designed by IDBI for professionally or technically qualified entrepreneurs and/or persons possessing relevant experience, skills and entrepreneurial traits.
2. All the projects eligible for financial assistance from IDBI, directly or indirectly through refinance are eligible under the scheme.
3. The Seed Capital Assistance is interest free but carries a service charge of one per cent per annum for the first five years and at increasing rate thereafter.
4. However, IDBI will have the option to charge interest at such rate as may be determined by IDBI on the loan if the financial position and profitability of the company so permits during the currency of the loan.
5. The repayment schedule is fixed depending upon the repaying capacity of the unit with an initial moratorium upto five years.
6. The project cost should not exceed Rs. 2 crores and the maximum assistance under the project will be restricted to 50 percent of the required promoter's contribution or Rs. 15 lacs, whichever is lower.

TOPIC - 15 What is Bridge Financing ?

1. Bridge finance refers to loans taken by a company normally from commercial banks for a short period because of pending disbursement of loans sanctioned by financial institutions.
2. The bridge loans are repaid/ adjusted out of the term loans as and when disbursed by the concerned institutions.
3. Bridge loans are normally secured by hypothecating movable assets, personal guarantees and demand promissory notes. Generally, the rate of interest on bridge finance is higher as compared with that on term loans.

TOPIC - 16 Lease Financing

Types of Lease contract :- 1. Operating Lease 2. Finance Lease

Basis	Finance Lease	Operating Lease
Lease term	Covers the economic life of the equipment	Covers significantly less than the economic life of the equipment
Cancellation	Financial lease cannot be cancelled during the primary lease period.	Operating lease can be cancelled by the lessee prior to its expiration
Amortization	The lease rentals are more or less fully amortized during the primary lease period.	The lease rentals are not sufficient enough to amortize the cost of the asset
Risk of obsolescence	The lessee is required to take the risk of obsolescence.	The lessee is protected against the risk of obsolescence
Costs of maintenance, taxes, insurance etc.	Incurred by lessee unless contract provides otherwise.	Incurred by the lessor.

1. What is Commercial Paper (CP)?

Commercial Paper (CP) is an unsecured money market instrument issued in the form of a promissory note.

2. Who can issue CP:

Corporate, primary dealers (PDs) and the All-India Financial Institutions (FIs) are eligible to issue CP.

3. What is the minimum and maximum period of maturity prescribed for CP?

CP can be issued for maturities between a minimum of 7 days and a maximum of up to one year from the date of issue. However, the maturity date of the CP should not go beyond the date up to which the credit rating of the issuer is valid.

4. In what denominations a CP that can be issued?

CP can be issued in denominations of Rs.5 lakh or multiples thereof.

5. Who can invest in CP?

Individuals, banking companies, other corporate bodies (registered or incorporated in India) and unincorporated bodies, Non-Resident Indians (NRIs) and Foreign Institutional Investors (FIIs) etc. can invest in CPs.

6. Whether CP can be held in dematerialised form? Yes.

7. Whether CPs are traded in the secondary market?

Yes. CPs are actively traded in the OTC [over the counter] market. Such transactions, however, are to be reported on the reporting platform within 15 minutes of the trade for dissemination of trade information to market participation thereby ensuring market transparency.

TOPIC - WORKING CAPITAL MANAGEMENT

CONCEPT - 1 Operating or Working Capital Cycle

Working Capital cycle indicates the length of time between a company's paying for materials, entering into stock and receiving the cash from sales of finished goods. For example, a company holds raw materials on an average for 60 days, it gets credit from the supplier for 15 days, production process needs 15 days, finished goods are held for 30 days and 30 days credit is extended to debtors. The total of all these, 120 days, i.e., 60 - 15 + 15 + 30 + 30 days is the total working capital cycle.

