MC 2.1

M.COM.

SEMESTER - II

(REVISED SYLLABUS AS PER NEP 2020)

ADVANCED COST ACCOUNTING

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June 2025, Print - 1

Published by : Director,
Centre for Distance and Online Education,
University of Mumbai,
Vidyanagari, Mumbai - 400 098.

DTP Composed : Mumbai University Press
Printed by Vidyanagari, Santacruz (E), Mumbai

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Mandatory 1

Programme Name: M.Com (Advanced Accountancy)
Course Name: Advanced Cost Accounting

Total Credits: 04 **Total Marks: 100**
University assessment: 50 **College assessment: 50**

Aims & Objectives:
1 To explain the concepts of process costing
2. To summarize the concept of cost allocation and ABC analysis
3. To define responsibility centers in company
4. To give knowledge about strategic cost management

Course outcomes:
CO1. Learners will be able to understand process costing and techniques applied in industry
CO2. Learners will be able to identify various cost allocation methods and apply ABC method of costing system
CO3. Learners will be able to define responsibility center and evaluate performance of company
CO4. Learners will be able to under different techniques used in strategic cost management

MODULE I: (2 CREDITS)

Unit 1: Process Costing

A) Introduction - Features of process, Concept of Process Loss, Abnormal Loss, Normal Loss, Abnormal Gain.

B) Computation of Inter Process Profit – Advantages and Disadvantages, Computation of Equivalent Production – Weighted Average and FIFO.

Unit 2: Cost Allocation and Activity Based Costing Systems

A) Cost Allocation – Meaning and its Types, Relationship between resources, activities, Cost and Cost drivers, Methods of allocating central costs - cost allocation using Direct Method, Step Down Method and Reciprocal Method.

B) Activity Based Costing – Introduction, Advantages, Limitations, Identification of cost drivers, Practical Problems on Traditional V/s Activity Based Costing System.

MODULE II : (2 CREDITS)

Unit 3: Responsibility Accounting

A) Responsibility Accounting – Meaning, Features, Objective, Assumptions, Problems, Responsibility Centre's – Cost, Profit, Revenue and Investment.

B) Concept of Controllability – Introduction, Measuring Managerial Performance (ROI and Residual Income Approach) ,Preparation of Managerial Reports using Segmented Costs and Controllable costs approach.

Unit 4: Strategic Cost Management

A) Transfer Pricing – Introduction, Advantages and Disadvantages, Setting Transfer Pricing – Negotiated transfer pricing, Cost Based transfer pricing.

B) Target Costing – Introduction, Concept, Objectives, Comparison between Target Costing and Cost Plus Pricing. Inflation Accounting – Meaning, Features, Conversion of Income Statement, Balance Sheet, Stocks and Net Assets Block using Current Purchasing Power Method.

References:

- Cost Accounting and Management Essentials You Always Wanted To Know Book By Kalpesh Ashar
- Cost Accounting: Texts and Problems Reference Book By M. C. Shukla
- Cost Accounting: Principles & Practices Book Reference By M. N. Arora

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PROCESS COSTING - I

Unit Structure :

1.0 LEARNING OBJECTIVES

After studying this chapter you should be able to understand:-

- The meaning of Process Costing and its characteristics.
- The distinction between job costing and process costing.
- The accounting procedure of process costing including normal loss, abnormal loss / gain.
- The valuation of work-in-progress, using FIFO, LIFO, average and weighted average methods.
- The steps involved in the treatment of inter process transfer.
- To solve practical problems on process costing.

1.1 INTRODUCTION

Process costing is a form of operations costing which is used where standardized homogeneous goods are produced. This costing method is used in manufacturing industries, chemical industries, mining industries and public undertaking works. In process costing, it is assumed that the average cost presents the cost per unit. The cost per unit is calculated by dividing cost of production during a particular period by the number of units produced during that period.

1.2 MEANING OF PROCESS COSTING

Process costing is a method of costing under which all costs are accumulated for each stage of production or process, and the cost per unit of product is ascertained at each stage of production by dividing the cost of each process by the normal output of that particular process.

1.2.1 Definition:

1) According to CIMA, London process costing means "that form of operation costing where standardized goods are produced."

2) Process costing is a method of costing under which cost of a product is calculated at each process by average method.

1.2.2 Characteristics of Process Costing:

1) The production is continuous and is carried out in anticipation of demand.
2) The product is homogeneous.
3) The process is standardized.
4) Output of one process become raw material of another process.
5) The output of the last process is transferred to finished stock.
6) Costs are collected process-wise.
7) Both direct and indirect costs are accumulated in each process.
8) If there is a stock of semi-finished goods, it is expressed in terms of equivalent units.
9) The total cost of each process is divided by the normal output of that process to find out cost per unit of that process.
10) A statement is prepared showing input and output of the process in physical units.

1.2.3 Applicability of process costing:

This method of costing is used by those concerns which manufactures articles of uniform standard. These concerns manufacture articles on a continuous basis. Process costing is favourably followed under the following conditions:-

1) Production of a single product.
2) Processing of a single product for a certain period.
3) Production of several products of a standard design in the same plant.
4) Division of a factory into separate operations or processes.

1.2.4 Advantages of process costing:

1) Costs can be computed periodically at the end of a particular period.
2) It is simple and involves less clerical work.

3) It is easy to allocate the expenses to processes in order to have accurate costs.
4) Use of standard costing systems in very effective in process costing situations.
5) Process costing helps in preparation of tenders and quotations.
6) Due to the availability of cost data for each process, operation and department, good managerial control is possible.

1.2.5 Limitations of process costing:

1) Cost obtained at each process is only historical cost and are not very useful for effective control.
2) Process costing is based on average cost method, which is not that suitable for performance analysis, evaluation and managerial control.
3) Where different products arise in the same process and common costs are prorated to various cost units, such individual products costs may be taken as only approximation and hence not reliable.
4) Work-in-progress is generally done on estimated basis which leads to inaccuracy in total cost calculations.
5) The computation of average cost is more difficult where more than one type of products is manufactured and a division of the cost element is necessary.

1.3 DISTINGUISH BETWEEN JOB COSTING AND PROCESS COSTING

Job costing and process costing are two different systems. Both the systems are used for cost calculation and attachment of cost to each unit completed, but both the systems are appropriate in different situations. The main points of difference between job costing and process costing are as under:-

Sr. No.	Basis of Distinction	Job order costing	Process costing
1	Specific order	Production is against specific orders.	Production is in contentious flow.
2	Nature	Each job may be different.	Product is homogeneous and standardized.
3	Cost ascertainment	Cost is ascertained for each job separately.	Costs are compiled for each process or department on time basis i.e. for production of a given accounting period.

4	Cost calculations	Costs are calculated when a job is completed.	Costs are calculated at the end of the cost period.
5	Control	Proper control is comparatively difficult as each product unit is different and the production is not continuous.	Proper control is comparatively easier as the production is standardized and is more suitable.
6	Paper Work	It includes more paper work.	It includes less paper work.
7	Existence of WIP	There may or may not be WIP at the beginning or at the end.	WIP arises in normal course of production due to continuous production.
8	Transfer	There is usually no transfer from one job to another unless there is some surplus work.	The output of one process is transferred to another process as input.

1.4 COSTING PROCEDURE

For each process, an individual process account is prepared.

Each process of production is treated as a distinct cost center.

1.4.1 Items on the Debit side of Process A/c.

Each process account is debited with:-

1) Cost of materials used in that process.
2) Cost of labour incurred in that process.
3) Direct expenses incurred in that process.
4) Overheads charged to that process on some pre-determined basis.
5) Cost of ratification of normald efectives.
6) Cost of abnormal gain (if any arises in that process).

1.4.2 Items on the Credit side:

Each process account is credited with:-

1) Scrap value of Normal Loss (if any) occurs in that process.

2) Cost of Abnormal Loss (if any occurs in that process)

1.4.3 Cost of Process:

1) The cost of the output of the process (Total Cost minus Sales Value of Scrap) is transferred to the next process.
2) The cost of each process is thus made up to cost brought forward from the previous process and net cost of material, labour and overhead added in that process after deducting the sales value of scrap.
3) The net cost of the finished process is transferred to the finished goods account. The net cost is divided by the number of units produced in order to determine the average cost per unit in that process.

Specimen of Process Account when there are both normal loss and abnormal loss/gain is as under:-

Dr. **Process I A/c** **Cr.**

Particulars	Units	₹	Particulars	Units	₹
To Basic Material	xxx	xx	By Normal Loss	xx	xx
To Direct Material		xx	By Abnormal Loss	xx	xx
To Direct Wages		xx	By Process II A/c (output transferred to Next process)	xx	xx
To Direct Expenses		xx			
To Production Overheads		xx			
To Cost of Rectification of Normal Defects		xx	By Process Stock	xx	xx
To Abnormal Gains		xx			
	xx	xxx		xx	xx

Units of Normal Output =Units of Input -- Units of Normal Loss

1.4.4 Process Losses:

In certain processes, some loss is inevitable. Certain production techniques are of such a nature that there is some loss in the production process. Wastages of material, evaporation of material cannot be avoided in some processes. But sometimes the losses are also arising because of poor quality raw material, carelessness of employees, poor technology etc. These are called as **avoid able losses.**

Basically, process losses are classified in to two categories:-

(a) Normal Loss

(b)Abnormal Loss

a) Normal Loss:

Normal loss is an unavoidable loss which occurs due to the inherent nature of the materials and production process under normal conditions. It is normally estimated on the basis of past experience of the industry. It may be in the form of normal wastage, normal scrap, normal spoilage and normal defectiveness. It may occur at any time during the process. E.g. There are weight losses in processes due to evaporation, melting, burning or reduction of raw material.

Number of Units of Normal Loss = Input Units x Expected Percentage of Normal Loss

The cost of normal loss in a process.

If the normal loss units can be sold as a scrap, the sale value is credited to process account. If some rectification is required before the sale of the normal loss, then that cost is debited to process account.

After adjusting the normal loss, the cost per unit is calculatedby using the following formula:

Cost per Unit = Total Cost Incurred – Scrap Value of Normal Loss

Input Units – Normal Loss Units

b)Abnormal Loss:

Some losses are caused by unexpected abnormal conditions like plant breakdown, substandard material, accident, carelessness, etc. Such losses are in excess of pre-determined normal losses. This loss is fundamentally avoidable. Thus, abnormal losses arrive when actual losses are more than expected losses. The units of abnormal loss is calculated as under:

Units of Abnormal Loss = Input - Units of Normal Loss – Units of Output

The value of abnormal loss is calculated with the help of following formula:

Cost of Abnormal Loss

= Total Cost Incurred – Scrap Value of Normal Loss X Units of Abnormal Loss

Input units – Normal Loss Units

Abnormal loss should not be allowed to affect the cost of production as it is caused by abnormal and unexpected conditions. These losses occur due to human error or managerial inefficiency. Such losses are due to bad plant design or operations, carelessness, such loss representing the cost of materials, labour and overhead charges is called abnormal loss account. The sales value of the abnormal loss is credited to Abnormal Loss Account and the balance is written off to Costing Profit and Loss A/c.

Dr. Abnormal LossA/c Cr.

Particulars	Units	₹	Particulars	Units	₹
To Process A/c.	xx	xx	By Bank	xx	xx
			By Costing Profit and Loss A/c.	xx	xx
	xx	xxx		xx	xx

The margin allowed for normal loss is an estimate (i.e. on the basis of expectation in process industries in normal conditions) and slight differences are bound to occur between the actual output of a process and that anticipated output of a process. This difference may be positive or negative. If it is negative it is called abnormal loss whereas if it is positive it is called abnormal gain.

If the actual loss is more than the normal loss then it is called as abnormal loss whereas if the actual loss is less than the normal loss then it is called as abnormal gain.

1.4.5 Abnormal gain

Abnormal gain arises because of high level of efficiency on the part of workers, managers or supervisors because of excellent quality materials, tools, machines, highly motivated employees and good climatic conditions.

Units of Abnormal Gain = Actual Output – Normal Output

The value of the abnormal gain is calculated in the similar manner of abnormal loss. The formula used for abnormal gain is:

Abnormal Gain

=Total Cost Incurred –Scrap Value of Normal Loss x Abnormal Gain Units

Input Units – Normal Loss Units

The sales value of abnormal gain units is transferred to Normal Loss Account as it attain out of the savings of Normal Loss. The difference is transferred to Costing Profit and Loss A/c as a Real Gain.

Dr. Abnormal Gain A/c Cr.

Particulars	Units	₹	Particulars	Units	₹
To Normal Loss A/c.	xx	xx	By Process A/c.	xx	xx
To Costing Profit and Loss A/c.	xx	xx			
	xx	xx		xx	xx

1.4.6 Joint Product and By Product:-

a) Joint product is an additional product produced with the main product which has significant value. E.g. Motor spirit, kerosene, lubricating oil, wax, tar are the joint products while refining oil.

b) By Product is an additional product produced incidentally while producing the main product which has negligible value. E.g. While producing sugar as main product in the sugar factory, molasses and bagasse are by products.

c) Point of separation is the point from where the main product is separated from the by product.

Problem 1. (When Normal / Abnormal Loss is Given)

A product passes through to distinct processes A and B and thereafter to finished stock.

Particulars	Process A ₹	Process B ₹	Process C ₹
Material Consumed	12,000	6,000	10,000
Direct Labour	14,000	8,000	12,000
Manufacturing Expenses	4,000	4,000	6,000
Input in Process A (units)	10,000	-	-
Input in value	10,000	-	-
Output (units)	9,400	8,300	7,600
Normal Wages %	5	10	10
Value of Normal Wastage (Per 100 units)	8	10	10

From the following information, you are required to prepare the process accounts, normal loss, abnormal Loss and abnormal gain accounts.(M.Com. October 2003)

Solution

Dr. Process A Account Cr.

Particular	Units	₹	Particular	Units	₹
To Input	10,000	10,000	By Normal Loss	500	40
To Material consumed		12,000	By Abnormal Loss	100	421
To Direct Labour		14,000	By Process B A/c	9,400	39,539
To Manufacturing Exp.		4,000	(@₹ 4.21 p.u.)		
	10,000	40,000		10,000	40,000

Dr. **Process B Account** **Cr.**

Particular	Units	₹	Particular	Units	₹
To Process A A/c	9,400	39,539	By Normal Loss	940	94
To Material consumed		6,000	By Abnormal Loss	160	1,086
To Direct Labour		8,000		8,300	56,359
To manufacturing Exp.		4,000	By Process C A/c (@₹ 6.79 p.u.)		
	9,400	57,539		9,400	57,539

Dr. **Process C Account** **Cr.**

Particular	Units	₹	Particular	Units	₹
To Process B A/c	8,300	56,359	By Normal Loss	830	83
To Material consumed		10,000	By Finished Stock A/c		
To Direct Labour		12,000		7,600	85,743
To Manufacturing Exp.		6,000			
To Abnormal Gain	130	1,467			
	8,430	85,826		8,430	85,826

Dr. **Normal Loss A/c** **Cr.**

Particular	Units	₹	Particular	Units	₹
To Process A A/c	500	40	By Abnormal Gain A/c	130	13
To Process B A/c	940	94	By Cash/Bank		
To Process C A/c	830	83	Process A	500	40
			Process B	940	94
			Process C	700	70
	2,270	217		2,270	217

Dr. **Abnormal Loss A/c** **Cr.**

Particular	Units	₹	Particular	Units	₹
To Process A A/c	100	421	By Cash/Bank		
To Process B A/c	160	1086	Process A	100	8
			Process B	160	16
			By Costing Profit and Loss A/c		1,483
	260	1,507		260	1,507

Dr. **Abnormal Gain A/c** **Cr.**

Particular	Units	₹	Particular	Units	₹
To Normal Loss A/c	130	13	By Process C A/c	130	1,467
To Costing Profit and Loss A/c		1,454			
	130	1,467		130	1,467

Working Notes:

Process A

Particulars	Units	Value ₹
Input Process	10,000	40,000
(-) Normal Loss	500	40
Expected Output	9,500	39,960
(+) Abnormal Gain	100	421
Actual Output	9,400	39,539

Process B

Particulars	Units	Value ₹
Input Process	9,400	57,539
(-) Normal Loss	940	94
Expected Output	8,460	57,445
(+) Abnormal Gain	160	1,086
Actual Output	8,300	56,359

Process C

Particulars	Units	Value ₹
Input Process	8,300	84,359
(-) Normal Loss	830	83
Expected Output	7,470	84,276
(+) Abnormal Gain	130	1,467
Actual Output	7,600	85,743

1.5 INTER PROCESS PROFITS

Normally the output of one process is transferred to another process at cost but sometimes at a price showing a profit at the transferred process. The transfer price may be made at a price corresponding to current wholesale market price or at cost plus an agreed percentage. The plus point of the method is that it helps to find out whether the particular process is making profit or loss. It helps the management whether to process the product or to buy the product from the market. If the transfer price is higher than the cost price then the process account will show a profit. The complexity brought into the accounting arises from the fact that the interprocess profits introduced remain a part of the prices of process stocks, finished stocks and work-in-progress. The balance cannot show the stock with profit. To avoid the complication, a provision must be created to reduce the stock at actual cost prices. This problem arises only in case of stock on

hand at the end of the period because goods sold must have realized the internal profits. The unrealized profit in the closing stock is eliminated by creating a stock reserve. The amount of stock reserve is calculated by the following formula:-

Stock Reserve = Transfer Value of stock x Profit included in transfer price

Transfer Price

The Cost of stock can be obtained by the formula:-

Cost x Closing Stock

Total

1.5.1 Advantages of Inter Process Profit

1) It is useful for the industry where certain process is performed outside the factory.

2) It facilitates deciding profitability of each process independently.

3) It facilitates effective evaluation of efficiency of each process.

1.5.2 Disadvantages of Inter Process Profit

1) Calculation of inter process profit is complicated.

2) Organisation cannot make profit by trading itself.

3) Transfer price has impact on profitability of the process.

Problem 2. Shree Ram Ltd. produces product AB which goes through two processes and after completion it is transferred to finished stock. The following data relates to March, 2025:

Particular	Process I ₹	Process II ₹	Finished Stock ₹
Opening Stock	15,000	18,000	45,000
Direct material	30,000	31,500	
Direct wages	22,400	22,500	
Factory overhead	21,000	9,000	
Closing Stock	7,400	9,000	22,500
Inter-process profit included in opening stock		3,000	16,500

Output of process I is transferred to process II at 25% profit on transfer price. Output of process II is transferred to finished stock at 20% profit on the transfer price. Stock in the process are valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales during the period are ₹ 2,80,000.

Prepare process accounts and finished goods account showing the profit element at each stage. (M.Com. November 2017)

Solution

Dr. Process I A/c Cr.

Particulars	Total ₹	Cost ₹	Profit ₹	Particulars	Total ₹	Cost ₹	Profit ₹
To Opening stock	15,000	15,000		By Transfer to Process II A/c	1,08,000	81,000	27,000
To Direct material	30,000	30,000					
To Direct wages	22,400	22,400					
	67,400	67,400					
(-) Closing stock	7,400	7,400					
To Prime cost	60,000	60,000					
To Factory Overheads	21,000	21,000					
To Process cost	81,000	81,000					
To Profit	27,000	-	27,000				
	1,08,000	81,000	27,000		1,08,000	81,000	27,000

Dr. Process II A/c Cr.

Particulars	Total ₹	Cost ₹	Profit ₹	Particulars	Total ₹	Cost ₹	Profit ₹
To Opening Stock	18000	15,000	3,000	By Transfer to Process IIIA/c	2,25,000	1,51,500	73,500
To Process I A/c	1,08,000	81,000	27,000				
To Direct material	31,500	31,500					
To Direct wages	22,500	22,500					
	1,80,000	1,50,000	30,000				
(-) Closing stock	9,000	7,500	1500				
To Prime cost	1,71,000	1,42,500	28,500				
To Factory Overheads	9,000	9,000	--				
To Process cost	1,80,000	1,51,500	28,500				
To Profit	45,000	--	45,000				
	2,25,000	1,51,500	73,500		2,25,000	1,51,500	73,500

Dr. **Finished Stock A/c** **Cr.**

Particulars	Total ₹	Cost ₹	Profit ₹	Particulars	Total ₹	Cost ₹	Profit ₹
To opening stock	45,000	28,500	16,500	By Sales	2,80,000	1,65,000	1,15,000
To Process II A/c	2,25,000	1,51,500	73,500				
(-) Closing stock	2,70,000	1,80,000	90,000				
To Finished stock	22,500	15,000	7,500				
To Profit	2,47,500	1,65,000	82,500				
	32,500	--	32,500				
	2,80,000	1,65,000	1,15,000		2,80,000	1,65,000	1,15,000

Working Notes

1. Transfer Price = 100 Profit 25 Cost 75

   If Cost = 81,000 × $\frac{25}{75}$ = 27,000

2. Out of 1,80,000 cost profit is 30,000

   If cost is 9,000 the profit is $\frac{30,000}{1,80,000}$ × 9,000 = 1,500

3. Transfer Price = 100 Profit 20 Cost 80

   Profit = 1,80,000 × $\frac{20}{80}$ = 45,000

4. If total cost is 2,70,000 Profit 90,000

   Cost = 22,500 7,500

Problem 3. A produce passes through three processes. A, B and C after which it is transferred to finished store. The following information is supplied for the month of November 2012.

Particular	Process A ₹	Process B ₹	Process C ₹	Finished Stock ₹
Opening Stock	20,000	24,000	16,000	60,000
Direct materials	40,000	42,000	60,000	-
Direct wages	30,000	30,000	32,000	-
Direct expenses	10,000	5,000	30,000	-
Production Overheads	18,000	7,000	50,000	-
Closing Stock	10,000	12,000	8,000	30,000
Inter process profit for opening stock	-	4,000	4,000	22,000
Profit percentage on cost price (%)	$33\frac{1}{3}$ %	25 %	25 %	-

Closing stock in each process is valued at Prime cost and Finished stock has been valued at the price at which it was received from Process C. Sales during the month amounted to ₹7,00,000.

Prepare process accounts showing Profit elements at each stage.

(M.Com. October 2012)

Solution

Dr. Process 'A' A/c Cr.

Particulars	Total ₹	Cost ₹	Profit ₹	Particulars	Total ₹	Cost ₹	Profit ₹
To Opening stock	20,000	20,000	-	By Process B (transfer)	1,44,000	1,08,000	36,000
To Material	40,000	40,000	-				
To Wages	30,000	30,000	-				
To Expenses	10,000	10,000	-				
	1,00,000	1,00,000	-				
Less:							
Closing stock	10,000	10,000					
Prime cost	90,000	90,000	-				
Overhead	18,000	18,000	-				
	1,08,000	1,08,000	-				
Add: Gross Profit ($33\frac{1}{3}$ % on cost)	36,000	-	-				
	1,44,000	1,08,000	36,000				
To Stock b|d	10,000	10,000	36,000		1,44,000	1,08,000	36,000

Dr. Process 'B' A/c Cr.

Particulars	Total ₹	Cost ₹	Profit ₹	Particulars	Total ₹	Cost ₹	Profit ₹
To Opening stock	24,000	20,000	4,000	By process B (transfer)	3,00,000	2,02,000	98,000
To Process A (transfer)	1,44,000	1,08,000	36,000				
To Material	42,000	42,000	-				
To Wages	30,000	30,000	-				
To Expenses	5,000	5,000	-				
	2,45,000	2,05,000	40,000				
Less:							
Closing stock	12,000	10,000	2,000				
Prime cost	2,33,000	1,95,000	38,000				
Overhead	7,000	7,000	-				
	2,40,000	2,02,000	38,000				
Add: Gross Profit @ 25% on cost	60,000	--	60,000		-	-	-
	3,00,000		98,000				
	12,000	2,02,000	2,000				
To Stock b|d		10,000			3,00,000	2,02,000	98,000

Dr. Process 'C' A/c Cr.

Particulars	Total ₹	Cost ₹	Profit ₹	Particulars	Total ₹	Cost ₹	Profit ₹
To Opening stock	16,000	12,000	4,000	By Process B (transfer)	6,00,000	3,80,000	2,20,000
To Process B (transfer)	3,00,000	2,02,000	98,000				
To Material							
To Wages	60,000	60,000	-				
To Expenses	32,000	32,000	-				
Less:	30,000	30,000	-				
Closing stock	4,38,000	3,36,000					
Prime cost	8,000	6,000					
Overhead	4,30,000	3,30,000					
	50,000	50,000					
Add G.P.	4,80,000	3,80,000					
25 % on cost					-	-	-
	1,20,000						
To Stock b|d	6,00,000	3,80,000	1,02,000		6,00,000	3,80,000	2,20,000
	8,000		2,000				
			1,00,000				
			1,00,000				
			1,20,000				
			2,20,000				
		6,000	2,000				

Dr. **Finished Stock A/c** **Cr.**

Particulars	Total ₹	Cost ₹	Profit ₹	Particulars	Total ₹	Cost ₹	Profit ₹
To Stock A/c	60,000	38,000	22,000	By Sales	7,00,000	3,99,000	3,01,000
To Process C A/c							
Less:Closing	6,00,000	3,80,000	2,20,000				
Stock	6,60,000	4,18,000	2,42,000				
To Profit							
	30,000	19,000	11,000				
	6,30,000	3,99,000	2,31,000				
	70,000	-	70,000				
	7,00,000	3,99,000	3,01,000		7,00,000	3,99,000	3,01,000

1.6 VALUATION OF WORK-IN-PROGRESS

1.6.1 Meaning of Work-in-Progress:

As production is a constant activity, there may be some incomplete production at the end of an accounting period. **Incomplete units means those units on which percentage of completion with regular to all elements of cost (i.e. material, labour and overhead) is not 100%. Such incomplete production units are known as Work-in- Progress**. Such Work-in-Progress is valued in terms of equivalent or effective production units.

