



The Motto of Our University
(SEWA)

SKILL ENHANCEMENT

EMPLOYABILITY

WISDOM

ACCESSIBILITY

JAGAT GURU NANAK DEV
PUNJAB STATE OPEN UNIVERSITY, PATIALA
(Established by Act No. 19 of 2019 of the Legislature of State of Punjab)

B.COM

SEMESTER-II

BCB32403T
COST ACCOUNTING

Head Quarter: C/28, The Lower Mall, Patiala-147001

Website: www.psou.ac.in

SELF-INSTRUCTIONAL STUDY MATERIAL FOR JGND PSOU

ALL COPYRIGHTS WITH JGND PSOU, PATIALA

The Study Material has been prepared exclusively under the guidance of Jagat Guru Nanak Dev Punjab State Open University, Patiala, as per the syllabi prepared by Committee of Experts and approved by the Academic Council.

The University reserves all the copyrights of the study material. No part of this publication may be reproduced or transmitted in any form.

COURSE COORDINATOR AND EDITOR:

DR. Pooja Aggarwal
Assistant Professor in Commerce
JGND PSOU, Patiala

LIST OF CONSULTANTS/ CONTRIBUTORS

Sr. No.	Name
1	Dr. Tulika Bal



JAGAT GURU NANAK DEV PUNJAB STATE OPEN UNIVERSITY, PATIALA
(Established by Act No. 19 of 2019 of the Legislature of State of Punjab)

PREFACE

Jagat Guru Nanak Dev Punjab State Open University, Patiala was established in December 2019 by Act 19 of the Legislature of State of Punjab. It is the first and only Open University of the State, entrusted with the responsibility of making higher education accessible to all, especially to those sections of society who do not have the means, time or opportunity to pursue regular education.

In keeping with the nature of an Open University, this University provides a flexible education system to suit every need. The time given to complete a programme is double the duration of a regular mode programme. Well-designed study material has been prepared in consultation with experts in their respective fields.

The University offers programmes which have been designed to provide relevant, skill-based and employability-enhancing education. The study material provided in this booklet is self-instructional, with self-assessment exercises, and recommendations for further readings. The syllabus has been divided in sections, and provided as units for simplification.

The University has a network of 10 Learner Support Centres/Study Centres, to enable students to make use of reading facilities, and for curriculum-based counselling and practicals. We, at the University, welcome you to be a part of this institution of knowledge.

Prof. G.S. Batra
Dean Academic Affairs

B.Com
CORE COURSE (CC)
SEMESTER IV
(BCB32403T): COST ACCOUNTING

MAX. MARKS: 100
EXTERNAL: 70
INTERNAL: 30
PASS: 35%
Credits: 6

Objective:

To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment and cost accounting book keeping systems.

INSTRUCTIONS FOR THE CANDIDATES:

Candidates are required to attempt any two questions each from the sections A and B of the question paper and any ten short questions from Section C. They have to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.

Section A

Meaning, objectives and advantages of cost accounting; Difference between cost accounting and financial accounting; Cost concepts and classifications; Elements of cost; Installation of a costingsystem; Role of a cost accountant in an organisation

Elements of Cost: Materials, Material/inventory control techniques. Accounting and control of purchases, storage and issue of materials. Methods of pricing of materials issues — FIFO, LIFO, Simple Average, Weighted Average, Replacement, Standard Cost. Treatment of Material Losses.

Labour: Accounting and Control of labour cost. Time keeping and time booking. Concept and treatment of idle time, over time, labour turnover and fringe benefits. Methods of wage payment and the Incentive schemes- Halsey, Rowan, Taylor's Differential piece wage.

Overheads: Classification, allocation, apportionment and absorption of overheads; Under- and over-absorption; Capacity Levels and Costs; Treatments of certain items in costing like interest on capital, packing expenses, bad debts, research and development expenses; Activity based cost allocation.

Section B

Methods of Costing: Unit costing, Job costing, Contract costing.

Process costing (process losses, valuation of work in, progress, joint and by-products), Service costing (only transport).

Book Keeping in Cost Accounting : Integral and non-integral systems; Reconciliation of cost and financial accounts



JAGAT GURU NANAK DEV PUNJAB STATE OPEN UNIVERSITY, PATIALA
(Established by Act No. 19 of 2019 of the Legislature of State of Punjab)

B.COM

SEMESTER : IV

BCDB32403T: COST ACCOUNTING

COURSE COORDINATOR AND EDITOR : DR. POOJA AGGARWAL

SECTION A

UNIT NO.	UNIT NAME
UNIT 1	INTRODUCTION TO COST ACCOUNTING
UNIT 2	MATERIAL COST MANAGEMENT - I
UNIT 3	MATERIAL COST MANAGEMENT - II
UNIT 4	LABOUR COST: ACCOUNTING AND CONTROL
UNIT 5	OVERHEADS - I
UNIT 6	OVERHEADS - II

SECTION - B

UNIT NO.	NAME OF THE UNIT
UNIT - 7	UNIT COSTING
UNIT - 8	JOB COSTING AND CONTRACT COSTING
UNIT - 9	PROCESS COSTING (PROCESS LOSSES, VALUATION OF WORK – IN- PROGRESS, JOINT PRODUCTS AND BY PRODUCTS)
UNIT - 10	SERVICE COSTING (ONLY TRANSPORT)
UNIT - 11	NON-INTEGRAL AND INTEGRAL SYSTEMS OF ACCOUNTING
UNIT - 12	RECONCILIATION OF COST AND FINANCIAL ACCOUNTS

B. COM

SEMESTER IV

COURSE: COST ACCOUNTING

UNIT – 1 INTRODUCTION TO COST ACCOUNTING

STRUCTURE

1.0 Objectives

1.1 Introduction

1.2 Evolution of Cost Accounting

1.3 Cost, Costing, Cost Accounting, etc.

1.4 Objectives and Advantages of Cost Accounting

1.5 Difference between Cost Accounting and Financial Accounting

1.6 Classification of cost

1.7 Installation of costing system

1.8 Role of Cost Accountant

1.9 Elements of Total Cost

1.10 Cost Sheet

1.11 Let Us Sum Up

1.12 Key Words

1.13 Some Useful Books

1.14 Answers to Check your Progress

1.15 Terminal Questions/Exercises

1.0 OBJECTIVES

After going through this unit, you should be able to:

- Understand the need for Cost Accounting and its evolution
- Explain the concept of cost and Cost Accounting
- Understand the objectives of Cost Accounting
- State the difference between the Cost Accounting and Financial Accounting
- Understand the role of Cost Accountant in an organisation
- Explain the various classifications of cost
- Explain the elements of cost
- Understand the factors to be considered in installation of costing system
- Explain the components of the total cost
- Understand a Cost Sheet

1.1 INTRODUCTION

Accounting is the language of business. There are mainly three branches of Accounting, such as Financial Accounting, Cost Accounting and Management Accounting. Due to the limitations of Financial Accounting, Cost Accounting was developed. Cost Accounting involves the study of principles, methods, techniques for ascertaining, analysing and controlling costs. The main objective of any business organization is to earn profit. Cost Accounting is concerned with cost control and cost reduction. This in turn will help the business organisations to achieve their main objective. The managers who are the main users of the Cost Accounting information, use this information for pricing, cost control, budgeting, periodic profit determination, etc. In this unit, we shall introduce you to this branch of Accounting, called Cost Accounting.

1.2 NEED AND EVOLUTION OF COST ACCOUNTING

Any economic activity associated with production of goods or in rendering of service involves some expenses or costs. For example, in the manufacturing of a pen, various expenses such as materials, labour and other direct and indirect expenses are involved. After knowing the total cost of a pen, the producer fixes the selling price so that some profit can be earned. We know that the main objective of any business organization is to earn profit. For this, cost determination and cost control are essential. An organization can also produce many products or render many services. It requires detailed cost information for planning, controlling and decision making of managers. Financial Accounting failed to provide detailed cost information regarding various activities undertaken by an organisation. Hence, the accountants developed a new branch of accounting, known as Cost Accounting.

During seventeenth century, the use of Cost Accounting system was first traced. In nineteenth century, the industrial revolution led to the development of modern Cost Accounting. It also started to take pace in 1890s when many new cost concepts were introduced. In 1919, the Institute of Cost and Works Accountants was established in London and at the same time the National Association of Cost Accountants was established in New York. In 1959, the Cost and Works Accountants of India was formed which is now called the Institute of Cost Accountants of India. The Government of India along with the institute have taken a lot of steps for the development of Cost Accounting profession in India.

1.3 COST, COSTING, COST ACCOUNTING, etc.

Cost: It refers to the expenditure incurred in producing a product or rendering a service. It is the resource given up in exchange for some goods or services.

Costing: It is the technique and process of ascertaining costs. It consists of rules and principles for ascertaining cost of products manufactured and services rendered.

Cost Accounting: It is the process of accounting for costs. It is a branch of accounting that meets the informational needs of the managers for their decision making. The Cost Accounting and Costing are usually interchangeably used.

The steps in Cost Accounting are:

- Recording of cost data,
- Classifying all cost data,
- Preparing cost data by using appropriate method,
- Analysing cost data by using cost control technique,
- Presenting relevant information for decision making.

Cost Accountancy: It is the science, art and practice of a Cost Accountant. According to CIMA London, “Cost Accountancy is the application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability. It includes the presentation of information derived therefrom for the purpose of managerial decision making.”

Cost unit: Cost unit is a unit or quantity of product, service or time in terms of which cost is expressed. It is necessary to express the output in terms of physical measurement like number, weight, length, etc. The cost unit of petrol or diesel is per litre, gold is per gram, rice is per kilo gram, etc.,.

Cost centre: It is a unit or part of the organization. It may be a location, person or item of equipment or a group of these for which cost is ascertained and used for cost control. It is a convenient unit of the organization for which cost may be ascertained. For example, various departments of a business organization can be taken as cost centre.

1.4 OBJECTIVES AND ADVANTAGES OF COST ACCOUNTING

OBJECTIVES OF COST ACCOUNTING:

There is relationship between the main objective of a business organization and the objectives of Cost Accounting. Some important objectives of Cost Accounting are as follows:

- i. ***To ascertain cost:*** The main objective of Cost Accounting is to determine cost of a product, process, job or operation.
- ii. ***To classify cost:*** Cost is classified in many ways based on element, function, variability, etc. for cost analysis.
- iii. ***To control cost:*** Cost Accounting also focus on controlling cost by comparing actual costs with standard costs that has been set by the organisation.
- iv. ***To fix selling price:*** Cost Accounting guides the management in fixing the selling price of various products and services.
- v. ***To identify the causes of wastage:*** Cost Accounting identifies the causes of wastage and takes steps to control it.

- vi. ***To facilitate preparation of cost statements:*** Cost Accounting prepares cost statements to review cost and plan future activities.
- vii. ***To report to the management:*** Cost Accounting reports all the information relating to cost to the management for their decision making.
- viii. ***To study the efficiency:*** It evaluates the efficiency of different departments, products and branches.

ADVANTAGES OF COST ACCOUNTING:

If a business organization follows Cost Accounting, it will get many benefits. A few important benefits of Cost Accounting are as follows:

- i. ***Facilitates decision making:*** Cost Accounting gives relevant information on cost, such as material, labour, overhead, etc. for planning and decision making of the management
- ii. ***Improves efficiency:*** Cost Accounting helps in increasing the efficiency of the organization by setting standards and analysing variances.
- iii. ***Identifies unprofitable activities:*** Cost Accounting reveals the wastage and improper use of resources.
- iv. ***Helps in price fixation:*** Cost Accounting helps management in fixing the selling price of a product by giving detailed information on different cost of the product.
- v. ***Helps in budget preparation:*** Cost Accounting provides information for preparation of plan of action for a future period.
- vi. ***Facilitates cost control:*** Cost Accounting has many techniques like budgetary control and standard costing which are used for cost control.
- vii. ***Facilitates inventory control:*** Different inventory control techniques helps in exercising control over raw materials, work in progress and finished goods.
- viii. ***Benefits the society:*** A good costing system helps in providing quality goods at reasonable price which ultimately benefit the society.

1.5 DIFFERENCES BETWEEN COST ACCOUNTING AND FINANCIAL ACCOUNTING

Cost Accounting and Financial Accounting are the two branches of accounting. They have many similarities. Both are concerned with systematic recording and presentation of data by following the same principles of debit and credit. Both the branches of accounting are complementary to each other and helps in maximizing the profit.

However, there are some differences between Cost Accounting and Financial Accounting which are as follows:

<i>Point of distinction</i>	<i>Cost Accounting</i>	<i>Financial Accounting</i>
<i>Purpose</i>	Its main purpose is to analyse, ascertain and control cost.	Its main purpose is to record financial transactions and prepare the financial statements.
<i>Uses</i>	Cost Accounting data are required for internal use.	Financial Accounting data are required for external use.
<i>Frequency of reporting</i>	Cost Accounting information are provided at frequent intervals.	Financial Statements are prepared at the end of the accounting period.
<i>Interested parties</i>	Cost Accounting information serves the management.	Financial Accounting information serves the lenders, creditors, owners, employees, Government, society, etc.
<i>Actual and Standard</i>	Cost Accounting sets the standard and compare the actual data to find out the variance.	Financial Accounting only records the actual transactions.
<i>Monetary/Non monetary information</i>	It records both monetary and physical units.	It records only monetary transactions.
<i>Analysis of profit/loss</i>	It determines the cost, profit or loss on each product, job, department, etc.	It determines the profit and loss for the entire organisation.
<i>GAAP/flexibility</i>	Cost Accounting is not constrained by GAAPs. It is flexible and voluntary.	Financial Accounting is prepared according to Generally Accepted Accounting Principles.

1.6 CLASSIFICATION OF COST

- period costs, do not change during an accounting period. For example, salary of managers, depreciation of buildings, insurance, rent, etc.
- *Variable Cost*: It refers to the cost that varies directly with the volume of production. These are also known as direct costs. For example, raw material, direct labour, direct expense, variable overhead, etc.

- i. Semi Variable Cost:* It refers to the cost that is partly fixed and partly variable. These costs are partly affected by the volume of production. For example, depreciation on plant and machinery, electricity charges
- According to element:**
- *Material Cost:* It refers to the cost of materials used in production of goods and rendering services.
 - *Labour Cost:* It refers to the cost of wages, salaries, commission, bonus, etc of the employees.
 - *Expenses:* It refers to the expenditure other than material and labour.
- ii. According to Valiability:*
- *Fixed Cost:* It refers to the cost that remain unchanged with the change in volume of production. These costs, also known as, etc.
- iii. According to Functions:*
- *Production Cost:* It refers to the cost incurred in the production process. It is also called as manufacturing cost. It represents prime cost plus the production overhead.
 - *Administration Cost:* It refers to the cost incurred in general administration of the organization. These are in the nature of indirect expenses. For example, salaries of office staff, maintenance of office building, rent and depreciation of office building, printing & stationary, office supplies, telephone charges, etc.
 - *Selling Cost:* It refers to the cost incurred for sale of goods. It includes salesman salary, training of salesman, advertisement cost, etc.
 - *Distribution Cost:* It refers to the cost incurred on dispatch of finished goods to customers. It includes the packaging cost, salary of transport personnel, carriage outward, etc.

ELEMENTS OF COST:

The three elements of cost are explained below:

- i. Material:** It refers to all the commodities supplied to any entity. Materials can be sub divided into two categories, i.e., Direct Materials and Indirect Materials.
- **Direct Materials:** The materials that can easily be identified with finished goods and directly allocated to a particular product are called direct material. For example, wood in furniture, cloth in shirt, bricks for building, etc.
 - **Indirect Materials:** The materials which cannot be conveniently traced and allocated as part of the product is called indirect material. For example, consumable like spare parts, thread used in garments, etc.
- ii. Labour:** It refers to the workers employed by the entity for production and other works. Labour can be sub divided into direct labour and indirect labour.
- **Direct Labour:** The workers involved directly in the process of production are called direct labour. Direct labour is also called direct wages, productive labour, prime cost

- labour, process labour and operating labour. For example, carpenter for making furniture, weavers in weaving unit, etc.
- **Indirect Labour:** The workers that are indirectly involved in process of production are called indirect labour. For example, maintenance workers, store keepers, workers employed in payroll department or providing services.
- iii. **Expenses:** All expenses other than material and labour cost are termed as expenses. Expenses can further be classified as direct expenses and indirect expenses.
- **Direct Expenses:** The direct expenses other than direct material cost and direct labour cost are called direct expenses. These expenses are directly identifiable with the job or process or operation. For example, carriage inward, hiring charges of machine, tools, cost of special pattern, layout, etc.
 - **Indirect Expenses:** The indirect expenses other than indirect material and indirect labour are called indirect expenses. These expenses cannot be charged to the product directly. For example, power, depreciation, rent, canteen expenses, repair and maintenance, etc.

1.7 INSTALLATION OF COSTING SYSTEM

A single system of costing cannot suit all business. Therefore, whenever there is a need for costing, it is necessary to conduct research to assess the requirements of the business. The factors to be considered for installation of a costing system are as follows:

- i. **Nature of business:** The nature of business should be studied to select the proper method of costing.
- ii. **Objectives:** The expectations of the management and the objectives to be achieved by adopting the costing system should be identified.
- iii. **Organisation Structure:** The size and type of the organisation, scope of authority of each executive should be studied.
- iv. **Technical aspects:** Nature of the product, stages of production cycle, inventory control, labour control, etc. should be studied in detail.
- v. **Standardisation:** Various forms should be standardized as far as possible to reduce the clerical work.
- vi. **Economical:** The system should be economical to install and operate.
- vii. **Cost control areas:** The various areas where cost control is to be exercised should be identified.
- viii. **Communication:** There should be proper system of communication so as to maintain continuous flow of information to appropriate authorities.
- ix. **Reconciliation:** Arrangements should be made to reconcile the cost and financial profits.

1.8 ROLE OF COST ACCOUNTANT

Cost Accountants are specialists who determine the costs associated with the manufacturing of a product or providing a service. They help to plan, budget, set the standards and monitor the performance, find the variance and take necessary steps. Some of the key responsibilities of a Cost Accountant are as follows:

- i. **Data Collection:** Collecting data is required to determine the cost of the product or services. Cost accountant suggests the basis for classification of cost into direct and indirect cost.
- ii. **Cost Control:** Cost accountant does the cost comparison for controlling the cost of the product. Standard cost is determined and compared with the actual cost to find out the variances. The variances are analysed and suitable actions are taken.
- iii. **Decision Making:** Cost accountant analyses the cost and takes various decisions, such as make or buy decision.
- iv. **Estimation:** He/she makes estimate of new and proposed product cost.
- v. **Cost Reports:** Cost accountant prepares cost reports which are then analysed by the management and the strengths and weaknesses are identified.
- vi. **Inspections:** He/she conducts physical inventory inspections.
- vii. **Other Reports:** He/she provides management with reports specifying and comparing factors affecting prices and profitability of the product.