In the form of an equation, the operating cycle process can be expressed as follows:

$$\text{Operating Cycle} = R + W + F + D - C$$

→	R	→	Raw Material Storage period = (Average stock of raw material) / (Average cost of raw material consumption per day)
→	W	→	Work in Progress holding period = (Average Work in progress inventory) / (Average cost of production per day)
→	F	→	Finished goods storage period = (Average stock of finished goods inventory) / (Average cost of goods sold per day)
→	D	→	Debtors collection period = (Average Debtors) / (Average credit sales per day)
→	C	→	Creditors payment period = (Average Creditors) / (Average credit purchases per day)

CONCEPT - 2 Estimate of Amount of different components of Current Assets and Current Liabilities

Current Assets	Raw Material Inventory	$\frac{\text{Estimated production (in units)} \times \text{Estimated cost of raw material per unit}}{12 \text{ months or } 360 \text{ days}} \times \text{Average raw material holding period (in months or in days)}$
	Work in progress Inventory	$\frac{\text{Estimated production (in units)} \times \text{Estimated WIP cost per unit}}{12 \text{ months or } 360 \text{ days}} \times \text{Average WIP holding period (in months or in days)}$
	Finished Goods Inventory	$\frac{\text{Estimated production (in units)} \times \text{Cost of production (p.u) excl depreciation}}{12 \text{ months or } 360 \text{ days}} \times \text{Average finished goods holding period (in months or in days)}$
	Debtors	$\frac{\text{Estimated credit sales (in units)} \times \text{Cost of sales (per unit) excl depreciation}}{12 \text{ months or } 360 \text{ days}} \times \text{Average debtors collection period (in months or in days)}$
Current Liabilities	Creditors	$\frac{\text{Estimated yearly production (in units)} \times \text{Raw material requirement per unit}}{12 \text{ months or } 360 \text{ days}} \times \text{Credit period granted by suppliers (in months or in days)}$
	Direct Wages Payable	$\frac{\text{Estimated production (in units)} \times \text{Direct labour Cost per unit}}{12 \text{ months or } 360 \text{ days}} \times \text{Average time lag in payment of wages (in months or in days)}$
	Overheads outstanding	$\frac{\text{Estimated yearly production (in units)} \times \text{Overhead Cost per unit}}{12 \text{ months or } 360 \text{ days}} \times \text{Average time lag in payment of overheads (in months or in days)}$

Management of Payables
Computation of cost of payables

$$\left(\frac{100}{100-d} \right)^{\frac{365}{t}} - 1$$

Where, d = size of discount, i.e. for 6% discount. d=6, t=The reduction in the payment period in days, necessary to obtain the early discount or Days Credit Outstanding - Discount Period.

TOPIC - CAPITAL STRUCTURE DECISIONS

CONCEPT - 1 Introduction

Capital structure refers to the mix of a firm's capitalisation (i.e. mix of long term sources of funds such as debentures, preference share capital, equity share capital and retained earnings for meeting total capital requirement).

CONCEPT - 2 Financial Break-even and Indifference Analysis

Financial break-even point is the minimum level of EBIT needed to satisfy all the fixed financial charges i.e. interest and preference dividends. It denotes the level of EBIT for which the firm's EPS equals zero.

The equivalency or indifference point can also be calculated algebraically in the following manner :

Where,

EBIT= Indifference point, E1=Number of equity share in alternative 1,

E2=Number of equity share in alternative 2, I1=Interest charges in alternative 1,

I2=Interest charges in alternative 2, Alternative 1= All Equity finance, Alternative 2= Debt-Equity finance, T= Tax rate,

$$\frac{(EBIT-I_1)(1-T)-PD}{E_1} = \frac{(EBIT-I_2)(1-T)-PD}{E_2}$$

CONCEPT - 3 Capital Structure Theories

a) Net income approach : The value of the firm on the basis of Net Income Approach can be ascertained as follows:

$$V = S + D$$

Where, V = Value of the firm, S = Market value of equity, D = Market value of debt

$$\text{Market value of equity} = (\text{Earnings available for Equity Shareholders}) / k_e$$

Under, NI approach, the value of the firm will be maximum at a point where weighted average cost of capital is minimum. Thus, the theory suggests total or maximum possible debt financing for minimising the cost of capital. The overall cost of capital under this approach is:

$$\text{Cost of equity} = \text{EBIT} / \text{Value of the firm}$$

b) Net operating income approach : NOI means earnings before interest and tax. According to this approach, capital structure decisions of the firm are irrelevant. Any change in the leverage will not lead to any change in the total value of the firm and the market price of shares, as the overall cost of capital is independent of the degree of leverage.

c) Modigliani-Miller approach : The above approach (NOI approach) is definitional or conceptual and lacks behavioural significance. It does not provide operational justification for irrelevance of capital structure.