1.6.2 Meaning of Equivalent Production Units:

a) **The term equivalent unit means "a notional quantity of completed units substituted for an actual quantity of incomplete physical units in progress, when the aggregate work content of the incomplete units is deemed to be equivalent to that of the substituted quantity."**

b) This represents the production of a process in terms of complete units. In other words, it means converting the incomplete production into its equivalent of complete units.

c) The principle applies when operation costs are apportioned between work in progress and completed units.

d) **Equivalent units of work in progress = Actual Number of Units in Process x Percentage of Work Completed**

e) Equivalent unit should be calculated separately for each element of cost (viz. material, labour and overheads) because the percentage of completion of the different cost component may be different.

1.6.3 Accounting Procedure:

The following procedure is followed when there is Work-in-Progress:-

a) Find out equivalent production after taking into account the process losses, degree of completion of opening and / or closing stock.

b) Find out net process cost according to elements of costs i.e. material, labour and overheads.

c) Ascertain cost per unit of equivalent production of each element of cost separately by dividing each element of costs by respective equivalent production units.

d) Evaluate the cost of output, finished and transferred work in progress.

The total cost per unit of equivalent units will be equal to the total cost divided by effective units and cost of work-in-progress will be equal to the equivalent units of work-in-progress multiplied by the cost per unit of effective production.

In short, the following four steps an involved:-

Step 1 – Prepare Statement of Equivalent Production.

Step 2 – Prepare Statement of Cost per Equivalent Unit.

Step 3 – Prepare Statement of Evaluation.

Step 4 – Prepare Process Account.

Step 1 – Statement of Equivalent Production.

Input		**Output**		**Equivalent Production**					
Particulars	**Units**	**Particulars**	**Units**	**Material**		**Labour**		**Overheads**	
				%	**Units**	**%**	**Units**	**%**	**Units**
Opening Stock	xx	Units completed	xx	xx	xx	xx	xx		
Units Introduced	xx	Normal Loss	xx	--	--	--	--		
		Abnormal Loss	xx	xx	xx	xx	xx		
	xx	Equivalent Units	xx	xx	xx	xx	xx	xx	xx

Step 2 – Statement of Cost per Equivalent Units :

Element of costing	**Cost ₹**	**Equivalent Units**	**Cost per Equivalent Units ₹**
Material Cost (Net)	xx	xx	xx
Labour Cost	xx	xx	xx
Overheads Cost	xx	xx	xx
	xx		xx

Step 3 – Statement of Evaluation

Particulars	Element of cost	Equivalent Units	Cost per equivalent units ₹	Cost ₹	Total Cost ₹
Units completed	Material	xx	xx	xx	
	Labour	xx	xx	xx	
	Overheads	xx	xx	xx	xx
Closing WIP	Material	xx	xx	xx	
	Labour	xx	xx	xx	
	Overheads	xx	xx	xx	xx
Abnormal Loss	Material	xx	xx	xx	
	Labour	xx	xx		
	Overheads	xx	xx	xx	xx

Step 4 – Prepare Process Account.

Dr. ProcessA/c Cr.

Particulars	Units	₹	Particulars	Units	₹
To Basic Material	xxx	xx	By Normal Loss	xx	xx
To Direct Material		xx	By Abnormal Loss	xx	xx
To Direct Wages		xx	By Process II A/c (output transferred to Next process)	xx	xx
To Direct Expenses		xx			
To Production Overheads		xx			
To Cost of Rectification of Normal Defects		xx	By Process Stock	xx	xx
To Abnormal Gains		xx			
	xx	xx		xx	xx

1.6.4 The methods of valuation of work-in-progress: -

The methods of valuation of work-in-progress are as under:-

(a) FIFO Method: The FIFO method of costing is based on the assumption that the opening work-in-progress units are the first to be completed. Equivalent production of opening work-in-progress can be calculated as follows:

Equivalent Production = Units of Opening WIP x Percentage of Work Needed to Finish the

Units

(b) Average Cost Method: This method is convenient when price fluctuates from period to period. The closing valuation of work-in-

progress in the old period is added to the cost of new period and an average rate is obtained. In calculating the equivalent production, opening units will not be shown separately as units of work-in-progress but included in the units completed and transferred.

(c) Weighted Average Cost Method: In this method, no distinction is made between completed units from opening stock and completed units from new production. All units finished during the current accounting period are treated as if they were started and finished during that period. The weighted average cost per unit is determined by dividing the total cost (opening work-in-progress cost + current cost) by equivalent production.

(d) LIFO Method: In LIFO method, the assumption is that the units entering into the process at last should be completed first. The cost of opening work-in-progress is charged to the closing work-in-progress and thus the closing work-in- progress appears cost of opening work-in- progress. The completed units are at their current cost.

The problems on equivalent production may be divided into following seven groups:-

I. Preparation of Process A/c where there is no opening Work -in - Progress and no Process Loss.

II. Preparation of Process A/c where there is Closing Work-in-Progressand Abnormal Loss.

III. Preparation of Process A/c where there is Closing WIP and Abnormal Gain.

IV. Preparation of Process A/c when these are both Opening and Closing Work- in-Progress and FIFO method is followed.

V. Preparation of Process A/c when there are Opening and Closing Work-in-Progress and Abnormal Gain

VI. Preparation of second Process A/c under FIFO Method.

VII. Preparation of second process A/c under Average Method.

1.7 QUESTIONS

A. Define the following terms:-

1. Process Costing
2. Normal Loss
3. Abnormal Loss
4. Abnormal Gain
5. By Product

6. Joint Product
7. Work in Progress
8. Inter Process Profit
9. Equivalent Production
10. Point of Separation

B. Answer the following questions:-

1. Explain characteristics of process costing.
2. Explain advantages of process costing.
3. Explain limitations of process costing.
4. What do you mean by normal loss? How isit treated in process cost accounts?
5. What do you mean by abnormal loss? How is it treated in process cost accounts?
6. What do you mean by abnormal gain? How is it treated in process cost accounts?
7. Distinguish between Job Costing and Process Costing.
8. What do you mean by inter process profit? What purpose does it serve?
9. What do you mean by equivalent production?Discuss methods of its valuation.
10. Name industries in which process costing is applicable?

C. Write short notes:-

1. Inter Process Profit.
2. Treatment of Losses in Process.
3. Equivalent Production.

D. Multiple Choice Questions:-

1. Materials may not be put into process----------.

(a) at the beginning of an operation
(b) continuously
(c) at the end of the operation
(d) in the shipping department

2. The type of spoilage that should not affect the cost of inventories is ---------.

(a) abnormal spoilage (c) seasonal spoilage
(b) normal spoilage (d) indirect spoilage

3. Process cost method is especially suitable for----------.

(a) custom production (c) FIFO
(b) standard costs (d) LIFO

4. In process costing, costs follow-------

(a) price rise (c) product flow
(b) price declines (d) finished goods

5. When average costing is used, the opening inventory costs are ----------.

(a) kept separate from the costs for the new period
(b) added to the costs of the new period
(c) subtracted from the new costs
(d) averaged with other costs to arrive at total cost.

6. Equivalent production of 2,000 units. 60% complete in all respects is ------

(a) 600 Units (c) 1,000 units
(b) 1,200 Units (d) 2,000 units

7. Which of the following method of costing can be used in a large oil refinery?

(a) Process costing (c) Unit costing
(b) Operating costing (d) Job costing

8. Which of the following paid is odd?

(a) Construction - Contract costing
(b) Ship-building - Job costing
(c) Brick manufacturing - Process costing
(d) Transport undertaking - Operating costing

9. A product which has practically no sales or utility value is--------

(a) Waste (c) Spoilage
(b) Scrap (d) Defectives

10. Trimmings in timber industry should be treated as a-------

(a) waste (c) spoilage

(b) scrap (d) defectives

11. The stage where joint products are separated from each other is known as

(a) break-even point (b) angle of incidence

(c) split-off point (d) None of the above

12. Equivalent units are -------

(a) equal units

(b) notional quantity of completed units

(c) units equal to inputs

(d) None of the above

(Answers: 1(d), 2 (a), 3(b), 4(c), 5(a), 6(b), 7(a), 8(c), 9(a), 10(b), 11(c), 12 (b))

2

PROCESS COSTING - II

Unit structure :

2.0 Learning Objectives

2.1 Solved Problems

2.2 Exercises

2.0 LEARNING OBJECTIVES

After studying this unit, you would be able to:-

- Able to solve the problems on Process Account, Normal Loss A/c, Abnormal Loss A/c, Abnormal Gain A/c, Inter Process Profits, Computation of Equivalent Production.

2.1 SOLVED PROBLEMS

Situation I:-

Preparation of Process A/c where there is no opening Work - in - Progress and no Process Loss:

Steps involved:-

1. Prepare a Statement of Equivalent Production

Particulars	Units	Material		Labour		Overheads	
		% of Completion	Units	% of Completion	Units	% of Completion	Units
I. Units introduced and completely processed	xx	xx	xx	xx	xx	xx	xx
II. Closing WIP	xx	xx	xx	xx	xx	xx	xx
III. Equivalent units (I+II)	xx	xx	xx	xx	xx	xx	xx

2. Draw Statement of Cost per Equivalent unit.

Elements of Cost (a)	Cost (b)	Equivalent units (c)	Cost per Equivalent units (d) (b / c)
Material	xx	xx	xx
Labour	xx	xx	xx
Overheads	xx	xx	xx

3. Prepare a Statement of Evaluation.

Particulars	Elements of Cost	E.U.	Cost per Eq. units	Cost of Eq. units	Total ₹
Units introduced and completed	Material	xx	xx	xx	xx
	Labour	xx	xx	xx	xx
	Overheads	xx	xx	xx	xx
Closing WIP	Material	xx	xx	xx	xx
	Labour	xx	xx	xx	xx
	Overheads	xx	xx	xx	xx

4. Prepare Process A/c as under:

Dr.Process A/c **Cr.**

	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Direct Material		xx	By Process A/c (Next Process)		xx
To Direct Labour		xx	By Closing WIP		xx
To Overheads		xx			xx
Total		xx	Total		xx

Problem 1. (Equivalent Units, Cost per Equivalent units, Statement of Evaluation)

The following information is furnished by Anvita Processers Ltd:-

Input of Materials	10,000 Units
Material	₹ 40,000
Labour	₹ 19,460
Overheads	₹ 9,370
Closing WIP	900 Units
Transfer to next process	9,100 Units

Degree of completion: Closing Stock (%)

Material	100
Labour	70
Overheads	30

You are required to prepare:-

a) Statement of Equivalent production.

b) Statement of cost per equivalent unit.

c) Statement of evaluation.

d) Process A/c.

Solution:

Statement of Equivalent Production

Particulars	Units	Material		Labour		Overheads	
		% of Completion	Units	% of Completion	Units	% of Completion	Units
Transfer	9,100	100%	9,100	100%	9,100	100%	9,100
Closing WIP	900	100%	900	70%	630	30%	270
Equivalent units	10,000		10,000		9,730		9,370

Statement of Cost per Equivalent Unit

Elements of Cost (a)	Cost ₹ (b)	Equivalent units (c)	Cost per Equivalent units ₹ (d) (b / c)
Material	40,000	10,000	4
Labour	19,460	9,730	2
Overheads	9,370	9,370	1

Statement of Evaluation

Particulars	Elements of Cost	E.U.	Cost per Eq. units ₹	Cost of Eq. units ₹	Total ₹
Units introduced and completed	Material	9,100	4	36,400	
	Labour	9,100	2	18,200	
	Overheads	9,100	1	9,100	63,700
Closing WIP	Material	900	4	3,600	
	Labour	630	2	1,260	
	Overheads	270	1	270	5,130

Dr.Process A/c Cr.

Particulars	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Direct Material	10,000	40,000	By Process II A/c	9,100	63,700
To Direct Labour		19,460	By Closing WIP	900	5,130
To Overheads		9,370			
Total	**10,000**	**68,830**	**Total**	**10,000**	**68,830**

Situation II:-

Preparation of Process A/c where there is Closing Work-in-Progress and Abnormal Loss:

Steps involved:-

1. Prepare a Statement of Equivalent Production

Particulars	Units	Material		Labour		Overheads	
		% of Completion	Units	% of Completion	Units	% of Completion	Units
I. Units introduced	xx	xx	xx	xx	xx	xx	xx
II. Closing WIP	xx	xx	xx	xx	xx	xx	xx
III. Abnormal Loss	xx	xx	xx	xx	xx	xx	xx
IV. Eq. Units (I+II+III)			xx		xx		xx

2. Draw Statement of Cost per Equivalent Unit.

Elements of Cost (a)	Cost (b)	Equivalent units (c)	Cost per Equivalent units (d) (b / c)
Material Cost	xx		
Less- Scrap value of Normal Loss	xx	xx	xx
Labour	xx	xx	xx
Overheads	xx	xx	xx

3. Prepare a Statement of Evaluation.

Particulars	Elements of Cost	E.U.	Cost per Eq. units	Cost of Eq. units	Total ₹
Units introduced and completed	Material	xx	xx	xx	xx
	Labour	xx	xx	xx	xx
	Overheads	xx	xx	xx	xx
Closing WIP	Material	xx	xx	xx	xx
	Labour	xx	xx	xx	xx
	Overheads	xx	xx	xx	xx
Abnormal Loss	Material	xx	xx	xx	xx
	Labour	xx	xx	xx	xx
	Overheads	xx	xx	xx	xx

4. Prepare Process A/c as under:

Dr. Process A/c Cr.

Particulars	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Direct Material		xx	By Normal Loss		xx
To Direct Labour		xx	By Abnormal Loss		xx
To Overheads		xx	By Process A/c (Next Process)		xx
			By Closing WIP		xx
Total		xx	Total		xx

Problem 2 (Closing WIP is given)

During the month of March 2025, 2,000 units were introduced into process P. The cost of 2,000 units was ₹11,600. At the end of the month,1,500 units had been produced and transferred to process Q, 360 units were still in process and 140 units were scrapped. A normal wastage of 5% on input is allowed. It was estimated that incomplete units have reached a stage in production as follows:

Material 75% complete. Labour 50% complete. Production Overhead 50% complete.

The cost incurred in addition to that on 2,000 units introduced were:

Direct Materials: ₹ 3,080. Direct Wages: ₹ 6,880.Works Overheads: ₹ 3,440.

Units scrapped realized₹2 each were 100% complete as regards material, labour and overheads.

You are required to prepare:-

a) Statement of Equivalent production.

b) Statement of cost per equivalent unit.

c) Statement of Appropriation of Process Cost Incurred.

d) Process P A/c.

Solution:

Statement of Equivalent Production in March 2025

Particulars	Units	Material		Labour		Overheads	
		% of Completion	Units	% of Completion	Units	% of Completion	Units
Units introduced (Input)	2,000						
Normal Wastage	100	-	-	-	-	-	-
Abnormal Wastage	40	100	40	100	40	100	40
Finished Output	1,500	100	1,500	100	1,500	100	1,500
Closing WIP	360	75	270	50	180	50	180
Eq. Units			**1,810**		**1,720**		**1,720**

Statement of Cost per Equivalent unit

Elements of Cost (a)	Cost ₹ (b)	Equivalent units (c)	Cost per Equivalent units ₹ (d) (b / c)
Material Cost of units introduced Other Direct Material	11,600 3,080		
Less- Scrap value of Normal Loss (100 Units * ₹ 2 per Unit)	200		
	14,480	1,810	8
Labour	6,880	1,720	4
Works Overheads	3,440	1,720	2
			14

Statement of Appropriation of Process Cost Incurred in March 2025

Particulars	Elements of Cost	E.U. (a)	Cost per Eq. units (b)	Cost of Eq. units (a*b)	Total ₹
Units introduced and completed	Material	1,500	8	12,000	
	Labour	1,500	4	6,000	
	Overheads	1,500	2	3,000	21,000
Abnormal Loss	Material	40	8	320	
	Labour	40	4	160	
	Overheads	40	2	80	560
Closing WIP	Material	270	8	2,160	
	Labour	180	4	720	
	Overheads	180	2	360	3,240

Dr.Process 'P' A/c Cr.

Particulars	Tones	Amounts ₹	Particulars	Tones	Amounts ₹
To Units Introduced	2,000	11,600	By Normal Loss	100	200
To Direct Material		3,080	By Process Q A/c	1,500	21,000
To Direct Labour		6,880	By Abnormal Loss	40	560
To Works Overheads		3,440	By Closing WIP	360	3,240
Total	**2,000**	**25,000**	**Total**	**2,000**	**25,000**

Situation III:-

Preparation of Process A/c where there is Closing WIP and Abnormal gain:

Steps involved:-

1. Prepare a Statement of Equivalent Production

Particulars	Units	Material		Labour		Overheads	
		% of Completion	Units	% of Completion	Units	% of Completion	Units
I. Units introduced	xx	xx	xx	xx	xx	xx	xx
II. Closing WIP	xx	xx	xx	xx	xx	xx	xx
III. Abnormal Gain	xx	xx	xx	xx	xx	xx	xx
IV. Eq. Units (I+II -III)			**		**		**

2. Draw Statement of Cost per Equivalent Unit.

Elements of Cost (a)	Cost (b)	Equivalent units (c)	Cost per Equivalent units (d) (b / c)
Material Cost	**		
Less- Scrap value of Normal Loss	**	**	**
Labour	**	**	**
Overheads	**	**	**

3. Prepare a Statement of Evaluation.

Particulars	Elements of Cost	E.U.	Cost per Eq. units	Cost of Eq. units	Total ₹
Units introduced and completed	Material	xx	xx	xx	xx
	Labour	xx	xx	xx	xx
	Overheads	xx	xx	xx	xx
Closing WIP	Material	xx	xx	xx	xx
	Labour	xx	xx	xx	xx
	Overheads	xx	xx	xx	xx
Abnormal Gain	Material	xx	xx	xx	xx
	Labour	xx	xx	xx	xx
	Overheads	xx	xx	xx	xx

4. Prepare Process A/c as under:

Dr.Process A/c **Cr.**

Particulars	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Direct Material	xx	xx	By Normal Loss	xx	xx
To Direct Labour		xx	By Process A/c (Next Process)	xx	xx
To Overheads		xx	By Closing WIP	xx	xx
To Abnormal Gain		xx		xx	xx
Total	xx	xx	Total	xx	xx

Problem 3. (Closing WIP, Abnormal Gain given)

The following information is furnished by Prakash Ltd:-

Input of Materials 15,000 Units

Current Cost incurred:

Materials ₹60,000

Labour ₹ 26,790

Overheads ₹ 12,855

Normal Loss 8% of Total input

Scrap realized @ ₹4 perunit.

Closing WIP 1,350 units

Transfer to next process (Process Y) 13,050 units

Degree of Completion:%

Materials 100

Labour 70

Overheads 30

You are required to prepare:-

(a) Statement of Equivalent Production

(b) Statement of Cost per Equivalent Unit

(c) Statement of Evaluation

(d) Process X A/c.

Solution:

Statement of Equivalent Production

Particulars	Units	Material		Labour		Overheads	
		% of Completion	Units	% of Completion	Units	% of Completion	Units
I. Units introduced	13,050	100	13,050	100	13,050	100	13,050
II. Closing WIP	1,350	100	1,350	70	945	30	405
III. Abnormal Gain	(600)	100	(600)	100	(600)	100	(600)
IV. Eq. Units (I+II -III)	13,800		13,800		13,395		12,855

Statement of Cost per Equivalent unit.

Elements of Cost (a)	Cost ₹ (b)	Equivalent units (c)	Cost per Equivalent units ₹ (d) (b / c)
Material Cost	60,000		
Less- Scrap value of Normal Loss (1,200 Units * ₹ 4 per Unit)	4,800		
	55,200	13,800	4
Labour	26,790	13,395	2₹
Overheads	12,855	12,855	1

Statement of Evaluation

Particulars	Elements of Cost	E.U.	Cost per Eq. units ₹	Cost of Eq. units ₹	Total ₹
Units introduced and completed		13,050	7	91,350	91,350
Closing WIP	Material Labour Overheads	1,350 945 405	4 2 1	5,400 1,890 405	7,695
Abnormal Gain		600	7	4,200	4,200

Dr.ProcessX A/c **Cr.**

Particulars	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Direct Material	15,000	60,000	By Normal Loss	1,200	4,800
To Direct Labour		26,790	By Process Y A/c	13,050	91,350
To Overheads		12,855	By Closing WIP	1,350	7,695
To Abnormal Gain	600	4,200			
Total	15,600	1,03,845	Total	15,600	1,03,845

Dr. **Abnormal Gain A/c**
Cr.

Particulars	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Normal Loss	600	2,400	By Process W A/c	600	4,200
To Costing Profit and Loss A/c		1,800			
Total	600	4,200	Total	600	4,200

Situation IV:-
Preparation of Process A/c when these are both Opening and Closing Work- in-Progress and FIFO Method is followed:
Steps involved:-
1. Prepare a Statement of Equivalent Production

Particulars	Units	Material		Labour		Overheads	
		% of Completion	Units	% of Completion	Units	% of Completion	Units
I. Opening WIP	xx	xx	xx	xx	xx	xx	xx
II. Unit introduced transferred	xx	xx	xx	xx	xx	xx	xx
III. Closing WIP	xx	xx	xx	xx	xx	xx	xx
IV. Abnormal Loss	xx	xx	xx	xx	xx	xx	xx
V. Eq. Units (I+II +III)			xx		xx		xx

2. Draw Statement of Cost per Equivalent Unit.

Elements of Cost (a)	Cost (b)	Equivalent units (c)	Cost per Equivalent units (d) (b / c)
Material Cost	xx		
Less- Scrap value	xx	xx	xx
Labour	xx	xx	xx
Overheads	xx	xx	xx

3. Prepare a Statement of Evaluation.

Particulars	Elements of Cost	E.U.	Cost per Eq. units	Cost of Eq. units	Total ₹
Opening WIP: Cost incurred during previous period Cost incurred during current period	Material Labour Overheads	xx xx xx	xx xx xx	xx xx xx	xx
Units introduced and completed	Material Labour Overheads	xx xx xx	xx xx xx	xx xx xx	xx
Closing WIP	Material Labour Overheads	xx xx xx	xx xx xx	xx xx xx	xx
Abnormal Loss	Material Labour Overheads	xx xx xx	xx xx xx	xx xx xx	xx

4. Prepare Process A/c as under:

Dr.Process A/c **Cr.**

Particulars	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Opening WIP	xx	xx	By Normal Loss	xx	xx
To Direct Material		xx	By Abnormal Loss	xx	xx
To Direct Labour		xx	By Process (Next) A/c	xx	xx
To Overheads		xx	By Closing WIP	xx₹	xx
Total	xx	xx	Total	xx	xx

Problem 4. (Openingand Closing WIP, FIFO Method is given)

Following information is available regarding Process A for the month of October 2023.

i) Opening work-in-progress 40,000 units

(Material 100% complete, 25% complete for labour and overheads)

ii) Units introduced 1,80,000 units

iii) Units completed 1,50,000 units

iv) Units in progress on 31-10-2023 70,000 units

(Material 100% complete, 50% complete for labour and overheads)

v) Cost records showed

Opening Work-in-progress:

Material ₹ 1,00,000

Labour ₹ 25,000

Overheads ₹ 45,000

vi) Cost incurred during the month October 2023

Material ₹ 6,60,000

Labour ₹ 5,55,000

Overheads ₹ 9,25,000

Assume FIFO method is used for WIP inventory valuation.

You are required to prepare:-

a) Statement of Equivalent Production

b) Statement Showing cost for Each Element

c) Statement of Cost Apportionment

d) Process A account

Use Average Method (M.Com April., 2014)

Solution:

Statement of Equivalent Production

Inputs	Particular	Output	%	Equivalent Production		
	Opening work in			Units	%	Units
40,000	progress	40,000	-	-	75	30,000
1,80,000	Introduced completed	1,10,000	100	1,10,000	100	1,10,000
-	Closing work in progress	70,000	100	70,000	50	35,000
2,20,000		2,20,000		1,80,000		1,75,000

Statement of Cost

Elements	Cost ₹	Equivalent units	Cost per unit ₹
Materials	6,60,000	1,80,000	3.66667
Labour and Overheads	14,80,000	1,75,000	8.45714
Total			**12.12381**

Statements of Cost Evaluation

Particular	₹	₹
	1,70,000	
	2,53,714	4,23,714
		13,33,619
		17,57,333
Opening work in progress completed:		
Cost already incurred	2,56,667	
Cost incurred every month (30,000 * 8.45714)	2,96,000	**5,52,667**
Introduced and completed (1,10,000 * 12.12381)		
Closing WIP		
Material (70,000 X 3.66667)		
Labour and Overheads (35,000 X 8.45714)		

Dr. Process A A/c Cr.