A. CHECK YOUR PROGRESS

1. What is Costing?
2. What is Cost Accounting?
3. Why do the business organisations need cost accounting?
4. What is variable cost?
5. What is direct material?
6. Define cost unit.
7. Give the classification of cost based on function.
8. Fill in the blanks:
 - i. Sugarcane in sugarcane industry is _____ material.
 - ii. The three main elements of cost are _____, _____ and _____.
 - iii. Cost Accounting provides data for managerial _____.
 - iv. Cost Accounting records both monetary and _____ units.

1.9 ELEMENTS OF TOTAL COST

The total cost of a product or a service has many components. A statement of cost usually has the following elements:

Prime Cost is the summation of all the direct cost. It is the total of direct material, direct labour and direct expenses. It is also called as direct cost or basic cost.

Factory Cost is the summation of prime cost and the factory overhead. Factory overhead include the indirect material used in factory such as oil or grease, indirect labour like the managers salary, and indirect factory expenses. Factory cost is also called as works cost, manufacturing cost or production cost.

We get cost of production by adding office and administrative overhead to the factory cost. Office and administrative overhead is the indirect material, indirect labour and indirect expenses used in office. For example, printing and stationary, office rent, staff salary, lighting, insurance, etc.

Total cost is the total of cost of production and selling and distribution overhead. The selling and distribution overhead include the indirect material, indirect labour and indirect expenses used in the selling and distribution. For example, packaging, salaries of salesman, advertisement expenses, etc.

Direct Material + Direct Labour + Direct Expenses = Prime Cost

Prime Cost + Factory Overheads = Factory Cost or Works Cost

Factory Cost + Office and Administrative Overhead = Cost of Production

Cost of Production + Selling and Distribution Overhead = Cost of Sales or Total Cost

1.10 COST SHEET

Cost sheet is statement of cost showing total cost as well as cost per unit for a particular period. It shows the components of total cost in a classified manner.

Proforma of Cost Sheet

Cost sheet of

For the period

Output units

	Total Cost	Cost per unit
Direct Material	xxx	xxx
Direct Labour	xxx	xxx
Direct Expenses	xxx	xxx
PRIME COST	xxx	xxx
Add: Factory Overhead	xxx	xxx

FACTORY COST/WORKS COST	xxx	xxx
Add: Administrative Overhead	xxx	xxx
COST OF PRODUCTION	xxx	xxx
Add: Selling and Distribution Overhead	xxx	xxx
TOTAL COST	xxx	xxx
Add: Profit	xxx	xxx
SALES	xxx	xxx

Illustration 1:

From the following information, prepare a cost sheet.

<i>Particulars</i>	<i>Amount (Rs.)</i>
Direct Material	10,50,000
Direct Expenses	50,000
Direct wages	2,50,000
Factory rent and taxes	24,000
Office rent	10,000
Showroom rent	20,000
Printing and stationery	5,000
Repair of factory plant	22,000
Maintenance of factory plant	23,000
Factory lighting	48,000
Office staff salary	24,000
Factory manager salary	13,000
Telephone charges	2,000
Legal expenses	5,000
Advertisement	12,000
Salesman salary	12,000

Plant depreciation	20,000
Director's remuneration	4,000
Distribution expenses	6,000
Profit: 15% on cost of sales	

Solution:

Cost Sheet for the month of ...

Particulars of Cost	Rs.	Rs.
Direct material	10,50,000	
Direct wages	2,50,000	
Direct expenses	50,000	
Prime Cost		13,50,000
<i>Factory overheads:</i>		
Factory rents and rates	24,000	
Repairs of factory plant	22,000	
Maintenance of factory plant	23,000	
Plant depreciation	20,000	
Factory lighting	48,000	
Factory manager's salary	13,000	1,50,000
Factory Cost		15,00,000
<i>Office and Administrative overheads:</i>		
Office staff salary	24,000	
Telephones charges	2,000	
Office rent	10,000	
Printing and stationery	5,000	
Legal charges	5,000	
Director's remuneration	4,000	50,000

Cost of Production		15,50,000
<i>Selling and Distribution Overhead:</i>		
Advertisement	12,000	
Salesman salary	12,000	
Showroom rent	20,000	
Distribution expenses	6,000	50,000
Total Cost (Cost of sales)		16,00,000
Profit (15% on cost of sales)		2,40,000
Sales		18,40,000

B. CHECK YOUR PROGRESS

1. Give three examples of factory overheads, indirect material, indirect expenses, office and administrative overhead.
2. How work in progress is adjusted in cost sheet?
3. How raw material consumed is calculated?
4. What is the difference between cost of production and cost of sales?
5. Choose the correct option:
 - i. Cost sheet is prepared:
 - a) at the end of the year
 - b) at the end of the production process
 - c) half yearly
 - d) quarterly
 - ii. Prime Cost of any product comprises of:
 - a) All indirect cost
 - b) All direct cost
 - c) All direct and indirect cost
 - d) Overheads
 - iii. If factory cost is Rs. 3,00,000, prime cost is Rs. 2,00,000, direct material is Rs. 1,50,000, the factory overhead is:
 - a) 50,000
 - b) 1,50,000
 - c) 100,000
 - d) 200,000
 - iv. Rent of building of manufacturing unit is:
 - a) Indirect expenses
 - b) Direct expenses
 - c) Selling expenses
 - d) Semi- variable cost
 - v. Which of the following is not a component of prime cost?
 - a) Direct material
 - b) Direct labour
 - c) Overheads
 - d) Direct expenses

TREATMENT OF STOCK IN COST SHEET:

There are three types of stock in a manufacturing organization namely stock of raw materials, stock of work in progress (W.I.P) and stock of finished goods.

Stock of Raw Materials, WIP and Finished Goods: If there is stock of raw materials then we calculate the cost of raw materials consumed by adding purchases with the opening stock of raw materials and deducting closing stock. Stock of work in progress refers to the partly finished goods. If work in progress is valued at prime cost basis, then it is adjusted before arriving at the prime cost. But if work in progress is valued at work cost basis, then it is adjusted before arriving at the works cost. In case of stock of finished goods, it is adjusted after cost of production to find the cost of goods sold.

Performa of Cost Sheet showing adjustment of Stock

Cost sheet of

For the period

	Total Cost	Cost per unit
Opening Stock of Raw Materials		
Add: Purchases		
Less Closing Stock of Raw Materials		
COST OF MATERIALS CONSUMED		
Direct Labour		
Direct Expenses		
PRIME COST		
Add: Factory Overhead		
Add: Opening W.I.P		
Less: Closing W.I.P		
FACTORY COST/WORKS COST		
Add: Administrative Overhead		
COST OF PRODUCTION		
Add: Opening Stock of Finished Goods		
Less: Closing Stock of Finished Goods		

COST OF PRODUCTION OF GOODS SOLD		
Add: Selling and Distribution Overhead		
TOTAL COST OF SALES		
Add: Profit		
SALES		

Illustration 2:

From the following information of manufacturing company for the month of January 2021, prepare Cost Sheet for showing the cost of goods produced.

Cost of raw materials as on 1.1.2021	7,500
Rs.	95,500
Raw materials purchased	2,000
Carriage on purchases	5,000
Chargeable expenses	40,000
Direct wages paid	15,000
Factory overheads	35,000
Cost of work in progress on 1.1.2021	15,000
Cost of raw materials on 31.1. 2021	25,000
Cost of work in progress on 31.1.2021	12,000
Office and administrative overhead	

Solution:

Cost Sheet
For the month of January 2021

	Rs.	Rs.
Cost of direct materials used:		
Opening stock of raw materials	7,500	
Add: Raw materials purchased	95,500	

Add: Carriage on purchases	<u>2,000</u>	97,500	
Less: Closing stock of raw materials		<u>15,000</u>	90,000
Direct Labour			40,000
Direct Expenses			<u>5,000</u>
	Prime Cost		135,000
Add: Factory Overhead			<u>15,000</u>
	Gross Works Cost		150,000
Add: Opening stock of work in progress			<u>35,000</u>
			185,000
Less: Closing stock of work in progress			<u>25,000</u>
	Works Cost		160,000
Add: Office and Administrative Overhead			<u>12,000</u>
	Cost of goods produced		172,000

SOME OTHER CONCEPTS OF COST:

Controllable costs: The cost that can be regulated or controlled are called controllable cost. Variable costs are generally controllable cost. But with time, all costs will be controllable by someone in the organization.

Uncontrollable costs: The cost that cannot be regulated or controlled are called uncontrollable cost. Fixed costs are generally uncontrollable cost.

Sunk cost: These are the historical costs that have been incurred due to a decision made in the past. These costs are irrecoverable and not relevant for decision making. For example, the costs incurred for plant and machinery.

Relevant Costs: The cost that are relevant in the decision-making process of the management are called relevant cost. Future variable costs are relevant in decision context.

Conversion cost: It is the total of direct labour, direct expenses and factory overheads.

Period cost: Fixed cost is referred to as period cost.

1.11 LET US SUM UP

Cost Accounting is a specialized branch of Accounting. This branch was developed by accountants for cost determination and cost control of goods produced or services rendered as financial accounting failed to provide detailed information of cost of various products and services. Cost Accounting involves recording of cost data, classifying all cost data, preparing cost data by using appropriate method, analysing cost data by using cost control technique and presenting relevant information for decision making.

Cost Accounting gives relevant information on material, labour, overhead, etc. for planning, controlling and decision making of the management. It helps in increasing the efficiency of the organization by setting standards and analysing variances. It reveals the wastage and improper use of resources. It also helps management in fixing the selling price of a product or service by giving detailed information on different costs. Cost Accounting provides information for preparation of plan of action for a future period. Many techniques like budgetary control and standard costing are used for cost control. Different inventory control techniques helps in exercising control over raw materials, work in progress and finished goods. A good costing system helps in providing quality goods at reasonable price which ultimately benefits the society.

The factors to be considered for installation of a costing system are the nature of business, the objectives to be achieved, the size and type of the organization, nature of the product, stages of production cycle, inventory control, labour control, etc. The system should be economical to install and operate. There should be proper system of communication so as to maintain continuous flow of information to appropriate authorities.

Cost accountants are specialist who determine the cost associated with the manufacturing of a product or providing a service. They help to plan, budget, set the standards and monitor the performance, find the variance and take necessary steps. Cost accountant analyses the cost and take various decisions, such as make or buy decision. Cost accountant prepares cost reports which are then analysed by the management and the strengths and weaknesses are identified.

Cost sheet is statement of cost showing total cost as well as cost per unit for a particular period. It shows the components of total cost in a classified manner.

1.12 KEY WORDS

Cost: It refers to the expenditure incurred in producing a product or rendering a service.

Costing: It is the technique and process of ascertaining costs.

Cost Accounting: It is the process of accounting for costs including cost ascertainment, cost planning, cost control and decision making.

Cost unit: Cost unit is a unit or quantity of product, service or time in terms of which cost is expressed.

Cost centre: It may be a location, person or item of equipment or a group of these for which cost is ascertained and used for cost control.

Direct Material:The materials that can easily be identified with finished goods and directly allocated to a particular product are called direct material.

Indirect Material:The materials which cannot be conveniently traced and allocated as part of the product is called indirect material.

Direct Labour: The workers involved directly in the process of production are called direct labour.

Indirect Labour:The workers that are indirectly involved in process of production are called indirect labour.

Direct Expenses: The expenses other than direct material cost and direct labour cost are called direct expenses. These expenses are directly identifiable with the job or process or operation.

Indirect Expenses:The indirect expenses other than indirect material and indirect labour are called indirect expenses. These expenses cannot be charged to the product directly.

1.12 SOME USEFUL BOOKS

1. Charles T. Horngreen, Srikant M. Datar, Madhav V. Rajan, *Cost Accounting: A Managerial Emphasis*, Pearson Education.
2. JawaharLal, *Cost Accounting*. McGraw Hill Education
3. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. PHI Learning
4. Rajiv Goel, *Cost Accounting*. International Book House
5. Singh, Surender. *Cost Accounting*, Scholar Tech Press, New Delhi
6. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers
7. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi
8. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. ShriMahavir Book Depot, New Delhi
9. Iyengar, S.P. *Cost accounting*. Sultan Chand & Sons
10. H.V. Jhamb, *Fundamentals of Cost Accounting*, Ane Books Pvt. Ltd.

1.14 ANSWERS TO CHECK YOUR PROGRESS

- A. 7.** i. Direct; ii. Material, labour, expenses; iii. Decision making; iv. Physical.
B. 5. i. b; ii. b; iii. c; iv. a; v. c

1.15 TERMINAL QUESTIONS/EXERCISES

1. "There are various bases according to which costs are classified." Explain the statement.
2. What is Cost Accounting? Discuss the advantages of Cost Accounting to the management.
3. What are the objectives of Cost Accounting?
4. State the differences between Cost Accounting and Financial Accounting.
5. Explain the components of total cost.

Exercises

1. Calculate the prime cost from the following data

Materials consumed	12,000
Direct Expenses	100
Works Cost	15,600
Factory Overheads	75% of direct labour

(Prime cost = 14,100)

2. From the particulars of a manufacturing unit prepare a statement showing the following:
 - i. Cost of materials consumed
 - ii. Works cost
 - iii. Cost of production
 - iv. Percentage of works overhead to productive wages
 - v. Percentage of general overhead to works cost.

Stock of materials on 1.1.20	40,000
Purchase of raw material in January, 2020	11,00,000
Stock of finished goods on 1.1.2020	50,000
Productive wages	5,00,000
Finished goods sold	24,00,000
Works overhead charges	1,50,000
Office and general expenses	1,00,000
Stock of materials on 31.1.2020	1,40,000
Stock of finished goods on 31.1.2020	60,000

(i. 10,00,000, ii. 16,50,000, iii. 17,50,000, iv. 30%, v. 6.06%)

3. From the following calculate the Works Cost:

Materials Consumed	3,30,000
Direct wages	1,70,000
Direct Expenses	25,000
Factory Overheads are 50% of direct wages	
Opening work in progress	40,000
Closing work in progress	50,000

Ans. (Rs. 6,00,000)

B. COM

SEMESTER IV

COURSE: COST ACCOUNTING

UNIT –2 MATERIAL COST MANAGEMENT - I

STRUCTURE

2.0 Objectives

2.1 Introduction

2.2 Materials

2.3 Material control

2.4 Accounting and control of purchases

2.5 Material/Inventory control techniques

2.6 Let Us Sum Up

2.7 Key Words

2.8 Some Useful Books

2.9 Answers to Check your Progress

2.10 Terminal Questions/Exercises

2.0 OBJECTIVES

After going through this unit, you should be able to:

- understand the concept of material and material cost
- state the objectives of material control
- describe the process of material purchase
- understand the techniques of material/inventory control

2.1 INTRODUCTION

In any industry, material cost constitutes a big portion of the cost of a product. As huge investments are made for materials, therefore there is need for proper planning and control. It is

essential to have proper accounting for materials. Material control is a management activity that administers how the inventory employed in the production process is procured, handled and utilized. The very purpose of material control is to ensure smooth and uninterrupted flow of production. The purchase department has to follow a structured process for purchasing the materials. Proper control should be exercised on materials to avoid wastages. In this unit, we shall be discussing about the concept of material cost, material purchase and inventory control techniques.

2.2 MATERIALS

Material: It is the physical commodity that is consumed in the process of production. Materials which are consumed in any manufacturing process may be classified into two categories: Direct material and Indirect material.

Material cost is treated as direct if the material:

- can be easily identified with a specific unit.
- varies directly with the volume of production.
- becomes the part of the finished product.

The direct materials are the basic raw materials like cloth in garments, timber in furniture and milk in ice cream, etc. Primary packing material are also taken as direct materials, such as bottles for water or any liquid. Direct material cost forms a part of prime cost.

Indirect materials have no relationship with the output and they cannot be easily identified with the finished product. For example, stores used for maintaining machines such as lubricant oil, cotton, consumable stores etc. It is a part of overhead cost.

2.3 MATERIAL CONTROL

Cost of material constitutes major portion of the cost of production. Therefore, proper planning and control of material cost is required. Purchase of material, its storage and issue are the key areas where proper control should be exercised. Material control is also called as 'Inventory Control' or 'Stores Control'.

OBJECTIVES OF MATERIAL CONTROL:

- i. *Avoid understocking and overstocking:*** By determining the stock level for the materials we can avoid the cost and burden of understocking and overstocking.
- ii. *Ensure uninterrupted production:*** Material control helps in smooth production by ensuring the availability of required materials at the right time and at right quantity.
- iii. *Efficient purchasing:*** Material control leads to purchase of right quantity of goods at the right price and from the right source.
- iv. *Minimum wastage:*** Through material control, wastage can be avoided which are due to poor storage facility, fire, theft, evaporation, etc.

2.4 ACCOUNTING AND CONTROL OF PURCHASES

According to Walter “Scientific purchasing is the procurement by purchase of proper materials, machinery, equipment and supplies or stores used in the manufacture of a product, adopted to marketing in the proper quantity, at the proper time and at the lowest price consistent with the quality desired.”

The purchase of materials should be backed by right quality, right quantity, right time, right price, right source of supply and right place of taking delivery. Quality should be expressed in terms of standard specifications and it should be suitable for the purpose for which they have been purchased. The ordering quantity is based on three types of cost: purchase cost, ordering cost and carrying cost. The ordering quantity that minimizes the ordering cost and carrying cost is considered as the right quantity. To order the material at the right time, the store keeper must initiate the purchase requisition when the stock reaches the re-order level. The price of the materials should be determined with respect to the quality, quantity, delivery time, after sales services, etc. The supplier should be able to deliver the right quality and quantity of materials at the right time and fair price.

The function of purchasing can be centralized or decentralized. Under centralized system, the purchases are done from one central point and then they are issued to the various departments as and when required. It brings about higher trade discounts and facilitates effective control over purchases. Under decentralized purchasing the materials are purchased by each department on their own. It is also called as localized purchasing. This method is very flexible and is best suited for emergency purchases.

The steps in scientific purchase are:

- i. **Receiving purchase requisitions:** Purchase requisition is a formal request given to the purchase department to purchase the materials. Purchase requisition is also called ‘indent for materials’. Purchase requisition is prepared in triplicate for three departments.
 - The original copy is sent to the purchase department.
 - Duplicate is sent to the Production and control Department.
 - Triplicate copy remains with the department that initiates purchase.