Based on the assumptions, Modigliani-Miller derived the following three propositions:

1. Total market value of a firm is equal to its expected net operating income dividend by the discount rate appropriate to its risk class decided by the market.

2. Average cost of capital is not affected by financial decision.

CONCEPT - 4 What is Venture Capital Financing? [Topics from Types of Financing]

The venture capital financing refers to financing of new high risky venture promoted by qualified entrepreneurs who lack experience and funds to give shape to their ideas.

In broad sense, under venture capital financing venture capitalist make investment to purchase equity or debt securities from inexperienced entrepreneurs who undertake highly risky ventures with a potential of success.

1. Some of the characteristics of Venture Capital Funding are:-

2. It is basically an equity finance in new companies.

3. It can be viewed as a long term investment in growth-oriented small/medium firms.

4. Apart from providing funds, the investor also provides support in form of sales strategy, business networking and management expertise, enabling the growth of the entrepreneur.

CONCEPT - 5 What is Debt Securitisation? [Topics from Types of Financing]

Debt Securitisation is the process of conversion of existing assets or future cash flows into marketable securities. In other words, securitisation deals with the conversion of assets which are not marketable into marketable ones.

The originator, entity owning the assets out of an agreement identifies a pool of homogeneous assets, which it desires to securitize.

1. Originator makes sales to customers in the normal course of business.

2. Originator transfers the assets to a different entity who has trust agreement with trustee, Guarantee agreement with guarantor and is top rated by rating agency, commonly known as special purpose vehicle (SPV)

3. SPV will convert such assets into certificates known as Pay through or Pass through certificates and sell those certificates to public.