Particular	Units	₹	Particular	Units	₹
To Opening WIP	40,000	1,70,000	By Process B A/c	1,50,000	17,57,333
To Material	1,80,000	6,60,000	By Closing WIP	70,000	5,52,667
To Labour		5,55,000			
To Overheads		9,25,000			
Total	2,20,000	23,10,000	Total	2,20,000	23,10,000

Situation V:-

Preparation of Process A/c when there are Opening and Closing Work-in-Progress and Abnormal Gain:

Steps involved:-

1. Prepare a Statement of Equivalent Production

Particulars	Units	Material		Labour		Overheads	
		% of Completion	Units	% of Completion	Units	% of Completion	Units
I. Units transferred to next process	xx	xx	xx	xx	xx	xx	xx
II. Closing WIP	xx	xx	xx	xx	xx	xx	xx
III. Abnormal Gain	xx	xx	xx	xx	xx	xx	xx
IV. Eq. Units (I+II+III)			xx		xx		xx

2. Draw Statement of Cost per Equivalent unit.

Elements of Cost	Cost of opening WIP	Current Cost	Total cost	Equivalent	Cost per Equivalent units
Material Cost	xx				
Less- Scrap value	xx	xx	xx	xx	xx
Labour cost	xx	xx	xx	xx	xx
Overheads	xx	xx	xx	xx	xx

3. Prepare a Statement of Evaluation.

Particulars	Elements	E.U.	Cost per Eq. units	Cost of Eq. units	Total ₹
Transferred to next process	Material Labour Overheads	xx	xx	xx	xx
Closing WIP		xx xx xx	xx xx xx	xx xx xx	xx
Abnormal Gain	Material Labour Overheads	xx xx xx	xx xx xx		xx xx xx

4. Prepare Process A/c as under:

Dr. Process A/c Cr.

Particulars	Units	Amounts ₹	Particulars	xx	xx
To Opening WIP	xx	xx	By Normal Loss	xx	xx
To Direct Material	xx	xx	By Process A/c (Next Process)		xx
To Direct Labour		xx	By Closing WIP	xx	xx
To Overheads		xx			
To Abnormal Gain					
Total	xx	xx	Total	xx	xx

Problem5. (Opening and Closing WIP, Normal Loss & Abnormal Gain given)

The following information is given in respect of Process III for the month of March 2025:

Opening stock - 200 units made up of:

Direct Material -I ₹ 1,235

Direct Material – II ₹ 1,320

Direct Labour ₹ 1,750

Overheads ₹ 1,100

Transferred to Process II : 2,000 units @ 6 per unit,

Transferred to Process No. IV: 1,700 units.

Expenditure incurred in Process III:

Direct Materials ₹ 3,000

Direct Labour ₹ 6,000.

Overheads ₹ 6,000.

Scrap: 100 units.

Direct Materials: 100%, Direct Labour: 60%, Overheads: 40%.

Normal Loss 10% of production. Scrapped units realised 4 per unit

Closing Stock: 400 units.

Degree of completion: Direct Material: 80%, Direct Labour: 60%, Overheads: 40%.

You are required to prepare:-

A) Statement of Equivalent Production

B) Statement of Cost per unit

C) Statement of Evaluation

D) Process III A/c

Solution:

Statement of Equivalent Production

Input Units	Particulars	Output Units	Equivalent Production in Units							
2 00	**Opening stock**		%	Units	%	Units	%	Units	%	Units
2,000	Transferred from process IIFully processed units	1,700								
	Normal Loss10% of (200+2,000-400 units)	180	100	1,700	100	1,700	100	1,700	100	1,700
	Closing stock		-	-	-	-	-	-	-	-
2,200	Less:-	400								
	Abnormal	2,280	100	400	80	320	60	240	40	160
	Gain	80	100	2,100	100	2,020	100	1,940	100	1,860
				80		80		80		80
		2,200								
				2,020		1,940		1,860		1,780

Statement of Cost per Unit

Cost items	Total Cost ₹	Equivalent Units	Cost per Equivalent units ₹
Material I:			
Opening balance (200 units)	1,235		
Cost of 2,000 units @ 6 per unit	12,000		
	13,235		
Less – Scrap (180 units @ ₹ 4)	720	12,515 / 2,020	6.1955
Material II:			
Opening Stock	1,320		
Introduction in Process	3,000	4,320 / 1,940	2.2268
Labour :			
Opening Balance	1,750		
Incurred in Process	6,000	7,750 / 1,860	4.1667
Overheads:			
Opening Balance	1,100		
Incurred in Process	6,000	7,100 / 1,780	3.9888
Total			**16.5778**

Statement of Evaluation.

Particulars	E.U.	Cost per Eq. units ₹	Total Cost ₹	Grand Total ₹
Finished Output	1,700	16.5778	28,182.26	28,182.2
Abnormal Gain	80	16.5778	1,326.22	1,326..2
Closing WIP:			₹	
Material I	400	6.1955	2,478.2	
Material II	320	2.2268	712.6	
Labour	240	4.1667	1,000	
Overheads	160	3.9888	638.2	4,829

Dr. Process III A/c Cr.

Particulars	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Opening WIP	200	5,405	By Normal Loss	180	720
To Transferred from Process II	2,000	12,000	By Finished Goods	1,700	28,182.2
To Direct Material II		3,000	By Closing WIP	400	4,829
To Direct Labour		6,000			
To Overheads		6,000			
To Abnormal Gain	80	1,326.2			
Total	2,280	33,731.2	Total	2,280	33,731.2

Situation VI:-
Process of Preparation of Second Process A/c under FIFO Method:
Steps involved:-
1. Prepare a statement of equivalent production

Particulars	Units	Cost of previous Process		Material		Labour		Overheads	
		%	EU	%	EU	%	EU	%	EU
I. Opening WIP		100		100		100		100	
II. Completely process		100		xx		xx		xx	
III. Closing WIP Abnormal Loss		100 100		xx		xx		xx	
IV. Eq. Units (I+II+III)									

2. Prepare Statement of Cost per Equivalent unit.

Particulars	Materials ₹	Labour ₹	Overheads ₹
V.Total Cost	xx	xx	xx
VI. Equivalent Units	xx	xx	xx
VII. Cost per Eq. units (I-+II+III)	xx	xx	xx

3. Prepare a Statement of Evaluation.

Particulars	Elements	E.U.	Cost per Eq. units	Cost of Eq. units	Total ₹
VIII. Opening WIP (I * VII)	Material Labour Overheads	xx xx xx	xx xx xx	xx xx xx	xx
IX. Completely Processed (II * VII)		xx xx xx	xx xx xx	xx xx xx	xx
X. Closing WIP (III * VII)		xx xx xx	xx xx xx	xx xx xx	xx
XI. Abnormal Loss (IV * VII)		xx xx xx	xx xx xx		xx xx xx

4. Prepare Process A/c as under:

Dr. Process A/c Cr.

Particulars	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Opening WIP	xx	xx	By Normal Loss	xx	xx
To Previous Process A/c	xx	xx	By Abnormal Loss	xx	xx
To Direct Material		xx	By Process A/c (Next Process)	xx	xx
To Direct Labour		xx	By Closing WIP	xx	xx
To Overheads		xx			xx
Total	xx	xx	Total		xx

Problem 6:-.

The following is the data available of AB Ltd. in respect of Process III for the month of January 20024.

(₹)

1. Direct material 776
2. Directlabour 386
3. Production Overheads 768
4. Transfer from process II: 4,200 Units 1,560
5. Transfer to process IV: 3,650Units
6. Stock on 01-01-2024 600 units

Degree of completion Material added in the process 60%

Labour 50%

Overhead 40% 390

7.Stock on 31-01-2024 800 units

Degree of completion Material added in the process 80%

Labour70%

Overhead 60%

8. 350 units scrapped are fully complete in all respects i.e. Material, Labour, Overhead.

9. Normal Loss was 10% of the production and units scraped have a scrap value of ₹0.10 per unit.

Prepare Process Account along with Statements of Equivalent Production, Cost Allocated

perEquivalent Unit and Statement of Evaluation for the month of January 2024, assuming F.I.F.O. basis. (M.Com. April 2011)

Solution:

Statement of Equivalent Production (F.I.F.O. Method)

Input		Output		Material I (for input from process II)		Material II		Labour		Overheads	
Details	**Units**	**Details**	**Units**	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**	**%**
Opening Stock	600	Normal loss	400	-		-		-		-	
		Completed From op. stock	600	-		240	40	300	50	360	60
Process II	4,200	Fresh	3,050	3,050	100	3,050	100	3,050	100	3,050	100
		Closing stock	800	800	100	640	80	560	70	480	60
		Ab. Gain	(50)	(50)	100	(50)	100	(50)	100	(50)	100
	4,800		4,800	3,800		3,880		3,860		3,840	

Calculation of cost per equivalent Units

	E. U.		E. U.
Material I	3,800	(₹1,560 – ₹40) = ₹1,520 (From process 2 – scrap ₹ 400×0.10 = ₹ 40)	₹ 0.40
Material II	3,880	₹ 776	₹ 0.20
Labour	3,860	₹ 386	₹ 0.10
Labour	3,840	₹ 768	₹ 0.20
Total cost per E. U.			**₹ 0.90**

Statement of Evaluation

	EU	CP	Total	
Opening stock				
Material II	240	0.20	48	
Labour	300	0.10	30	
Overhead	360	0.20	72	150.00
Units introduced and completed	3,050	0.90		2,745.00
Closing stock	800	0.40	320	
Material I	640	0.20	128	
Material II	560	0.10	56	
Labour	480	0.20	96	600.00
Overhead				
(-) Abnormal Gain	50	0.40	(20)	
Units I	50	0.20	(10)	
Units II	50	0.10	(5)	
Labour	50	0.20	(10)	(45)
Overhead				**3,450**

DrProcess III A/c **Cr**

Particular	Unit	Amount ₹	Particular	Unit	Amount ₹
To Opening stock	600	390	By Normal loss	400	40
To Process II A/c	4,200	1,560	By Process IV A/c	3,650	3,285
To Material		776	By Closing Stock	800	600
(Introduced in Process III)		386			
To Labour		768			
To Overhead	50	45			
To Abnormal Gain	4,850	3,925		4,850	3,925
Total					

Particulars	₹
Cost already incurred on opening stock	390
Cost incurred to complete the units representing Opening Stock	150
Cost incurred in completing newly introduced units	2,745
	3,285

Dr. **Abnormal Gain** **Cr.**

Particular	Unit	Amounts ₹	Particular	Unit	Amounts ₹
To Scrap @ ₹ 0.10	50	5	By process 3	50	45
To Costing Profit and Loss A/c	-	40		-	-
	50	45		50	45

Situation VII:-

Process of preparation of Second Process A/c under Average Method:

Steps involved:-

Step I Prepare a Statement of Equivalents Units.

Output	Units	Cost of previous process		Cost of current process					
				Material		Labour		Overhead	
		%	EU	%	EU	%	EU	%	EU
I. Transferred from		100	xx	100	xx	100	xx	100	xx
II. Closing WIP	xx	xx	xx	xx	xx	xx	xx	xx	xx
III. Abnormal Loss	xx	xx	xx	xx	xx	xx	xx	xx	xx
IV. Equivalents unit	xx	xx	xx	xx	xx	xx	xx	xx	xx

Step II Prepare a statement of Cost per Equivalents Unit.

Particular	Material ₹	Labour ₹	Overhead ₹
V. Total cost	xx	xx	xx
VI. Equivalent Unit	xx	xx	xx
VII. Cost per Equivalent unit (V /VI)	xx	xx	xx

Step III Prepare a Statement of Evaluation.

Output	Elements	EU	Cost per Equivalent	Toal
VIII. Opening WIP (I x VII)	Material	xx	xx	
	Labour	xx	xx	
	Overhead	xx	xx	xx
IX. Completely Processed	Material	xx	xx	
	Labour	xx	xx	
	Overhead	xx	xx	xx
X. Abnormal Los	Material	xx	xx	
	Labour	xx	xx	
	Overhead	xx	xx	xx
XI. Transfer to next Process	Material	xx	xx	
	Labour	xx	xx	
	Overhead	xx	xx	xx
XII. Closing WIP	Material	xx	xx	
	Labour	xx	xx	
	Overhead	xx	xx	xx

Step IV Draw Process A/c

Dr. Process A/c Cr.

Particular	Units	Amount ₹	Particular	Units	Amount ₹
To Opening WIP	xx	xx	By Normal loss	xx	xx
To Previous Process	xx	xx	By Abnormal	xx	xx
A/c		xx	Loss	xx	xx
To Material		xx	By Next Process	xx	xx
To Labour		xx	A/c	-	-
To Overhead	xx	xx	By Closing WIP	xx	xx

Problem7(Average Cost Method)

Process B receives from Process A and after carrying out work on the units transfer them to Process C. For one accounting period, the relevant data relating to Process B were as follow:-

Opening WIP 100 Units (25% Complete) value at ₹ 2,500.

400 Units received from Process A valued at ₹4,300

420 Units were transferred to Process C.

Closing WIP 80 units (50% complete).

The cost incurred during the period was ₹ 16,580 and no units were scrapped.

You are required to prepare:-

1. Statement of Equivalent Production

2. Statement of Apportionment of cost

3. Process B A/c using the Average Cost Method of Valuation.

Solution:

Statement of Equivalent Production (Average Method)

Input Units	Particulars	Output Units	Equivalents Production	
			%	Units
100	Opening WIP			
400	Receives from process A			
	Transferred to process C	420	50	420
	Closing WIP	80	25	40
	Units Scrapped	Nill	-	-
500	**Total**	**500**		**460**

Cost incurred:-

Particulars	₹	₹
Opening cost on Opening WIP		2,500
Add: Cost incurred in current period	4,300 + 16,580	20,880
Total		23,380
Average cost per unit = 23,380÷ 460 = ₹ 50.8261 per unit		

Statement of Apportionment of Cost

Particulars	₹
Cost of output transfer to Process C (420 x 50.8261)	21,347
Cost of Closing WIP (40 x 50.8261)	2,033
Total Cost of Output	**23,380**

Process B A/c

Dr. **Cr.**

Particular	Units	₹	Particular	Units	₹
To Opening WIP	100	2,500	By Output		
To Output from	400	4,300	transferred to	420	21,347
Process A			Process C	80	2,033
To Cost incurred		16,580	By Closing WIP		
during the period					
	500	23,380		500	23,380
Total					

Problem 8 (Opening and Closing WIP, Average Method)

The following details are given in respect of a manufacturing unit for the month of November 2023 for Process 'R'.

a) Opening Work-in-Process 5,000 units

i) Material (100% complete) ₹ 18,750

ii) Labour (60% complete) ₹7,500

iii) Overheads (60% complete) ₹ 3,750

b) Units introduced into the process 17,500 units

c) 17,500 units are transferred to the next process

d) Process costs for the period are

Materials ₹ 2,51,250

Labour ₹ 1,92,500

Overheads ₹ 96,250

e) The stage of completion of 5,000 units in closing WIP are estimated to be Material 100%, Labour 50% and Overheads 50%.

You are required to prepare:-

i) Statement of Equivalent Units of Production

ii) Statement of Cost

iii) Statement of Evaluation

iv) Process R A/c

Use Average Method. **(M.Com October 2012)**

Solution:

Statement of Equivalent Production

Particular	Units	Equivalent production					
		Material		Labour		Overheads	
		%	Units	%	Units	%	Units
Finished unit transferred to next process	17,500	100	17,500	100	17,500	100	17,500
Closing WIP	5,000	100	5,000	50	2,500	50	2,500
	22,500		22,500		20,000		20,000

Statement of Cost

Particular	Material ₹	Labour ₹	Overheads ₹	Total ₹
Cost of opening work in progress	18,750 2,51,250	7,500 1,92,500	3,750 96,250	30,000 5,40,000
Cost incurred in the process in current month	2,70,000	2,00,000	1,00,000	5,70,000
Total cost (A)	22,500	20,000	20,000	-
Equivalent units (B)	12	10	5	27
Cost per unit's A/B				

Statement of Evaluation

Particular	₹	₹
Finished output transferred to next process 17,500 units @ ₹ 27 each		4,72,500
Closing Work in progress	60,000	
Material (5,000 X 12)	25,000	
Labour (2,500 X 10)	12,500	97,500
Overheads (2,500 X 5)		
		5,70,000

Dr. Process R A/c Cr.

Particulars	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Opening WIP	5,000	30,000	By Next process A/c (Transfer of output @ ₹27 p.u.)	17,500	4,72,500
To Material	17,500	2,51,250	By Closing WIP	5,000	97,500
To Labour		1,92,500			
To Overheads		96,250			
Total	22,500	5,70,000	Total	22,500	5,70,000

Problem 9 (Opening, Closing WIP)

Given below is the information available from the records of a process industry for "Process Q" for the month of March, 2023:

Units in Work in Process as on 01/03/2023	4,000
Degree of Completion:	
Materials100%, Labour and Overheads 25%	
Units introduced	16,000
Units completed in the month	14,000
Units in Work in Process as on 31/03/2023	6,000
Degree of Completion:	
Materials: 100%, Labour and Overheads 33.33%	
Cost incurred on Opening Work in Process:	₹
Materials	6,000
Labour	1,000
Overheads	1,000
Cost incurred during the month:	
Materials	25,600
Labour	15,000
Overheads	15,000

By using Average (Weighted Average Method), you are required to prepare:

a) Statement of Equivalent Production

b) Statement Showing Cost per Element.

c) Statement of Evaluation/Apportionment of Cost

d) Process Q Account.

(M.Com. November 2011)

Solution:

Statement of Equivalent Production

Particulars	Qty. Reconciliation		Material		Labour		Overheads	
	Input	Output	%	Units	%	Units	%	Units
Opening work in progress	4,000							
Unit introduced	16,000							
Unit Trf..to next Process /Stock		14,000	100	14,000	100	14,000	100	14,000
Closing work in progress		6,000	100	6,000	33.33	2,000	33.33	2,000
Total	20,000	20,000		20,000		16,000		16,000

Statement showing Cost per Elements

Particular	Material ₹	Labour ₹	Overheads ₹	Total ₹
Cost of opening work in progress	6,000	1,000	1,000	8,000
Cost incurred in the process	25,600	15,000	15,000	55,600
Total cost (B)	31,600	16,000	16,000	63,600
Equivalent units (A)	20,000	16,000	16,000	-
Cost per Equivalent unit's **(C=B/A)**	1.58	1	1	3.58

Statement of Apportionment of Cost

Particular	EU	CPEU	₹	Total ₹
Finished output transferred to next process	14,000	4		50,120
Closing Work in progress				
Material	6,000	1.58	9,480	
Labour	2,000	1	2,000	
Overheads	2,000	1	2,000	13,480
				63,600

Dr. **Process 'Q' A/c**
Cr.

Particulars	Units	Amount ₹	Particulars	Units	Amount ₹
To Opening WIP	4,000	8,000	By Finished units	14,000	50,120
To Material	16,000	25,600	By Closing WIP	6,000	13,480
To Labour		15,000			
To Overheads		15,000			
Total	20,000	63,600	Total	20,000	63,600

Problem 10:-Roy and Johnson (P) Ltd gives the following particulars relating to Process A in its plant for the month of December 2023:-

Work-in-progress

(Opening balance) on 01.12.2023 500 units Material 4,800

Labour 3,200

Overhead 6,400

Total 14,400

Units introduced during the month: 19,500

Processing costs incurred during the month:

Material ₹1,86,200

Labour ₹72,000

Overhead ₹1,06,400

Total ₹3,64,600

Output: Unit transferred to Process B 18,200

Units scrapped (Completely Processed) 1,400

Work-in-progress (Closing Balance) 400

(Degree of completion: Material 100%,Labour and Overhead 50%)

Normal Loss in processing is 5% of total input and normal scrapped units fetch ₹1 each.

Prepare the following statements for Process A for December 2023:

(a) Statement of Equivalent Production.

(b) Statement of Cost.

(c) Statement of Evaluation.

(d) Process A Account. **(ICWA Inter)**

Solutions:

Statement of Equivalent Production

Input units	Particulars	Output units	Material		Labour and Overheads	
			%	Eq. units	%	Eq. units
500	Opening WIP					
19,500	Units introduced					
	Units completed	18,200	100%	18,200	100%	18,200
	Normal loss	1,000				
	Abnormal Loss	400	100%	400	100%	400
	Closing WIP	400	100%	400	50%	200
20,000		20,000				
	Equivalent units			19,000		18,800

Statement of Cost per Unit

Materials	Cost ₹ (A)	Eq. units (B)	Cost per unit ₹ (A÷B)
Materials:			
Opening work-in-progress	4,800		
Add: Material Consumed	1,86,200		
	1,91,000		
Less: Sale from normal loss	1,000		
	190,000	19,000	10
Labour:			
Opening work-in-progress	3,200		
Add: Cost incurred	72,000		
	75,200	18,800	4
Overhead:			
Opening WIP	6,400		
Add: Cost incurred	1,06,400		
	1,12,800	18,800	6
Total			**20**

Statement of Evaluation

₹	
Output Completed 18,200 units @₹20	3,64,000
Abnormal loss 400 units @₹20	8,000
Work in progress (closing)	
Material 400 units @₹10	4,000
Labour and overheads 200 units @₹10	2,0006,000

Dr. Process A Account Cr.

Particulars	Units	Amounts ₹	Particulars	Units	Amounts ₹
To Opening WIP	500	14,400	By T rf. to Process B	18,200	3,64,000
To Unit introduced	19,500	1,86,200	By Normal Loss	1,000	1,000
To Labour		72,000	By Abnormal Loss	400	8,000
To Overhead		1,06,400	By Closing WIP	400	6,000
	20,000	3,79,000		20,000	3,79,000

Note: Average Method is used.

2.2 EXERCISES

Problem 1. A product manufactured by the Standard Chemicals Ltd passes through three processes – I, II and III. The following costs have been incurred for the month of September 2024.

Particulars	Process I ₹	Process II ₹	Process III ₹
Material Consumed	40,000	7,500	5,000
Direct Wages	22,500	10,000	10,000
Direct Expenses	20,500	2,250	2,505
Total Output	83,000	19,750	17,505
Finished Process Stock	Units	Units	Units
(i) 01-9-2020	3,900	3,850	3,200
(ii) 30-9-2020			
Stock valuation on	600	550	800
01-9-2020 (₹ per unit)	500	800	Nill
Percentage of Wastage			
Net Realizable value of	24.50	31.00	37.00
Wastage per unit (₹)	2	5	10
	13.50	16.25	21.00

4,000 units of raw materials were introduced in process I at a cost of ₹20,000. Stock are valued and transferred to subsequent processes at weighted average cost. The percentage of wastage is computed on the number of units entering the process concerned.

You are required to prepare:-

(i) Process A/cs

(ii) Process Stock A/c

(iii) Normal Loss A/c

(iv)Abnormal Loss/Gain A/c.

(Ans. Cost p. u. of output Process I ₹26 , Process II ₹31.50, Process III ₹38)

Problem 2. Prepare a Process Account, Abnormal Loss Account and Normal Loss Account from the following information:-

Input of Raw Material	1000 units@ ₹ 20 per unit
Direct Material	₹4,200/-
Direct Wages	₹ 6,000/-
Production Overheads	₹ 6,000/-
Actual output transferred to process II	900 units
Normal Loss	5%
Value of Scrapper unit	₹ 8/-

(Ans. Transferred to Process II: - 900 Units, ₹ 35,800, Abnormal Loss:- 50Units, ₹400, Normal Loss: - 50 Units)

Problem 3. The following data are available in respect of Process I for February 2025

1) Opening stock of work-in-progress: 800 units at a total cost of ₹ 4,000.

2) Degree of completion of opening work-in-progress :

Material	100%
Labour	60%
Overhead	60%

3) Input of materials at a total cost ₹36,800 for 9,200 units.

4) Direct wages incurred ₹16,740.

5) Production overhead ₹8,370.

6) Units scrapped: 1,200 units. The state of completion of these units was:

Material	100%
Labour	80%
Overhead	80%

7) Closing work-in-progress: 900 units. The stage of completion of these units was:

Material	100%
Labour	70%
Overhead	70%

8) 7,900 units were completed and transferred to next process.

9) Normal Loss is 8% of the total input (opening stock plus units put in).

10) Scrap value is ₹4 per unit.

You are required to

(a) Compute equivalent production.

(b) Calculate the cost per equivalent unit for each element.

(c) Calculate the cost of abnormal loss (or gain), closing work-in-process and the units

(d) Transferred to the next process using the FIFO method, and Prepare the Process Account.

((Ans. Equivalent Units, Material: 8,400, Labour: 8,370, Overheads: 8,370)

Problem 4. (FIFO –Process A/c with Abnormal Loss)

From the following information prepare Process account as per FIFO assumption:

Opening stock :- 80 units @ Rs.6 per unit Rs.4,800

Material60%, Labour40%, Overheads 40%

Transferfrompreviousprocess: 12,000unitscostingRs.16,350

Transfer to next process: 9,700; Units scrapped 1,300 units Normal loss 10%; Closing stock: 1,800 units

Degree of completion

For units scrapped:		**For closing stock:**	
Material	100%	Material	60%
Labour	50%	Labour	50%
Overheads	50%	Overheads	50%
Scrap realized Re. 1.00 per unit			
Other information	Rs.		
Material	10,500		
Labour	20,760		
Overheads	16,470		

(M.Com, Oct. 2008, adapted)

(Ans. Equivalent Units, Material I:10,900, Material II: 10,500, Labour: 10,380, Overheads10,380)

Problem 5. The following information is given is respect for Process No. 3 for the month of March 2025.

Opening Stock- 2,000 units, made up of:

Direct Material – I ₹12,350; Direct Material – II ₹13,200.

Direct Labour ₹17,500; Overhead ₹11,000.

Transferred from Process No. 2; 20,000 units 6 per unit

Transferred to process No. 4; 17,000 units

Expenditure incurred in process No. 3

Direct Material ₹30,000; Direct Labour ₹60,000; Overheads ₹60,000.

Scrap: 1,000 units – Direct Material 100% ; Direct Labour 60% : Overhead 40%

Normal Loss 10% of production, scrapped units realized ₹4 per unit.

Closing Stock: 4,000 units

Degree of completion Direct Material 80% ; Direct Labour 60% : Overhead 40%

Prepare statement of equivalent Production, Statement of cost per unit, Statement of Evaluation and Process 3 Account.