The purchase requisition contains the requisition number, date, description, code number, quantity of materials required and signature of three persons, i.e., the person initiating the requisition, the person checking it and the approving authority.

The *Specimen of purchase requisition* is given below:

ABC Pvt. Ltd.	
Purchase Requisition	
No.	Date:

Date by which materials are required:				
Sl. No.	Description	Stores Code No.	Quantity Required	Remarks
Requisitioned by..... By.....		Checked By.....		Approved
For Purchase Department reference				
Supplier..... Officer			Purchase	
Date of Delivery				

ii. **Selecting the supplier:** After the purchase requisition is received, the purchase department invites quotations from the suppliers. The following types of tenders are invited from the suppliers:

- **Open Tender:** In this case, tenders are invited through advertisement in journals, newspapers, etc.
- **Limited Tender:** in this case, tenders are invited from limited number of firms on the basis of goodwill or performance of the organizations.
- **Single Tender:** In single tender only one firm is selected.

The tenders are received and the particulars are summarized and tabulated in a comparative statement.

The *specimen of comparative statement* of quotation is as follows:

ABC Pvt. Ltd.	
Comparative Statement of Quotations	
Tender No....	
Date....	
Name of the material.....	

Sl No.	Name of the Supplier	Quantity	Rate	Terms of Delivery	Time of delivery	Remarks

Price of material, quality and quantity of material, trade discount, credit facility, transportation cost, etc. are some of the factors that needs to be considered before selecting the right supplier.

iii. **Placing the purchase order:** After selecting the supplier, the purchase department prepares purchase order. Purchase order is usually prepared in five copies for the following purposes:

- For the supplier
- For the receiving department
- For the accounting department
- For the initiating department
- Retained in the purchase department

The *Specimen of purchase order* is given below:

ABC Pvt. Ltd Purchase Order							
To Supplier's Name..... Address..... Dear Sir, Your quotation bearing No.... dated.... Has been accepted. Please supply the following materials as per the instructions mentioned herein:						Order No. Date.....	
Sl No.	Description	Quantity	Code No.	Price Rs.	Total Rs.	Delivery date	Remarks
Packing and dispatching instructions..... Terms of Payment..... Place of Delivery..... Discount Allowed..... Freight.....							
							For ABC Pvt Ltd.

Purchase Manager

- iv. **Follow-up of purchase order:** In order to ensure delivery of goods within schedule time, follow up with the supplier is necessary. Any delay must be communicated to the supplier immediately.
- v. **Receiving and inspecting materials:** The inspection department or the storekeeper checks the quality of the goods received. The receiving department checks the copy of the delivery challan and purchase order and then prepares the 'goods received note'. Goods received note is prepared in five copies for:

- Receiving Department
- Purchase Department
- The department initiating the purchase requisition
- Stores Department
- Accounts Department

The *specimen of goods received note* is as follows:

ABC Pvt. Ltd Goods Received Note						
Supplier's Name.....					G.R.	
Code....					Date...	
Purchase Order No.....					Date...	
Item No.	Description	Code	Quantity Ordered	Quantity Received	Amount	Remarks
Received by.....					Inspected	
by.....						
Storekeeper....						
Store Ledger Folio.....						

- vi. **Checking and passing invoices for payment:** The purchase department checks the invoice with reference to the purchase order and goods received note. If everything is found in order then invoice is passed to the accounts department for payment.

CHECK YOUR PROGRESS:

1. What are the objectives of material control?
2. What is limited tender?
3. What is scientific purchasing?

4. Give the specimen of purchase requisition.
5. Choose the correct option:
 - i. Purchase order is prepared by:

a) Storekeeper	c) Purchase Department
b) Plant engineer	d) Production Manager
 - ii. Purchase order is usually prepared in ____ copies.

a) 2	c) 7
b) 5	d) 10
 - iii. Tender is an:

a) estimation of profit	c) estimation of selling price
b) estimation of cost	d) estimation of units

2.5 MATERIALS/INVENTORY CONTROL TECHNIQUES

Materials/Inventories comprise of:

- i) Stock of raw materials
- ii) Stock of work-in-progress
- iii) Stock of finished goods
- iv) Stock of stores and spares

Raw materials are the inventory items that a business organization uses to produce finished goods. Typically, raw materials are commodities such as grain, petroleum, paint, steel, wood, paper, etc. Work in progress are the unfinished goods. It refers to the items that have crossed the stage of raw materials but is not yet a finished product. Finished goods are the items that are ready for sale. Stores and spares refers to the consumables, maintenance and repair supplies.

Inventory control involves proper planning, organising and controlling the purchase, storage and usage of materials. It ensures the availability of good quality and quantity of materials at the required time and at minimum cost.

The various techniques of inventory control are as follows:

- i) Fixation of Stock Levels
- ii) Economic Order Quantity
- iii) Effective Purchase Procedure
- iv) Stock Verification
- v) Control Ratios
- vi) Selective Control Techniques (ABC analysis, VED analysis, etc.)

(i) Fixation of Stock Levels:

- a) **Reorder Level:** It is the point at which the storekeeper should initiate the purchase requisition. Reorder level is higher than minimum level and the difference between

the minimum level and the reorder level meet the production requirement during the delivery period.

Reorder Level = Maximum Consumption x Maximum Reorder period

or

Reorder Level = Minimum Level + Consumption during the time required to get fresh delivery

b) **Maximum Level:** It is the level beyond which stock is normally not kept. It leads to overstocking if the stock rises above the maximum level.

Maximum Level = Reorder Level + Reorder Quantity – (Minimum rate of Consumption x Minimum Reorder Period)

The main objectives of fixing maximum level are to avoid overstocking, to control unnecessary investment in stock and to use working capital in a proper way. Some of the factors that are taken into consideration before fixing the maximum level are rate of consumption, lead time, availability of storage space, cost of maintaining stores, economic order quantity, etc.

c) **Minimum Level:** It is the minimum quantity of inventory that should always be maintained in the business organization. Beyond minimum level, the stock should not fall as this will lead to disruption in the flow of production. It is also called as buffer stock.

Minimum Level = Reorder Level – (Normal Rate of Consumption x Normal Delivery Period)

Some of the factors that are considered before fixing minimum stock level are average rate of consumption, lead time, etc.

d) **Danger level:** Normally stock should not fall below the minimum level. Danger level is the level below the minimum level. In such case immediate actions are needed to replenish the stock.

e) **Average Level:** It is the average quantity of stock held by any organization during a particular period of time. It is the average of maximum and minimum level of stock. It is above minimum level and below maximum level.

Average Level = (Maximum Stock level + Minimum Stock Level)/2

(ii) ECONOMIC ORDER QUANTITY

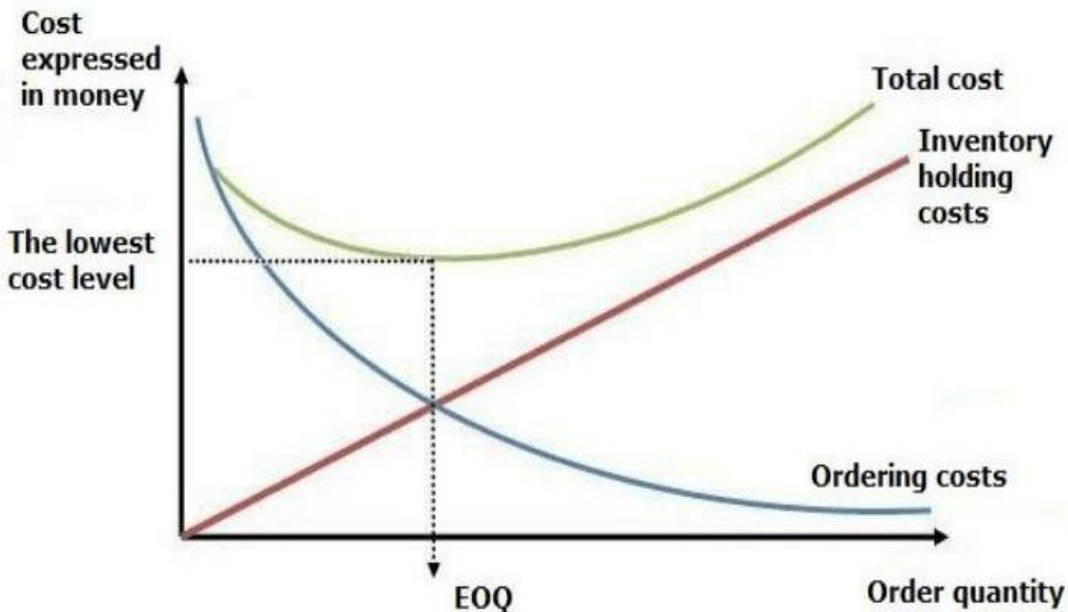
Economic Order Quantity is the size of order that gives maximum economy in purchasing the material and storing it. The following factors are considered in determining EOQ:

- Cost of material
- Inventory Carrying Cost

- Ordering Cost

Carrying Cost: It refers to the cost of holding the stock. It includes the cost of storage facilities, salaries and wages of stores department, insurance, losses in stores, etc.

Ordering Cost: It refers to the cost that is incurred every time an order is placed. It includes the salary of employees of the purchase department, office expenses, administrative expenses, etc.



In the above figure we can see that carrying cost varies directly with the size of the order whereas the ordering cost varies inversely with the size of the order. The total cost represents the summation of both carrying cost and ordering cost of inventories. The total inventory cost has a minimum point and this point is the EOQ. EOQ is the optimum order that minimizes the total costs of inventory management.

Mathematical Formula for EOQ:

$$EOQ = \sqrt{\frac{2AO}{c}}$$

Here, A = Annual Consumption in unit

O = Ordering Cost per order

C = Carrying Cost per unit

Illustration 1:

Calculate EOQ from the following information:

Consumption of material per annum 10,000 kg

Cost of placing order Rs. 50 and cost per Kg of raw material is Rs. 2.
Storage cost is 8% on average inventory.

Solution:

$$EOQ = \sqrt{\frac{2AO}{c}}$$

A = Annual Consumption in unit = 10,000 units

O = Ordering Cost per order = Rs. 50

C = Carrying Cost per unit = 2 x 8%

$$EOQ = \sqrt{\frac{2 \times 10,000 \times 50}{2 \times 8\%}}$$

$$= 2500 \text{ kg}$$

Illustration 2 :

A small manufacturing firm provides the following information in respect of materials.

Cost per unit = Rs. 50

Rate of Consumption

Average: 15 units per day

Maximum: 20 units per day

Annual: 5,000 units

Ordering cost: 20 per order

Carrying cost: 10% of the unit price per annum

Re-order period: 5 to 15 days

Calculate: a) Re-order Level b) Minimum Level c) Maximum Level

Solution:

a) Reorder Level = Maximum Consumption x Maximum Reorder period
= 20 units x 15 days = 300 units

b) Minimum Level = Reorder Level – (Normal Rate of Consumption x Normal Delivery Period)
= 300 – (15 units x 10 days) = 150 units

c) Maximum Level = Reorder Level + Reorder Quantity – (Minimum rate of Consumption x Minimum Reorder Period)
= 300 + 200* - (10 x 5) = 450 units

*Reorder Quantity = $\sqrt{(2 \times 5,000 \times 20) \div (50 \times 10\%)} = 200 \text{ unit.}$

(iii) **Effective Purchase Procedure :**

It is one of the inventory control techniques. The purchase manager must develop an effective purchase procedure for smooth flow of production. The purchase procedure must vary from

industry to industry. The size of the organization, type of raw materials used, the type of finished product, source of supply, terms and condition of purchase are some of the factors that influence the purchase procedure.

(iv) **Stock Verification**

At times, the physical balance of stock does not tally with the book balance. For this reason, the stock verification is needed. The physical balances are determined by stock taking and the book balance are determined from the bin card or the stores ledger. The recorded stock and the actual stock are checked to find the discrepancies. Then proper investigation is done to find the cause of such discrepancies and subsequently corrective measures are taken to curb it.

As regards to inventory system, **Perpetual Inventory System** is widely used. It is also called continuous recording system as a continuous record of receipt and issue of materials is maintained by stores department. Here, all the receipts and issue of materials are recorded simultaneously in Bin Cards and Stores Ledger. Perpetual Inventory System shows the stock in hand in quantity or value or both at any time without physical stock verification.

Physical Stock Verification: The process of physically counting and weighing the stock is referred to as physical stock taking. There can be two ways of physical stock taking, i.e., periodic stock taking and continuous stock taking. Under periodic stock taking, the physical counting of inventory is made at the end of the accounting year. Under continuous stock taking, the verification of stock is done on regular and continuous basis. When perpetual inventory system is supported by continuous physical verification, strict control over materials can be exercised.

The reasons of discrepancy between stock as per record and actual stock position are as follows:

- **Errors:** Errors refers to the wrong balancing, wrong posting, omission of any issue or receipt. This can be rectified by passing the necessary entry in the books.
- **Normal Losses:** This refers to the losses due to unavoidable reasons like evaporation, shrinkage, deterioration in quality due to lapse of time, etc. Normal loss is adjusted by debiting Store Adjustment A/c and crediting Store Ledger Control A/c.
- **Abnormal Losses:** These are the avoidable losses that arises due to strike, lockout, theft, mishandling of inventory, etc. Abnormal loss is adjusted by debiting the Costing profit and loss A/c and crediting the stores ledger A/c.

(v) **Inventory Control Ratios**

The various ratios to exercise inventory control are as follows:

- i. **Material Turnover Ratio:** It is ratio of the cost of materials consumed during a period to the average cost of inventory during the period. This is expressed in terms of times. Material turnover ratio indicates how many times the investment in average stock has been turned over during the period. Material turnover ratio is also known as stock turnover ratio and inventory turnover ratio.

$$\text{Material Turnover Ratio} = \frac{\text{Cost of materials consumed during the period}}{\text{Average stock of materials held during the period}}$$

$$\text{Average Stock} = (\text{Opening Stock} + \text{Closing Stock})/2$$

Material turnover ratio can be expressed in terms of days. It shows the number of days it takes for the firm to transfer inventories to finished goods. The formula is as follows:

$$\frac{\text{Days during the period}}{\text{Material turnover ratio}}$$

- ii. **Productivity Ratio:** It is the ratio of output to input. Higher productivity ratio is an indicator of material cost control. Managers regularly use productivity ratio to measure efficiency and evaluate their business model.

$$\text{Productivity ratio} = \frac{\text{Output}}{\text{Input}}$$

(vi) Selective Control Techniques

ABC Analysis: It is a part of material management which categorises inventory according to three distinct category. The aim of ABC analysis is to determine the level of control and frequency of review of the items. ABC is based on Pareto Principle which states that vast majority of the result is determined by small percentage of a group.

According to this method of inventory control, inventory is classified into three classes, i.e., A, B and C. Items of high value but small in quantity are classified as “A”, items of moderate value and moderate size are classified as “B” and items of small value and large size are classified as “C”. Category A items requires continuous and strict control, category B requires moderate control and category C periodic verification or annual review.

VED Analysis: It is an inventory management technique that categorizes the inventory on three heads: vital, essential and desirable. ‘Vital’ includes the inventory that are necessary for production in an organization. Here, continuous checking and replenishment happens for this stock. ‘Essential’ category refers to the inventory that is next to vital. ‘Desirable’ category of inventory is least important among three and its unavailability may result in minor stoppage in production.

JIT System of Purchasing: Just in time purchase means purchasing of materials just before their use. In this system, the carrying cost and material handling cost are reduced.

A. Check your progress:

1. Explain the ABC method of inventory control technique.
2. What is carrying cost?
3. What is reorder level?
4. What is buffer stock?
5. Explain perpetual inventory system.
6. Choose the correct option:

- i. In order to avoid stoppage of production due to shortage of material:
 - a) minimum stock level is maintained c) reorder level is maintained
 - b) maximum stock level is maintained d) average stock level is maintained.
- ii. Which is not a type of inventory:
 - a) Work in progress c) Raw materials
 - b) Finished goods d) Plant and machinery
- iii. Which among the following cost is the expense of storing inventory for a specified period of time?
 - a) Purchasing cost c) Financial cost
 - b) Carrying cost d) Ordering cost

2.6 LET US SUMUP

The term 'materials' refers to all commodities purchased by a business organisation for manufacturing of a product or rendering a service. For costing purposes, materials can be classified into direct materials and indirect materials. Direct material cost is taken for calculation of prime cost whereas indirect material cost is treated as part of production overhead. It helps in exercising proper control over material cost.

Material control involves proper planning, organising and controlling the purchase, storage and usage of materials. It helps to achieve the objective of efficiency and avoiding wastages.

Scientific purchasing of materials involves the procurement of proper materials, and supplies or stores used in the manufacture of a product or rendering of a service. It helps in ensuring the flow of materials in the proper quantity, at the proper time and at the lowest price consistent with the quality desired.

The various techniques of inventory control are as follows: Fixation of Stock Levels; Economic Order Quantity; Effective Purchase Procedure; Stock Verification; Control Ratios and Selective Control Techniques (ABC analysis, VED analysis, etc.)

2.7 KEY WORDS

Bill of material: It is a document stating the detailed list of materials that are required for manufacturing a product or for a job or process.

Lead time: It is the time required to receive materials from point of placing order.

Carrying Cost: It refers to the cost of holding the stock.

Ordering Cost: It refers to the cost that is incurred every time an order is placed.

Material Turnover Ratio: It is ratio of the cost of materials consumed during a period to the average cost of inventory during the period.

2.8 SOME USEFUL BOOKS

1. Charles T. Horngreen, Srikant M. Datar, Madhav V. Rajan, *Cost Accounting: A Managerial Emphasis*, Pearson Education
2. JawaharLal, *Cost Accounting*. McGraw Hill Education
3. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. PHI Learning
4. Rajiv Goel, *Cost Accounting*. International Book House
5. Singh, Surender. *Cost Accounting*, Scholar Tech Press, New Delhi
6. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers
7. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi
8. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. Shri Mahavir Book Depot, New Delhi
9. Iyengar, S.P. *Cost accounting*. Sultan Chand & Sons
10. H.V. Jhamb, *Fundamentals of Cost Accounting*, Ane Books Pvt. Ltd.