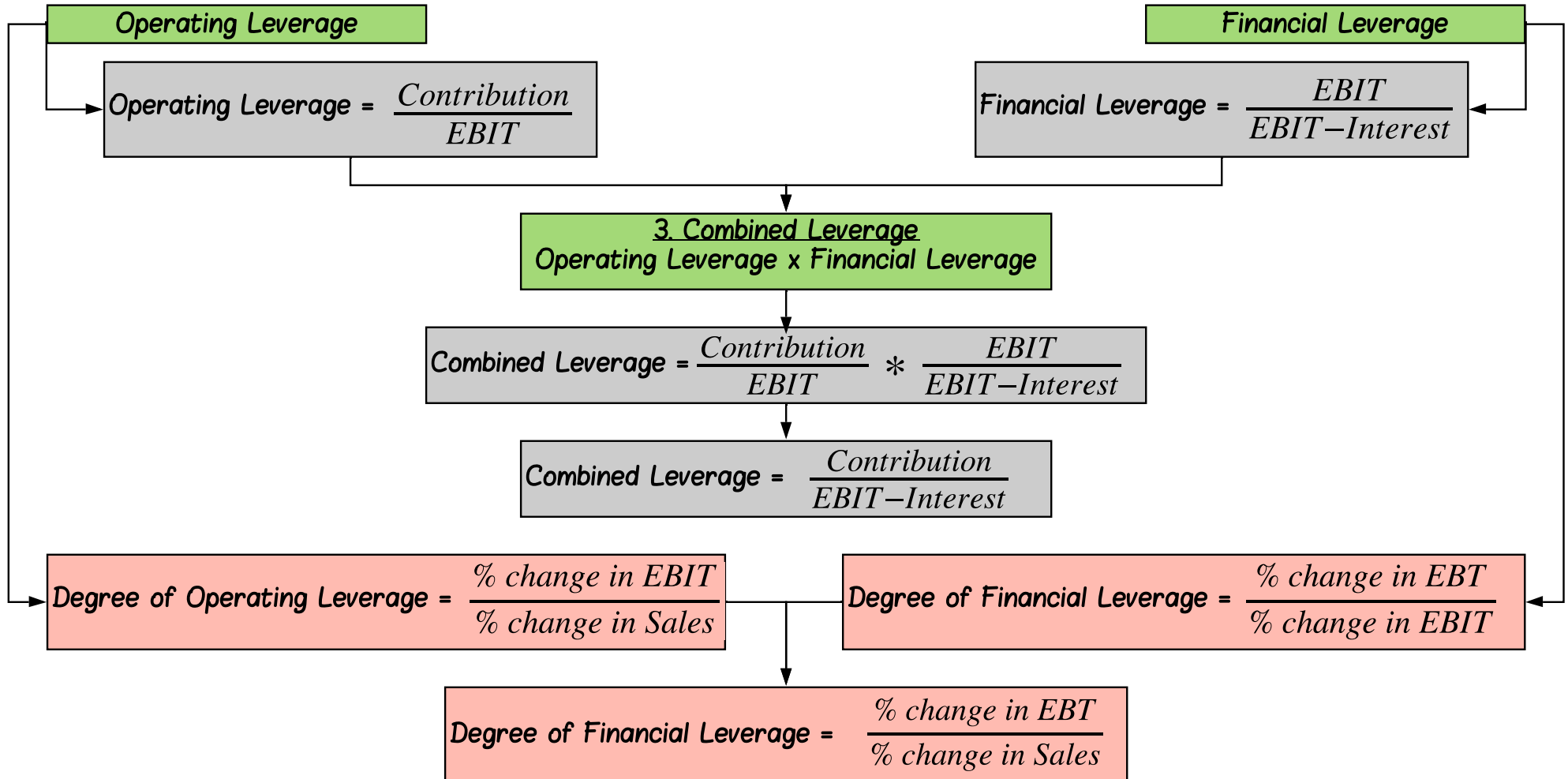
4. Public subscribes to such certificates and pay to the SPV.

5. SPV after deducting his charges transfers the proceeds to Originator.

6. The debtors will due amount.

7. As and when SPV collects money from debtors, it will be immediately distributed to public (In case of pass through certificates) or will accumulate upto a point of time say a year and then distribute to public (In case of pay through certificates).

TOPIC - LEVERAGES
CONCEPT - 1 Types of Leverages



Operating Structure	
Sales	XXX
-Variable Cost	XX
Contribution	XXX
-Fixed Cost	XX
Earnings Before Interest and Tax	XXX
-Interest	XX
Earnings Before Tax	XXX
-Tax	XX
Earnings After Tax	XXX

TOPIC - RATIO ANALYSIS

Liquidity

Capital Structure Ratios

Coverage

Profitability Ratios

Activity Ratios

A. Liquidity

1. Current Ratio	→	$(\text{Current Assets}) / (\text{Current Liabilities})$ (also known as Working Capital Ratio)
2. Quick Ratio	→	$(\text{Quick Assets}) / (\text{Quick Liabilities})$ (also known as Acid test ratio) Quick Assets = Current Assets – Inventories – Prepaid Expenses, Quick Liabilities = Current Liabilities – Bank OD
3. Cash Ratio	→	$(\text{Cash} + \text{Marketable Securities}) / \text{Current Liabilities}$ (also known as absolute liquidity ratio)
4. Basic Defense Interval (BDI)	→	$\frac{\text{Cash} + \text{Receivables} + \text{Marketable Securities}}{\frac{\text{Operating Cash Expenses} + \text{Int} + \text{Tax}}{365}}$
5. Adequacy of resources	→	$\frac{\text{Cash} + \text{Receivables} + \text{Marketable Securities}}{\text{Monthly Expenses}}$ Determines the number of months you could operate without further funds received (burn rate)