(Ans. Equivalent Units, Material I: ₹ 20,200, Material II: ₹19,400, Labour: ₹18,600, Overheads: ₹17,800))

Problem 6. GH & Co. manufactures a product. The process costing is followed and work-in-progress stocks at the end of each month are valued at FIFO basis.

At the beginning of the month of June, the inventory of work-in- progress showed 400 units, 40% complete, valued as follows:

	₹
Material	3,600
Labour	3,400
Overheads	1,000
Total	8,000

In the month of June, materials were purchased for ₹ 75,000. Wages and overheads in the month amounted to ₹ 79,800 and ₹ 21,280 respectively. Actual issue of material to production was ₹ 68,500. Finished stock in the month was 2500 units. There was no loss in process.

All the end of the month, the work-in-process inventory was 500 units, 60 percent complete as to labour and overheads and 80% complete as to materials.

Prepare a Process Account for recording the month's transactions and prepare a Process Cost Sheet showing total and units costs. [I.C.W.A., Final]

(Ans. Transfer to Finished stock 2,500 Units, ₹ 1,56,094, Total Cost of 2500 units ₹1,56,094)

Problem 7. Avdoot Ltd., a manufacturer of a specialized product, is have a process costing system. The stock of work-in-progress at the end of each month is valued on First in First Out (FIFO) basis. At the beginning of January 2008 the stock of work-in-progress was 2000 units (40% completed) which was valued as :

Material ₹18,000

Labour ₹ 17,000

Overheads ₹5,300

During the month of January 2008, actual issue of materials for the production purpose was ₹3,42,500. wages and overheads in the month of January, 2008 amounted to ₹4,02,600 and ₹1,12,200 respectively. Finished production taken into the stock in the month was 12,500 units. There was no loss in the process. At the end of the month of January, 2008 the stock of Work-in-Progress was 2500 units (60% complete as to Labour and Overheads and 80% complete as to materials).

Prepare the following statements for January, 2008:-.

a) No. of units introduced in the process

b) Statement of Equivalent Production

c) Statement of Cost

d) Statement of Evaluation

e) Process Account. (M.Com. April 2008, adapted) (Equivalent Units: - Material: 13,700, Labour: 13,200, Overheads: 13,200)

Problem 8. XYZ Ltd. is engaged in process industry. During the month August 2000, 2000 Units were introduced in process 'X'. The normal loss was estimated at 5% of input. At the end of the month 1,400 units had been produced and transferred to process 'Y'. 460 units were incomplete and 140 units, after passing through fully the entire process had to be scrapped. The incomplete units had reached the following state of completion:

Materials	75% Completed
Labour	50% Completed
Overheads	50% Completed

Following are the further information on the process 'X':

Cost of the 2000 units	₹ 58,000
Additional Direct materials	₹ 14,400
Direct Labour	₹ 33,400
Direct Overheads	₹ 16,700
Units scrapped realized	₹ 10 each

Prepare statement of equivalent production, statement of cost, statement of evaluation and process 'X' account. (M.Com. March 2005)

Ans. (Equivalent Units, Material: 1,785, Labour: 1,670, Overheads: 1,670)

❖❖❖❖

3

COST ALLOCATION

Unit Structure :

3.0 INTRODUCTION

Cost Allocation or cost assignment is the process of identifying and assigning costs to the various cost objects. These cost objects could be those for which the company needs to find out the cost separately. A few examples of cost objects can be a product, customer, project, department, and so on. The need for cost allocation arises because some costs are not directly attributable to the particular cost object. In other words, these costs are incurred for various objects, and then the sum is split and allocated to multiple cost objects. These costs are generally indirect. Since these costs are not directly traceable, an accountant uses their due diligence to allocate these costs in the best possible way. It results in an allocation that could be partially arbitrary, and thus, many refer cost allocation exercise as the spreading of a cost. Cost allocation is the process of identifying, accumulating, and assigning costs to costs objects such as departments, products, programs, or a branch of a company. It involves identifying the cost objects in a company, identifying the costs incurred by the cost objects, and then assigning the costs to the cost objects based on specific criteria.

When costs are allocated in the right way, the business is able to trace the specific cost objects that are making profits or losses for the company. If costs are allocated to the wrong cost objects, the company may be assigning resources to cost objects that do not yield as much profits as expected.

3.1 TYPES OF COSTS

There are several types of costs that an organization must define before allocating costs to their specific cost objects. These costs include:

1. Direct cost

Direct costs are costs that can be attributed to a specific product or service, and they do not need to be allocated to the specific cost object. It is because the organization knows what expenses go to the specific departments that generate profits and the costs incurred in producing specific products or services. For example, the salaries paid to factory workers assigned to a specific division is known than does not need to be allocated again to that division.

2. Indirect Cost

Indirect costs are costs that are not directly related to a specific cost object like a function, product, or department. They are costs that are needed for the sake of the company's operations and health. Some common examples of indirect costs include security costs, administration costs, etc. The costs are first identified, pooled, and then allocated to specific cost objects within the organization.

Indirect costs can be divided into fixed and variable costs. Fixed costs are costs that are fixed for a specific product or department. An example of a fixed cost is the remuneration of a project supervisor assigned to a specific division. The other category of indirect cost is variable costs, which vary with the level of output. Indirect costs increase or decrease with changes in the level of output.

3. Overhead costs

Overhead costs are indirect costs that are not part of manufacturing costs. They are not related to the labor or material costs that are incurred in the production of goods or services. They support the production or selling processes of the goods or services. Overhead costs are charged to the expense account, and they must be continually paid regardless of whether the company is selling goods or not .Some common examples of overhead costs are rental expenses, utilities, insurance, postage and printing, administrative and legal expenses and research and development costs.

3.2 COST DRIVER

A cost driver triggers a change in the cost of an activity. The concept is most commonly used to assign overhead costs to the number of produced units. It can also be used in activity-based costing analysis to determine the causes of overhead, which can be used to minimize overhead costs. A large number of cost drivers may be used within an activity-based costing system. If a business is only concerned with following the minimum accounting requirements to allocate overhead to produced goods, then just a single cost driver should be used. It is an activity that is the root cause of why a cost occurs. It must be applicable and relevant to the event that is incurring a cost. A cost driver assists with

allocation expenses in a systematic manner that results in more accurate calculations of the true costs of producingspecific products.

Cost pool: It is an aggregate of all the costs associated with performing a particular business activity.

An activity cost driver refers to actions that cause variable cost to increase or decrease for a business. Therefore, identifying what product/service is causing particular costs can help the business to become more profitable by better understanding the specific activities that are driving the costs. **Allocating cost drivers appropriately is important in accurately determining the cost of producing a good or service, as well as making financial projections.**

Activity cost drivers are specific activities that cause variable expenses to be incurred. One variable expense can comprise more than a single activity cost driver. For example, machine hours and labor hours can be activity cost drivers in the manufacturing of a product.

All variable expenses can be broken down and looked at by one or several activity cost drivers, which can also be influenced by several factors. For example, if the minimum wage increases, it can cause the cost of producing a product to also increase.

Examples of Activity Cost Drivers

- Direct labour hours
- Machine setups required
- Number of customer contacts
- Number of customer change orders

Examples of Activity and its Cost Drivers

• Machine Set-up	• No. of Production Runs
• Purchase Materials	• No. of orders Placed
• Warehousing	• Items in Stock
• Material Handling	• No. of Parts
• Inspection	• Inspection per Item
• Quality Testing	• Hours of Test Time
• Receiving Material	• No. of Receiving Orders
• Packing	• No. of Packing Orders
• Store Delivery	• No. of Store Delivers
• Line Item Ordering	• No. of Line Items

3.3 METHODS OF ALLOCATING COST

Direct method of cost allocation

The direct method is considered the most simple method of allocating the cost of service departments to operating departments. In the direct

method, interactions between service departments are ignored and costs are allocated just to operating departments. Under this method, the costs incurred by service departments are not allocated to each other; rather, they are directly allocated to operating departments using some appropriate allocation base. In other words, we can say that the **direct method of departmental cost allocation** ignores the service provided by a service department to itself and to other service departments.

A firm generates various expenses that can be assigned to a specific "cost item" — such as a commodity, program, function, or service. These costs include anything from mop floors to functional equipment. You should, however, generate enough income to pay such corporation overhead expenditures. This means that revenue must surpass total costs. The direct allocation technique is one of numerous cost allocation strategies used to allocate indirect costs to activities. It is one of the most often used technique The direct technique is the easiest in terms of cost allocation, even though it has several shortcomings. Nevertheless, because of its simplicity of using it, it became one of the most widely applied cost allocation techniques in recent years. In a nutshell, it assumes that service departments do not give facilities or services to each other, and it merely distributes the service departments' costs in the company's manufacturing departments.

The direct approach of transferring service department costs to the operational department is the simplest way of allocating costs between divisions. As a result of this technique, the expenses involved by service departments are not assigned to one another. Still, they are instead allotted straight to operational departments using a suitable rate of allocation.

The direct approach assigns the expenses of all the support departments to every other manufacturing unit calculated based on the rates of each operational department rates. Services that other support departments receive are not considered in this method of cost allocation. With the help of this approach, it is possible to completely charge operational departments with the overhead expenditures for which they are accountable. Firms that use the direct method completely transfer excess costs from service departments to inventories, even though there may be cross-costs across service departments, because of the nature of the business.

For instance, the cleaning crew offers services to sanitize all business buildings. In contrast, the maintenance department oversees the firm's machinery, and the information technology department oversees maintaining the organization's computer networks. Assume that a service Department 1 utilizes a few of the facilities provided by Service Department 3. Such services will be excluded from consideration throughout the cost allocation procedure. Because such services are not assigned to certain other service divisions, many cost auditors think that the direct approach is not as precise as other methods.

Advantages and disadvantages

Many organizations use direct method for allocating departmental costs because it is very simple and easy to employ.

The major disadvantage of direct method is that it ignores interdepartmental services and can therefore lead to distorted products and services cost. Moreover, it is commonly considered a less accurate method when compared with other methods available for departmental cost allocation.

There is, however, a disadvantage to using this approach. Direct allocation does not enable companies to shift expenditures from one support department to another support department and vice versa. Depending on the nature of your company, this is a possibility. Assume that there is an HR and maintenance department. Allowing for the possibility that almost all the HR and maintenance department support expenditures are assigned to an operational unit through direct allocation. As a result, HR and maintenance department expenses are completely depleted.

Q.1) The Murphy Company has two service departments and two operating departments as shown below:

	SERVICE DEPARTMENTS		OPERATING DEPARTMENTS		
	Dept. A	**Dept. B**	**Dept. X**	**Dept. Y**	**Total**
Departmental costs before allocation	$180,000	$45,000	$130,500	$344,500	$700,000
Employee hours	6,000	3,000	9,000	15,000	33,000
Space occupied - square feet	5,000	100	3,000	22,000	30,100

The two service departments provide service to each other as well as to operating departments. The department A's cost is allocated on the basis of employee hours and department B's cost is allocated on the basis of square feet occupied.

Required: Allocate the cost of service departments to operating departments using direct method of cost allocation.

Solution

	SERVICE DEPARTMENTS		OPERATING DEPARTMENTS		
	Dept. A	**Dept. B**	**Dept. X**	**Dept. Y**	**Total**
Departmental costs before allocation	$180,000	$45,000	$130,500	$344,500	$700,000
Allocation:					
Department A cost (9/24,15/24)*	(180,000)		67,500	112,500	
Department B cost (3/25, 22/25)**		(45,000)	5,400	39,600	
	$ 0	$ 0	$203,400	$496,600	$700,000

Department A's cost has been allocated on the basis of employee hours:

9,000 hours + 15,000 hours = 24,000 hours.

Allocated to department X: $180,000 × (9/24) = $67,500
Allocated to department Y: $180,000 × (15/24) = $112,500

Department B's cost has been allocated on the basis of spaces occupied:

3,000 square feet + 22,000 square feet = 25,000 square feet.

Allocated to department X: $45,000 × (3/25) = $5,400
Allocated to department Y: $45,000 × (22/25) = $39,600

On the other hand, the human resources department assists the maintenance department throughout the same time frame. It goes without saying that the maintenance department should bear a portion of the costs of human resources. However, the expenditures of the maintenance department have already been transferred in whole to another operating unit.

3.4 STEP DOWN METHOD

In the step down method, one service department's costs are allocated to another service department as well as operating departments that use it. Any amount of the allocation base attributable to the service department whose cost has already been allocated is ignored. Each service department assigns its own costs to operating departments plus the costs that have been allocated to it from other service departments.

The step technique of distributing service department expenses is the second way of allocating costs. As part of a sequential process, service expenses are allocated to operational departments and other service departments by using this approach. The following are the critical phases in the allocation process:

1. Service departments that offer services to the greatest number of other service departments or that have the greatest proportion of their expenses used by the other service departments receive priority in allocating their expenses to certain other service departments. It also distributes the remainder of its expenses across the operational divisions.

2. The service department that offers services to the second-highest number of other services departments or has the second-highest proportion of its expenses absorbed by other service departments, oversees allocating its expenses towards the other service departments. At this point, all the company's other expenses have been assigned to the operational divisions.

3. Till the service department offering services to the fewest amount of other service departments or having the lowest proportion of its expenses absorbed by the other service departments is assigned its expenses, the procedure is repeated. The procedure comes to an end when all the allotment has been accomplished.

Advantages

This technique is easy and uncomplicated to execute and can be finished quickly. Due to the higher level of convenience, supervisors willing and eager to reduce the time spent on record keeping and forming accounting reports are far more likely to select it, even though the precision offered is not the highest in this cost allocation.

Q.1) The TCS Company uses the step method for allocating the costs of its service departments to operating departments. The company has two service departments and two operating departments. The selected information for the four departments is given below:

	SERVICE DEPARTMENTS		OPERATING DEPARTMENTS		
	Dept. A	**Dept. B**	**Dept. X**	**Dept. Y**	**Total**
Departmental costs before allocation	$180,000	$45,000	$130,500	$344,500	$700,000
Employee hours	6,000	3,000	9,000	15,000	33,000
Space occupied - square feet	5,000	100	3,000	22,000	30,100

The company uses employee hours as the base for allocating the cost of department A and space occupied for allocating the cost of department B.

Required: Allocate the cost of service departments to operating departments using step down method.

Solution

	SERVICE DEPARTMENTS		OPERATING DEPARTMENTS		
	Dept. A	**Dept. B**	**Dept. X**	**Dept. Y**	**Total**
Departmental costs before allocation	$180,000	$45,000	$130,500	$344,500	$700,000
Allocation:					
Department A cost (3/27, 9/27, 15/27)*	(180,000)	20,000	60,000	100,000	
Department B cost (3/25, 22/25)**		(65,000)	7,800	57,200	
Total costs after allocation	$ 0	$ 0	$198,300	$501,700	$700,000

Allocation of department A's cost:

Allocation ratio:

Department B: 3,000/(3000 + 9000 + 15,000) = 3,000/27000 or 3/27
Department X: 9,000/(3000 + 9000 + 15,000) = 9,000/27000 or 9/27
Department Y: 15,000/(3000 + 9000 + 15,000) = 15,000/27000 or 15/27

Allocated to department B: $180,000 × (3/27) = $20,000
Allocated to department X: $180,000 × (9/27) = $60,000
Allocated to department Y: $180,000 × (15/27) = $100,000

Allocation of department B's cost:

Allocation ratio:
Department X: 3,000/(3,000 + 22,000) = 3,000/25,000 or 3/25
Department Y: 22,000/(3,000 + 22,000) = 22,000/25,000 or 22/25

Total cost of department B: $45,000 + $20,000 = $65,000

Allocated to department X: $65,000 × (3/25) = $7,800
Allocated to department Y: $65,000 × (22/25) = $57,200

Q.2) The Religare Company provides the following selected data about its three service and two operating departments:

	SERVICE DEPARTMENTS			OPERATING DEPARTMENTS		
	Dept A	**Dept B**	**Dept C**	**Dept X**	**Dept Y**	**Total**
Overhead costs	$180,000	$105,000	$48,000	$200,000	$267,000	$800,000
Number of employees	60	35	140	315	210	760
Square feet of space occupied	5,000	10,000	20,000	40,000	100,000	175,000
Hours of press time	--	--	--	15,000	30,000	45,000

The order and bases for allocating service department costs is given below:

1. Department A; allocation base is "number of employees".
2. Department B; allocation base is "space occupied".
3. Department C; allocation base is "hours of time".

Required: Allocate the cost of service departments to operating departments using step down method of cost allocation.

Solution

	ALLOCATION BASES					
	Department A		Department B		Department C	
Department B data	35 Empl.	1/20	--		--	
Department C data	140 Empl.	4/20	20,000 Sq. feet	1/8	--	
Department X data	315 Empl.	9/20	40,000 Sq. feet	2/8	15,000 Hrs.	1/3
Department Y data	210 Empl.	6/20	100,000 Sq. feet	5/8	30,000 Hrs.	2/3
	700 Empl.	20/20	160,000 Sq. feet	8/8	50,000 Hrs.	3/3

	SERVICE DEPARTMENTS			OPERATING DEPARTMENTS		
	Dept A	Dept B	Dept C	Dept X	Dept Y	Total
Overhead costs	$180,000	$105,000	$48,000	$200,000	$267,000	$800,000
Allocation:						
Department A (1/20, 4/20, 9/20, 6/20)	(180,000)	9,000	36,000	81,000	54,000	
Department B (1/8, 2/8, 5/8)		(114,000)	14,250	28,500	71,250	
Department C (1/3, 2/3)			(98,250)	32,750	65,500	
	$ 0	$ 0	$ 0	$342,250	$457,750	$800,000

3.5 RECIPROCAL METHOD OF COST ALLOCATION

Reciprocal method is a method of allocating service department costs to other departments that gives full recognition to interdepartmental services .Although it is the most accurate, it is also the most complicated. In the reciprocal method, the relationship between the service departments is recognized. This means service department costs are allocated to and from the other service departments. The reciprocal method gives full recognition to interdepartmental services. Under the step method, only partial recognition of interdepartmental services is possible. The step method always allocates costs forward never backward. The reciprocal method, by contrast, allocates service department costs in both directions. The reciprocal allocation requires the use of simultaneous equations.Other names for the reciprocal method are simultaneous solution method, cross allocation method, matrix allocation method and double distribution method.

Under this method the true cost of the service departments are computed first with the help of simultaneous equations and these are then distributed to producing departments on the basis of given percentage or ratio. Remember that true cost of the service department means the cost of the service department which includes original cost of the department plus the share of the other service department. The main advantage of this method is to have an accurate distribution in a single step in the distribution summary.

Use of Reciprocal Method

This method is rarely used in practice for two reasons. First, the computations are relatively complex. Although the complexity issue could be overcome by use of computers, there is no evidence that computers have made the reciprocal method more popular. Second, the step method usually provides results that are a reasonable approximation of the results that the reciprocal method would provide. Thus, companies have little motivation to use the more complex reciprocal method.

Q.1) A company has two service and two producing departments. The two service departments serve not only to producing departments but also to each other. The departmental estimates for the next year are as follows.

Producing	**departments:**	
A		
B		50,000
Service	**departments:**	40,000
X		10,000
Y		8,800

The service departments costs are to be distributed as under:
Cost of X : 50% to A, 40% to B, and 10% to Y
Cost of Y : 40% to A, 40% to B, and 20% to X

Required:
Transfer the service departments costs to each other and to producing departments.

Solution:
Now we solve the given illustration first using the simultaneous equation method as follows:**Original costs of service departments:**
X = Rs.10,000
Y = Rs. 8,800
After getting the share from distribution of service departments:
X = Rs. 10,000 + 20% Y
Y = Rs. 8,800 + 10% X
By putting the value of Y in equation (1)
X = Rs. 10,000 + 20%(Rs.8,800 + 10%X)
X = Rs. 10,000 + 1760 + 0.2X
X – 0.02X = Rs. 10,000 + Rs.1,760
0.98X = Rs. 11,760
X = 11760 / 0.98
= Rs. 12,000
By putting the value of X in equation (2)
Y = Rs. 8,800 + 10%(Rs. 12000)
Y = Rs. 8,800 + Rs. Rs. 1,200
= Rs. 10,000

Distribution Summary

Department	**Producing**	**Service**

Original costs				
Distribution of service department costs:	**A** Rs 50,000	**B** Rs 40,000	**X** Rs 10,000	**Y** Rs 8,8001,200
X	6,000	4,800	(12,000)	(10,000)
Y	4,000	4,000	2,000	
Total departmental overheads	60,000	48,800	Nil	Nil

3.6 ACTIVITY BASED COSTING

Activity based costing (ABC) assigns manufacturing overhead costs to products in a more logical manner than the traditional approach of simply allocating costs on the basis of machine hours. Activity based costing first assigns costs to the activities that are the real cause of the overhead. It then assigns the cost of those activities only to the products that are actually demanding the activities. ABC works best in complex environments, where there are many machines and products, and tangled processes that are not easy to sort out. Conversely, it is of less use in a streamlined environment where production processes are abbreviated, so that costs are easy to assign.

Activity based costing is basically a change in accent. People perform activities and activities use resources. Thus, by controlling activities the manager is making sure that costs are controlled at their source. A wise manager will not focus on how to estimate product costs, but will focus more on why the costs were there in the first place. When intending an activity based costing system this should be utilized as a departure point.

Advantages of Activity Based Costing System

- The first and most significant benefit is the accuracy in the procedure of costing with regards to the product line, the consumers of the product, the stock-keeping units employed by the administration and the channel and group which streamline the flow of the product from the maker to the consumer.
- This system better helps in the procedure of understanding the concept of overhead costs i.e. the distribution of common business resources as they are utilized by particular product lines and their association to particular cost driver.
- The system is simple to interpret and understand is it is available, useable and specifically implement capable across all norms of business set-ups.
- This procedure consumes unitary cost, or marginal cost as the calculation base in comparison to the conventional cost accounting techniques which employ total cost.

- This system is specifically useful in recognizing and ear-marking some of the matters business activities which are a stress or burden on the business i.e. wasteful or non value adding services..
- This procedure permits firms to implement costing policies across another diagonal of the company as business procedures, supply chains and value addition channels are capably and optimally analyzed in this procedure.
- This system mimics the actual business procedure as the appropriation of common pool resources takes place in the same way as common resources are utilized in the business.
- Disadvantages of Activity Based Costing System
- Data collection procedure for this system is very time consuming.
- The capital expense on the activity based system and its subsequent running costs can be a road block for companies.
- The system is very apparent which some managers would not authorize of as they would like to keep some things out of the view of the owners of the firm.
- ABC Costing System is very costly to implement and maintain in a manufacturing and serving departments. Data concerning numerous activity measures must be collected, checked, and entered into the system.
- ABC costing systems produces the reports that are different from the profit and loss reports produced through traditional costing systems.
- As most of the companies are using , traditional costing systems, so because of the difference in the costing basis the costing and financial reports of the two companies of the same industry could not be compared for performance evaluation purposes.
- Adaptability of ABC Costing System is not suitable for all kind of companies because small companies have not many resources to ad
- Data Produced through ABC Costing System can easily misinterpret and can lead towards wrong decisions. So manager should use the data produced through ABC Costing System with extreme care and should assign the costs that are relevant to the products, customers and should not consider the other cost objects that are irrelevant.
- ABC costing system does not comply with the GAAP and a company has to produce its reports for internal and external purposes by using traditional and ABC costing system both at a time.
- In ABC costing system costs are allocated on the base of cost drivers and activities undertaken to manufacture the product, definitely, it provides the accurate and proper allocation of the costs to the products but there is a danger of over or under costing of the products when irrelevant cost drivers or activities are assigned to the products or services produced.

Steps in ABC

- Identify which activities are necessary to create a product
- Separate each activity into its own cost pool
- Assign activity cost drivers to each cost pool
- Divide the total overhead in each cost pool by the total cost drivers to get your costdriver rate
- Compute how many hours, parts, units, etc. that the activity used and multiply it by thecost driver rate to find total cost
- Calculate Cost per Unit by dividing the Total Cost by Total Units produced.

Uses of ABC

- Identification of necessary activities: The ABC system shows how overhead is used, which helps to determine whether certain activities are necessary for production.
- Focus on Value adding activities: The Activity Based Costing helps the management on focusing the forces on value adding activities and eliminate non-value adding activities.
- Ensuring profit margin: The specific allocation of costs also helps to set prices that produce a healthy small business profit margin.
- Product pricing: With an ABC system, the business can assign costs to each activity inthe production process, allowing it to more accurately set a price that accounts for howmuch it costs to create a product.
- Measures to improve productivity: The accurate cost information helps the management to adopt productivity improvement approaches like Total Quality Management (TQM), Business Process Re-engineering (BPR) etc.
- Help in deciding Make or Buy: The management can take make or buy decisions by considering the cost of manufacture of a product or sub contract the same with an outside agency through Activity Based Costing analysis.

3.7 DIFFERENCE BETWEEN TRADITIONAL COST SYSTEM AND ABC SYSTEM

Basis	Traditional	ABC
1. Cost pools	One or limited number	Many
3. Applied Rate	Volume based	Activity Based
3. Applied for	Labour Intensive	Capital Intensive
4. Benefits	Simple, Inexpensive	Accurate product costing, identificationof necessary activitiesetc

5. Cost assignments	Primary and secondary distribution ofOverhead and then allocation of Overhead as per the suitable rate	Allocation of cost pool based on cost drivers then allocation of coststo product or service based on the drivers used by the particularproduct or service
6. Focus	Departments or responsibility centres	Processes and activities

3.8 PRACTICAL SUM

Problems involving calculations of Total cost and CPU under both Traditional and ABCmethods.