2.9 ANSWERS TO CHECK YOUR PROGRESS

- A. 5. i. c, ii. b, iii. b**
B. 6. i. a, ii. d, iii. b

2.10 TERMINAL QUESTIONS/EXERCISES

1. What are the steps involved in purchase procedure?
2. What is purchase order? Give its specimen.
3. State the various inventory control techniques.
4. From the following information calculate the
 - a) Re-order level
 - b) Minimum Stock level
 - c) Maximum Stock level
 - d) Average Stock level

Minimum Consumption = 300 units per day
 Maximum Consumption = 500 units per day
 Normal Consumption = 400 units per day
 Re-order Quantity = 4,500 units
 Re-order period = 10-15 days
 Normal re-order period = 12 days
 (a. 7,500 units, b. 2,700 units, c. 9,000 units, d. 5,850 units)
5. Calculate EOQ from the following information:

Annual demand = 600 units
 Carrying cost = 20% of unit price
 Cost per unit = Rs. 3
 Ordering cost per order = Rs. 80
 (400 units)

6. A publishing house purchases 2,000 units of a particular item per year at a unit cost of Rs. 20, the ordering cost per order is Rs. 50 and the inventory carrying cost is 25%. Find the Economic Order Quantity.
(200 units)

B.COM

(SEMESTER) IV

COURSE: COST ACCOUNTING

UNIT –3 MATERIAL COST MANAGEMENT - II

STRUCTURE

- 3.0 Objectives**
- 3.1 Introduction**
- 3.2 Storage of Materials**
- 3.3 Pricing the Issue of Materials**
- 3.4 Cost Price Methods**
- 3.5 Average Price Methods**
- 3.6 Market Price Methods**
- 3.7 Standard Price Method**
- 3.8 Treatment of material losses**
- 3.9 Let Us Sum Up**
- 3.10 Key Words**
- 3.11 Some Useful Books**
- 3.12 Answers to Check your Progress**
- 3.13 Terminal Questions/Exercises**

3.0 OBJECTIVES

After going through this unit, you should be able to:

- understand the importance of storage of materials
- describe various stores records
- understand the need for ascertaining the cost of issue and closing stock
- explain different methods of pricing the issue of materials
- describe the treatments of material losses.

3.1 INTRODUCTION

The business organisations need to ensure uninterrupted supply of materials to the production and service departments. Proper storage of materials is essential to avoid pilferage, theft and deterioration. Materials are regularly issued to the production and other departments. It is also required to find out the price of the materials issued. Various methods are followed for this

purpose such as LIFO, FIFO, weighted average, simple average, base stock method, etc. The methods to be used in the organization depends on its own circumstances. The various classification of material losses and its accounting treatment is also discussed in this unit.

3.2 STORAGE OF MATERIALS

Storage of materials refers to the act of storing materials for their safe custody till these are issued to the production and other departments. It involves receiving, storing and issuing of materials. Store is the place where materials are kept. A store keeper maintains various store records for materials management.

Store Records:

Some of the important store records that are kept for different transactions of material are as follows:

- **Bin Card:**

After inspection, materials are stored in different bins. For each bin, a card is maintained where the quantity of receipts, issues and balances are recorded by the storekeeper. This card is called as Bin Card. Separate Bin Card is maintained for each type of material. It is maintained by store keeper.

The *specimen of bin card* is as follows:

ABC Pvt. Ltd. Bin Card								
Code No....			Bin No...			Maximum Stock		
Name of Material....								
Level...						Minimum Stock		
Storekeeper....						Reorder Stock		
Level...								
Stores Ledger Folio No...								
Level.....								
Date	Receipts		Issues		Balance	Audit		
	G.R.No.*	Quantity	S.R.No.*	Quantity	Quantity	Date	Remarks	Initial

*G.R. No is the Goods Received Note number and S.R.No. is the Stores Requisition Note number.

Bin card is an important stores record. It helps to keep the stock within the required level and thereby controls the investment in materials. It also guides the storekeeper to issue purchase requisition when the material reaches the reorder level. Bin card shows up-to-date information on the receipts, issues and balances.

- **Stores Ledger:**

Stores Ledger is maintained by the Cost Accounting Department. It is opened for each item of material to record both the quantity and cost of the materials received, issued, returned and in hand. It is usually in loose leaf card and it is maintained to ensure correct stores accounting.

The *specimen of stores ledger* is as follows:

ABC Pvt. Ltd. Stores Ledger											
Code No....											
Name of Material....				Maximum Stock Level...							
Location....				Minimum Stock Level...							
Bin Card No...				Reorder Stock Level.....							
Date	Receipts				Issue				Balance		
	G.R. No.	Quantity	Rate	Amount	S.R.No	Quantity	Rate	Amount	Quantity	Rate	Amount

Checked By....

Storekeeper.....

- **Stores Requisition Note:**

All issue of material is done on the presentation of the Stores Requisition Note. It is a document authorizing the storekeeper to issue the materials.

The *specimen of Stores Requisition Note* is as follows:

ABC Pvt. Ltd Stores Requisition Note	
Job No.	No.....
Department....	Date....

To Storekeeper Please issue the material stated below:					
Description	Code	Quantity	For Cost Office		Remarks
			Rate	Amount	
Bin Card No..Authorised By... Issued By... Received By.... Priced by... Stores Ledger Folio No..					

- **Bill of Material:**

Bill of material is a document stating the detail list of materials that are required for manufacturing a product or for a job or process. When a copy of bill of material is received by the Purchase Department, steps are taken for collection of quotation, selection of supplier and placing of purchase order.

A *specimen of bill of material* is given below:

ABC Pvt. Ltd. Bill of Materials						
Job Order No.....			No..... Date.....			
Item No.	Description	Code No.	Quantity		Accounts Office	
			Required	Issued	Rate	Amount
Prepared by (Drawing Officer)		Purchase Deptt ref: Order Date.....			Stock verified by.....	
Checked by..... Storekeeper.....		Delivery Date...				

- **Material Transfer Note:**

When the materials or equipment are transferred from one sub store to another sub store or from one production section to another or from one job to another, the document called Material Transfer Note is prepared.

A *specimen of material transfer note* is given below:

ABC Pvt. Ltd. Material Transfer Note				
From:				
Job No.....		No...		
Deptt.....				
Date....				
To:				
Job No.....				
No...				
Deptt.....				
Date....				
Reasons of transfer.....				
Description	Code No.	Quantity	For Accounts Office	
			Unit Price	Value
Authorised by.....		Issued by.....		Received
by.....				

B. CHECK YOUR PROGRESS:

1. Why we need store records?
 2. What is stores ledger?
 3. What is material transfer note?
 4. Explain bill of material.
 5. Choose the correct option:
- iv. Which of the following is not a store record?
- | | |
|---------------------------|---------------------|
| a) Bin Card | c) Bill of Material |
| b) Material Transfer Note | d) Cost Sheet |
- v. Stores Ledger is maintained in:
- | | |
|-------------------------------|-------------------------|
| a) Store Department | c) Accounts Department |
| b) Cost Accounting department | d) Personnel department |
- vi. Bin Card is maintained by
- | | |
|----------------------|------------------------|
| a) Stores Department | c) Accounts Department |
|----------------------|------------------------|

Advantages of FIFO method are:

- i. It is simple to understand and easy to operate.
- ii. Closing stock value represents the current market price.
- iii. This method is suitable when prices are falling as the cost of goods sold will be higher and the closing stock will be lower.
- iv. Material cost shows the actual cost which is charged to the product. So profit or loss doesn't arise here.
- v. Under FIFO method possibility of obsolescence is avoided.

Disadvantages of FIFO method are:

- i. In case of fluctuating prices, this method leads to complex calculations and clerical errors.
- ii. When the prices rise, this method will give low charge to production which will further lead to higher profit and higher tax liability.
- iii. When price change frequently the material charged to different jobs will be different and comparison will be difficult.

Illustration 1:

The following transactions occurred in purchase and issue of a material in an organization during January 2021.

Receipts

Dated	Quantity	Rate per unit
04.01.21	200 units	Rs. 24
10.01.21	150 units	Rs. 23
18.01.21	100 units	Rs. 24
22.01.21	100 units	Rs. 23

Issued

Dated	Quantity
05.01.21	250 units
12.01.21	200 units
25.01.21	250 units

The stock on 1.1.21 was 200 units at the rate of Rs. 25 per unit. Prepare Stores Ledger Account by adopting FIFO method of charging material issued. What is the value of closing stock as on 31.01.21?

Solution:

Stores Ledger Account Under FIFO method

Name:
Code No.

Maximum Level:
Minimum Level:

Ordering Level:
Re-order Quantity:

Date	Receipts				Issue				Balance		
	G.R. N No	Qty	Rate Rs.	Amount Rs.	Requisition slip No.	Qty	Rate Rs.	Amount Rs.	Qty	Rate Rs.	Amount Rs.
Jan 1	Bal.	200	25	5,000	-	-	-	-	200	25	5,000
Jan 4	b/f	200	24	4,800	-	-	-	-	400	25	5,000
									200	24	4,800
Jan 5		-	-	-		200	25	5,000	200		
						50	24	1,200		24	3,600
Jan 10		150	23	3,450	-	-	-	-	150	24	3,600
									300	23	3,450
Jan 12		-	-	-		150	24	3,600	150		
						50	23	1,150		23	2,300
Jan 18		100	24	2,400	-	-	-	-	150	23	2,300
										24	2,400
Jan 22		100	23	2,300	-	-	-	-	100	23	2,300
									200	24	2,400
									100	23	2,300
Jan 25		-	-	-		100	23	2,300	100		
						100	24	2,400	300		
						50	23	1,150	100	23	1,150
									100		
									100		

									50		
		750		17,950		700		16,800	50		1,150

Value of closing stock as on 31.01.21 was Rs. 1,150.

- **Last In First Out (LIFO)**

Under LIFO, issues are made out of the latest purchase. In this case the unit cost or price of the latest lot is taken first for issue until all units from this lot are exhausted. After the latest lot is fully issued, the price of the lot immediately preceding the last lot will be used and so on.

Advantages of LIFO method are:

- The cost of production reflects the current price as the value of materials are issued to production is at the current prices.
- In this method, complete recovery of material cost is facilitated.
- LIFO is suitable when prices are rising.

Disadvantages of LIFO method are:

- In case of fluctuating prices, this method leads to complex calculations and clerical errors.
- Cost of materials charged to different jobs at different times varies, therefore effective comparison cannot be made.

Illustration 2:

The following transactions occurred in purchase and issue of a material in an organization during January 2021.

Receipts

Dated	Quantity	Rate per unit
04.01.21	200 units	Rs. 24
10.01.21	150 units	Rs. 23
18.01.21	100 units	Rs. 24
22.01.21	100 units	Rs. 23

Issued

Dated	Quantity
05.01.21	250 units
12.01.21	200 units
25.01.21	250 units

The stock on 1.1.21 was 200 units at the rate of Rs. 25 per unit. Prepare Stores Ledger Account by adopting LIFO method of charging material issued. What is the value of closing stock as on 31.01.21?

Solution:

Stores Ledger Account
Under LIFO method

Name:
Code No.

Maximum Level:
Minimum Level:
Ordering Level:
Re-order Quantity:

Date	Receipts				Issue				Balance		
	G.R. N No	Qty	Rate Rs.	Amount Rs.	Requisition slip No.	Qty	Rate Rs.	Amount Rs.	Qty	Rate Rs.	Amount Rs.
Jan 1	Bal.	200	25	5,000	-	-	-	-	200	25	5,000
Jan 4	b/f	200	24	4,800	-	-	-	-	400	25	5,000
									200	24	4,800
Jan 5		-	-	-		200	24	4,800	200		
						50	25	1,250		25	3,750
Jan 10		150	23	3,450	-	-	-	-	150	25	3,750
									300	23	3,450
Jan 12		-	-	-		150	23	3,450	150		
						50	25	1,250		25	2,500
Jan 18		100	24	2,400	-	-	-	-	150	25	2,500
										24	2,400
Jan 22		100	23	2,300	-	-	-	-	100	25	2,500
									200	24	2,400
									100	23	2,300
Jan 25		-	-	-		100	23	2,300	100		
						100	24	2,400	300		
						50	25	1,250	100	25	1,250
									100		

									100		
									50		
		750		17,950		700		16,700	50		1,250

Value of closing stock as on 31.01.21 was Rs. 1,250.

- **Specific Price method:**

In this method materials are purchased separately for a specific job or contract and kept in stores. When materials are issued for jobs or contracts, they are priced at the exact cost as per the respective accounts maintained separately. This method is suitable for job or contract costing. This is also suitable for purchase and issue of non-standardised items that are required to meet customer specification.

- **Base Stock Method:**

In every organization minimum quantity of stock is always held in stores. This minimum stock is called safety stock or base stock. The base stock is used in case of emergency situation. Minimum stock is created out of the first lot, so it is valued at the cost price of the first lot of materials. The remaining stock is issued at a price similar to FIFO or LIFO method. Thus, the advantages and disadvantages of both the method will be applicable to base stock method.

3.5 AVERAGE PRICE METHODS

- **Simple Average Method**

In this case materials are issued at the average price of different lots of materials purchased. It uses average price for pricing the issue of materials until either the old lot is exhausted or a new lot is purchased where a new average price will be calculated.

$$\text{Issue price} = \frac{\text{Total of unit purchase prices of different lots in stock}}{\text{Number of purchases}}$$

Example:

Opening stock 500 units @ Rs. 50

Purchased 800 units @ Rs. 50

Purchased 1,500 units @ Rs. 56

The simple average price = $50+50+56/3 = \text{Rs. } 52$ per unit

- **Weighted Average Price Method**

Weighted average price is a price obtained by dividing the total cost of materials in the stock by the total quantity of materials in the stock. It is based on the assumption that each issue consists of a due proportion of the earlier lots. It averages out the effect of price fluctuations.

$$\text{Weighted Average Price} = \frac{\text{Value of materials in stock}}{\text{Total quantity in stock}}$$

Example:

Opening stock 250 units @ Rs. 52

Purchased 200 units @ Rs. 45

Purchased 300 units @ Rs. 54

$$\begin{aligned} \text{The weighted average price} &= (250 \times 52 + 200 \times 45 + 300 \times 54) / (250 + 200 + 300) \\ &= \text{Rs. } 50.93 \end{aligned}$$

3.6 MARKET PRICE METHODS

- **Replacement Price Method:**

Under this method, materials are issued at a price at which they can be replaced. The use of this method presupposes the determination of replacement cost of materials each time when an issue is likely to be made. This method is suitable in periods of rising prices because the cost of material considered in cost of production enables replacement of the same quantity of materials at the increased price. It reflects the current price levels.

- **Realisable Price Method**

Realisable price is the price at which similar materials can be sold in the market. In this method, materials are issued at realisable price as on the date of issue of material. This method has similar advantages like Replacement Price Method.

3.7 STANDARD PRICE METHOD

Materials are issued at standard price. Standard price is a pre-determined price fixed for a particular period taking into consideration the factors affecting it.

Standard cost for each material can be fixed after taking into consideration the following factors:

- Current prices
- Expected change in prices due to market conditions
- Discount available
- Transport and warehousing expenses

This method is simple to apply as all issues are priced at the same standard price. But it is difficult to fix the standard price when prices fluctuate frequently.

3.8 TREATMENT OF MATERIAL LOSSES:

Material losses can be in the form of waste, scrap, spoilage and defective. Problem of material losses arises in almost all manufacturing concerns. The types of material losses are discussed below:

i. **Wastage:**

Wastage refers to the discarded materials that have no value. The various factors that cause loss are loss due to evaporation, shrinkage, destruction during production. In many organisations, waste is inevitable. Waste may be normal waste or abnormal waste.

Normal waste is unavoidable. It is due to the nature of the raw material. For example: evaporation of chemicals, shrinkage of silks, waste during loading and unloading, etc. Any loss of material due to abnormal conditions is referred to as abnormal waste. For example: loss due to theft, breakdown of machinery, etc.

Accounting Treatment: The loss of normal waste is borne by the good units produced. The value of abnormal wastage is charged to the costing profit and loss account.

ii. **Scrap:**

Scrap is the residue of the raw material which is incidental to the production process. For example: wood dust in saw mill, cotton waste in cotton mill, etc. It is discarded material and has low disposal value.

Any loss of material due to abnormal conditions is referred to as abnormal waste. For example: loss due to theft, breakdown of machinery, etc.

Accounting Treatment: When the value of scrap is very low and it cannot be identified with specific job, then it is credited to profit and loss account as miscellaneous receipts. If the scrap is significant and identifiable with particular job or work order then it should be credited to the specific job or work in progress for determining the actual cost of the work order or job. In case of continuous production process, it is difficult to quantify the scrap for a specific job or work order. In that case, the value of scrap is credited to production overhead in order to reduce the overhead absorption rate.

iii. **Spoilage:**

Spoilage refers to the units produced that are rejected as they do not meet the quality standards. They are the rejected or damaged units. For example, broken glass in glass industry, etc. These units are disposed without further work as they cannot be repaired. Spoilage can be of two types, normal spoilage and abnormal spoilage.

Accounting Treatment: Normal spoilage arises under efficient operating conditions and it is within the standard limit. Normal spoilage is charged to good units. Abnormal spoilage refers to rejection in work in progress that exceeds the standard normal spoilage. It is not expected to arise under efficient operating conditions. Abnormal spoilage is charged to costing profit and loss account.

iv. **Defectives:**

Defectives are the units that do not meet the quality standards. These units can be reprocessed and rectified by incurring additional expenditure of material, labour and overhead expenses. If the defects can be completely rectified then these are sold like good units. But if after rectification, some defects still exist then the units are sold at reduced rates. These units are called second quality products.

Accounting Treatment: Where the defectives are identifiable with a specific job then the rectification cost is charged to that job. When the defective production cannot be identified with a specific job then the rectification cost is treated as a part of production overhead. When the defectives are due to fault of particular department then the rectification cost is charged to that department. If the defective production is due to abnormal reasons, then the rectification cost is charged to costing profit and loss account.

C. CHECK YOUR PROGRESS:

1. What is FIFO?
2. What is scrap? Discuss its treatment in accounts.
3. State the advantages of LIFO method.
4. What are the various average price methods used in issue of materials?
5. Choose the correct option:
 - i. Which one out of the following is not an inventory valuation method?
 - a) FIFO
 - b) LIFO
 - c) Weighted Average
 - d) EOQ
 - ii. In case of rising price (inflation), LIFO will:
 - a) Provide lowest value of closing stock and profit
 - b) Provide highest value of closing stock and profit
 - c) Provide highest value of closing stock but lowest value of profit
 - d) Provide lowest value of closing stock and highest value of profit
 - iii. If raw materials prices are inflated, which of the following stock valuation methods will the lowest gross profit.
 - a) FIFO
 - b) LIFO
 - c) Replacement cost
 - d) Simple Average
 - iv. A method of pricing of material where a minimum quantity of stock is always kept in stores is known as:
 - a) Minimum stock method
 - b) Base stock method
 - c) Low Stock method
 - d) Weighted average method
 - v. In case of falling prices, the most suitable method of pricing of issue of material is
 - a) Base stock
 - b) LIFO
 - c) FIFO
 - d) Simple average method

3.9 LET US SUM UP

Storage of materials involves receiving, storing and issuing of materials. Store is the place where materials are kept. A store keeper maintains various store records for materials management such as bin card, stores ledger, bill of materials etc.