B. Capital Structure Ratios

1. Equity Ratio	→	$(\text{Shareholders Equity}) / (\text{Total Capital Employed})$
2. Debt Ratio	→	$(\text{Total Debt}) / (\text{Capital Employed})$
3. Debt to Equity Ratio	→	$(\text{Total Liabilities}) / (\text{Shareholder's Equity})$ or Total Liabilities = Long Term Debt
4. Capital Gearing Ratio	→	$\frac{\text{pref. share capital} + \text{debentures} + \text{long term debt}}{\text{equity share capital} + \text{reserves nad surplus} - \text{losses}}$ Capital gearing ratio is also calculated to show the proportion of fixed interest (dividend) bearing capital to funds belonging to equity shareholders.

C. Coverage Ratios

1. Debt Service Coverage Ratio	→	$(\text{Earnings available for debt service}) / (\text{Interest} + \text{Installment})$
2. Interest Service Coverage Ratio	→	$ISCR = \frac{EAT + \text{Interest}}{\text{Interest}}$
3. Preference Dividend Coverage Ratio	→	$\frac{EAT}{\text{preference dividend liability}}$

D. Profitability Ratios

I. Market Information	II. Point of view	III. Based on Assets/ Investments	IV. Based on Sales
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I. Market Information

1. Price Earning Ratio (PE Ratio)	→	$(\text{Market Price per share}) / (\text{Earning per share})$
2. Yield	→	$\text{Yield} = (\text{Dividend}) / (\text{Closing share price}) \times 100$ or $\text{Yield} = (\text{Dividend}) / (\text{Average share price}) \times 100$
3. Book Value per share	→	$\text{BV per share} = (\text{Net worth}) / (\text{No. of equity shares})$
4. Market Price per share	→	$\text{MP per share} = \text{PE Ratio} \times \text{EPS}$ or $\text{MP per share} = (\text{Opening price} + \text{Closing Price}) / 2$

II. Point of view

1. Return on Equity (ROE)	→	$\text{ROE} = (\text{PAT} - \text{Pref. Dividend}) / (\text{Net Worth})$
2. Earning per share (EPS)	→	$\text{EPS} = (\text{PAT} - \text{Pref. Dividend}) / (\text{No. of ordinary shares outstanding})$
3. Dividend per share (DPS)	→	$\text{DPS} = (\text{Total Dividend}) / (\text{No. of Equity shares})$

III. Based on Assets/ Investments

1. Return on Capital Employed/ Return on Investment	→	$\text{ROCE} = \frac{\text{EBIT} (1-t)}{\text{Capital Employed}}$ where, $\text{Capital Employed} = \text{Total Assets} - \text{Current Liabilities}$
2. Return on Asset (ROA)	→	$\text{ROA} = (\text{Net profit after taxes}) / (\text{Average Total Assets})$

IV. Based on Sales

1. Gross Profit Ratio	→	$\text{GPR} = (\text{Gross Profit}) / (\text{Sales}) \times 100$
2. Operating Profit Ratio	→	$\text{OPR} = (\text{Operating Profit}) / (\text{Sales}) \times 100$ Where, $\text{OP} = \text{Sales} - \text{Cost of Sales}$
3. Net Profit Ratio	→	$\text{NPR} = (\text{Net Profit}) / (\text{Sales}) \times 100$

E. Activity Ratios

1. Capital Turnover Ratio	→	$\text{CTR} = (\text{Sales}) / (\text{Capital Employed})$
2. Fixed Assets Turnover Ratio	→	$\text{FATR} = (\text{Sales}) / (\text{Fixed Assets})$
3. Working capital T/o Ratio	→	$\text{WCTR} = (\text{Sales}) / \text{Working Capital}$

→ 3.a Inventory Turnover Ratio	→	$\text{ITR} = (\text{Cost of goods sold}) / (\text{Avg Inventory})$
→ 3.b Debtors Turnover Ratio	→	$\text{DTR} = (\text{Credit Sales}) / (\text{Average Accounts Receivables})$
→ 3.b Creditors Turnover Ratio	→	$\text{CTR} = (\text{Credit Purchases}) / (\text{Average Accounts Payables})$