Question:

Amrit Company produces 3 products A, B and C. The company follows Activity Based Costing system. Information related to various costs of these products for the last year:

Particulars	**A**	**B**	**C**
Production and Sales (Units)	15000	12000	18000
Selling Price p.u. (Rs.)	7.5	12	13
Raw Material Usage (kg) p.u.	2	3	4
Direct labour hours p.u.	0.1	0.15	0.2
Machine Hours p.u.	0.5	0.7	0.9
No. of Production runs p.a.	16	12	8
No. of purchase orders p.a.	24	28	42
No. of deliveries to retailers p.a.	48	60	32

The price of Raw materials remained constant through out the year at Rs.1.2 per kg and the labour cost was Rs.14.8 per hour. The annual Overhead costs are as follows:

Overheads	**Rs**
Machine set up costs	26550
Machine running costs	66400
Procurement Costs	48000
Delivery costs	54320

Solution: Traditional Method

a) Calculation of Total Overhead

Overheads	**Rs**
Machine set up costs	26550
Machine running costs	66400
Procurement Costs	48000
Delivery costs	54320
Total	195270

b) Calculation of Overhead Absorption rate

Particulars	**A**	**B**	**C**	**Total**
Production Volumes	15000	12000	18000	
Labour hours p.u.	0.1	0.15	0.2	
Total Labour hours	1500	1800	3600	6900

Overhead absorption rate = 195270/6900 = Rs.28.30 per hour.

c) Calculation of Cost p.u.

Particulars	**A**	**B**	**C**
Raw material cost (Usage * Rs.1.20)	3.4	3.6	4.8
Direct Labour Cost (Labour hours * Rs.14.80)	1.48	3.22	3.96
Overhead (Labour hours * Rs.28.30)	3.83	4.25	5.66
CPU	6.71	10.07	13.42

ABC Method

a) Calculation of Overhead Absorption rate

Cost Pool	**Rs.**	**Cost Driver**		**Rate of OH per activity (Rs.)**
Machine costs set up	26550	No. of Production runs p.a.	(16+12+8) = 36 runs	26550/36= 737.50 per run
Machine costs running	66400	No. of Machine Hours p.a.	(7500+8400+16200)# = 32100 hours	66400/32100 = 3.0685 per hour
Procurement Costs	48000	No. of purchase orders p.a.	(24+28+42) = 94 orders	48000/94= 510.6383per order
Delivery costs	54320	No. of deliveries to retailers p.a.	(48+30+62) = 140 deliveries	54320/140= 388 per delivery

Total Machine hours p.a. = Machine hours p.u. * Total units producedA = 0.5*15000 = 7500

B = 0.7*12000 = 8400 C = 0.9*18000 = 16200

b) Calculation of Cost p.u.

Particulars	**A**	**B**	**C**
Material Cost	3.4	3.6	4.8
Labour Cost	1.48	3.22	1.96
Overhead:##			
Machine Set up Costs	(737.50*16)/15000= 0.7867	(737.50*12)/12000= 0.7375	(737.5*8)/18000 = 0.3278
Machine running Costs	(3.0685*7500)/15000 = 1.034	(3.0685*8400)/12000 = 1.4479	(3.0685*16200)/18000 = 1.8616
Procurement Costs	(510.6383*24)/15000 = 0.817	(510.6383*28)/12000 = 1.1915	(510.6383*42)/18000 = 1.1915
Delivery costs	(388*48)/15000 = 1.2416	(388*30)/12000 = 0.97	(388*62)/18000 = 1.3364
Total CPU	7.7593	10.1669	11.4773

Overheads p.u. for products A, B and C

= (Overhead absorption rate* No. of cost drivers used by the individual products p.a.)/ No. of units produced

4

RESPONSIBILITY ACCOUNTING-I

A) Responsibility Accounting – Meaning, Features, Objectives, Assumptions, Problems, Responsibility Centre's Cost, Profit, Revenue and Investment.

Responsibility Accounting- Concept

Responsibility accounting is a control system meticulously designed to assign and manage accountability within an organization's various operational segments. It departs from a purely top-down, organization-wide approach by focusing on individual performance within specific areas. This system empowers individuals with clearly defined authority, providing them with the necessary tools and autonomy to manage costs effectively. By doing so, it shifts the emphasis from broad, systemic metrics to the direct actions and results of individual managers. This approach is particularly effective in large, decentralized organizations where individual contributions significantly impact overall performance.

At the heart of responsibility accounting lies the principle of aligning accountability with control. This is achieved by collecting and reporting crucial financial data, including inputs (resources consumed) and outputs (results achieved) for each designated responsibility center. The system's effectiveness hinges on its seamless integration with the existing organizational structure. Each role within the organization must have a clear delineation of authority and responsibility, ensuring that individuals possess the necessary power to fulfill their assigned duties. This alignment creates a robust framework for performance evaluation, as managers are held accountable only for those factors within their control. This also enables a clear chain of command and reporting, facilitating effective communication and decision-making.

By evaluating managerial performance based on these clearly defined factors, organizations can achieve a granular level of cost control and operational efficiency. Responsibility accounting goes beyond simply tracking financial metrics; it fosters a culture of accountability and ownership. This system emphasizes the human element by focusing on individual performance and utilizes metrics like Return on Investment (ROI) and Residual Income (RI) to assess divisional performance. Crucially, it gathers and reports both planned and actual financial data, enabling comparisons and variance analysis. This detailed analysis allows for proactive interventions and continuous improvement. The system's alignment with the organizational hierarchy ensures that accountability matches authority, leading to improved cost management and performance across all levels of the organization.

Responsibility Accounting- Meaning & Definition

Responsibility accounting is a management accounting framework that systematically assigns accountability to various levels of management based on their delegated responsibilities. It establishes a robust information and reporting system designed to deliver timely performance feedback, directly aligned with these delegated duties. This approach moves beyond simply tracking overall organizational performance, instead focusing on individual contributions and the effectiveness of specific management teams. By creating a clear link between responsibility and performance evaluation, organizations can foster a culture of accountability and drive improved efficiency.

The system centers on identifying and evaluating the performance of individual divisions or units, which are designated as "responsibility centers" or "accountability hubs," each operating under the authority of a specific manager. The performance of each center is assessed independently to understand its contribution to the overarching organizational goals. This granular evaluation allows for targeted interventions and improvements, ensuring that each part of the organization is working effectively towards the overall strategic objectives. By connecting performance reporting directly to the responsibilities of each manager, responsibility accounting creates a powerful tool for driving accountability and improving overall organizational performance.

Horngreen: defines “Responsibility accounting is a system of accounting that recognizes various responsibility centres throughout the organisation and reflects the plans and actions of each of these centres by assigning particular revenues and costs to the one having the pertinent responsibility. It is also called profitability accounting and activity accounting”. According to this definition, the organisation is divided into various responsibility centres and each centre is responsible for its costs. The performance of each responsibility centre is regularly measured.

Institute of Cost and Works Accountants of India defines Responsibility accounting as “a system of management accounting under which accountability is established according to the responsibility delegated to various levels of management and a management information and reporting system instituted to give adequate feedback in terms of the delegated responsibility. Under this system divisions or units of an organisation under a specified authority in a person are developed as responsibility centres and evaluated individually for their performance.”**Features of responsibility Accounting**

1. Resource Utilization and Financial Outcomes:

Responsibility accounting is fundamentally anchored in the meticulous tracking of resource consumption and financial results. It involves the careful recording of physical resources utilized by an organization, such as raw material quantities and labor hours, which are then translated into

monetary values, representing expenditures. Similarly, the outputs generated, whether products or services, are assigned monetary values, resulting in earnings. The system, therefore, heavily relies on comprehensive expenditure and earnings data to assess performance and pinpoint areas for improvement.

2. Integration of Planning and Performance:

A robust responsibility accounting system necessitates the fusion of projected and actual financial data. This implies that beyond merely documenting past expenditures and earnings, it's crucial to incorporate future financial forecasts through budgetary tools. Budgets serve as a vital communication mechanism, conveying the organization's strategic objectives and assigning accountability for their realization to each management echelon. By incorporating techniques such as static budgets, dynamic budgets, and profit planning, the system ensures a holistic approach to performance evaluation and control.

3. Establishment of Accountability Centers:

The core principle of responsibility accounting centers on the creation of distinct accountability centers within the organizational framework. These centers represent specific areas of authority and decision-making, enabling clear lines of accountability. While smaller organizations might be managed by a single individual or a small team, larger firms require segmentation into meaningful sub-units, such as departments or divisions. Each accountability center is overseen by an individual responsible for its performance, ranging from small units like a single machine operation to larger divisions like regional profit centers. The key is that each unit must be clearly defined and measurable to facilitate effective performance assessment.

4. Alignment of Financial Reporting and Organizational Structure :

A well-defined organizational framework with clear lines of authority and accountability is a prerequisite for a successful responsibility accounting system. The system must be designed to mirror the existing organizational framework, ensuring that financial reporting accurately reflects the established authority-accountability relationships. In essence, the responsibility accounting system should mirror the organization's structure, providing financial data that enables the evaluation of each individual's performance within their respective functional domain.

5. Allocation of Costs to Individuals and Focusing on Controllable Expenditures:

After establishing accountability centers and defining authority-accountability relationships, the system involves allocating costs and earnings to specific individuals. However, only those costs and earnings that are directly controllable by an individual should be allocated to them for performance evaluation. Guidelines for allocating costs include charging individuals with the cost of services if they have authority over

both acquisition and utilization, charging individuals with costs they can significantly influence through their actions, and even charging individuals with costs they cannot directly influence but that management wants them to be cognizant of to encourage them to influence those who are directly responsible.

Objectives of Responsibility Accounting

Responsibility accounting serves as a critical management tool designed to enhance organizational performance by clearly defining and assigning accountability across various levels. Its primary objectives center on fostering a culture of ownership, improving decision-making, and driving continuous improvement through the strategic use of financial and operational data. By aligning individual and departmental goals with overall organizational objectives, responsibility accounting aims to maximize efficiency, optimize resource allocation, and ultimately, elevate performance across the entire enterprise.

1. Establish Clear Accountability Frameworks:

Responsibility accounting aims to create a structured system where individuals or departments are assigned specific responsibilities. This involves clearly defining the scope of their authority and obligations. By doing so, it ensures that everyone understands their role in achieving organizational goals and can be held accountable for their performance. This clarity minimizes ambiguity and promotes a sense of ownership.

2. Enable Objective Performance Measurement:

A key objective is to provide a framework for evaluating performance objectively. Responsibility accounting establishes predetermined targets and benchmarks against which actual results are compared. This allows for a fair and consistent assessment of individual and departmental contributions, reducing subjectivity and bias in performance evaluations.

3. Identify and Address Performance Variances:

Responsibility accounting facilitates the identification of performance gaps by comparing actual results to budgeted figures and established standards. This process highlights areas where performance deviates from expectations, allowing for timely corrective actions. By analyzing these variances, organizations can pinpoint the root causes of underperformance and implement strategies for improvement.

4. Empower Informed Decision-Making at Responsibility Centers:

The system provides managers with relevant financial and operational data within their respective responsibility centers. This empowers them to make informed decisions that align with organizational goals. By decentralizing decision-making authority, organizations enable quicker and more effective responses to changing market conditions and operational challenges.

5. Optimize Resource Allocation and Utilization:

Responsibility accounting offers valuable insights into the performance and resource utilization of different departments. This information allows management to allocate resources more efficiently, ensuring that they are directed towards the most promising areas of the business. By optimizing resource allocation, organizations can maximize productivity and achieve greater returns on investment.

6. Foster a Culture of Continuous Operational Improvement:

The emphasis on performance measurement and feedback within responsibility accounting cultivates a culture of continuous improvement. Managers are encouraged to identify areas for improvement, implement corrective actions, and strive for ongoing operational excellence. This proactive approach leads to increased efficiency, reduced costs, and enhanced overall performance.

7. Enhance Communication and Coordination Across Departments:

Responsibility accounting promotes regular information exchange between management and responsibility centers, fostering better communication and coordination within the organization. By highlighting the interdependencies between different departments, it encourages cross-functional collaboration and teamwork, breaking down departmental silos and improving overall organizational effectiveness.

8. Drive Employee Motivation and Engagement Through Recognition:

By recognizing and rewarding individual and team contributions based on performance metrics, responsibility accounting motivates employees and fosters a sense of ownership and engagement. Granting greater autonomy and decision-making authority to managers empowers them, leading to improved morale, job satisfaction, and a stronger commitment to achieving organizational goals.

Assumptions of Responsibility Accounting

Responsibility accounting, while a powerful tool for enhancing organizational control and performance, is predicated on several core assumptions. These assumptions, though often implicit, are critical to the system's effective implementation and the accurate evaluation of managerial performance. Understanding these underlying principles is essential for organizations to leverage responsibility accounting effectively and to mitigate potential limitations that may arise from deviations from these foundational beliefs.

1) **Clearly Defined Authority and Accountability:** The foundational principle of responsibility accounting rests on the assumption that an organization possesses a well-structured hierarchy with clearly delineated lines of authority and responsibility. This means that each individual and department must have a comprehensive understanding

of their roles, duties, and the extent of their decision-making power. Such clarity is indispensable for ensuring individuals are held accountable for their actions and the resulting outcomes. Without a clear framework, ambiguity arises, hindering effective performance evaluation and control. A well-defined organizational chart and detailed job descriptions are crucial tools in establishing this essential foundation.

2) **Accurate Cost Tracking and Allocation:** Responsibility accounting assumes that costs can be accurately traced and allocated to the relevant responsibility centers. This requires a robust cost accounting system capable of properly assigning expenses to the units that incur them. Accurate cost allocation is essential for evaluating the performance of individual departments and holding managers accountable for the costs they can influence. However, challenges such as joint costs and shared services can complicate this process, potentially affecting the precision and reliability of reporting. Therefore, careful consideration must be given to the methodologies used for cost allocation to ensure the integrity of the system.

3) **Controllable Cost Focus:** A fundamental assumption is that managers are primarily held accountable for costs that they can directly influence. The system aims to isolate and assign controllable costs to the relevant managers, ensuring that they are not held responsible for factors beyond their control, such as corporate overhead or external market fluctuations. This approach fosters fairness and encourages managers to focus on areas where they can make a real impact. However, identifying truly controllable costs can be complex in practice, as many costs are influenced by a combination of internal and external factors.

4) **Rational Decision-Making and Aligned Goals:** Responsibility accounting relies on the assumption that managers will act logically and in the best interests of the organization. This necessitates that individual and departmental goals align with the overall organizational objectives. Goal congruence is essential for optimal performance, as misaligned incentives can lead to suboptimal decisions that hinder the organization's progress. Therefore, incentive structures and performance evaluation systems should be designed to promote alignment and encourage managers to make decisions that benefit the organization as a whole.

5) **Relatively Stable Operating Environment:** While not always explicitly stated, responsibility accounting often implicitly assumes a degree of environmental stability. Rapid changes or unforeseen events, such as economic downturns or technological disruptions, can disrupt the system's underlying assumptions and affect the validity of performance data. Therefore, organizations must be prepared to adapt the system to changing circumstances and consider external factors when evaluating performance.

6) **Reliable Data Availability:** The system requires access to accurate and timely financial and operational information. Effective data collection and analysis are essential for the system to function correctly. Data quality issues, such as inaccuracies, inconsistencies, and delays in data collection, can significantly undermine the system's effectiveness. Therefore, organizations must invest in robust data management systems and processes to ensure the reliability of the information used for performance evaluation and decision-making.

Problems in responsibility accounting

While responsibility accounting offers significant advantages in enhancing organizational control and accountability, it is not without its challenges. The system, like any management tool, faces inherent problems that can hinder its effective implementation and accurate performance evaluation. These issues range from practical difficulties in cost classification to behavioral challenges and the impact of a dynamic business environment. Recognizing and addressing these potential pitfalls is crucial for organizations seeking to maximize the benefits of responsibility accounting and ensure its alignment with strategic objectives.

1) **Difficulties in Controllable vs. Non-Controllable Cost Classification:** A foundational requirement for effective responsibility accounting is the accurate segregation of controllable and non-controllable costs. However, this proves challenging due to the intricate and diverse nature of organizational expenditures. In practice, costs are often influenced by a mix of factors, making it difficult to definitively assign them as entirely controllable or uncontrollable. This ambiguity can lead to unfair performance evaluations and hinder the system's effectiveness.

2) **Interdepartmental Rivalry and Suboptimization:** While responsibility accounting aims to enhance individual accountability, it can inadvertently foster interdepartmental rivalry. The focus on departmental performance may lead managers to prioritize their own unit's goals over the overall organizational objectives. This can result in suboptimization, where decisions that benefit individual departments may ultimately harm the enterprise as a whole. Managers may act in what they perceive to be their best interest, without considering the broader implications for the organization.

3) **Limited Reliance as a Sole Management Control Tool:** Responsibility accounting should not be viewed as a comprehensive management control solution. It serves as a valuable tool for directing management's attention to areas requiring further investigation, but it doesn't provide all the answers. It's a system that highlights potential performance issues, necessitating further analysis and the use of other management techniques. Relying solely on responsibility accounting can lead to an incomplete understanding of organizational performance.

4) **Challenges in Organizational Chart Development:** Creating an organizational chart that clearly delineates lines of responsibility and authority is a complex undertaking. This task becomes increasingly difficult in large, decentralized organizations with intricate reporting structures. Ambiguity in roles and responsibilities can hinder the implementation of responsibility accounting, as it relies on a clear understanding of who is accountable for what.

5) **Information Overload in Reporting:** Responsibility accounting reports can sometimes become overloaded with excessive information. This can overwhelm managers and make it difficult for them to identify and focus on the most critical performance indicators. The sheer volume of data can obscure key insights and hinder timely decision-making. Reports should be concise, relevant, and focused on actionable information.

6) **Measurement of Intangible Factors:** Many critical aspects of organizational performance, such as innovation, customer satisfaction, and employee morale, are difficult to quantify. Traditional financial measures often fail to capture these intangible factors, limiting the effectiveness of performance evaluation within responsibility centers. This can lead to an incomplete picture of overall performance and a neglect of crucial non-financial indicators.

7) **Short-Term vs. Long-Term Focus:** Responsibility accounting systems often emphasize short-term results, which can discourage managers from making long-term investments that are crucial for the organization's future success. This short-term focus can lead to a neglect of strategic initiatives and a focus on immediate gains at the expense of long-term sustainability.

8) **Data Collection and Analysis Challenges:** Implementing and maintaining an effective responsibility accounting system requires robust data collection and analysis capabilities. Organizations with complex operations and large volumes of data may face significant challenges in gathering, processing, and analyzing the necessary information. This can lead to inaccuracies and delays in reporting, undermining the system's effectiveness.

9) **Behavioral Issues: Goal Congruence and Game Playing:** Ensuring that individual and team goals align with overall organizational objectives is crucial for the success of responsibility accounting. However, misaligned incentives can lead to suboptimal decisions and hinder performance. Managers may also engage in "game playing," manipulating performance metrics to improve their own evaluations. This can include shifting expenses to other departments or delaying necessary investments. Addressing these behavioral issues requires careful design of incentive structures and a culture of ethical behavior.

Responsibility Centres

Meaning

A responsibility center is a defined area of control, where the manager has been delegated authority to make decisions related to the center's objectives. The performance of a responsibility center is typically measured using key performance indicators (KPIs) that align with its defined scope.

Essentially, a responsibility center is a tool for decentralizing management and fostering accountability. By assigning clear responsibilities and providing managers with the necessary authority, organizations can improve efficiency, drive performance, and ensure alignment with overall strategic goals. These centers can vary in scope, from cost centers focused on expense control to investment centers that manage profits and assets.

Definition

A responsibility center is a segment or unit within an organization that is headed by a manager who is accountable for the performance of that specific unit. Essentially, it's like a mini-business operating within the larger organization.

Characteristics of Responsibility Center

Responsibility centers form the cornerstone of effective management control, serving as distinct organizational units where accountability and performance are clearly defined. These centers are not merely administrative divisions; they are strategic tools designed to empower managers and drive organizational goals.

Understanding the key characteristics is essential for implementing a successful responsibility accounting system, ensuring that each segment contributes optimally to the overall success of the enterprise.

1. **Clearly Defined Scope of Operations and Responsibilities:** Each responsibility center operates within a specific, well-defined scope. This ensures that managers and their teams understand the boundaries of their authority and the extent of their duties. A defined scope eliminates ambiguity and prevents overlap with other centers, promoting focused effort and clear accountability. This clarity is crucial for effective performance evaluation and control.

2. **Designated Managerial Accountability:** A designated manager is held responsible for the performance of each responsibility center. This individual is the focal point for all activities and outcomes within the center. Their performance is typically measured using specific key performance indicators (KPIs) that align with the center's objectives. This direct accountability fosters a sense of ownership and drives managers to achieve their targets.

3. **Delegation of Authority for Decision-Making:** Managers are granted a degree of authority to make decisions within their area of responsibility. This delegation empowers them to take necessary actions to achieve the center's objectives without constant oversight from higher management. This autonomy promotes agility and responsiveness to changing conditions, enabling managers to adapt strategies and tactics as needed.

4. **Performance Measurement Using Key Performance Indicators (KPIs):** The performance of a responsibility center is objectively measured using relevant KPIs. These indicators are tailored to the center's specific objectives and provide a quantifiable basis for evaluating progress. KPIs can include financial metrics (e.g., costs, revenue, profit), operational metrics (e.g., production efficiency, customer satisfaction), or other relevant measures.

5. **Alignment with Organizational Goals:** Responsibility centers are designed to align with the overall strategic goals of the organization. The objectives and KPIs of each center contribute to the achievement of broader organizational objectives. This alignment ensures that individual efforts are directed towards the common purpose and that the performance of each center supports the overall success of the organization.

6. **Regular Performance Reporting and Feedback:** Responsibility centers are subject to regular performance reporting and feedback mechanisms. This involves the periodic generation of reports that compare actual performance to planned targets, highlighting variances and areas for improvement. Regular feedback allows managers to track progress, identify potential issues, and implement corrective actions in a timely manner, promoting continuous improvement and accountability.

Significance of Responsibility Centers:

- **Improved Performance:** By clearly defining responsibilities and empowering managers, responsibility centers can significantly enhance organizational performance.
- **Enhanced Decision-Making:** Managers are encouraged to make informed decisions within their areas of responsibility, leading to better resource allocation and improved operational efficiency.
- **Improved Communication:** Responsibility centers facilitate better communication and coordination between different departments within the organization.
- **Increased Motivation:** By recognizing and rewarding individual and team contributions, responsibility centers can boost employee morale and motivation.

1. Cost Center

A cost center represents a specific segment within an organization where management's accountability is strictly limited to the control of incurred expenses, with no responsibility for revenue generation. As defined by the Chartered Institute of Management Accountants (CIMA), a cost center is "a location, person, or equipment for which costs may be ascertained and used for purposes of cost control." This definition highlights the fundamental purpose of a cost center: to isolate and manage costs effectively. In practical terms, this means managers are evaluated based on their ability to adhere to budget estimates and minimize cost variances, which are the differences between actual and budgeted expenditures. Planning within a cost center revolves around developing cost budgets, while control is exercised through the analysis of cost variances.

Cost centers are prevalent in various organizational settings, particularly in manufacturing environments where production and service departments are typically classified as such. However, the concept extends beyond manufacturing, encompassing marketing departments, sales regions, and even individual sales representatives. The size of a cost center can vary significantly, ranging from small departments with limited personnel to entire manufacturing plants. Furthermore, cost centers can be nested within one another, creating a hierarchical structure of cost management. The core principle remains consistent: managers are responsible for controlling costs within their designated area of responsibility, focusing on efficiency and adherence to budget rather than revenue generation.

Production departments, maintenance departments, accounting departments, and even individual sales representatives can be classified as cost centers.

Features

1. **Sole Focus on Cost Management:** Cost centers are exclusively concerned with controlling and minimizing expenses within their designated area. Revenue generation is not a factor in their evaluation.

2. **Managerial Accountability for Expenses:** Managers are directly responsible for the costs incurred within their departments, ensuring that expenditures remain within budget and are used efficiently.

3. **Performance Measured Against Budgeted Costs:** The performance of a cost center is primarily evaluated by comparing actual costs to predetermined budgeted costs. Variances are analyzed to identify areas of overspending or inefficiency.

4. **Absence of Revenue Responsibility:** Unlike profit or revenue centers, cost centers do not have any direct responsibility for generating sales or revenue. Their sole focus is on cost containment.

5. **Emphasis on Operational Efficiency:** Cost centers prioritize operational efficiency to minimize costs. This involves streamlining processes, reducing waste, and optimizing resource utilization.

6. **Control Over Specific Cost Categories:** Managers typically have control over specific cost categories within their department, such as labor, materials, and overhead.

7. **Budgeting as a Key Control Tool:** Budgeting plays a crucial role in cost center management. Managers use budgets to plan and control expenses, ensuring that they stay within allocated limits.

8. **Variance Analysis for Performance Improvement:** Variance analysis is used to investigate deviations from budgeted costs. This allows managers to identify the causes of variances and implement corrective actions to improve performance.

2. Profit Centers

A profit center, also known as a business center, is an organizational segment where the manager is held accountable for both revenue generation and cost management. This dual responsibility empowers the manager to make decisions that directly impact the profitability of their department or division, essentially operating as if they were running an independent business. They are encouraged to maximize profits by strategically managing production volume, product mix, pricing, and marketing strategies.