Various methods are used for valuing the issue of materials. The important methods used for valuing the issue of materials are: First In First Out (FIFO) method; Last In First Out (LIFO) method; Specific Price method; Base Stock method; Simple Average method; Weighted Average method; Replacement Price method; Realisable Price method and Standard Price method.

Material losses can be in the form of waste, scrap, spoilage and defective. Problem of material losses arises in almost all manufacturing concerns. Proper accounting and control is necessary for the material losses.

3.10 KEY WORDS

- **Bin Card:** For each bin, a bin card is maintained where all the receipts, issues and balances are recorded by the storekeeper.
- **Stores Ledger:** Stores Ledger is maintained by the Cost Accounting Department for each item of material in the store to record both the quantity and cost of materials received and issued.
- **Bill of Material:** Bill of material is a document stating the detail list of materials that are required for manufacturing a product or for a job or process.
- **Material Transfer Note:** When the materials or equipment are transferred from one sub store to another sub store or from one production section to another or from one job to another, the document called Material Transfer Note is prepared.
- **Wastage:** It refers to the discarded materials that have no value.
- **Defectives:** Defectives are the units that do not meet the quality standards. These units can be reprocessed and rectified by incurring additional expenditure of material, labour and overhead expenses.
- **Scrap:** It is the residue of the raw material which is incidental to the production process.
- **Spoilage:** It refers to the units produced that are rejected as they do not meet the quality standards. They are the rejected or damaged units.
- **First in First Out (FIFO):** Under this method materials received first are issued first.
- **Last In First Out (LIFO):** Under LIFO, issues are made out of the latest purchase.

3.11 SOME USEFUL BOOKS

11. Charles T. Horngreen, Srikant M. Datar, Madhav V. Rajan, *Cost Accounting: A Managerial Emphasis*, Pearson Education.
12. JawaharLal, *Cost Accounting*. McGraw Hill Education

13. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. PHI Learning
14. Rajiv Goel, *Cost Accounting*. International Book House
15. Singh, Surender. *Cost Accounting*, Scholar Tech Press, New Delhi
16. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers
17. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi
18. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. ShriMahavir Book Depot, New Delhi
19. Iyengar, S.P. *Cost accounting*. Sultan Chand & Sons
20. H.V. Jhamb, *Fundamentals of Cost Accounting*, Ane Books Pvt. Ltd.

3.12 ANSWERS TO CHECK YOUR PROGRESS

C. 5. i. d; ii. b; iii. a; iv. b; v. c

D. 5. i. d; ii. a; iii. b; iv. b; v. c

3.12 TERMINAL QUESTIONS/EXERCISES

7. Explain the various store records maintained by any organization.
8. What is FIFO method of pricing of issues of materials? Explain with an example.
9. What is weighted average method of pricing the issue of raw materials to the production process? Give an illustration.
10. Write a note on standard price method.
11. Distinguish between Bin Card and Stores Ledger.
12. From the following particulars prepare stores ledger account using FIFO method for the month of July, 2021:
 July 01 Opening balance 1000 units at Rs. 50 each
 July 05 Received 1200 units at Rs. 48 each
 July 07 Issued 1500 units
 July 09 Issued 400 units
 July 15 Received 1000 units at Rs. 49 each
 July 20 Issued 500 units
 July 25 Issued 500 units
 July 28 Received 1000 units at Rs. 52 each
 July 30 Issued 1000 units
13. In a factory, the following purchases and issues were made during the month of August, 2021. Prepare the store ledger account under FIFO method and LIFO method.

Date	Purchases(units)	Rate(Rs.)	Issues(units)
Aug 01	1000	10	-
Aug 10	1200	10.5	-
Aug 15	-	-	1500
Aug 25	800	10.6	-
Aug 30	-	-	700

Is there any difference in the value of closing stock between these methods?

14. Prepare stores ledger account under weighted average price method from the following information:

Date	Particulars	Quantity	Rate (Rs.)
June 1	Purchase	1000 kg	10
June 9	Purchase	600 kg	10.40
June 14	Issue	1100 kg	
June 19	Purchase	800 kg	10.8
June 30	Issue	600 kg	

B. COM
SEMESTER IV
COURSE: COST ACCOUNTING

UNIT – 4 LABOUR COST: ACCOUNTING AND CONTROL

STRUCTURE

- 4.0 Objectives**
- 4.1 Introduction**
- 4.2 Labour Cost**
- 4.3 Time-keeping**
- 4.4 Time Booking**
- 4.5 Pay Roll Accounting**
- 4.6 Idle Time**
- 4.7 Overtime**
- 4.8 Labour Turnover**
- 4.9 Fringe Benefits**
- 4.10 Characteristics of ideal wage system**
- 4.11 Methods of Wage Payment**
- 4.12 Incentive System**
- 4.13 Let Us Sum Up**
- 4.14 Key Words**
- 4.15 Some Useful Books**
- 4.16 Answers to Check your Progress**
- 4.17 Terminal Questions/Exercises**

4.0 OBJECTIVES

After going through this unit, you should be able to:

- understand the labour cost
- explain the concept of time-keeping and time booking
- describe the methods of time keeping and time booking
- learn the process of pay roll accounting
- understand the effects of labour turnover
- discuss the various methods of wage payment including incentive schemes

4.1 INTRODUCTION

Labour is an important factor of production. They are human resources of a business organisation. They participate in the process of production and rendering of services. Labour cost is a significant element of cost of a product or a service. Time management and cost management of labour are essential part of labour control. Time keeping is a system of recording the arrival and departure time of the workers. There are various methods of time keeping such as attendance register method, token or disc method, mechanical clock method, dial time recorders method, etc. Time booking is recoding the time spent by the workers in the factory. Organisations maintain payroll accounting to calculate the wages payable to the employees according to specified method of wage payment. Organisations also keep its workers motivated by paying several incentives. Halsey plan, Halsey Weir plan and Rowan plan are some of the incentive plans discussed in this unit.

4.2 LABOUR COST

The cost of labour in the process of production, construction and distribution of goods and services is called as labour cost. Direct labour is a part of Prime Cost whereas indirect labour is a part of Overheads.

Labour is sub divided into:

- Direct labour
- Indirect labour

Direct Labour: It refers to the labour that is directly engaged in manufacturing of a product, or in a job, work order, etc. Direct labour varies directly with the volume of output. It is easily identifiable and directly attributable to the cost unit. For example: production workers, machine operator, painters, etc. Direct labour cost includes the payments of the direct labour employees those who are engaged in manufacturing of a product and rendering a service.

Indirect Labour: It refers to the labour that indirectly helps in production but is not directly engaged in process of production of goods and services. They don't play active part in conversion of raw materials to finished goods. It supports the production process. For example: managers, security men, labour engaged in time keeping, office, etc.

The following points show the differences between direct labour cost and indirect labour cost:

Direct Labour Cost	Indirect Labour Cost
i. It can be conveniently identified with a cost centre.	i. It cannot be conveniently identified with a cost centre.
ii. It varies directly with the volume of output.	ii. It is not directly concerned with the production.
iii. It forms a part of prime cost.	iii. It forms a part of overheads.

<ul style="list-style-type: none"> iv. It is easy to ascertain. v. It can be directly allocated to the manufactured units on basis of labour hours, etc. vi. Example: Wages paid to workers, machine operators, line workers, etc. 	<ul style="list-style-type: none"> iv. It is not easy to ascertain. v. The cost of indirect labour is accumulated as overheads and then allocated to products on reasonable basis. vi. Example: Salaries of managers, security, accounts staff, administrative staff, etc.
---	---

Components of labour cost:

- Payment of wages, salary, allowances.
- Contribution towards PF, ESI and Gratuity
- Free or concessional facilities like canteen, housing, medical facilities, etc. to employees
- Employee training and development such as training cost, recruitment cost, etc.

4.3 TIME KEEPING

There must be a suitable method of recording time of arrival and departure of the employees or workers. This method of recording time is called as time keeping. The reasons of time keeping are:

- i. Preparation of payrolls.
- ii. Determination of labour cost of products, work orders, services, etc.
- iii. Checks idle time and promotes productive environment in the organization.
- iv. Labour hours spent may be taken as base for overhead distribution.
- v. Helps in maintaining record of works performed by the workers.
- vi. Helps in control of labour cost through statistical analysis.

Methods of time keeping are:

- Manual methods
- Mechanical methods

Manual methods include:

- i. ***Attendance Register Method:*** Under this method an attendance register is maintained and the worker's entry and exit time are noted. The workers are required to sign the register at the time of their arrival and at the time of departure. Even though this is a common method of time keeping but there is possibility of fake attendance. It is very time consuming and involves extra clerical costs.

- ii. **Disc Method:** Under this method every worker is allotted a token number or a metal disc. The metal discs are placed on hooks near the factory gate. While entering the factory, the workers remove their respective discs and place them in a tray. The tray is removed once the time for entry is over. On the basis of the discs dropped on the tray, the attendance is recorded by the timekeeper in a register and then this is passed on to the payroll accounting.

Mechanical methods include:

- i. **Clock Card Method:** Each worker is given a clock card. The entry and exit time is recorded with the help of clock recorders. At the time of entry the workers take their card from the rack one and punch them in the machine placed at the factory gate. Again at the time of exit they punch the card in the time recording clock and put them in rack two. It is safe and reliable method of time keeping.
- ii. **Dial Time Recorders:** The dial time recorder has a dial around the clock with a number of holes. Each hole bears a number corresponding to the identification number of the worker. There is a radial arm at the centre of the dial. At the time of entry, the workers press the radial arm in the hole bearing his identification number. The time recorder will automatically record time on the roll paper within the machine against the number of the worker. This method is accurate but the presence of time keeper is necessary to prevent fraud. The capacity of this method is also limited.

The business organisations, now-a-days, use many computer-based new models for time keeping to keep the record of arrival and departure of human resources.

4.4 TIME BOOKING

In time keeping, we record the time of arrival and departure of the workers. But it is also necessary to know the time spent on work order, job, operations, etc. This is called as time booking. Time booking helps to ascertain the cost of the job or operation in each department. It ensures proper utilization of time and minimum idle time. The time booking method varies among organizations depending on the size, normal practice, accuracy requirement, etc. Many computer-based softwares are now available for time booking. Some of the methods that are usually followed are:

- i. Daily time sheet
- ii. Weekly time sheet
- iii. Job cards or Job tickets

Daily Time Sheet:

This is a record of each worker showing the time spent by him on each job during the day. It shows the details like name of the worker, work order number, quantity produced, start and finish time, total time spent for the job, rate of wages per hour and the total amount of wages.

Daily Time Sheet							
Name:							
Date:							
Clock No.:							
Week No.:							
Cost Centre:							
Works Order No.	Description of Work	Quantity	Time		Hours	Rate Rs.	Cost Rs.
			On	Off			
Signed: (worker)		Certified By: (foreman)				Ref....	
Date...							

Weekly Time Sheet:

Weekly time sheet records similar particulars as the daily time sheet. But here, the workers records their time for a week.

Weekly Time Sheet								
Name:								
Date:								
Clock No.:								
Department								
Week Ending.								
Cost Centre:								
Day	Job	Operation	Time		Time	Standard	Rate Rs.	Amount Rs.
			Start	Finish				
Monday								

Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								
Total								
Signed: (worker)			Certified By: (foreman)				Ref....	
Date...								

Job Card:

For each job or operation a separate job card is maintained. The job card authorizes the worker to carry out the job and also facilitates time booking for the job. Usually, four types of job cards are used:

- Combined Time and Job Card: In small organizations, employees are few in number. In that case, this card is used to record time spent on each job. No separate record is made for time keeping. This card serves both the purpose of time keeping and time booking.
- Job Card for each worker: In this card, time spent in different job during a week by a worker is recorded.
- Job Card for each Job: In this case, separate card is given for each job. The card passes from one worker to another who attends the job.
- Piece Work Card: This card is given where the importance is on quantity of output (piece work basis). Here the time is recorded for apportionment of indirect cost.

A specimen of Combined Time and Job Card is given below:

Combined Time and Job Card
Name:
Worker's No.:
Date:
Work Order No.:
Machine No:

Week Ending.							
Department:							
Day	Job	Time		Time		Office Cost	
		Start	Finish	Normal	Overtime	Rate	Amount
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							
Saturday							
Total							
Signed: (worker) Ref....				Certified By: (foreman)			
Entered in wage sheet by-- Date...							

A. CHECK YOUR PROGRESS

1. What is indirect labour?
2. What is the purpose of time keeping?
3. Why do the business organisations need time booking?
4. Distinguish between time keeping and time booking.
5. Choose the correct option:
 - i. Labour engaged in service departments like purchase, time keeping, stores are examples of:

a) Additional labour	c) Extra labour
b) Indirect labour	d) Direct labour
 - ii. Which of the following is a method of time keeping:

a) Ranking method	c) Disc method
b) Work sampling	d) Weekly time sheet
 - iii. Job wise analysis of time of direct workers is:

a) Time booking	c) Idle time
b) Time keeping	d) Labour turnover

- iv. Time keeping refers to:
 - a) time spent by workers on their job
 - b) time spent by workers in their factory
 - c) time spent by workers without work
 - d) time spent by workers off their job
- v. Recording of time spent by a worker on a different job is called:
 - a) Time keeping
 - b) Time booking
 - c) Job card keeping
 - d) Time card

4.5 PAYROLL ACCOUNTING

Every business organization has a payroll accounting to determine the wages/salaries payable to the workers/employees. This involves determination of gross wages, net amount payable to the workers after making the deductions and preparation of wage sheet. Payroll accounting minimizes the possibility of errors and frauds in wage payment. It provides data for cost control. Many accounting softwares are available for payroll accounting. Computer-based payroll accounting is essential in large organisations.

4.6 IDLE TIME

It is the difference between the time paid for and the time actually spent on production. Idle time is divided into two parts: (a) normal idle time, and (b) abnormal idle time. Normal idle time is due to the unavoidable factors whereas abnormal idle time is caused by the avoidable factors.

The reasons of idle time are:

- Production Causes:
 - i. Machine breakdown
 - ii. Power failure
 - iii. Waiting for materials, tools, instructions, etc.
- Administrative Causes
 - i. Lack of planning
 - ii. Lack of supervision
 - iii. Non utilization of surplus capacity of plant and machinery, etc.
- Economic Causes
 - i. Surplus manpower
 - ii. Inadequate demand
 - iii. Closure of seasonal industries
 - iv. Surplus production capacity
 - v. Strikes, etc.

Treatment of Idle Time:

- When the idle time is normal and controllable, it is charged to factory overhead.

- When idle time is normal but uncontrollable, it is charged to jobs by inflating rates of wages.
- When the idle time is abnormal and uncontrollable, it should be taken to Costing Profit and Loss Account.

Control of Idle Time:

The following steps should be taken to minimize idle time:

- i. Regular and preventive maintenance should be done periodically to avoid idle time due to machine break down.
- ii. Responsibility should be fixed for idle time arising in different activities or at different stages.
- iii. Adequate stock should be maintained to ensure continuous material supply for production.
- iv. Proper planning and supervision should be maintained.
- v. Periodical idle time report should be obtained and corrective measures should be taken to reduce it.

4.7 OVERTIME

When a worker works beyond the normal working hours, it is referred to as 'Overtime'. For overtime work, the worker is paid at a higher rate than normal rate. Overtime is useful when there is urgency of job completion, makeup of the shortfall in production or meeting any seasonal demand or making up for labour shortage.

Treatment of Overtime:

- If the overtime is due to the general pressure of work, then overtime premium is charged to overhead
- If the overtime is due to delayed schedule, then overtime premium is charged to the department
- If the overtime is due to the customer request to complete the job within a specified time, then overtime premium is charged to the job.
- If the overtime is due to the seasonal rush, then overtime premium is charged to the prime cost
- If the overtime is due to loss of time for unavoidable reasons or abnormal factors, then overtime premium is taken to Costing Profit and Loss Account.

4.8 LABOUR TURNOVER

'Labour Turnover' refers to the change in average labour force during a particular period for an organization. Even though it is a normal process, frequent change in labour force leads to substantial loss in production. The labour cost increases as the newly recruited workers donot

possess the same expertise as the old workers. The organization has to incur training cost of the new workers.

$$\text{Labour Turnover} = \frac{\text{Change in labour force during the period}}{\text{Average Working force during the period}} \times 100$$

Causes of Labour Turnover:

- **Avoidable Causes:**
 - i. Low wages
 - ii. Bad working condition
 - iii. Mismatch of workers and jobs
 - iv. Unfavourable working hours
 - v. Poor relation with co-workers and supervisors
 - vi. Lack of non-monetary facilities
 - vii. Absence of proper recruitment and training policy
 - viii. Poor promotion policy, etc.
- **Unavoidable Causes:**
 - i. Better opportunities
 - ii. Deaths
 - iii. Accidents
 - iv. Marriages
 - v. Domestic Responsibilities
 - vi. Criminal prosecutions
 - vii. Seasonal businesses
 - viii. Shortage of raw materials, market demand, etc.

Methods of Computing Labour Turnover:

- ***Separation method***

$$\text{Labour Turnover} = \frac{\text{Number of separations during the period}}{\text{Average number of workers during the same period}} \times 100$$
- ***Replacement method***

$$\text{Labour Turnover} = \frac{\text{Number of workers replaced during the period}}{\text{Average number of workers during the same period}} \times 100$$
- ***Flux method***

$$\text{Labour Turnover} = \frac{\text{Number of separations} + \text{Number of replacements}}{\text{Average number of workers during the period}} \times 100$$

Illustration 1:

From the following information, calculate the labour turnover rate under: i. Separation method ii. Replacement method and iii. Flux method
 Number of workers on the payroll:

At the beginning of the month: 900

At the end of the month: 1100

During the month 10 workers left, 40 were discharged and 250 workers were recruited. Of these, 25 workers are recruited in the vacancies of those leaving, while the rest were engaged for an expansion scheme.