The core purpose of a profit center is to drive profitability by effectively balancing production and marketing activities. Managers are expected to optimize both revenue streams and cost control, ensuring that the division contributes positively to the organization's bottom line. This requires a comprehensive understanding of market dynamics, production capabilities, and financial management, as managers strive to enhance both the efficiency of operations and the effectiveness of sales efforts.

Product divisions, regional sales offices, and independent business units often operate as profit centers.

Features

1) **Combined Revenue and Cost Accountability:** Profit centers hold managers responsible for both generating revenue and controlling costs. This dual accountability is the defining characteristic of a profit center.

2) **Decentralized Decision-Making Authority:** Managers possess significant autonomy to make decisions that directly affect both revenue and expenses. This empowers them to operate with a degree of independence, much like running their own business.

3) **Profit Maximization as Primary Goal:** The core objective of a profit center is to maximize profitability. Managers focus on strategies that increase revenue while minimizing costs to achieve optimal profit levels.

4) **Strategic Management of Production Volume:** Managers make decisions regarding production volume to align with market demand and optimize resource utilization, directly impacting both costs and revenue.

5) **Optimization of Product Mix:** They determine the most profitable product mix to offer, considering factors like customer demand, production costs, and market trends, to maximize overall profit.

6) **Pricing Strategy Development:** Profit center managers are responsible for setting and adjusting selling prices to maximize revenue while remaining competitive, directly influencing the center's profitability.

7) **Implementation of Effective Marketing Strategies:** They develop and execute marketing strategies to drive sales and increase market share, impacting revenue generation and ultimately, the profit center's performance.

8) **Performance Evaluation Based on Profit Metrics:** The performance of a profit center is evaluated primarily using profit-related metrics, such as gross profit, net profit, and profit margins. These measures provide a clear indication of the center's success in achieving its profitability goals.

Revenue Centers

A revenue center is a distinct organizational segment primarily focused on generating sales revenue. The manager of a revenue center is held accountable for maximizing sales, but typically does not have control over costs or investments in assets. Instead, their influence lies in managing aspects of the marketing department's expenses. They are responsible for strategic decisions regarding selling prices, promotional activities, and the product mix offered to customers.

Performance evaluation in a revenue centercenters on comparing actual revenue with budgeted revenue, and actual marketing expenses with budgeted marketing expenses. This allows for a clear assessment of the manager's ability to drive sales and manage marketing-related expenditures effectively. The sales department is a classic example of a revenue center, where the primary objective is to achieve and exceed sales targets.

Sales departments are a common example of revenue centers.

Features

1. **Primary Focus on Sales Revenue Generation:** Revenue centers are specifically designed to maximize sales revenue. Their core function is to drive sales through effective strategies and tactics. This focus is paramount, as the center's success is directly measured by its ability to generate revenue.

2. **Limited Control Over Costs and Investments:** Unlike profit or investment centers, revenue center managers typically have restricted control over the organization's overall costs and investments in assets. Their primary domain is revenue generation, and they are not generally held accountable for broader financial expenditures.

3. **Authority Over Marketing-Related Expenses:** While general cost control is limited, revenue center managers usually have authority over certain marketing expenses. This includes budgets for advertising, promotions, sales incentives, and other activities directly related to driving sales. This allows them to influence revenue through strategic marketing spending.

4. **Strategic Decision-Making Regarding Selling Prices:** Revenue center managers play a crucial role in setting and adjusting selling prices. They analyze market conditions, competitor pricing, and customer demand to determine optimal price points that maximize revenue while remaining competitive.

5. **Development and Implementation of Promotional Strategies:** They are responsible for creating and executing promotional strategies designed to increase sales. This includes developing advertising campaigns, running sales promotions, and implementing other marketing initiatives aimed at attracting and retaining customers.

6. **Management of Product Mix and Sales Channels:** Revenue center managers influence revenue by determining the right product mix to offer to customers. They also decide which sales channels to utilize, considering factors such as customer preferences, market reach, and cost-effectiveness.

7. **Performance Evaluation Based on Revenue and Marketing Expense Variances:** The performance of a revenue center is evaluated by comparing actual revenue and marketing expenses to their respective budgeted targets. This analysis of variances allows management to assess the center's effectiveness in achieving its revenue goals and managing marketing expenditures.

8. **Clear Accountability for Sales Targets:** Managers of revenue centers are held directly accountable for achieving specific sales targets. This accountability drives them to focus on effective sales strategies and ensures that their efforts are aligned with the organization's overall revenue objectives.

Investment Centers

An investment center is a sophisticated organizational segment where managers are held accountable for profitability, alongside the efficient management of invested capital. Unlike cost or profit centers, investment center managers have comprehensive control over revenues, expenses, and the assets employed within their division. This includes strategic decisions regarding credit policies, which directly impact debt collection, and inventory policies, which determine the level of investment in inventory.

Essentially, investment center managers operate with a greater degree of autonomy, possessing the authority to acquire, dispose of, and utilize divisional assets. Their responsibility extends beyond mere cost control and revenue generation to encompass the prudent allocation of capital resources. This level of control necessitates a holistic understanding of financial management, strategic planning, and operational efficiency, allowing managers to maximize returns on invested capital and contribute significantly to the organization's overall financial performance. A new hotel being developed is a good example of an investment center.

A new hotel development project would typically be managed as an investment center, where the manager has broad authority over all aspects of the project, including investment decisions, revenue generation, and cost control.

Features

1. **Comprehensive Responsibility Scope:** Investment centers hold the broadest scope of responsibility compared to cost, revenue, or profit centers. They are accountable for managing revenues, expenses, and the efficient utilization of invested capital.

2. **Control Over Revenue Generation:** Managers have direct control over revenue streams, including pricing strategies, sales initiatives, and market penetration efforts. They are responsible for driving sales and maximizing revenue within their division.

3. **Authority Over Expense Management:** They possess authority over all expenses incurred within the investment center. This includes operational costs, administrative expenses, and any other expenditures that impact the center's profitability.

4. **Management of Invested Capital:** A defining feature is the manager's control over the assets invested in the center. This includes decisions regarding asset acquisition, disposal, and utilization, ensuring that capital is deployed effectively to maximize returns.

5. **Strategic Formulation of Credit Policies:** Investment center managers are responsible for formulating credit policies that influence debt collection. They determine credit terms, set credit limits, and implement procedures to manage receivables, impacting the center's cash flow and financial stability.

6. **Determination of Inventory Policies:** They also establish inventory policies that dictate the level of investment in inventory. This involves balancing the need to meet customer demand with the costs of holding inventory, ensuring optimal inventory management.

7. **Performance Evaluation Based on Return on Investment (ROI) and Residual Income (RI):** Investment center performance is primarily evaluated using financial metrics like ROI and RI. These measures assess the center's ability to generate profits relative to the capital invested, providing a comprehensive view of its financial efficiency.

8. **Autonomous Decision-Making Authority:** Investment center managers operate with a high degree of autonomy, making strategic decisions that directly impact the center's performance. This autonomy empowers them to act decisively and adapt to changing market conditions, contributing to the overall success of the organization.

Exercise :

Q.1 Choose the correct alternate and answer the following :

1. Responsibility accounting primarily focuses on:

a) Overall company profits.

b) Individual performance within specific areas.

c) External market analysis.

d) Legal compliance.

Answer: b) Individual performance within specific areas.

2. Which of the following is a key feature of responsibility accounting?

a) Ignoring financial data.

b) Integration of planned and actual financial data.

c) Centralized decision-making.

d) Avoiding cost allocation.

Answer: b) Integration of planned and actual financial data.

3. A cost center manager is primarily responsible for:

a) Generating revenue.

b) Controlling costs.

c) Managing investments.

d) Setting market prices.

Answer: b) Controlling costs.

4. Profit centers are evaluated based on:
a) Cost control only.
b) Revenue generation only.
c) Both revenue generation and cost management.
d) External audits.

Answer: c) Both revenue generation and cost management.

5. Which of the following is an assumption of Responsibility accounting?
a) Ambiguous lines of authority.
b) Inaccurate cost tracking.
c) Clearly defined authority and accountability.
d) Unstable operating environment.

Answer: c) Clearly defined authority and accountability.

6. What is the primary objective of responsibility accounting?
a) To increase interdepartmental rivalry.
b) To enable objective performance measurement.
c) To overload managers with information.
d) To ignore intangible factors.

Answer: b) To enable objective performance measurement

Q.2 Write Short Notes on :

1. Responsibility Accounting
2. Cost Centers
3. Profit Centers
4. Assumptions of Responsibility Accounting

Q.3 Answer in Brief :

1. What are the key differences between cost centers and profit centers?
2. Explain the challenges in classifying costs as controllable or non-controllable.
3. How does responsibility accounting promote goal congruence within an organization?
4. What are the limitations of relying solely on responsibility accounting as a management control tool?
5. Describe the significance of establishing clear accountability frameworks in responsibility accounting.

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5

RESPONSIBILITY ACCOUNTING-II

B) Concept of Controllability – Introduction, Measuring Managerial Performance (ROI and Residual Income Approach) ,Preparation of Managerial Reports using Segmented Costs and Controllable costs approach.

I. Concept of Controllability

I. Controllability

A. Introduction:

Controllability refers to the extent to which a manager can influence or direct the activities, costs, and revenues within their area of responsibility. It's a crucial concept in management accounting because it forms the basis for evaluating managerial performance. Managers should be held accountable only for those aspects of the business they can control. Holding them responsible for uncontrollable factors can be demotivating and unfair.

B. Levels of Controllability:

Controllability exists on a spectrum. Some costs are directly controllable, meaning the manager has complete authority over them (e.g., direct materials, direct labor). Other costs are partially controllable, where the manager can exert some influence but not complete control (e.g., advertising expenditure, maintenance costs). Finally, some costs are uncontrollable, meaning the manager has little to no influence over them (e.g., depreciation on assets acquired by top management, corporate overhead allocations).

Examples of Controllability Levels:

To understand the concept of controllability in performance evaluation, the following series of examples can be explored that highlight the varying degrees of influence, managers have over different aspects of their responsibilities. Following examples will demonstrate the distinction between directly controllable, partially controllable, and uncontrollable factors, providing a clearer understanding of how these concepts apply in real-world scenarios.

1. Directly Controllable Costs (Direct Materials):

Imagine a production manager in a furniture manufacturing plant. They have the authority to choose suppliers for wood, negotiate prices, and determine the quality and quantity of wood used in production. These decisions directly affect the cost of direct materials. Thus, the cost of direct materials is directly controllable by the production manager. If the

cost of wood increases because the manager chose a premium supplier, the manager is directly accountable.

2. Partially Controllable Costs (Maintenance Costs):

Consider a maintenance department manager in a large factory. They can influence maintenance costs by scheduling preventative maintenance, training staff on equipment handling, and choosing maintenance suppliers. However, they might not have complete control over costs due to factors like the age of the equipment, unforeseen breakdowns, or the quality of original equipment installation (which might be decisions made by upper management). They can influence these costs, but not fully control them. If a machine breaks down due to age, the manager is partially accountable, but not fully.

3. Uncontrollable Costs (Corporate Overhead Allocations) :

Take the example of a divisional manager in a multinational corporation. They are assigned a portion of the corporate headquarters' overhead costs, such as executive salaries, legal fees, and central IT services. These costs are allocated based on a predetermined formula, and the divisional manager has no influence over the total amount allocated to their division. These are completely uncontrollable costs. If corporate overhead costs increase, the divisional manager is not accountable.

C. Importance of Controllability in Performance Evaluation:

The concept of controllability is paramount in performance evaluation, particularly within responsibility accounting.

The importance of controllability are explained as under:

1. Ensuring Fair and Accurate Performance Assessment:

Controllability ensures that managers are evaluated only on factors they can directly influence. It prevents them from being held accountable for outcomes beyond their control, such as market fluctuations, corporate overhead allocations, or decisions made by higher management. This leads to a more equitable and realistic assessment of their managerial abilities and contributions.

2. Motivating Managers and Fostering Ownership:

When managers are evaluated based on controllable factors, they are more motivated to take ownership of their responsibilities. They understand that their efforts directly impact their performance evaluation, encouraging them to be proactive, efficient, and innovative. Conversely, being held accountable for uncontrollable factors can lead to demotivation and a sense of helplessness, undermining their engagement and productivity.

3. Facilitating Effective Decision-Making:

By focusing on controllable factors, managers are encouraged to make decisions that optimize their area of responsibility. This allows them to

concentrate on improving operational efficiency, managing costs, and enhancing revenue generation within their sphere of influence. This targeted focus leads to more effective decision-making and improved operational outcomes.

4. Promoting Goal Congruence and Alignment:

When performance evaluations are based on controllable factors, it helps align individual and departmental goals with overall organizational objectives. Managers are encouraged to make decisions that benefit their specific area while also contributing to the broader success of the organization. This fosters goal congruence and ensures that efforts are directed towards achieving common goals.

5. Enhancing Performance Feedback and Development:

Controllability enables more meaningful performance feedback. By focusing on factors within the manager's control, feedback becomes more specific, actionable, and relevant. This facilitates effective performance development, as managers can identify areas for improvement and implement targeted strategies to enhance their skills and performance.

6. Strengthening Accountability and Transparency:

Using controllability as a basis for performance evaluation strengthens accountability and transparency within the organization. It ensures that managers are held responsible for their actions and decisions, while also providing a clear understanding of the factors influencing their performance. This transparency builds trust and fosters a culture of accountability, leading to improved organizational governance and performance.

D. Case Study 1 :

Tech Solutions Inc. - The Marketing Budget Dilemma

Background:

Tech Solutions Inc. is a mid-sized technology company with three divisions: Software Development, Hardware Manufacturing, and IT Services. Each division has a marketing department with a designated marketing manager. The overall marketing budget is set annually by the corporate headquarters and allocated to each division based on projected sales and strategic priorities.

The Situation:

The marketing manager of the Software Development division, Sarah, has been consistently exceeding her sales targets. However, she's facing challenges with her marketing budget. Corporate headquarters has allocated a fixed budget, and Sarah has limited control over the total amount. She can, however, decide how to allocate the budget within her division's marketing activities, such as online advertising, trade shows, and content creation.

Controllability Issues:

a) **Uncontrollable Factor:** The total marketing budget allocation is an uncontrollable factor for Sarah. She has no influence over the overall amount set by corporate headquarters.

b) **Partially Controllable Factors:** Sarah can influence the effectiveness of her marketing campaigns, but she has limited control over external factors like market trends, competitor actions, or changes in the company's overall marketing strategy.

c) **Directly Controllable Factors:** Sarah has direct control over how she allocates the budget within her division. She can decide which marketing channels to invest in, how much to spend on each activity, and how to measure the effectiveness of her campaigns.

Performance Evaluation:

a) If Sarah's sales targets are not met, it's crucial to analyze whether the shortfall was due to factors within her control (e.g., ineffective campaign execution) or uncontrollable factors (e.g., insufficient budget allocation).

b) Sarah's performance should be evaluated based on how effectively she utilized the budget she was given, the return on investment of her marketing activities, and her ability to adapt to changing market conditions within the constraints of her budget.

c) The company should avoid solely basing Sarah's performance on total sales numbers, since she has no control over the total budget.

d) The company could improve the situation by allowing divisional managers to give input on the total budget allocation.

Conclusion and Outcome:

To ensure a fair evaluation, Tech Solutions Inc. should focus on Sarah's controllable factors, such as the efficiency of her marketing campaigns and her ability to maximize results within her given budget. This case study highlights the importance of distinguishing between controllable, partially controllable, and uncontrollable factors in performance evaluation.

Case Study 2 :

Global Auto Parts - The Production Overtime Challenge

Background:

Global Auto Parts (GAP), a multinational auto parts manufacturer and distributor, operates several production plants globally. Robert manages a plant in a region with fluctuating labor costs. His plant's performance is gauged primarily by its ability to achieve production targets while maintaining cost-effectiveness.

The Situation:

Robert's plant has consistently met its production targets, but overtime costs have significantly exceeded the budgeted amounts. Corporate headquarters has expressed concern over these escalating overtime expenses and is pressuring Robert to implement reductions.

Controllability Issues:

- **Uncontrollable Factors:**

a) Regional Labor Market Volatility: The availability and expense of labor in the region are governed by external market forces outside of Robert's influence. For instance, a sudden surge in demand for skilled labor in the region can inflate wages and overtime rates.

b) Corporate Production Mandates: The overarching production targets set by the corporate office are beyond Robert's jurisdiction. These targets are derived from global demand projections and strategic decisions made at the corporate level.

- **Partially Controllable Factors:**

a) Equipment Upkeep: Robert can influence the reliability of production equipment through scheduled preventative maintenance. However, the age and condition of the equipment, along with unexpected breakdowns, are only partially within his control.

b) Workforce Skill Enhancement: Robert can invest in employee training to boost efficiency and decrease reliance on overtime. However, the efficacy of training can be affected by factors like employee aptitude and the complexity of the manufacturing processes.

- **Directly Controllable Factors:**

a. **Overtime Authorization:** Robert has direct control over how overtime is scheduled and approved. He can enforce policies to minimize unnecessary overtime and ensure it is used only when absolutely essential.

b. **Production Planning:** Robert can optimize production schedules to mitigate bottlenecks and delays, reducing the need for last-minute overtime to meet deadlines.

c. **Material Conservation:** Robert maintains control over material waste.

b) Performance Evaluation:

a) GAP must differentiate between the factors contributing to overtime costs that Robert can and cannot control. Simply holding Robert accountable for all increased expenses would be unjust and counterproductive.

b) Robert's performance should be evaluated based on his effectiveness in managing the controllable factors, such as overtime approval and production schedule optimization.

c) GAP should consider granting Robert greater flexibility in adjusting production targets to accommodate regional labor market fluctuations.

d) GAP should invest in upgrading equipment and providing employee training to lessen dependence on overtime.

e) GAP should evaluate Robert's success in limiting material waste.

Conclusion and Outcome:

By concentrating on the controllable factors and providing Robert with the necessary support, GAP can improve the plant's cost efficiency while sustaining its production targets. This case study underscores the significance of a refined approach to performance evaluation, acknowledging the complexities of controllability within a global business setting.

II . Measuring Managerial Performance (ROI and Residual Income Approach)

A. Introduction:

Measuring managerial performance is essential for assessing the effectiveness of managers and identifying areas for improvement. Two common methods are Return on Investment (ROI) and Residual Income (RI).

B. Return on Investment (ROI):

Definition:

ROI measures the profitability of an investment relative to its cost.

ROI is a fundamental profitability metric that assesses the efficiency of an investment by measuring the return generated relative to the capital invested. It's expressed as a percentage, providing a clear indication of how effectively resources are being utilized.

Formula :

ROI = (Net Operating Income / Invested Capital) 100

- **Net Operating Income:** Income earned before interest and taxes.
- **Invested Capital:** The resources employed in generating the income. This can be total assets, operating assets, or shareholders' equity, depending on the context.

OR

ROI = (Net Profit / Investment) × 100

- Where:
- Net Profit = Total Revenue - Total Expenses
- Investment = Total Assets Employed (or Capital Invested)
  - This formula can be further decomposed into two components:
- **ROI = (Net Profit / Sales) × (Sales / Investment) × 100**
- **(Net Profit / Sales) = Profit Margin:** This ratio measures the profitability of each rupee of sales, indicating how much profit is generated per rupee of revenue.
- **(Sales / Investment) = Asset Turnover:** This ratio measures how efficiently assets are utilized to generate sales, indicating how many rupees of sales are generated per rupee of invested capital.

ILLUSTRATIONS:

ILLUSTRATION 1: A company's retail division invested Rs. 4,500,000 in assets and generated a net profit of Rs. 900,000. Calculate the ROI for this division. If the division aims to increase its ROI by 5%, what net profit would it need to achieve, assuming the investment remains the same?

- **Answer:**
- Current ROI = (900,000 / 4,500,000) × 100 = 20%
- Target ROI = 20% + 5% = 25%
- Required Net Profit = (25 / 100) × 4,500,000 = Rs. 1,125,000

ILLUSTRATION2 : A manufacturing plant has sales of Rs. 3,200,000 and a net profit of Rs. 640,000. Its average invested capital is Rs. 2,000,000. Calculate the plant's ROI using both the basic formula and DuPont analysis. If sales increase by 15% and net profit increases by 10%, what is the new ROI?

- **Answer:**
- Basic ROI = (640,000 / 2,000,000) × 100 = 32%
- Profit Margin = (640,000 / 3,200,000) × 100 = 20%
- Asset Turnover = 3,200,000 / 2,000,000 = 1.6
- DuPont ROI = 20% × 1.6 = 32%
- New Sales = 3,200,000 x 1.15 = 3,680,000

- New Net profit = 640,000 x 1.10 = 704,000
- New Profit Margin = (704,000/3,680,000)x100 = 19.13%
- New Asset Turnover = 3,680,000/2,000,000 = 1.84
- New ROI = 19.13% x 1.84 = 35.19%

IILLUSTRATION 3 : A tech startup invested Rs. 1,200,000 in a new software project. The project generated revenue of Rs. 2,100,000, with operating expenses of Rs. 1,300,000. Calculate the ROI for the project. If the company aims for a 25% ROI, what revenue would they have needed to generate, keeping expenses constant?

- **Answer:**

- Net Profit = 2,100,000 - 1,300,000 = Rs. 800,000
- ROI = (800,000 / 1,200,000) × 100 = 66.67%
- Required Net Profit = (25 / 100) × 1,200,000 = Rs. 300,000
- Required Revenue = Required Net Profit + Operating expenses.
- Required Revenue = 300,000 + 1,300,000 = 1,600,000

ILLUSTRATION4 : A hotel division has an average invested capital of Rs. 6,000,000. It generated a net profit of Rs. 1,100,000 and sales of Rs. 8,000,000. Calculate the ROI, profit margin, and asset turnover for the hotel division. If the division wants to increase its ROI by 3% by only increasing sales, what would the new sales figure need to be?

- **Answer:**

- ROI = (1,100,000 / 6,000,000) × 100 = 18.33%
- Profit Margin = (1,100,000 / 8,000,000) × 100 = 13.75%
- Asset Turnover = 8,000,000 / 6,000,000 = 1.33
- Target ROI = 18.33% + 3% = 21.33%
- Required Net profit = (21.33/100) x 6,000,000 = 1,279,800
- Required Sales = 1,279,800/.1375 = 9,314,909.09

ILLUSTRATION 5: A consulting firm invested Rs. 950,000 in a new training program. The program generated revenue of Rs. 1,800,000, with operating expenses of Rs. 850,000. Calculate the ROI for the program. If the company wants to maintain the same ROI but reduce the investment by 15%, what net profit would they need to achieve?

- **Answer:**

- Net Profit = 1,800,000 - 850,000 = Rs. 950,000
- ROI = (950,000 / 950,000) × 100 = 100%
- New Investment = 950,000 x .85 = 807,500
- Required net profit = (100/100) x 807,500 = 807,500

Advantages:

1. **Simplicity and Ease of Understanding:** ROI is a straightforward metric, calculated as a percentage. This makes it easy for managers and investors to understand and interpret. The formula is simple, and the concept of return on investment is widely recognized in the business world. This simplicity facilitates communication and comparison across different levels of management and between different investment opportunities.

2. **Widely Used and Accepted:** ROI is a commonly used performance measure across various industries and organizations. This widespread acceptance allows for benchmarking against competitors and industry averages. It also makes it easier for managers to understand how their performance compares to others. Investors also frequently use ROI to evaluate the performance of companies.

3. **Facilitates Comparison:** ROI allows for the comparison of performance across different divisions, projects, or investments, even if they are of different sizes. Because ROI is expressed as a percentage, it levels the playing field, making it possible to compare the efficiency of capital utilization across different areas of the business. This is particularly useful for resource allocation decisions.

4. **Focus on Profitability:** ROI directly links profit to the capital invested to generate that profit. This encourages managers to focus on both profitability and efficient asset utilization. It highlights the importance of generating a return on the resources employed and discourages investment in projects that do not generate adequate returns.

Disadvantages:

1. **Potential for Dysfunctional Behavior:** ROI can incentivize managers to take actions that boost short-term ROI at the expense of long-term value creation. For example, a manager might cut research and development spending or postpone necessary maintenance to increase current profits, even if it harms the company's future prospects. This "myopia" can be detrimental to the organization's overall performance.

2. **Ignores Absolute Profit:** ROI focuses on the rate of return, not the absolute amount of profit generated. A division with a high ROI might generate a smaller absolute profit than a division with a slightly lower

ROI but a much larger investment base. This can lead managers to reject projects that, while having a lower ROI than their current division average, would still add significant absolute value to the company.

3. **Sensitivity to Accounting Policies:** ROI can be influenced by accounting policies related to depreciation, asset valuation, and expense allocation. Different accounting methods can lead to different ROI calculations for the same underlying economic performance. This can make it difficult to compare ROI across different divisions or companies that use different accounting standards.

4. **Difficult to Apply to Cost Centers:** ROI is primarily designed for evaluating profit centers or investment centers. It is not as easily applicable to cost centers, where the primary objective is cost control rather than profit generation. For cost centers, other performance measures, such as cost variances or efficiency ratios, are more appropriate.

Case Study 1:

Tech Innovators - Divisional Performance Analysis

Background:

Tech Innovators is a technology conglomerate with two main divisions: Software Solutions and Hardware Manufacturing. The company evaluates its divisional managers based on ROI. The financial details for the past year:

- **Software Solutions Division:**

a) Sales: Rs. 8,000,000

b) Net Profit: Rs. 1,200,000

c) Average Invested Capital: Rs. 4,000,000

- **Hardware Manufacturing Division:**

a) Sales: Rs. 12,000,000

b) Net Profit: Rs. 1,800,000

c) Average Invested Capital: Rs. 6,000,000

Analysis:

1. **Software Solutions Division ROI:**

a) Basic ROI = (Net Profit / Investment) × 100[1]

b) ROI = (1,200,000 / 4,000,000) × 100 = 30%

c) DuPont Analysis:

- Profit Margin = (1,200,000 / 8,000,000) × 100 = 15%
- Asset Turnover = 8,000,000 / 4,000,000 = 2
- ROI = 15% × 2 = 30%

2. **Hardware Manufacturing Division ROI:**

a) Basic ROI = (Net Profit / Investment) × 100

b) ROI = (1,800,000 / 6,000,000) × 100 = 30%

c) DuPont Analysis:

- Profit Margin = (1,800,000 / 12,000,000) × 100 = 15%
- Asset Turnover = 12,000,000 / 6,000,000 = 2
- ROI = 15% × 2 = 30%

Conclusion:

Both divisions have an ROI of 30%. However, the Hardware division has higher sales and net profit, but also a higher asset base. The DuPont analysis shows that both divisions have the same profit margin and asset turnover, indicating similar efficiency in generating profit and utilizing assets. This allows for a deeper understanding than just the basic ROI.

Case Study 2:

Retail Dynamics - Store Performance Improvement

Background:

Retail Dynamics operates several retail stores. One store, Store X, is underperforming. The store manager, Sarah, is tasked with improving its ROI. The financial details are:

- **Store X (Initial):**

a) Sales: Rs. 5,000,000

b) Net Profit: Rs. 400,000

c) Average Invested Capital: Rs. 2,000,000

Sarah's Initiatives:

Sarah implements several initiatives to improve performance:

- Reduces operating expenses by streamlining processes.
- Improves inventory management to increase sales.

After these changes, the store's performance is:

- **Store X (After Initiatives):**

a) Sales: Rs. 6,000,000

b) Net Profit: Rs. 600,000

c) Average Invested Capital: Rs. 2,200,000

Analysis:

1. **Store X (Initial) ROI:**

Basic ROI = (400,000 / 2,000,000) × 100 = 20%

DuPont Analysis:

- Profit Margin = (400,000 / 5,000,000) × 100 = 8%
- Asset Turnover = 5,000,000 / 2,000,000 = 2.5
- ROI = 8% × 2.5 = 20%

2. **Store X (After Initiatives) ROI:**

Basic ROI = (600,000 / 2,200,000) × 100 = 27.27% (approximately)

DuPont Analysis:

- Profit Margin = (600,000 / 6,000,000) × 100 = 10%
- Asset Turnover = 6,000,000 / 2,200,000 = 2.73 (approximately)
- ROI = 10% × 2.73 = 27.3% (approximately)

Conclusion:

Sarah's initiatives significantly improved the store's ROI from 20% to approximately 27.27%. The DuPont analysis reveals that both profit margin and asset turnover increased, indicating improvements in profitability and asset utilization. This demonstrates how effective management strategies can positively impact ROI.

C. Residual Income (RI):

Definition: RI is the net operating income that an investment center earns above the minimum required rate of return on its invested capital. It is calculated as:

RI = Net Operating Income - (Minimum Required Rate of Return Invested Capital)

Minimum Required Rate of Return: The minimum rate of return that the company expects to earn on its investments. Also known as the cost of capital or hurdle rate.

ILLUSTRATIONS:

ILLUSTRATION 1 : A division has a Net Operating Income of Rs. 800,000 and Invested Capital of Rs. 4,000,000. The company's Minimum Required Rate of Return is 12%. Calculate the Residual Income.

Calculations:

- RI = Net Operating Income - (Minimum Required Rate of Return × Invested Capital)
- RI = 800,000 - (0.12 × 4,000,000)
- RI = 800,000 - 480,000
- RI = 320,000

Answer: The Residual Income is Rs. 320,000.

ILLUSTRATION 2 : A business unit has Invested Capital of Rs. 2,500,000 and generates a Net Operating Income of Rs. 350,000. If the company's Minimum Required Rate of Return is 10%, what is the Residual Income?

Calculations:

- RI = Net Operating Income - (Minimum Required Rate of Return × Invested Capital)
- RI = 350,000 - (0.10 × 2,500,000)
- RI = 350,000 - 250,000
- RI = 100,000

Answer: The Residual Income is Rs. 100,000.

ILLUSTRATION 3 : A department invested Rs. 6,000,000 and achieved a Net Operating Income of Rs. 900,000. The company's Minimum Required Rate of Return is 15%. Determine the Residual Income.

Calculations:

- RI = Net Operating Income - (Minimum Required Rate of Return × Invested Capital)
- RI = 900,000 - (0.15 × 6,000,000)
- RI = 900,000 - 900,000
- RI = 0

Answer: The Residual Income is Rs. 0.

Case Study:

Manufacturing Excellence - Evaluating Divisional Performance

Background:

Manufacturing Excellence (ME) is a company with two divisions: Division A and Division B. The company uses Residual Income to evaluate divisional performance. The following information is available:

- **Division A:**
  - Net Operating Income: Rs. 1,200,000
  - Invested Capital: Rs. 8,000,000
- **Division B:**
  - Net Operating Income: Rs. 900,000
  - Invested Capital: Rs. 5,000,000

The company's Minimum Required Rate of Return is 14%.

Analysis:

1. **Division A Residual Income:**
   - RI = Net Operating Income - (Minimum Required Rate of Return × Invested Capital)
   - RI = 1,200,000 - (0.14 × 8,000,000)
   - RI = 1,200,000 - 1,120,000
   - RI = 80,000
2. **Division B Residual Income:**
   - RI = Net Operating Income - (Minimum Required Rate of Return × Invested Capital)
   - RI = 900,000 - (0.14 × 5,000,000)
   - RI = 900,000 - 700,000
   - RI = 200,000

Conclusion:

- Division A has a Residual Income of Rs. 80,000.
- Division B has a Residual Income of Rs. 200,000.

Although Division A has a higher Net Operating Income, Division B has a higher Residual Income. This indicates that Division B is creating more value for the company relative to its invested capital, after considering the

minimum required return. This highlights the value of RI in evaluating managerial performance, especially when comparing divisions with different levels of invested capital.

Advantages:

1. **Encourages Value Creation:** RI encourages managers to accept projects that add value to the company, even if they lower the division's ROI. Since RI measures the absolute amount of profit earned above the minimum required return, managers are more likely to pursue projects that increase total company profit, even if the project's ROI is lower than the division's current ROI. This helps align managerial incentives with the overall goals of the organization.

2. **More Suitable for Cost Centers:** RI can be more easily adapted for use in evaluating cost centers. By setting a target RI (which could be zero or a small positive number), managers of cost centers can be incentivized to minimize costs while still achieving a certain level of performance.

3. **Less Prone to Myopia:** RI is less likely to lead to short-term thinking than ROI. Because it focuses on absolute profit, managers are less tempted to sacrifice long-term gains for short-term improvements in the ratio. This makes it a more suitable measure for evaluating managers with long-term responsibilities.

4. **Considers the Cost of Capital:** RI explicitly takes into account the minimum required rate of return (cost of capital). This ensures that managers are aware of the opportunity cost of the capital they are using and are incentivized to generate returns that exceed this cost. This helps ensure that resources are allocated efficiently.

Disadvantages:

1. **Not as Widely Used:** RI is not as widely used or understood as ROI. This can make it difficult to benchmark performance against competitors or industry averages. It also requires managers to have a good understanding of the concept of cost of capital, which can be challenging in some organizations.

2. **Difficult to Compare Across Different Sizes:** RI can be difficult to compare across divisions of different sizes. Larger divisions are likely to have higher RI simply because they have more resources at their disposal. This can make it difficult to compare the relative efficiency of management in different divisions.

3. **Requires Accurate Cost of Capital Estimation:** The accuracy of RI calculations depends on the accurate estimation of the minimum required rate of return (cost of capital). Estimating the cost of capital can be complex and subjective, and errors in this estimation can lead to misleading RI figures.

4. **Can be Affected by Accounting Policies:** Like ROI, RI can also be affected by accounting policies, although perhaps to a lesser extent. The calculation of net operating income, which is a component of RI, can be influenced by accounting choices related to revenue recognition, expense allocation, and depreciation. This can reduce the comparability of RI across different divisions or companies.

D. Comparison of ROI and RI:

Feature	ROI	RI
Calculation	(Net Operating Income / Invested Capital) 100	Net Operating Income - (Minimum Required Rate of Return Invested Capital)
Focus	Profitability relative to investment	Absolute amount of profit above the required return
Potential Issue	Dysfunctional behavior	Difficult to compare across different sizes
Usefulness	Comparing divisions/companies	Evaluating cost centers, encouraging value creation

III. Preparation of Managerial Reports Using Segmented and Controllable Costs

Managerial reports utilizing segmented and controllable cost approaches are crucial for effective performance evaluation and decision-making. These reports provide insights into the performance of different segments within an organization and highlight the costs that managers can influence.

These reports provide valuable information for performance evaluation, cost control, and strategic decision-making. By focusing on segmented and controllable costs, organizations can improve their overall efficiency and profitability.

These reports are essential for providing a granular view of organizational performance, empowering managers with insights to make informed decisions and drive accountability.

1. Segmented Reporting:

Definition: Segmented reporting involves dividing the organization into distinct segments (e.g., divisions, departments, product lines, geographical regions) and reporting financial information for each segment separately.

Characteristics of Segmented Reporting

1. Clear Identification of Segments:

The foundation of segmented reporting is the precise delineation of organizational units. Segments should be defined based on relevant criteria, such as product lines, geographical areas, customer types, or divisions. This ensures that each segment represents a distinct and meaningful portion of the business. The criteria used should be consistent

and aligned with the organization's strategic goals. This clarity is vital for accurate performance evaluation and strategic decision-making.

2. Preparation of Segmented Income Statements:

Segmented income statements are crucial for evaluating the financial performance of each segment. These statements should present revenues, direct costs (costs directly attributable to the segment), and segment margins. The contribution margin format is often preferred, as it separates variable and fixed costs, allowing for a better understanding of how changes in sales volume impact profitability. The statements should be prepared using consistent accounting principles to ensure comparability between segments.

3. Appropriate Allocation of Common Costs:

Common costs, which are shared by multiple segments, must be allocated using a fair and reasonable basis. This allocation should reflect the benefits received by each segment. Common allocation methods include allocating costs based on sales revenue, square footage, or employee headcount. If allocation is arbitrary or unfair, it can distort segment profitability and lead to inaccurate performance evaluations. Sometimes, it is best to not allocate common costs at all, and just show them at the end of the report.

4. Disclosure of Segment-Specific Information:

In addition to financial data, segmented reports should include segment-specific information that is relevant to performance evaluation. This may include non-financial metrics, such as market share, customer satisfaction, or production efficiency. This information provides a more comprehensive view of segment performance and helps in identifying areas for improvement.

5. Regular and Timely Reporting:

Segmented reports should be prepared and distributed regularly and in a timely manner. This ensures that managers have access to up-to-date information for decision-making. The frequency of reporting should be determined based on the organization's needs and the nature of its operations. Timely reporting allows for prompt identification of performance issues and implementation of corrective actions.

Purposes of Segmented Reporting

1. Performance Evaluation and Comparison:

Segmented reporting enables the evaluation of the performance of individual segments and facilitates comparisons between them. This allows management to identify high-performing and underperforming segments, assess the effectiveness of segment strategies, and make informed decisions about resource allocation.

2. Strategic Decision-Making:

Segmented reports provide valuable insights for strategic decision-making. This includes decisions related to segment expansion or contraction, product line diversification, market entry or exit, and resource allocation. By analyzing segment profitability and performance, management can make informed choices that align with the organization's overall strategic goals.

3. Resource Allocation:

Segmented reporting helps in determining how to allocate resources effectively among different segments. By identifying profitable segments, management can allocate resources to maximize returns. Conversely, underperforming segments may require additional resources or restructuring.

4. Identification of Profitable and Unprofitable Segments:

Segmented reporting allows for the identification of segments that contribute positively or negatively to the organization's overall profitability. This information is essential for making decisions about segment restructuring, divestiture, or investment.

5. Improved Transparency and Accountability:

Segmented reporting enhances transparency by providing detailed financial information about each segment. This promotes accountability by holding segment managers responsible for their performance. It also allows stakeholders to gain a better understanding of the organization's operations and financial health.

Challenges of Segmented Reporting

1. Difficulty in Allocating Common Costs:

Allocating common costs fairly and accurately can be challenging. Arbitrary allocation methods can distort segment profitability and lead to inaccurate performance evaluations. Determining the most appropriate allocation basis requires careful consideration and judgment.

2. Potential for Intersegment Transfers and Manipulation:

Intersegment transfers can create opportunities for manipulation, as managers may try to shift costs or revenues between segments to improve their performance. This can distort segment profitability and undermine the accuracy of segmented reports.

3. Determining Appropriate Segment Definitions:

Defining segments that are meaningful and relevant to performance evaluation can be challenging. The choice of segment definitions can significantly impact the usefulness of segmented reports.

4. Information Overload:

Segmented reports can contain a large amount of information, which can overwhelm managers and make it difficult to identify key performance indicators. It is important to present information in a clear and concise manner, focusing on the most relevant metrics.

5. Cost of Implementation:

Implementing a segmented reporting system can be costly, requiring significant investments in data collection, analysis, and reporting systems. The benefits of segmented reporting must be weighed against the costs of implementation.

Contribution Margin Format: Segmented income statements are often prepared using the contribution margin format, which separates variable and fixed costs. This format helps in analyzing the impact of changes in sales volume on segment profitability.

2. Controllable Cost Approach:

Definition: The controllable cost approach focuses on reporting costs that are within the manager's control.

The controllable cost approach in management accounting centers on reporting and evaluating only those costs that a manager can directly influence. It emphasizes accountability by ensuring managers are responsible solely for decisions within their authority. This method promotes fairness in performance assessment by avoiding the inclusion of costs determined by higher management or external factors. By focusing on controllable costs, managers are empowered to make informed decisions and take ownership of their results, leading to improved efficiency and cost management. This approach fosters a sense of responsibility, motivating managers to actively seek cost reduction and operational improvements.

Characteristics of Controllable Cost Reports

1. Clear Cost Classification:

The foundation of controllable cost reporting is the accurate classification of costs as controllable or uncontrollable at the manager's level. This requires a thorough understanding of the manager's responsibilities and authority.

2. Controllable Performance Reports:

Controllable performance reports should highlight the costs that are within the manager's control and present variances between budgeted and actual costs. These reports should be prepared regularly and in a timely manner.

3. Focus on Managerial Responsibility:

Controllable cost reports should focus on the costs that the manager can influence, avoiding the inclusion of uncontrollable costs. This ensures that managers are evaluated fairly and held accountable only for their actions.

4. Variance Analysis:

Variance analysis is crucial for identifying areas where costs are deviating from budgeted amounts. This analysis helps in understanding the reasons for variances and implementing corrective actions.

5. Regular Feedback and Communication:

Regular feedback and communication between management and managers are essential for effective cost control. This allows managers to understand their performance and make necessary adjustments.

Purposes of Controllable Cost Reports

1. Fair Performance Evaluation:

Controllable cost reports provide a fair basis for evaluating managerial performance by focusing only on the costs that the manager can influence.

2. Motivation and Accountability:

By holding managers accountable for controllable costs, these reports motivate them to control costs effectively and take ownership of their responsibilities.

3. Cost Control and Reduction:

Controllable cost reports help in identifying areas where costs can be reduced or controlled more effectively.

4. Improved Decision-Making:

These reports provide managers with relevant information for making informed decisions about cost management.

5. Enhanced Communication and Collaboration:

Regular feedback and communication based on controllable cost reports enhance collaboration between management and managers.

Challenges of Controllable Cost Reports

1. Difficulty in Distinguishing Controllable and Uncontrollable Costs:

Accurately distinguishing between controllable and uncontrollable costs can be challenging, especially in complex organizations.

2. Varying Levels of Controllability:

The level of controllability can vary depending on the manager's position and the organization's structure.

3. Potential for Manipulation:

Managers may try to manipulate cost classifications to improve their performance evaluations.

4. Resistance to Change:

Implementing a controllable cost reporting system may face resistance from managers who are accustomed to traditional reporting methods.

5. Cost of Implementation:

Implementing and Maintaining a controllable cost reporting system requires time, money, and resources.

Illustrations:

Illustration 1: Segmented Income Statement

Company M/s. Prime Ploy has two divisions: Retail and Online.

The segmented income statement for the past month:

Item	Retail	Online	Total
Sales Revenue	Rs. 500,000	Rs. 300,000	Rs. 800,000
Variable Costs	Rs. 300,000	Rs. 180,000	Rs. 480,000
Contribution Margin	Rs. 200,000	Rs. 120,000	Rs. 320,000
Direct Fixed Costs	Rs. 80,000	Rs. 60,000	Rs. 140,000
Segment Margin	Rs. 120,000	Rs. 60,000	Rs. 180,000
Common Fixed Costs			Rs. 50,000
Net Income			Rs. 130,000

Analysis: The Retail division is more profitable than the Online division. The report helps management assess each segments performance.

Illustration 2: Controllable Cost Report

A production manager is responsible for direct materials and direct labor costs.

The controllable cost report for the past week:

Item	Budgeted Cost	Actual Cost	Variance
Direct Materials	Rs. 100,000	Rs. 105,000	Rs. 5,000 (Unfavorable)
Direct Labor	Rs. 80,000	Rs. 78,000	Rs. 2,000 (Favorable)
Total Controllable Costs	Rs. 180,000	Rs. 183,000	Rs. 3,000 (Unfavorable)

Analysis: The manager exceeded the budgeted cost for direct materials but saved on direct labour. The report helps in identifying areas for cost control improvement.

Illustration 3: Combined Segmented and Controllable Cost Report

Alpha Numeric Pvt. Ltd., has 2 sales regions, North and South. Each sales region has a sales manager.

Combined Report.

Item	North Budget	North Actual	North Variance	South Budget	South Actual	South Variance
Sales Revenue	500,000	520,000	20,000 F	400,000	380,000	20,000 U
Variable costs (Controllable)	200,000	210,000	10,000 U	160,000	150,000	10,000 F
Contribution Margin	300,000	310,000	10,000 F	240,000	230,000	10,000 U
Fixed Costs (Controllable)	100,000	90,000	10,000 F	80,000	85,000	5,000 U
Segment Margin (Controllable)	200,000	220,000	20,000 F	160,000	145,000	15,000 U
Fixed costs (Uncontrollable)	50,000	50,000	0	40,000	40,000	0
Segment Margin	150,000	170,000	20,000 F	120,000	105,000	15,000 U

- **Analysis:** This report shows each regions performance, as well as the controllable and uncontrollable costs. The north region outperformed the south region. The sales manager of the north region controlled their fixed costs well. The sales manager of the south region had uncontrollable circumstances that lowered their performance.

ILLUSTARTIONS FOR PRACTICE

1. Segmented Income Statement with Allocation of Common Costs

- **Question:** "Global Retail Inc." has three product segments: Apparel, Electronics, and Home Goods. The following data is available:

  - **Apparel:**
    - Sales: Rs. 800,000
    - Variable Costs: Rs. 320,000
    - Direct Fixed Costs: Rs. 160,000
  - **Electronics:**
    - Sales: Rs. 1,200,000
    - Variable Costs: Rs. 720,000
    - Direct Fixed Costs: Rs. 240,000
  - **Home Goods:**
    - Sales: Rs. 600,000
    - Variable Costs: Rs. 300,000
    - Direct Fixed Costs: Rs. 120,000

The company has common fixed costs of Rs. 300,000, which are allocated based on sales revenue.

a. Prepare a segmented income statement using the contribution margin format.

b. Calculate the segment margin for each segment.

c. Calculate the Net Income of the Company.

- **Answer:**

  a. Segmented Income Statement:

Item	Apparel	Electronics	Home Goods	Total
Sales	800,000	1,200,000	600,000	2,600,000
Variable Costs	320,000	720,000	300,000	1,340,000
Contribution Margin	480,000	480,000	300,000	1,260,000
Direct Fixed Costs	160,000	240,000	120,000	520,000

Segment Margin	320,000	240,000	180,000	740,000
Allocated Common Fixed Costs	92,308	138,462	69,230	300,000
Net Income	227,692	101,538	110,770	440,000

Allocation of Common Fixed Costs:

Apparel: (800,000 / 2,600,000) 300,000 = 92,308

Electronics: (1,200,000 / 2,600,000) 300,000 = 138,462

Home Goods: (600,000 / 2,600,000) 300,000 = 69,230

b. Segment Margin:

Apparel: Rs. 320,000

Electronics: Rs. 240,000

Home Goods: Rs. 180,000

c. Net Income:

Rs. 440,000

2. Segmented Income Statement with Intersegment Sales

- **Question:** "Industrial Components Ltd." has two divisions: Division A and Division B. Division A sells a component to Division B at a transfer price of Rs. 50 per unit.

  - **Division A:**
    - Sales (External): Rs. 500,000
    - Sales (to Division B): 10,000 units
    - Variable Costs: Rs. 300,000
    - Direct Fixed Costs: Rs. 100,000
  - **Division B:**
    - Sales (External): Rs. 1,500,000
    - Variable Costs (External): Rs. 600,000
    - Variable Costs (Internal, From A): Rs. 500,000
    - Direct Fixed Costs: Rs. 300,000

    a. Prepare segmented income statements for each division.

    b. Calculate the company's total net income.

- **Answer:**

a. Segmented Income Statements:

Division A:

Sales (External): Rs. 500,000

Sales (to Division B): 10,000 units Rs. 50 = Rs. 500,000

Total Sales: Rs. 1,000,000

Variable Costs: Rs. 300,000

Contribution Margin: Rs. 700,000

Direct Fixed Costs: Rs. 100,000

Segment Margin: Rs. 600,000

Division B:

Sales (External): Rs. 1,500,000

Variable Costs (External): Rs. 600,000

Variable Costs (Internal): Rs. 500,000

Total Variable Costs: Rs. 1,100,000

Contribution Margin: Rs. 400,000

Direct Fixed Costs: Rs. 300,000

Segment Margin: Rs. 100,000

b. Total Net Income:

Total Net Income = Division A Segment Margin + Division B Segment Margin

Total Net Income = Rs. 600,000 + Rs. 100,000 = Rs. 700,000

3. Segmented Reporting with Different Products and Sales Increase

- **Question:** "Food Products Inc." has two product lines: Snacks and Beverages. The following information is available:
  - **Snacks:**
    - Sales: Rs. 900,000
    - Variable Costs: Rs. 450,000
    - Direct Fixed Costs: Rs. 200,000

- **Beverages:**
  - Sales: Rs. 1,100,000
  - Variable Costs: Rs. 550,000
  - Direct Fixed Costs: Rs. 250,000

  If the sales for Snacks increase by 20% and the sales for Beverages decrease by 10%, prepare a new segmented income statement.

- **Answer:**

- **Snacks (After Sales Increase):**
  - Sales: Rs. 900,000 1.20 = Rs. 1,080,000
  - Variable Costs: Rs. 450,000 1.20 = Rs. 540,000
  - Contribution Margin: Rs. 1,080,000 - Rs. 540,000 = Rs. 540,000
  - Direct Fixed Costs: Rs. 200,000
  - Segment Margin: Rs. 540,000 - Rs. 200,000 = Rs. 340,000

- **Beverages (After Sales Decrease):**
  - Sales: Rs. 1,100,000 0.90 = Rs. 990,000
  - Variable Costs: Rs. 550,000 0.90 = Rs. 495,000
  - Contribution Margin: Rs. 990,000 - Rs. 495,000 = Rs

Exercise :

Q.1 A. Choose the correct alternate and answer the following :

1. Controllability refers to:

a) The overall profitability of a company.
b) The extent to which a manager can influence activities, costs, and revenues.
c) The allocation of corporate overhead.
d) The company's stock price.

Answer: b) The extent to which a manager can influence activities, costs, and revenues.

2. **W**hich of the following is an example of a directly controllable cost?

a) Corporate overhead allocations.
b) Depreciation on assets acquired by top management.
c) Direct materials cost.
d) Regional labor market volatility.

Answer: c) Direct materials cost.

3. Which of the following is an example of an uncontrollable cost?

a) Maintenance costs.

b) Advertising expenditure.

c) Corporate overhead allocations.

d) Direct labor.

Answer: c) Corporate overhead allocations.

4. What is the primary benefit of using controllability in performance evaluation?

a) It increases corporate overhead.

b) It ensures fair and accurate performance assessment.

c) It simplifies accounting policies.

d) It increases market fluctuations.

Answer: b) It ensures fair and accurate performance assessment.

5. ROI is calculated as:

a) Net Operating Income - Invested Capital.

b) (Net Operating Income / Invested Capital) × 100.

c) Net Operating Income + Invested Capital.

d) Invested Capital / Net Operating Income.

Answer: b) (Net Operating Income / Invested Capital) × 100.

6. Residual Income (RI) is calculated as:

a) (Net Operating Income / Invested Capital) × 100.

b) Net Operating Income + (Minimum Required Rate of Return × Invested Capital).

c) Net Operating Income - (Minimum Required Rate of Return × Invested Capital).

d) Invested Capital - Net Operating Income.

Answer: c) Net Operating Income - (Minimum Required Rate of Return × Invested Capital).

7. Segmented reporting helps to:

a) Increase uncontrollable costs.

b) Identify profitable and unprofitable segments.

c) Simplify corporate overhead allocation.

d) Ignore external market factors.

Answer: b) Identify profitable and unprofitable segments.