Solution:

Separation method:

$$\text{Labour Turnover} = \frac{\text{Number of separations during the period}}{\text{Average number of workers during the same period}} \times 100$$

$$\begin{aligned} \text{Number of separations} &= \text{workers left} + \text{Workers discharged} \\ &= 10 + 40 = 50 \end{aligned}$$

$$\text{Average number of workers} = (900 + 1100)/2 = 1000$$

$$\text{Labour Turnover} = (50/1000) \times 100 = 5\%$$

Replacement method:

$$\text{Labour Turnover} = \frac{\text{Number of workers replaced during the period}}{\text{Average number of workers during the same period}} \times 100$$

$$\text{Number of workers replaced} = 25$$

$$\text{Labour Turnover} = (25/1000) \times 100 = 2.5\%$$

Flux method:

$$\text{Labour Turnover} = \frac{\text{Number of separations} + \text{Number of replacements}}{\text{Average number of workers during the period}} \times 100$$

$$= (50 + 25)/1000 \times 100 = 7.5\%$$

Cost of Labour Turnover:

The cost of labour turnover is divided into two groups:

- ***Preventive Costs:***

The cost incurred to prevent the workers from leaving the organization are referred to as preventive costs. For example: cost of providing good working condition, imparting regular training, cost of non-monetary facilities, cost of suitable policy of promotion and transfer, etc. Preventive costs are apportioned to the departments on the basis of respective labour force.

- ***Replacement Costs:***

The cost that arises from replacement of labour is referred to as replacement cost. For example: cost of recruitment and training of new employees, cost of loss arising due to inefficiency of workers, cost of additional supervision, etc. Replacement cost are allocated directly to the department where replacement takes place.

4.9 FRINGE BENEFITS

Almost all non-salary benefits given by an employer to its employees is considered as fringe benefits. These benefits are provided in addition to the basic salary and allowances like Dearness Allowance, House Rent Allowance, etc. It is provided to improve the morale and stability of the employees towards the organization. The benefits includes medical facilities, insurance premium paid, employee discount, housing facilities, a company car, facilities for children of the employees, etc. These benefits help in improving the productivity and efficiency of the employees.

If the amount of fringe benefit is substantial, then it may be recovered as direct charge by means of supplementary labour rate or charging nominal fees for the employees receiving the benefits. But if the amount of fringe benefit is not substantial, then it is treated as part of production overheads.

4.10 CHARACTERISTICS OF IDEAL WAGE SYSTEM

Wages are paid to the workers as a reward for their service or labour. Unless the workers are paid properly, they will not participate actively in discharging their duties. Thus, the wage system should be planned carefully. A good wage system increases the efficiency of the workers. A good wage system should have the following characteristics:

- The wage system should be easy to understand and simple to operate.
- It should guarantee a minimum wage to every worker irrespective of their work.
- The wage system should be satisfactory from the point of view of workers as well as employers.
- It must encourage the workers to increase the quality of output along with the quantity of output.
- There must be incentive plan for the efficient workers.
- The system should minimize labour turnover, absentees, etc.
- The system should be in conformity with the labour laws.
- The system should be flexible to allow changes in the future.

4.11 METHODS OF WAGE PAYMENT

Broadly there are two methods of wage payment:

- i. Time Wage System
- ii. Piece Wage System

Time wage system: It is referred to as Time Rate. In this system, the worker is paid on the basis of the time spent by him/her in the factory. It is the most popular method of payment. The worker is paid at a specific rate per unit of time (for example: per hour, per day, etc.).

Earnings = Hours worked x Rate per hour

Advantages of time wage system are:

- i. It gives a minimum wage to the workers for a period of time. It secures return to the workers.
- ii. It is easy to understand and simple to calculate.
- iii. Under this method, workers tend to concentrate on quality of the work rather than quantity.
- iv. It gives a sense of equality among the workers.

Limitations of time wage system are:

- i. It ignores the quantity of production.
- ii. It requires close supervision.
- iii. No incentive is given to efficient workers under this method.
- iv. The cost of production is higher as there is a tendency to consume more time in completing a job.

Piece Wage System: Under this system the workers are paid on the basis of output produced by them. Rate of payment under this method is related to the quantity of work done (for example: per unit of output, per commodity, etc.).

Earnings = Output x Rate per unit of output.

Advantages of piece wage system:

- i. It induces workers to be efficient and produce more.
- ii. It is simple to calculate and easy to understand.

Limitations of Piece wage system:

- i. It ignores quality of the output.
- ii. It penalizes the slow workers.
- iii. It needs continuous supervision over the quality of the goods.
- iv. It creates differences among the workers as there is disparity in wages.

Piece Rate system is sub divided into:

- *Straight piece rate system:* Under this system, rate is fixed for each unit of output. The total wage is calculated by multiplying the number of units produced and the rate per unit.
- *Piece rate with guaranteed day rates:* Under this system, the workers are paid minimum wages on time rate basis. But when the output produced is more and wages on piece rate system is more than time rate system, the worker is paid on piece wage system.
- *Differential piece rate:* Here, different rates are applied on different level of output. The workers who produce more than the standard output gets wage at a higher rate and the workers who produce less than standard output gets less wages at a lower rate.

Taylor's Differential Piece Wage:

Taylor's differential piece rate system was developed by F.W.Taylor. Under this system the day wages are not guaranteed and the workers are paid on the degree of efficiencies. There are two piece rates: a lower piece rate for output of below standard (80% of piece rate) and a higher piece rate for output of above standard (120% of piece rate). It is an additional incentive for the expert workers towards maximization of production.

4.12 INCENTIVE SYSTEM

The objective of incentive system is to improve productivity and increase production. This also helps to bring down the unit cost of production. The incentives may be monetary inducement or enhanced facility or any non-monetary incentive. Some of the important incentive systems are discussed below.

Halsey Premium Plan: this plan was introduced by F.W. Halsey. The main features of Halsey Premium Plan are as follows:

- i. Standard time is prescribed for each job.
- ii. Workers are paid for the time taken to complete the job as per time rate.
- iii. If a worker completes the work in less than the predetermined standard time then he receives bonus for the time saved.
- iv. A bonus equal to 50% of wages of time saved is paid to workers as reward.
- v. If a worker takes more time to complete the work, then he gets the time wage.

Earnings of a worker under this plan:

$$E = T \times R + (S - T) 50/100 \times R$$

Here, E = Earnings; T = Time taken by the worker to complete the job; S = Standard time for the job; and R = Rate of wage for a unit of time usually per hour.

Halsey-Weir Plan: This is similar to Halsey premium plan. But under this system, workers get bonus on 1/3rd of the time saved.

Earnings of a worker under this plan:

$$E = T \times R + (S - T) 1/3 \times R$$

Rowan Plan: This plan was introduced by David Rowan. The features of this plan are as follows:

- i. Workers are paid for the actual time taken by them in completing the job on basis of time rate.
- ii. They are paid bonus for the time saved.
- iii. Bonus is calculated as a proportion of the time wages as the time saved bears to the standard time.

$$\text{Bonus under Rowan Plan} = \frac{S-T}{S} \times T \times R$$

$$\text{Earning} = T \times R + \frac{S-T}{S} \times T \times R$$

Here, T = Time taken; R = Rate of wages per unit of time; and S = Standard Time.

B. CHECK YOUR PROGRESS

1. What is overtime?
2. How is abnormal idle time accounted for?
3. What are the economic causes of idle time?
4. What are the two costs associated with labour turnover?
5. Distinguish between time rate and piece rate.
6. What are the features of Halsey premium plan?
7. What is differential piece rate system?
8. Choose the correct option:
 - i. In which wage system, the amount/wage is fixed?

a) Piece rate	c) Rowan plan
b) Time rate	d) Halsey plan
 - ii. A worker is entitled to bonus on wages in proportion of time saved to time allowed in:

a) Rowan plan	c) Profit sharing scheme
b) Halsey plan	d) None of the above
 - iii. The difference between the attendance time and job time is the:

a) Idle time	c) Actual time
b) Over time	d) Normal time
 - iv. The cost that is incurred to prevent the labour turnover is:

a) Management cost	c) Replacement cost
b) Preventive cost	d) Compensation cost
 - v. Wage sheet is prepared by:

a) Cost Accounting department	c) Time booking department
b) Time keeping department	d) Payroll department
 - vi. Bonus under Halsey plan is paid at:

a) 50% of time saved	c) 25% of time saved
b) 75% of time saved	d) 55% of time saved

Illustration 2:

The standard time allowed to complete a job is 80 hours and the hourly rate of wage payment is Rs. 5. The actual time taken by the worker to complete the job is 60 hours. Calculate the total wage of the workers on the basis of:

(i) Time rate, (ii) Piece rate, (iii) Halsey plan and (iv) Rowan plan.

Solution:

- (i) Time Rate:
Total Wages = $60 \times 5 = \text{Rs. } 300$
- (ii) Piece Wage:
Total Wages = $80 \times 5 = \text{Rs. } 400$
- (iii) Halsey Plan:
Total wages = $60 \times 5 + \frac{1}{2} (80 - 60) \times 5$
 $= 300 + 50 = \text{Rs. } 350$
- (iv) Rowan Plan:
Total wages = $60 \times 5 + (80-60)/80 \times 60 \times 5$
 $= 300 + 75 = \text{Rs. } 375$

4.13 LET US SUM UP

Labour cost is one of the major elements of cost of production. There are two types of labour cost: direct labour cost and indirect labour cost. Direct labour cost is the amount paid to workers who are directly involved in the process of production of goods or services. Indirect labour cost is the amount paid to the workers that are not directly involved in the process of production of goods or services.

There should be a suitable method of recording time of arrival and departure of the employees or workers which is called as time-keeping. It is also necessary to know the time spent on work order, job, operations, services, etc. This is called as time booking. Time booking helps to ascertain the cost of the job or operation in each department.

Every organization has a payroll accounting to determine the wages payable to the workers. This involves determination of gross wage, net amount payable to the workers after making the deductions and preparation of wage sheet.

Idle time is the difference between the time paid for and the time actually spent on production.

When a worker works beyond the normal working hours, it is referred to as overtime. Overtime is useful when there is urgency of job completion, makeup of the shortfall in production or meeting any seasonal demand or making up for labour shortage. Labour turnover refers to the change in average labour force during a particular period for an organization.

Broadly, there are two methods of wage payment, e.g., Time Wage System and Piece Wage System. Time wage system is referred to as Time rate. Here, the worker is paid on the basis of the time spent by the worker in the factory. The worker is paid at a specific rate per unit of time (for example: per hour, per day, etc.). Under Piece wage system, the workers are paid on the basis of output produced by them. Rate of payment under this method is related to the quantity of work done (for example: per unit of output, per commodity, etc.). The objective of incentive system is to improve productivity and increase production. This also helps to bring down the unit cost of production. This may be monetary inducement or enhanced facility or any non-monetary

incentive. Some of the important incentive systems are Halsey Premium Plan, Rowan Plan and Taylor's Differential Piece Wage.

4.14 KEY WORDS

Direct Labour: It refers to the labour that is directly engaged in manufacturing of a product, or in a service, etc.

Indirect labour: It refers to the labour that indirectly helps in production but is not directly engaged in process of production of goods and services.

Idle Time: It is the difference between the time paid for and the time actually spent on production.

Labour Turnover: It refers to the change in average labour force during a particular period for an organization.

Overtime: When a worker works beyond the normal working hours, it is referred to as overtime.

Time keeping: The method of recording time of arrival and departure of the employees or workers is called as time keeping.

Standard Time: Pre determined time allowed to complete a task is called standard time.

Time Booking: The determination of time spent by the workers on the work order, job, etc. is called time booking.

Piece Wage System: A system under which wages are paid on the basis of output produced.

Time Wage System: A system under which wages are paid on the basis of time spent by the workers in the factory.

4.15 SOME USEFUL BOOKS

21. Charles T. Horngreen, Srikant M. Datar, Madhav V. Rajan, *Cost Accounting: A Managerial Emphasis*, Pearson Education.
22. JawaharLal, *Cost Accounting*. McGraw Hill Education
23. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. PHI Learning
24. Rajiv Goel, *Cost Accounting*. International Book House
25. Singh, Surender. *Cost Accounting*, Scholar Tech Press, New Delhi
26. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers
27. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi
28. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. ShriMahavir Book Depot, New Delhi
29. Iyengar, S.P. *Cost accounting*. Sultan Chand & Sons

4.14 ANSWERS TO CHECK YOUR PROGRESS

A. 5. i. b; ii. c; iii. a; iv. b; v. c

B. 8. i. b; ii. a; iii. a; iv. b; v. d; vi. a

4.16 TERMINAL QUESTIONS/EXERCISES

1. What is direct labour? Distinguish between direct labour and indirect labour.
2. What are the different methods of time keeping? Explain briefly.
3. What is labour turnover? Explain the methods of computing labour turnover.
4. What is idle time? Explain are the various reasons of idle time?
5. What are different methods of wage payment? Discuss briefly
6. A worker produced 200 units in a week time. The guaranteed weekly wage payment for 45 hours is Rs. 810. The expected time to produce one unit is 15 minutes which is raised further by 20% under incentive scheme. What will be the earnings per hour of that worker under Halsey and Rowan bonus schemes?
(21,22.5)
7. From the following particulars, calculate the earnings of workers 'X' and 'Y' for a day under: a) Straight Piece Rate System and b) Taylor's Differential Piece Rate System:
Standard production 10 units per hour
Normal time rate Rs. 5 per hour
Differentials to be applied:
80% of piece rate below standard
120% of piece rate at or above standard
Hours of the day: 8
Outputs: 'X'- 75 units; 'Y'- 100 units
(a. 'X' - 37.5, 'Y' - 50; b. 'X' - 30, 'Y' - 60)

B. COM
SEMESTER IV
COURSE: COST ACCOUNTING

UNIT – 5 OVERHEADS - I

STRUCTURE

- 5.0 Objectives**
- 5.1 Introduction**
- 5.2 Overheads: Meaning**
- 5.3 Features of Overheads**
- 5.4 Classification of Overheads**
- 5.5 Production Overheads/Manufacturing Overheads**
- 5.6 Distribution of Overheads**
- 5.7 Re-apportionment of Service Department Overheads to Production Departments**
- 5.8 Methods of Redistribution**
- 5.9 Let Us Sum Up**
- 5.10 Key Words**
- 5.11 Some Useful Books**
- 5.12 Answers to Check your Progress**
- 5.13 Terminal Questions/Exercises**

5.0 OBJECTIVES

After going through this unit, you should be able to:

- Understand the concept of overheads
- Explain the classification of overheads
- Describe the sources of collection of overheads

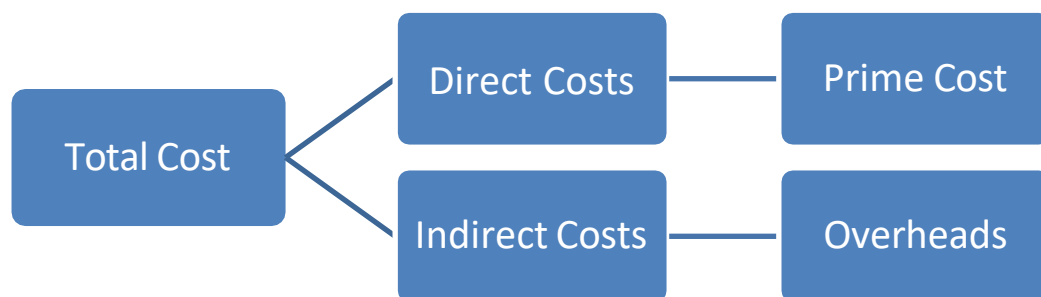
- Explain the concept of allocation and apportionment
- Describe the basis of allocation and apportionment
- Re-apportion service department overheads to production department
- Understand the methods of re-distribution.
- Prepare the distribution summary
-

5.1 INTRODUCTION

There are certain costs that cannot be easily identified with any product or process. These are the indirect costs that cannot be attributable directly to any cost unit. Overheads are the total cost of indirect material, indirect labour and indirect expenses. They are the operating cost of business enterprise that cannot be directly traced to an output. They are important part of cost element. In large organizations, overheads are huge amounts of costs. Thus, proper accounting and control of overheads are essential. The collection, allocation, apportionment and re-apportionment of overheads are discussed in this unit.

5.2 OVERHEADS: MEANING

The cost of the product can be divided into two components, i.e., direct costs and indirect costs. Direct costs (direct material, direct labour, direct expenses) form the part of prime cost. These costs can be easily identified with a particular product or process, etc. All indirect costs that cannot be identifiable with the product or process are referred to as overheads. Indirect materials, indirect labour and indirect expenses are known as overheads. The expenditure incurred over and above the prime cost is referred to as overhead. Overheads are vital in running the organisation as they give support for carrying out business activities. Some examples of overhead expenses are factory rent, insurance, lighting, supervisors' salary, advertising, repair and maintenance, travel expenditure, etc.



5.3 FEATURES OF OVERHEADS

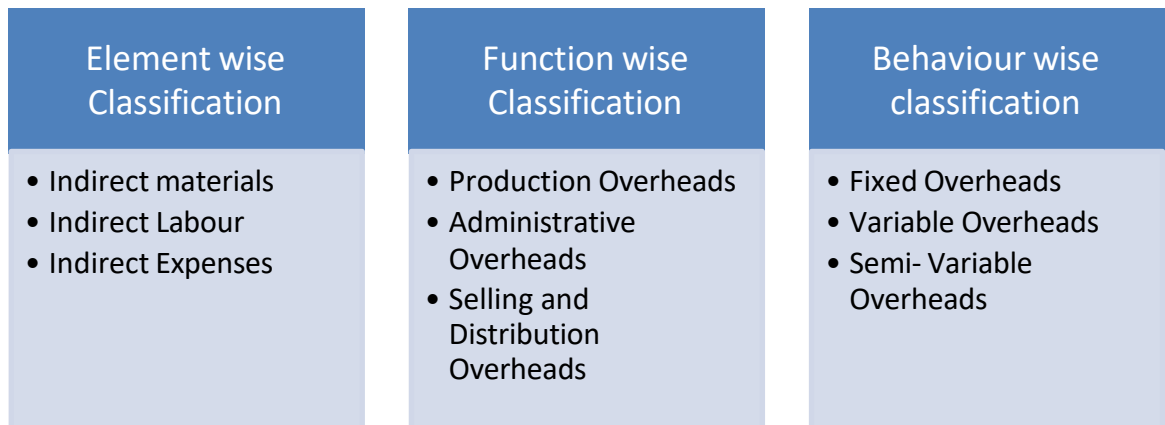
The characteristics of overheads are as follows:

- i. Overheads are the operating costs of a business entity.
- ii. Indirect material, indirect labour and indirect expenses are part of overheads.
- iii. Overheads cannot be traced directly with a particular product. Identification of the expenditure is not possible to a particular product.
- iv. Overheads are charged to all the units produced in the production centre.
- v.

5.4 CLASSIFICATION OF OVERHEADS

The overheads can be classified on the basis of:

- Elements
- Function
- Behaviour



According to elements, overheads can be classified into:

- i. **Indirect Materials:** The materials that cannot be easily identified and allocated to a particular product are called indirect material. They generally do not form part of the product. Sometimes, indirect materials do form a part of the product but the value is relatively small.
Example: nuts and bolts, lubricant, small tools, etc.
- ii. **Indirect Labour:** Indirect labour is not directly involved in the process of production. This cost cannot be assigned to any specific unit of product or process. Indirect labour assists in the production process.
Example: salary of supervisor, inspector, watchman, etc.
- iii. **Indirect Expenses:** Indirect expenses are the expenses that can not be identified with a particular product or process. The indirect costs other than indirect material and indirect labour are indirect expenses.
Example: depreciation, rent, repair and maintenance, electricity, administrative expenses, etc.

According to function, overheads can be classified into:

- i. **Production Overheads:** It is the indirect expenditures incurred in the production process of a product. It includes the indirect materials, indirect labour and indirect expenses relating to the production process. This is also referred to as manufacturing overhead.
Example: small tools, lubricant, thread, wages paid to foremen, supervisors, factory lighting, factory rent, depreciation, repair and maintenance, idle expenses, etc.
- ii. **Administrative Overhead:** The indirect materials, indirect labour and indirect expenses incurred for managerial functions of an organization is called administrative overhead. The managerial functions refer to the planning, organizing, directing, coordinating, controlling the operations of the business.
Example: office stationery, salary to administrative staff, office lighting, office expenses, postage, telephone, insurance, repair and maintenance of office building, travelling allowances of office staff, legal expenses, audit fees, etc.
- iii. **Selling and Distribution Overheads:** It refers to the indirect costs relating to the selling and distribution activities of the business organization. This includes costs incurred for creation of demand of the product, delivery of the goods to the customer, etc.
Example: advertising, commission of the selling agents, showroom rent, travelling expenses of salesmen, repair and maintenance of warehouse, depreciation of the delivery vehicle, transit insurance, packaging of products, etc.

According to behaviour, overheads can be classified into:

- i. **Fixed Overheads:** The overhead expenses that does not change with the change in volume of production is referred to as fixed overheads. An increase in volume of output will result in decrease in fixed cost per unit of product and a decrease in volume of output will lead to increase in fixed cost per unit of product.
Example: rent and rates, salary of office staff, insurance of office building, legal expenses, bank charges, etc.
- ii. **Variable Overheads:** The overhead expenses that varies directly with the volume of output is called as variable overheads.
Example: fuel, indirect labour, salesman's commission, etc.
- iii. **Semi-Variable Overheads:** The expenses that are partly fixed and partly variable is referred to as semi-variable overheads. These costs are partly fixed and partly varies with the volume of production.
Example: supervisor's salary, depreciation of plant and machinery, electricity charges, etc.

5.5 PRODUCTION OVERHEAD/MANUFACTURING OVERHEAD

Production overheads refer to the indirect costs in the factory that are not directly identifiable and allocated to a product. By adding prime cost with factory overheads, we get factory cost or works cost. Factory overhead is also known as manufacturing overhead. Manufacturing overhead is a part of conversion cost.

Accounting and Control of Manufacturing Overhead:

There is need for distribution of overheads to the products or processes or departments as overheads cannot be directly allocated to the products or departments. The steps in accounting and control of manufacturing overheads are as follows:

- i. Collection of overheads
- ii. Distribution of overheads
 - Primary Distribution
 - Secondary Distribution
- iii. Absorption of Overheads

Collection of Overheads:

Overheads are required to be classified and codified before collection of overheads. Codification is assigning codes in the form of numbers, letters, symbols, etc. Such symbols, numbers, letters are codes for overheads and are known as standing orders. Standing orders may be assigned in the following methods:

- **Numerical method:** Under this method, group of numbers are assigned to the broad heads and the individual numbers are assigned to sub heads of that class.

Example:

Broad Heads	Standing Order Numbers
Indirect Material	1-30
Indirect Labour	31-60
Indirect Expenses	61-100
Indirect Materials	Standing Order Number
Fuel	1
Tools	2
Nuts and Bolts	3

- **Mnemonic method:** Here, symbols or letters are assigned to the items of overhead.

Example: ‘S’ may represent sales, ‘DE’ may represent distribution expenses, ‘AD’ may represent advertising expenses, etc.

To Cost ledger control A/c

Invoices are the supporting documents for purchases. On the analysis of the invoices with reference to standing order numbers, the amount of purchases can be collected.

Subsidiary records such as plant register, asset register, journals are scrutinized to collect overhead information like depreciation on plant, depreciation on factory building, outstanding indirect expenses, etc.

Manufacturing overheads – Classification:

The indirect expenses that come under manufacturing overheads are classified as under:

- i. Indirect Materials
Examples of indirect materials are spare parts, grease, lubricants, welding rods, etc.
- ii. Indirect Labour
Examples of indirect labour are salary for maintenance staff, support staff, manufacturing supervisors, etc.
- iii. Indirect Expenses
Examples of indirect expenses are factory rent, factory lighting, depreciation of factory building, depreciation of factory equipment, etc.

A. CHECK YOUR PROGRESS:

- 1. Define overheads.
- 2. What are fixed overheads?
- 3. Explain selling and distribution overheads with examples.
- 4. Choose the correct option:
 - i. Which of the following is not factory overhead?
 - a) Power and fuel
 - b) Warehousing expenses
 - c) Depreciation on machine
 - d) Repair of plant
 - ii. Depreciation of delivery van is a:
 - a) Selling and distribution overhead
 - b) Manufacturing overhead
 - c) Factory overhead
 - d) Administrative overhead
 - iii. Prime cost plus manufacturing overhead is called:
 - a) Factory overhead
 - b) Works overhead
 - c) Cost of sales
 - d) Inventoriable cost
 - iv. Overhead costs can be classified according to the function of the organization as:
 - a) Production, administrative and selling overheads
 - b) Fixed, variable and semi variable overheads
 - c) Indirect material, indirect labour and indirect expenses
 - d) None of the above

5.6 DISTRIBUTION OF OVERHEADS

The departments of a business organisation can be classified into:

- **Manufacturing Departments:** Here, the actual process of conversion of raw materials to finished goods takes place. Example: weaving, spinning, etc.
- **Service Departments:** They provide services to other departments. Example: purchase department, time keeping department, etc.
- **Common Department:** This department performs both as production and service department.

The overhead expenses are finally charged to cost units. In order to determine the cost units, first primary and secondary distribution of overhead expenses are necessary.

The distribution involving both allocation and apportionment of overheads among the production departments and service departments is known as **primary distribution of overheads**. When any overhead expense is directly identified with any particular department, then it is allotted to the same department. This is termed as **allocation**.

Certain costs cannot be identified with a specific department. These costs are referred to as common costs. These costs are to be apportioned to various production and service departments on certain estimated basis. This is referred to as **apportionment**. So, the expenses that cannot be charged against specific department are apportioned over multiple departments.

The guiding principles that are to be followed in determining the basis of apportionment are:

- Actual benefits:** According to this principle the overheads are distributed on the basis of actual benefits received by the departments. Where the actual benefits received can be measured, the overhead expenses are apportioned on that basis.
Example: floor area occupied by each department of a factory forms the basis of apportionment of rent, depreciation, insurance, etc.
- Potential benefits:** Benefit that is likely to be received forms the basis of apportionment in case the benefits cannot be conveniently measured.
Example: number of workers working in each department forms the basis of apportionment of canteen expenses, time keeping expenses, etc. Lighting cost can be apportioned on the basis of light points in each department.
- Ability to pay:** This principle says that more overhead expenses should be charged to the department which earns more revenue or which has more ability to pay.
Example: cost of store keeping, internal transport apportioned on the basis of revenue of the departments.
- Survey:** When it is difficult to determine a specific basis of apportionment, survey method is followed. Overhead expenses are apportioned to different departments on the basis of ratios that are determined after survey of the functions.
Example: Work manager's salary is apportioned on the basis of survey conducted to determine the time given by him to different cost centres.

<i>Overhead Costs</i>	<i>Basis of Apportionment</i>
Factory rent	Floor area
Canteen expenses, personnel department, supervision, time keeping	Number of employees
Lighting	Number of light points
Internal transport	Value of materials, number of requisition
Other fringe benefits to the workers	Direct wages
Stores	Number of requisition
Insurance	Insurable value
Building Maintenance	Floor space
Asset Maintenance	Book value of an asset
Depreciation of factory building	Floor area
General overheads	Direct labour hours or machine hours

Overhead Distribution Summary

The allocation and apportionment of overheads to production department and service department is called as departmentalization of overheads. It is done by preparing overhead distribution summary. In order to prepare overhead distribution summary, first the items of overheads that can be directly identified with particular departments are allotted and then the overheads that cannot be identified with a particular department are apportioned. The specimen of overhead distribution summary is as below:

<i>Expenses</i>	<i>Basis of Apportionment</i>	<i>Total (Rs.)</i>	<i>Production Department</i>			<i>Service Department</i>	
			P1 (Rs.)	P2 (Rs.)	P3 (Rs.)	S1 (Rs.)	S2 (Rs.)

--	--	--	--	--	--	--	--

5.7 RE-APPORTIONMENT OF SERVICE DEPARTMENT OVERHEADS TO PRODUCTION DEPARTMENTS

The overhead expenses are ultimately charged to the production units. Once the overheads are distributed to production and service departments, next step is to reapportion the service department cost to the production department. This is referred to as secondary distribution.

Basis of Secondary Distribution

Service Department	Basis of Re-distribution
Time keeping	Number of employees, labour hours, machine hours
Canteen	Number of workers
Repair and Maintenance	Hours worked
Purchase Department	Number of purchase order, value of materials purchased
Stores Department	Number of stores requisition
Recruitment Department	Number of employees
Labour welfare, Recreation	Number of employees
Power	Horse power, floorspace, meter reading

Illustration 1:

A company has four production department (A,B,C,D) and six service departments (power, purchase department, stores department, canteen, labour welfare, time keeping). From the following, apportion the service departments overheads to production departments. The expenses of these departments as per primary distribution summary are as follows:

Production Departments:	Rs.
A	30,000
B	30,000
C	24,000
D	<u>16,000</u>

Service Departments:

Power	18,000
Purchase department	15,000
Stores department	12,000
Canteen	9,000
Labour Welfare	6,000
Time Keeping	4,500

Additional information of production departments are as follows:

	A	B	C	D	
Horse power of machine	600	600	300	300	
Value of materials purchased	5 lakh	4lakh	4 lakh	2 lakh	
No. of stores requisition		4	3	3	2
No. of workers		18	16	14	12

Solution:

<i>Expenses</i>	<i>Basis of apportionment</i>	<i>Total</i>	<i>Production Department</i>			
			A	B	C	D
	Cost as per primary distribution	1,00,000	30,000	30,000	24,000	16,000
Power	Horse power (6:6:3:3)	18,000	6,000	6,000	3,000	3,000
Purchase Department	Value of materials purchased (5:4:4:2)	15,000	5,000	4,000	4,000	2,000
Stores Department	No. of stores requisition (4:3:3:2)	12,000	4,000	3,000	3,000	2,000
Canteen	No. of workers (18:16:14:12)	9,000	2,700	2,400	2,100	1,800
Labour welfare	No. of workers (18:16:14:12)	6,000	1,800	1,600	1,400	1,200
Time	No. of workers	4,500	1,350	1,200	1,050	900

keeping	(18:16:14:12)					
---------	---------------	--	--	--	--	--

B. CHECK YOUR PROGRESS:

1. What is standing order number?
2. What is reapportionment?
3. What is primary distribution of overheads?
4. What is allocation of overheads?
5. Explain numerical method of standing order number.
6. Choose the correct option:
 - i. Factory rent is apportioned on the basis of:
 - a) Number of employees
 - b) Horse power
 - c) Floor area
 - d) Direct wages
 - ii. Allocation and apportionment of manufacturing overheads among all the production department is known as:
 - a) Primary distribution of overheads
 - b) Secondary distribution of overheads
 - c) Additional distribution of overheads
 - d) Supplementary distribution of overheads
 - iii. Re-distribution of service department overheads among the production departments on appropriate basis is called:
 - a) Primary distribution of overheads
 - b) Secondary distribution of overheads
 - c) Additional distribution of overheads
 - d) Supplementary distribution of overheads
 - iv. Basis of time keeping department cost is:
 - a) Direct material cost
 - b) Floor area
 - c) Number of employees
 - d) Number of requisition

5.8 METHODS OF REDISTRIBUTION

• **Step Distribution Method or Non Reciprocal Method:**

In this method, it is assumed that service departments are not independent and there is no two-way distribution of cost between two service departments. The service departments are arranged in the descending order of their serviceability. The most serviceable department that serves the largest number of other departments is distributed first and then the rest service departments.

• **Reciprocal Service Method:**

In this method, it is assumed that service department are mutually dependent which means that service departments provide services to other service departments and also enjoys services rendered by that service department. When two service departments provide services to each other, then each department should be charged for the cost of services rendered by the other. For computing the total overhead costs of a service department, all apportioned

cost of other service departments must be added with its own overhead costs. The following methods are used for apportionment of cost under reciprocal method:

- i. **Simultaneous equations method:** This method determines the cost of a service department with the help of two simultaneous equations as follows:
$$X = a_1 + b_1 Y$$
$$Y = a_2 + b_2 X$$

Here, X = the total overhead of first service department
Y = the total overhead of second service department
 a_1 = overhead of first service department before re-apportionment
 a_2 = overhead of second service department before re-apportionment
 b_1 = percentage of overheads of second service to be included in the total overheads of first service
 b_2 = percentage of overheads of first service to be included in the total overheads of second service

Then distribute the service department cost (as determined from the above equation) among the production department on given basis.
- ii. **Repeated distribution method:** This method is applied when the number of service departments are more than two.

In this method, apportion the cost of the first service department to the production and service department in normal procedure as per given basis. After this, the cost of first service is closed. Then apportion the cost of the second service department. Here, the cost is equal to original cost plus apportioned cost from the first service department. Now the cost of second service is closed. Repeat this procedure for all the service departments until the amount available for distribution is insignificant. This method is also known as cycles method.
- iii. **Trial and Error method:** Under this method, the costs of the first service department to the other service departments are apportioned (production departments are to be ignored) in the given ratio. This procedure is repeated for all the service departments until the service department overheads are exhausted or when they become too small to matter. Then, find the total expense of all the service departments and then prepare a statement showing redistribution of total service department expenses on given percentage.

5.9 LET US SUM UP

The expenditure incurred over and above the prime cost is called as overheads. Under element wise classification, the overheads are divided into indirect materials, indirect labour and indirect expenses. Some overhead charges varies with the volume of production and some remain fixed. So according to behaviour, the overheads are classified as fixed overheads, variable overheads and semi variable overheads. Under function wise

classification, overheads are divided into production overheads, administrative overheads, selling and distribution overheads.

Costs are incurred in both production and service departments. Some costs are directly allocated to departments while some costs are apportioned on estimated basis. This is referred to as primary distribution. The overhead expenses are ultimately charged to production lots, processes. Therefore, the service department costs are to be reapportioned to the production department. This process is called as secondary distribution.

5.10 KEY WORDS

Overheads: The aggregate of indirect materials, indirect labour and indirect expenses is called overheads.

Indirect Materials: The materials that cannot be easily identified and allocated to a particular product are called indirect materials.

Indirect Labour: Indirect labour is not directly involved in the process of production. This cost cannot be assigned to any specific unit of product or process.

Fixed Overheads: The overhead expenses that does not change with the change in volume of production is referred to as fixed overheads.

Variable Overheads: The overhead expenses that varies directly with the volume of output is called as variable overheads.

Semi-Variable Overheads: The expenses that are partly fixed and partly variable with the volume of production is referred to as semi variable overheads.

Primary distribution of overheads: Distribution involving both allocation and apportionment of overheads among the production departments and service departments is known as primary distribution of overheads.

Allocation: When any overhead expense is directly identified with any particular department, then it is allotted to the same department. This is termed as allocation.

Apportionment: Division of costs among two or more cost centres is referred to as apportionment.

5.11 SOME USEFUL BOOKS

31. Charles T. Horngreen, Srikant M. Datar, Madhav V. Rajan, *Cost Accounting: A Managerial Emphasis*, Pearson Education.
32. JawaharLal, *Cost Accounting*. McGraw Hill Education

33. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. PHI Learning
34. Rajiv Goel, *Cost Accounting*. International Book House
35. Singh, Surender. *Cost Accounting*, Scholar Tech Press, New Delhi
36. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers
37. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi
38. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. ShriMahavir Book Depot, New Delhi
39. Iyengar, S.P. *Cost accounting*. Sultan Chand & Sons
40. H.V. Jhamb, *Fundamentals of Cost Accounting*, Ane Books Pvt. Ltd.

5.12 ANSWERS TO CHECK YOUR PROGRESS

- A. 4. i. b, ii. a, iii. d, iv. a
 B. 6. i. c, ii. a, iii. b, iv. C

5.13 TERMINAL QUESTIONS/EXERCISES

1. Define overheads. Discuss function wise classification of overheads.
2. What do you mean by collection of overheads? Discuss the sources from which overhead expenses are collected.
3. What do you mean by allocation of overheads? Distinguish between allocation and apportionment of overheads.
4. A company has three production departments (A,B,C) and two service departments (X,Y). Following information is available from departmental distribution summary:

Production Departments	Rs.
A	7,500
B	12,000
C	4,500
Service Department	Rs.
X	4,000
Y	2,600

The expenses of service departments are charged on a percentage basis as follows:

	A	B	C	X	Y
X	30%	40%	20%	-	10%
Y	10%	20%	50%	20%	-

Show the distribution of service department cost under repeated distribution method.

B. COM
SEMESTER IV
COURSE: COST ACCOUNTING

UNIT – 6 OVERHEADS - II

Structure

- 6.0 Objectives**
- 6.1 Introduction**
- 6.2 Absorption**
- 6.3 Methods of absorption of overheads**
- 6.4 Overhead rates**
- 6.5 Under absorption and Over absorption**
- 6.6 Capacity levels and costs**
- 6.7 Treatment of other overheads**
- 6.8 Treatment of certain items**
- 6.9 Activity based costing**
- 6.10 Let Us Sum Up**
- 6.11 Key Words**
- 6.12 Some Useful Books**
- 6.13 Answers to Check your Progress**
- 6.14 Terminal Questions/Exercises**

6.0 OBJECTIVES:

After going through this unit, you should be able to:

- Understand the concept of absorption
- Explain the methods of absorption
- Explain the various overhead rates
- Describe under and over absorption and its causes
- Explain the treatment of other overheads
- Understand the treatment of certain items like interest on capital, bad debt, etc.
- Explain the concept and steps of activity based costing
-

6.1 INTRODUCTION

Absorption of overheads refers to charging of overheads to individual products or jobs. Overhead absorption charges the overheads to the cost units by means of rates separately calculated for each cost centre. The various methods of overhead absorption are production unit method, percentage of direct material cost method, percentage of direct labour cost method, percentage of prime cost method, direct labour hour rate method and machine hour rate method. Activity based costing is a costing method that identifies activities in an organization and assigns the cost of each activity to all products and services according to the consumption. In this unit, we will understand the concept of absorption and its various methods.