Q. 1 B. Choose the correct alternate and answer the following : (Numerical)

1) A division has a net profit of Rs. 200,000 and total assets of Rs. 1,000,000. What is the ROI?

a) 10%

b) 20%

c) 30%

d) 40%

Answer: b) 20%

2) A company has sales of Rs. 500,000 and total assets of Rs. 250,000. What is the asset turnover?

a) 0.5

b) 1

c) 2

d) 3

Answer: c) 2

3) A division has a net operating income of Rs. 300,000, capital invested of Rs. 2,000,000, and a required rate of return of 10%. What is the RI?

a) Rs. 50,000

b) Rs. 100,000

c) Rs. 150,000

d) Rs. 200,000

Answer: b) Rs. 100,000

4) A company has a net operating profit after tax of 600,000, Capital invested of 3,000,000, and a WACC of 15%. What is the EVA?

a) 50,000

b) 100,000

c) 150,000

d) 200,000

Answer: c) 150,000

5) **Question:** A division has a Net Operating Income of Rs. 600,000 and Invested Capital of Rs. 3,000,000. If the company's Minimum Required Rate of Return is 10%, what is the Residual Income?

a) Rs. 100,000

b) Rs. 200,000

c) Rs. 300,000

d) Rs. 400,000

Answer: c) Rs. 300,000

6) **Question:** A company requires a minimum return of 15% on its invested capital. A division with invested capital of Rs. 5,000,000 generates a Net Operating Income of Rs. 700,000. What is the Residual Income?

a) Rs. 50,000
b) Rs. (50,000)
c) Rs. 100,000
d) Rs. 150,000

Answer: b) Rs. (50,000)

7) **Question:** Which of the following formulas correctly calculates Residual Income (RI)?

a) RI = Net Operating Income + (Minimum Required Rate of Return × Invested Capital)
b) RI = Net Operating Income - (Minimum Required Rate of Return × Invested Capital)
c) RI = (Net Operating Income / Invested Capital) × 100
d) RI = (Invested Capital / Net Operating Income) × 100

Answer: b) RI = Net Operating Income - (Minimum Required Rate of Return × Invested Capital)

Q.2 Write Short Notes on :

1. Controllability Spectrum
2. ROI (Return on Investment)
3. Residual Income (RI)
4. Importance of Segmented

Q.3 Answer in Brief :

1. How does the concept of controllability impact managerial motivation and ownership?
2. What are the key differences between ROI and Residual Income as performance measures?
3. Why is it important to distinguish between directly controllable, partially controllable, and uncontrollable costs in performance evaluation?
4. How does segmented reporting aid in strategic decision-making and resource allocation?
5. What are the potential disadvantages of relying solely on ROI for evaluating managerial performance?
6. How does the case study of Tech Solutions Inc. illustrate the challenges of controllability in budget management?

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6

TRANSFER PRICING

Unit Structure :

6.0 INTRODUCTION

Transfer pricing is the setting of the price for goods and services sold between controlled (or related) legal entities within an enterprise. For example, if a subsidiary company sells goods to a parent company, the cost of those goods paid by the parent to the subsidiary is the transfer price. Legal entities considered under the control of a single corporation include branches and companies that are wholly or majority owned ultimately by the parent corporation. Certain jurisdictions consider entities to be under common control if they share family members on their boards of directors. Transfer pricing can be used as **a profit allocation method** to attribute a multinational corporation's net profit (or loss) before tax to countries where it does business. Transfer pricing results in **the setting of prices among divisions** within an enterprise. Transfer pricing accounting occurs when goods or services are exchanged between divisions of the same company. A transfer price is based on market prices in charging another division, subsidiary, or holding company for services rendered. Companies use transfer pricing to reduce the overall tax burden of the parent company.

6.2 OBJECTIVES

- True and fair reporting of financial statements
- Better estimation of profits generated by entities from associated transfers
- Avoidance of double taxation and avoiding tax evasion by entities
- Promoting competitiveness among the associated enterprises.

6.3 ADVANTAGES AND DISADVANTAGES

- The critical importance of Transfer Pricing provisions is that there will be an equal and fair distribution of resources between associated entities leading to nondiscriminatory trade transactions.
- This provides opportunities for associated enterprises to transact business between them as the transactions are valued at market price, this will enhance the scope of business and have a positive impact on the group company as a whole due to internal profits generated by these associated entities,
- Also, it is useful for the tax authorities to determine the actual value of such transactions and to estimate the profits derived from such transactions taking place between associate entities. Without transfer pricing provision, there would be a reduction or avoidance of tax by misleading authorities and transferring or reporting profits based on the limitation presents in tax provisions.
- It is used not only by multi-company organizations but also by entities that satisfy the conditions of associated enterprises.

Disadvantages

- This would require additional administrative cost and a time-consuming process.
- There are few limitations in the determination of arms-length price as two products cannot be compared due to the homogenous nature of such commodities or services.

6.3 COST BASED TRANSFER PRICING:

When external markets do not exist or are not available to the company or when information about external market prices is not readily available, companies may decide to use some forms of cost-based transfer pricing system. Cost-based transfer prices may be in different forms such as variable cost, actual full cost, full cost plus profit margin, standard full cost.

(a) Variable Cost:

Variable cost-based pricing approach is useful when the selling division is operating below capacity. The manager of the selling division will generally not like this transfer price because it yields no profit to that division. In this pricing system, only variable production costs are transferred. These costs are direct materials, direct labour and variable factory overhead.

Variable cost has the major advantage of encouraging maximum profits for the entire firm. By passing only variable costs alone to the next division, production and pricing decisions are based on cost- volume-profit relationships for the firm as a whole. The obvious problem is that

selling division is left holding all its fixed costs and operating expenses. That division is now a loss division, no where near a profit centre.

(b) Actual Full Cost:

In actual full cost approach, transfer price is based on the total product cost per unit which will include direct materials, direct labour and factory overhead. When full cost is used for transfer pricing, the selling division cannot realise a profit on the goods transferred. This may be disincentive to the selling division. Further, full cost transfer pricing can provide perverse incentives and distort performance measures. A full cost transfer price would have shutdown the chances of any negotiation between divisions about selling at transfer prices.

(c) Full Cost Plus Profit Margin:

Full cost plus mark up (or profit margin) overcomes the weaknesses of full cost basis transfer pricing system. The full cost plus price include the allowed cost of the item plus a mark up or other profit allowance. With such a system, the selling division obtains a profit contribution on units transferred and hence, benefits if performance is measured on the basis of divisional operating profits. However, the manager of the buying division would naturally object that his costs (and hence reported performance) are adversely affected.

The basic question in full cost plus mark up is 'what should be the percentage of mark up.' It can be suggested that the mark up percentage should cover operating expenses and provide a target return on sales or assets.

(d) Standard Costs:

In actual cost approaches, there is a problem of measuring cost. Actual cost does not provide any incentive to the selling division to control cost. All product costs are transferred to the buying division. While transferring actual costs any variances or inefficiencies in the selling division are passed along to the buying division.

The problem of isolating the variances that have been transferred to subsequent buyer division becomes extremely complex. To promote responsibility in the selling division and to isolate variances within divisions, standard costs are usually used as a basis for transfer pricing in cost-based systems.

Whether transferring at differential costs or full costs, standard costs, where available, are often used as the basis for the transfer. This encourages efficiency in the selling division because inefficiencies are not passed onto the buying division. Otherwise, the selling division can transfer cost inefficiencies to the buying division. Use of standard cost reduces risk to the buyer. The buyer knows that standard costs will be transferred and avoids being charged with suppliers' cost overruns

6.4 NEGOTIATED TRANSFER PRICING

Negotiated prices are generally preferred as a middle solution between market prices and cost- based prices. Under negotiated prices, the managers involved act much the same as the managers of independent companies. Negotiation strategies may be similar to those employed when trading with outside markets. If both divisions are free to deal either with each other or in the external market, the negotiated price will likely be close to the external market price. If all of a selling division's output can not be sold in the external market (that is, a portion must be sold to the buying division), the negotiated price will likely be less than the market price and the total margin will be shared by the divisions.

Negotiated price avoids mistrusts, bad feelings and undesirable bargaining interests among divisional managers. Also, it provides an opportunity to achieve the objectives of goal congruence, autonomy and accurate performance evaluation. The overall company is beneficiary if selling and buying divisions can agree upon some mutually transfer prices. Negotiated transfer price is considered as a vital integrating tool among divisions of a company which is necessary to achieve goal congruence.

If negotiations help ensure goal congruence, top management has little temptation to intervene between divisions. The agreed prices also can be used for performance measurement without creating any friction. The use of negotiated prices is consistent with the concept of decentralised decision-making in the divisionalised firms.

However, negotiated prices have the following disadvantages:

(1) A great deal of management effort, time and resources can be consumed in the negotiating process.

(2) The final emerging negotiated price may depend more on the divisional manager's ability and skill to negotiate than on the other factors. Thus, performance measures will be distorted leading to incorrect evaluation of divisional performance.

(3) One divisional manager having some private information may take advantage of another divisional manager.

(4) It is time-consuming for the managers involved.

(5) It leads to conflicts between divisions.

(6) It may lead to a suboptimal level of output if the negotiated price is above the opportunity cost of supplying the transferred goods.

6.5 TARGET COSTING

Target costing is a structural approach to determine the cost at which a proposed product with specified function and quality must be produced, to generate a desired level of profitability at its anticipated selling price.

In other words, Target Costing is a cost management tool for producing overall cost of product over its entire life cycle with the help of the function engineering and research and development. Target cost is called estimated cost of the product that helps a manufacturing unit to remain. It competes in the market in the long run. Target costing is a cost management technique. Target cost is the difference between target sales minus target margin. It is, thus, the difference between estimated selling price of a proposed product with specified functionality and quality and the target margin.

The features of target costing are as follows:

1. It is viewed as an integral part of the design and introduction of new products.
2. A target selling price is determined using various sales forecasting techniques.
3. The target selling price is the establishment of target production volumes, given the relationship between price and volume.
4. Target costing process is to determine, cost reduction targets.
5. A fair degree of judgement is needed where the allowable cost and the target cost differ.

Characteristics of Target Costing

The main characteristics of target costing system are as under:

(1) Identification of Opportunities -

With the help of value engineering and value analysis, opportunities, for cost reduction can be identified easily. Value engineering involves searching the opportunities to modify the design for reducing the cost without reducing the quality of the product.

Similarly, value analysis involves rejecting non-value adding activities which may minimise the cost without reducing quality of the product. Thus current cost is reduced to the level of target cost. It is presumed that when production commences, the total cost will meet the target and profit also.

(2) Target Cost -

Target cost is decided by deducting target income from the target price.

(3) Integral Part of Design -

Target costing is known as an integral part of the design and introduction of new products.

(4)Target Price -

It is the estimated market price of the product. It is a target price which is determined by using various sales forecasting techniques in which consideration is made for design specifications of the product and competitive market conditions.

(5) Cost Reduction Target -

Cost reduction target is fixed, which requires estimation of current cost of the new product. It is based on existing technologies and its various components. The excess of current cost over target cost indicates the cost reduction.

Objectives

1. To lower the costs of new products so that the required profit level can be ensured.
2. The new products meet the levels of quality, delivery timing and price required by the market.
3. To motivate all company employees to achieve the target profit during new product development by making target costing a company wide profit management activity.

6.6 COMPARISION BETWEEN TARGET COSTING AND COST PLUS PRICING

Target costing and cost-plus pricing are two different things. In product development, target costing is a management technique used to determine the cost of manufacturing a product, while cost-plus pricing is a system used to determine the selling price of the product. **Cost-plus pricing** starts with an estimate of the **costs** incurred to build a product, and a certain profit percentage is added to establish the **price**. ... **Target costing** integrates the product design, desired **price**, desired profit, and desired **cost** into one process beginning at the product development stage.

6.7 INFLATION ACCOUNTING

Inflation accounting refers to the adjustment of the financial statements during inflationary periods. This special accounting technique is only used in inflationary periods where the general level of prices is usually high for three consecutive quarters.

It involves the recording of the income and expenditure of the business at the current prices and reinstating all the three statements of the company and analyze the cost and the trend of the current company.

There are various kinds of techniques that are involved in inflation accounting and there are various methods attached to it.

- **Current Purchasing Power Method:** This technique involves the adjustment of the financial statements to the current price changes. It involves recalculating the historical financial figures of the company at the current purchasing power which is done by applying a certain conversion factor.
- **Current Cost Accounting:** Under this method, the cost categories and the various cost items and the items in the balance sheet are shown at the current cost rather than the historical cost and the profit is determined on the actual cost period and not on the basis of the sales.
- **Current Value:** Under this method, all assets and liabilities are measured and are reinstated at their current cost structure.
- **Replacement Cost Accounting:** The cost of replacing is the parameter under which all the assets and the liabilities on the balance sheet are recorded.

Advantages of Inflation Accounting

The following are the advantage of Inflation Accounting:

- It reflects the current and not the historical cost of the balance sheet.
- It is highly effective in times of general inflation or hyperinflation.
- Depreciation of the business is valued and cost on the current price and not on the historical or the carrying value of the asset which is the correct method.
- Profit and loss will reflect the true condition of the company.
- Financial ratios based on figures, adjusted to the current value, are more meaningful.

Disadvantages of Inflation Accounting

The following are the disadvantage of Inflation Accounting:

- Changing in price is a never-ending process hence it becomes difficult every time to reinstate the figures of the company and present the financial statements.
- Inflation accounting is a complicated process and it involves too much calculation and the data gathering process.
- In times of deflation, the depreciation cost will be on a lower side hence it does not reflect the true picture.

6.8 ILLUSTRATIONS

Q1) A firm had Rs 2,00,000 as cash at bank on April 1, 2011. The consumer price index on that date was 200. During the year ended 31st March, 2012 the receipts and payments were stated below:

Receipts		₹	*Index*	*Payments*		₹	Index
June 1	Sales	1,05,000	210	Sept. 15	Costs	2,15,000	215
January 15	Sales	3,45,000	230	Dec. 1	Plant	2,00,000	225
				Mar. 20	Costs	1,50,000	240

Ascertain the profit or loss on account of price changes; the year end index was 240.

Solution:

Statement showing Profit / Loss on Cash during the year ended 31st March, 2012:

	Historical ₹	*Adjustment*	*Constant* ₹
Opening Balance	2,00,000	240/200	2,40,000
Receipts: June 1	1,05,000	240/210	1,20,000
Jan. 15	3,45,000	240/230	3,60,000
	6,50,000		7,20,000
Payments: Sept. 15	2,15,000	240/215	2,40,000
Dec. 1	2,00,000	240/225	2,13,333
Mar. 20	1,50,000	240/240	1,50,000
	5,65,000		6,03,333
Balance	85,000		1,16,667

The balance according to Constant Rupees should have been Rs 1,16,667 whereas the actual balance is only Rs 85,000. Therefore, as a result of changes in prices, there has been a loss of Rs 31,667.

Q.2)Below is given a simplified balance sheet and statement of profit and loss of a company in existence for about 10 years:

A Ltd.

Balance Sheet as at 31st March, 2012

₹

Particulars	*Note No.*	*Figures as at the end of current reporting period*	*Figures as at the end of the previous reporting period*
I. Equity and Liabilities			
Shareholders' funds			
Share capital		413	413
Reserves and surplus	1	100	(83)
Non-current liabilities			
Long-term borrowings	2	985	1,005
Current liabilities			
Sundry current liabilities		241	213
Short-term provision		55	–
		1,794	1,548
II. Assets			
Non-Current assets			
Fixed assets			
Tangible assets	3	737	884
Capital work in progress		76	38
Current assets			
Inventories	4	475	358
Trade receivables	5	191	133
Cash and cash equvalents	6	54	32
Short-term loans and advances		261	103
		1,794	1,548

Statement of Profit and Loss for the year ended 31st March, 2012

(₹ *in lakhs*)

	Particular	*Note No.*	*Figures for the current reporting period*	*Figures for the previous reporting period*
	Revenue from operations	7	2,478	1,741
	Other income		62	124
I	Total revenue		2,540	1,865
	Expense			
	Cost of material consumed		948	721
	Finance cost	8	108	185
	Depreciation*		236	91
	Other expenses	9	981	649
II	Total expenses		2,273	1,646
	Profit (I - II)		267	219

Depreciation charge comes to Rs 124 lakhs.

The following facts are established:

(1) The price indices of tangible assets had climbed to 200 in the beginning of 2011-2012 and to 225 by the end of the year with the prices ten years ago being 100; the price increase in 2010-2011 was only 6%. Till the end of 2010-2011 the company had not made any substantial additions to the tangible assets. The company considers the life of the tangible assets to be 20 years and would prefer the straight line basis of depreciation.

(2) Prices of materials rose by 54% and of finished goods by 35% during 2011-2012; rates relating to manufacturing costs increased by 20%.

(3) The value of finished goods stock in the beginning and at the end of the year was respectively Rs 158 lakhs and Rs 203 lakhs.

Prepare the current cost accounting balance sheet as at 31st March, 2012 and statement of profit and loss for the year 2011-2012 on that basis.

Solution:

The following assumptions are made:

(a) Material stocks are valued on FIFO basis.

(b) Loans and advance are against supplies of materials and stores, so also current liabilities.:

The various adjustments required under CCA are worked out below (to the nearest lakh of rupee):

(*i*) The current cost of tangible assets on the basis of price changes:

			₹ *lakhs*
(*a*)	March 31, 2010:—		
	Present "Cost" 1217 × 200/100		2,434
	Less: 9 years' depreciation on straight line basis (life being 20 years)		1,095
			1,339
	Add: Work-in-progress 38 plus 3%, *i.e.*, half the increase in prices		39
			1,378
	Amount shown in Balance Sheet		922
	Credit to Current Cost Accounting Reserve		456
(b)	March 31, 2011:		
	Present cost of assets as on 31.3.2011, 1,217 × 225/100		2,738
	Present cost of assets installed during the year (assuming half the increasing price applies, i.e., 82 × 225/212.5		94
			2,832
	Less: Depreciation for 10 years on 2,738	1,389	
	For ½ year on 94	2	1,371
			1,461
	Work-in-progress: 76 plus 6¼, *i.e.*, ½ the increasing prices		81
			1,542
	Amount shown in the Balance Sheet		813
	Credit to Current Cost Accounting Reserve		729

(*ii*) Depreciation for 2011-2012

	₹ *lakhs*
1/20 of 2,434 — the current cost of fixed assets in the beginning	122
1/40 of increasing the values of these assets during 2011-2012 assuming the increase was gradual during the year	8
1/40 of assets installed during the year	2
	132
Depreciation charged in the accounts (236 less 112 which in in the nature of appropriate of profits)	124
Additional depreciation to be charged	8

(*iii*) Increase in value of inventories:

	31.3.2011		31.3.2012
Finished Goods (as given)	158		203
Materials and Stores	216*	$311 \times \frac{154}{127}$	377
Process Stocks	42*		46*
As per Balance Sheet	358		475
Credit to Current Cost Accounting Reserve	58		151

(*iv*) Cost of Sales Adjustment:

Purchases as per accounts already given:	
Materials consumed	948
Add: Closing Stock of materials and stores	311
	1,259
Less: Opening stock of materials and stores	216
Purchases	1,043
Increase by 27% (half of total in the year)	282
	1,325

(e) Gearing Adjustment:		
Additional depreciation charge		8
COSA		258
MWCA		22
Total		288
45.3% of 288		130

The Profit and Loss Adjustments for 2011-2012 may be set out as shown below:

Operating Profit:	₹ lakhs	₹ lakhs
Profit as given		267
Add: Interest		108
Extra Depreciation		112
		487
C.C.A. Adjustments:		
Depreciation	8	
COSA	258	
MWCA	22	288
		790
Add: Gearing Adjustment: 45.3% of 288	130	
Less: Interest	108	22
Profit as per Current Cost Accounts		221
Less: Appropriation towards Depreciation Reserve		112
		109

The Current Cost Accounting Reserve on 31.3.2012 will stand at ₹ 1,038 lakh as shown below:

	₹ *lakhs*
Increase in the value of: Fixed assets	729
Inventories	151
Adjustment for Depreciation, COSA and MWCA	288
	1,168
Less: Gearing Adjustment	130
	1,038

The Current Cost Accounting Balance Sheet is set out below:

A Ltd.

Balance Sheet as at 31st March, 2012

(₹ *in lakhs*)

Particulars	*Note No.*	*Amounts as at 31st March, 2012*
I. Equity and Liabilities		
Shareholders' funds		
Share capital		413
Reserve and surplus	2	980
Non-current liabilities		
Long-term borrowings	2	985
Current liabilities	3	296
Total		2,674
II. Assets		
Non-current assets		
Tangible assets	4	1,461
Capital work in progress		81
Current assets		
Inventories	5	626
Trade receivables	6	191
Cash and cash equivalents	7	54
Short term loans and advances		261
Total		2,674

Statement of Profit and Loss for the year ended 31st March, 2012

(₹ *in lakh*)

Particular	*Note No.*	*Amouts for the year ended 31st March 2012*
Revenue from operations	7	2,478
Other income		62
Gearing adjustment		130
I Total revenue		2,670
Expenses		
Cost of matrials consumed		1,164
Finance cost	8	108
Depreciation		132
Other expenses	9	1,023
Monetary working capital adjustment		22
II Total expenses		2,449
Profit before appropriations, (I—II)		221
Appropriation:		
Transfer to depreciation reseve		112
Profit left after appropriation		109

Notes:

1. **Reserves and Surplus**

Current Cost According Reserve	1,038
General Reserve and Surplus	(58)*
	980

*₹ 100 lakh less adjustment in the P & L Account totalling in net to ₹ 158 lakh

2. **Long-term Borrowings**

Loan	985

3. **Current Liabilities**

Accounts of Credit Surpliers	241
Short-term Provisions	55
	296

4. **Tangible Assets**

Tangible Assets, as valued	2,832
Less: Depreciation till date	1,371
	1,461

5. **Inventories**

Finished Goods	203
Materials and Store	377
Work in Process	46
	626

6. **Trade Receivable**

Accounts of Credit Customers	191

7. **Cash and Cash Equivalents**

Balance with Bank	54

8. **Revenue from Operations**

Sales of Goods in Trade	2,478

9. **Finance Cost**

Interest on Loan	108

10. **Other Expenses**

Excise Duty	366
Manufacturing Costs	457
Other Costs	200
	1,023

Some observations:

The accounts given above are naturally much too simple compared to the actual situation but, nevertheless, they are based on reality.**The following observations on these accounts may be pertinent:**

(i) The additional depreciation for the current year is only Rs 8 lakh; this low figure is because the depreciation actually charged in the accounts is much higher than that warranted on straight line basis with a life of 20 years. Generally, in industrial concerns the adjustment required for depreciation will be heavy. COSA in the above case is very large. This is because there was a very big increase in the prices of materials - 54%. Normally, the adjustment may not be large. Still the point that emerges is that if prices rise rapidly and if there is big time lag between purchase and consumption, the adjustment in respect of cost of sales will be material. Trading concerns cannot naturally ignore COSA. The gearing adjustment has reduced the debit to the Profit and Loss Account by Rs 130 lakhs. Indian companies normally resort to loans in a big way and, hence, for Indian companies this adjustment will be generally substantial. In the case under discussion, interest payment was only Rs 108 lakhs, showing that due to rise in prices, there was a saving of Rs 22 lakhs because of the fixed nature of monetary obligations.

On 31st March, 2002, when the general price index was say 100, Forward Ltd. purchased fixed assets of Rs one crore. It had also permanent working capital of Rs 40 lakh. The entire amount required for purchase and permanent working capital was financed by 10% redeemable preference share capital. Forward Ltd. wants to maintain its physical capital.

On 31st March, 2012, the company had reserves of Rs 1.75 crore. The general price index on this day was 200. The written down value of fixed assets was Rs 10 lakh and they were sold for Rs 1.5 crore. The proceeds were utilised for redemption of preference shares.

On the same day (31st March, 2012) the company purchased a new factory for Rs 10 crore. The ratio of permanent working capital to cost of assets is to be maintained at 0.4 : 1.

The company raised the additional funds required by issue of equity shares.

Based on the above information (a) Quantify the amount of equity capital raised and (b) Show the Balance Sheet as on 1.6.2012.

Solution: (₹ *in crores*)

(*i*) Preference share capital on 31st March, 2002:

Fixed assets	1.0
Working capital	0.4
10% Redeemable preference share capital	1.4

To maintain physical capital, the company needs to evaluate the financial capital on 31st March, 2012 which is required to maintain the existing operating capability of the physical assets. On the basis of price index data available, it has been worked out as follows:

$$₹ 1.4 \text{ crore } \frac{200}{100} = ₹ 2.8 \text{ crore}$$

The actual amount has been more than this minimum capital required to be maintained as can be seen below:

(*ii*) Working capital on 31st March 2012;

before the given transactions or events:	(₹ *in crores*)
Preference share capital	1.40
Add: Reserves	1.75
	3.15
Less: Written down value of fixed assets	0.10
	3.05

(*iii*) Position as on 31st March, 2012,
after sale of fixed assets and redemption of preference shares:

Liabilities:		
Reserves	1.75	—
Add: Profit on sale of fixed assets	1.40	3.15
		3.15
Assets:		
Fixed assets		
Working capital		3.15
₹ (3.05 + 1.50 – 1.40) crore		
		3.15

(*iv*) Amount of equity capital raised:

Amount required for purchase of new factory	10.00
Permanent working capital requirement at 40%	4.00
	14.00
Less: Existing working capital	3.15
	10.85

(*b*)

Forward Ltd:
Balance Sheet as on 1st April, 2010

(₹ *in crores*)

Particulars	*Note No.*	*Amounts as at April, 2012*
I. Equity and Liabilities		
Shareholders' funds		
Share capital	1	10.85
Reserve and surplus		3.15
		14.00

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