6.2 ABSORPTION

After the redistribution of service department costs to the production departments is complete, the total expenses of the production departments are now to be borne by all the cost units. Charging of overheads of production departments to the cost units is referred to as absorption.

Total overheads of production department are:

- Its own indirect cost
- Its share of common cost by apportionment
- Its share of service department cost by way of re-apportionment.

6.3 METHOD OF ABSORPTION OF OVERHEADS

The various methods of absorption of overheads are as follows:

- i. Production unit method
- ii. Percentage methods
 - Percentage on direct material cost
 - Percentage on direct labour cost
 - Percentage on Prime cost
- iii. Hourly rate methods
 - Direct labour hour rate

- Machine hour rate

i. Production unit method:

It is calculated by dividing the total overheads of the production department by the number of units produced. This is also called as cost unit rate method. It is easy to understand and simple to calculate. This method is suitable where only one kind of output is produced. This method ignores the time factor. It ignores the differences between the jobs done by skilled workers and those by unskilled workers. It also ignores the distinction between job done by manual labour and by the machine.

Illustration 1. The production overheads to be absorbed is Rs 12,000. The number of units produced is 3000. Calculate the overhead absorption rate.

Solution:

$$\begin{aligned} \text{Overheads rate} &= \frac{\text{Amount of production overhead}}{\text{Number of units produced in that department}} \\ &= 12000 / 3000 = \text{Rs. } 4 \end{aligned}$$

ii. Percentage Methods:

Percentage on direct material cost:

It is a rate calculated by dividing the amount of production overhead by the direct material cost and expressing the result as a percentage. This method is seldom used as the material prices varies frequently and this leads to high or low charges in overheads.

$$\text{Overheads rate} = \frac{\text{Amount of production overhead}}{\text{Direct material cost}} \times 100$$

Percentage on direct labour cost:

It is similar to the previous one except that here direct labour cost is taken to determine the overhead rate. Absorption rate is ascertained by dividing the production overheads by the direct labour cost. Labour rate does not vary frequently and the overheads chargeable will not vary appreciably from period to period.

$$\text{Overheads rate} = \frac{\text{Amount of production overhead}}{\text{Direct labour cost}} \times 100$$

Percentage on Prime cost:

This is a combination of percentage on direct material and direct labour cost methods. This method is suitable where equal importance is given to the material and labour cost.

$$\text{Overheads rate} = \frac{\text{Amount of production overhead}}{\text{Prime cost}} \times 100$$

iii. Hourly Rate Methods:

Direct Labour Hour Rate method:

Under this method overhead rate is determined by dividing the total production overheads by the total direct labour hours for the period. Here, only productive working hours are taken into consideration ignoring the idle time. It is suitable where most of the work is done manually.

$$\text{Overheads rate} = \frac{\text{Amount of production overhead}}{\text{Direct labour hours during a period}}$$

Machine Hour Rate method:

The absorption rate is calculated by dividing the factory overhead by the effective machine hours during the period. The machine hours here refer to the effective machine hours ignoring the idle machine time.

$$\text{Overheads rate} = \frac{\text{Amount of production overhead relating to machine}}{\text{Effective machine hours during the period}}$$

Illustration 2:

Compute the overhead absorption rate for Summer Ltd. from the following information:

Number of workers	10
Number of working days in a year	300
Number of working hours per day	8
Idle time	10%
Works overhead	Rs. 43,200

Solution:

$$\begin{aligned}\text{Total Labour Hours in a year} &= \text{Number of days in a year} \times \text{Number of labour hours per day} \\ &= 300 \times 8 = 2,400 \text{ hours}\end{aligned}$$

$$\text{Idle time} = 10\% \times 2400 = 240 \text{ hours}$$

$$\text{Productive hours per worker} = 2400 - 240 = 2160 \text{ hours}$$

$$\text{Total net productive hours} = 2160 \times 10 = 21600 \text{ hours}$$

$$\begin{aligned}\text{Labour hour rate} &= \frac{\text{Amount of production overhead}}{\text{Direct labour hours during a period}} \\ &= 43,200 / 21,600 = \text{Rs. 2 per hour}\end{aligned}$$

Illustration 3:

Find out the overhead rates under direct material cost method, direct labour cost method, prime cost method, direct labour hour rate method and machine hour rate method from the following information:

	Rs.
Direct material	45,000

Direct wages	60,000
Overheads	90,000
Direct labour hours	15,000
Machine hours	30,000

Solution:

Direct material cost method:

$$\begin{aligned} \text{Overhead rate} &= \frac{\text{Amount of overhead}}{\text{Cost of direct material}} \times 100 \\ &= 90,000/45,000 \times 100 = 200\% \end{aligned}$$

Direct labour cost method:

$$\begin{aligned} \text{Overhead rate} &= \frac{\text{Amount of overhead}}{\text{Cost of direct labour}} \times 100 \\ &= 90,000/60,000 \times 100 = 150\% \end{aligned}$$

Prime cost method:

$$\begin{aligned} \text{Overhead rate} &= \frac{\text{Amount of overhead}}{\text{Prime Cost}} \times 100 \\ &= 90,000/105,000 \times 100 = 85.71\% \end{aligned}$$

Direct labour hour rate method:

$$\begin{aligned} \text{Overheads rate} &= \frac{\text{Amount of production overhead}}{\text{Direct labour hours during a period}} \\ &= 90,000/15,000 = \text{Rs. 6 per labour hour} \end{aligned}$$

Machine hour rate method:

$$\begin{aligned} \text{Overheads rate} &= \frac{\text{Amount of production overhead}}{\text{Direct machine hours during a period}} \\ &= 90,000/30,000 = \text{Rs. 3 per machine hour} \end{aligned}$$

6.4 OVERHEAD RATES

Overhead absorption rate may be actual (based on actual figures) or pre determined (based on estimated figures). The various types of overhead rates are as follows:

i. Actual overhead rates:

It is calculated by dividing the actual overheads by the actual quantity produced. It is computed after the expenses have been incurred.

$$\text{Actual rate} = \frac{\text{Actual overhead expenses incurred during the period}}{\text{Actual units produced during the period}}$$

It does not provide any basis for cost control. It does not facilitate comparison of cost of one period with that of another period because it may fluctuate from period to period due to fluctuations in the amount of overheads.

ii. Predetermined rate or standard rate:

It is calculated by dividing the estimated overheads by the budgeted or estimated units. It is computed before the expenses are incurred.

$$\text{Predetermined or standard rate} = \frac{\text{Estimated or budgeted overheads}}{\text{Estimated or budgeted units}}$$

This rate helps in prompt cost ascertainment because these are computed in advance. As actual overheads can be compared with the predetermined overheads, predetermined rate helps in cost control.

iii. Single or blanket rate:

It is a single rate for the factory as a whole. It is calculated by dividing the overhead cost for the factory for the period by labour hours or machine hours for the period.

$$\text{Single rate} = \frac{\text{Overhead costs for the entire factory for the period}}{\text{Labour hours or machine hours for the period}}$$

This method is suitable where a single product is produced. It is also suitable where more products are produced, but all products must pass through all departments and processed for same length of time in each department.

iv. Multiple or departmental rate:

Here, separate absorption rates are calculated for different production departments or different cost centres.

$$\text{Overhead rate} = \frac{\text{Overhead costs allotted to a production department}}{\text{Corresponding Labour hours or machine hours}}$$

This method is suitable where two or more products are produced and all of these do not pass through all departments for the same length of time.

v. Supplementary rate:

Supplementary rate is determined by dividing the under absorbed or over absorbed amount by the base hours or base units. These rates are used to adjust the under absorbed or over absorbed amounts. It is usually used where the under or over absorption of overheads is due to normal reasons like increase in material price or labour rates, etc.

$$\text{Supplementary overhead rates} = \frac{\text{Actual overheads incurred} - \text{Overhead absorbed}}{\text{Base (hours or units)}}$$

vi. Normal overhead rates:

Here, predetermined overhead rate is fixed based on normal capacity.

$$\text{Normal overhead rates} = \frac{\text{Normal budgeted overhead expenses}}{\text{Normal level of production}}$$

6.5 UNDER ABSORPTION AND OVER ABSORPTION

When the overhead absorbed is higher than the overhead incurred, it is referred to as over absorption. In other words, when the amount absorbed is more than the expenditure incurred due to expenses being less than the estimates, it is called over absorption of overheads. And when the overhead absorbed is less than overhead incurred, it is under absorption. It means the overheads incurred are not fully recovered in the cost of the product or process.

Causes Of Over Absorption or Under Absorption

- i. Error in estimating the amount of overhead expenses: In case of under recovery, actual overheads exceed the budgeted overheads and vice versa.
- ii. Error in estimating the quantity of production: In case of under recovery, actual output is less than budgeted output.
- iii. Seasonal fluctuation in the levels of production
- iv. Unforeseen changes in the production methods affecting overheads
- v. Changes in the techniques and methods of production

Treatment Of Under or Over-Absorbed Overheads:

The under and over absorbed overheads may be disposed of in any one of the following ways:

- i. ***Carry forward to the next period's accounts:*** Under this method, under or over absorbed overheads are transferred to an overhead reserve account and carried forward to the next period. This method should be applied when the normal business cycle extends for more than one year.
- ii. ***Write-off to Costing Profit and Loss Account:*** Under this method, the balance is transferred to production overhead under or over absorbed account and eventually transferred to Costing Profit and Loss Account.
- iii. ***Use of supplementary rate:*** Here, under or over absorbed overheads are adjusted to work in progress, finished goods and factory cost by way of supplementary rate. Thus, the amount of under absorbed overheads is to be added back while the amount of over absorbed overheads is to be deducted by applying supplementary rates.

CHECK YOUR PROGRESS:

1. What is absorption of overheads?
2. What is over absorption?
3. What is under absorption?
4. Choose the correct answer:
 - i. The process of absorbing all overhead costs allocated or apportioned over a particular cost centre or production department by the units produced is known as:
 - a) Absorption of overhead
 - c) Apportionment of overhead

- b) Allocation of overhead
- d) Assignment of overhead
- ii. An overhead absorption rate is used to:
 - a) Share out common costs over benefitting cost centres
 - b) Find total overheads for a cost centre
 - c) Charge overheads to products
 - d) Control overheads
- iii. Absorption is also called:
 - a) Allocation
 - c) Overhead recovery
 - b) Sharing
 - d) None of the above
- iv. Blanket overhead rate is:
 - a) One single overhead absorption rate for the whole factory
 - b) Rate which is blank or nil rate
 - c) Rate in which multiple overhead rates are calculated for each production department, service department, etc.
 - d) Always a machine hour rate

6.6 CAPACITY LEVELS AND COSTS

In computation of absorption rates, various bases are used like product units, machine hours, labour hours, direct wages, etc. Each of the base has different capacity levels. Determining the level of capacity is important. If the capacity is low then the demands of the customers may not be met, and if the capacity is high then there will be lot of unused capacity.

Maximum Capacity: It is also referred to as theoretical capacity. It is based on producing at full efficiency at all times, i.e., without any loss of time and any interruptions. Majority of units cannot have maximum capacity as it is difficult to attain it.

Practical Capacity: It is the maximum capacity reduced by the unavoidable interruptions. It takes into consideration the breakdowns, delay in delivery of raw materials, time taken for repairs, etc. The extent of reduction from theoretical capacity to practical capacity varies from unit to unit depending on the circumstances.

Normal Capacity: It is average of the capacity based on sales expectancy considering the trend factors, seasonal and cyclical variations.

6.7 TREATMENT OF OTHER OVERHEADS:

Earlier, we have studied about the production overheads. Now, we will understand the distribution on administrative and selling and distribution overheads.

The expenses that are related to the administrative offices of a business organization are called as administrative overheads. They are not directly related to production or sales. For example,

salary of office staff, depreciation of office building, office rent, printing and stationary, audit fees, etc. Treatment of administrative overheads are done in three possible ways as follows:

- Transfer to costing profit and loss account: When the administrative overheads are treated as fixed expenses, they are written off to costing profit and loss account.
- Apportion to production and sales: As the administrative expenses are incurred for the two major function of the business, i.e., production and sales, therefore the administrative overheads can be apportioned to them on some equitable basis.
- Administrative overhead as a separate function: This method advocates that the administrative overhead is a separate function like production and sales. Thus, it should be taken as separate item of cost and added to the cost of the product or job.

Some of the method of absorption administrative overheads are production unit method, percentage of conversion cost, percentage of sales, percentage of works cost, etc.

Selling and distribution costs are the after-production costs that help in stimulating demand and increasing the sales. For example: free gifts, advertisements, salesman remuneration, carriage outward, etc. Selling and distribution overheads can be analysed on the basis of nature of expenses, functions and channels of distribution. By functions, selling and distribution overhead can be classified as:

- Direct selling expenses: These expenses includes salary of the technical staff, salesman, expense on showroom, expense on tenders, after sales service, etc.
- Advertising and sales promotion: These expenses include cost of advertising, free gifts, samples, displays, etc.
- Transportation expenses: It includes the expenses of delivery vans, insurance of goods in transit, etc.
- Warehousing expense: It includes the cost of the storage of finished goods like warehouse rent, salary of warehouse staff, etc.
- Credit and collection expense: It includes the bad debt, collection of debt expenses, legal expenses, etc.
- Financial and general administration expense: It includes invoicing, royalty on sales, etc.

Selling and distribution overheads which cannot be directly allocated are to be apportioned to different cost centres on certain basis. For example, show room or warehouse expenses are apportioned on the basis of area occupied; credit and collection expenses on the basis of number of invoices or the number of customers, etc. After apportionment, the selling and distribution overheads must be absorbed by cost units. They are absorbed on the basis of rate per unit sold, percentage of selling price or percentage of works cost.

6.8 TREATMENT OF CERTAIN ITEMS

Interest on Capital:

Interest on capital can be on the borrowed capital and on own capital. Generally, interest on capital is paid or payable, then it is taken in the cost. But if the interest is not payable (interest on own capital), then there are some arguments in favour and some arguments against it. It can be argued that interest on capital must be included in cost like the interest on borrowings. In certain industries the capital is locked up for a longer period of time. In that case, the interest must be included to find the true cost. The ultimate result of replacing manual labour by the machinery cannot be identified if the interest on capital is not taken into consideration.

According to some accountants, the cost accounts should only take the actual expenditure. Thus, interest that is not payable should not be considered. In certain cases, it is difficult to determine the exact capital employed and the fair rate of interest. Inclusion of interest on capital may also lead to complications.

RESEARCH AND DEVELOPMENT EXPENSES:

Research and development is highly essential for survival. It is also required for maintaining competitive position in the market. It helps in replacing or improving the present product which can have greater acceptance in the market. Research involves pure research for basic knowledge, creation of new product, major improvement in product or process, etc. Development starts after the research. It is the application of knowledge obtained through research.

All direct costs relating to research and development like the direct material, direct labour, salary of special staff, etc., are directly allocated to the product or work order. Fixed expenses of research and development like insurance, depreciation, etc. can be apportioned to products or work orders. General overheads of research and development are also apportioned.

Revenue basis and capitalization basis are two methods of treatment of research and development cost in accounts. Under revenue basis, all cost on this account are charged to the current production. Under capitalisation basis, the cost can be taken under intangible assets and amortised over the estimated life of the product.

PACKING EXPENSES:

There are two types of packaging expenses: primary packaging and secondary packaging. Primary packaging expenses are part of prime cost. Secondary packaging expenses are treated like selling and distribution overheads and it is apportioned based on sales volume. Cost of special packing at the request of the customer is charged to specific job or work order.

Bad Debt:

Bad debts happen due to credit sales. Normally bad debts are charged to selling overheads. Amount in excess of normal bad debts is charged to Costing Profit and Loss Account.

6.9 ACTIVITY BASED COSTING (ABC)

In traditional method of allocation, the costs are allocated evenly, which lead to under or over costing of the products or the services. Under over costing, the product uses less resources but is charged high cost. In under costing, the product consumes high resources but are allocated low cost. This results in misleading cost information which in turn causes the management to make poor pricing decision for the products.

Activity based costing is different from the traditional costing system only in case of allocation of indirect costs. Direct cost is treated here in the same way as traditional costing system. Activities drive costs and cost are allocated based on cost drivers. Cost drivers are the factors that are significant determinants of cost. Cost driver, also known as activity driver, is used to refer to an allocation base. In ABC, there is a cause and effect relationship in the absorption of overheads.

Some examples of activities and cost drivers are as follows:

Activity	Cost driver
Machine set-up:	Number of production run, number of machine hours
Research and development:	Number of research projects, technical complexities of project
Purchase of materials:	Number of purchase order
Warehousing:	Items in stock
Packing:	Number of packing orders
Stores delivery:	Number of stores deliveries
Quality testing:	Hours of test time

The major kind of activities in any organization are as follows:

- **Unit level activity:** it refers to the activities relating to number of units produced. Here, the cost varies with the units. These are short run variable costs. Example: indirect materials, energy, indirect consumables, etc.
- **Batch level activity:** Some costs are incurred by activities each time a batch of product is produced. Here, costs vary with number of batches produced. For example: set up costs, purchase order, inspection, etc.
- **Product level activity:** This refers to activities relating to a particular product. These costs increase when more products are added to product line. They are easily traceable to a product line. For example: design of the product, product enhancement, advertising cost for that individual product, process engineering, producing parts with specifications, etc.
- **Facility level activity:** This refers to the activities relating to the organization as a whole and not to any particular product or batch. For example: plant security, maintenance of building, advertising for the company as a whole, production manger's salary, etc.

Steps In Activity Based Costing:

- i. Identification of significant activities: Significant activities are to be identified to give separate treatment. For example, ordering of materials, customer support, machine set up, inspecting, material handling, etc.
- ii. Identification of total cost of activity: Total cost of each activity is to be identified. For example: total cost of inspection, total cost of customer support, total ordering cost, etc.
- iii. Determination of cost drivers for each activity: Cost drivers are to be identified as they influences the cost of the activities. For example: number of orders, number of inspections, number of deliveries, etc.
- iv. Calculation of activity cost driver rate: Activity cost driver rate is determined by dividing the total cost of an activity by the cost driver volume.
Example: Total cost of inspection is Rs. 2lakh and total number of inspections are 200. Then, the cost per inspection = $2,00,000/200 = \text{Rs. } 1000$ per inspection
- v. Charging of activity cost to the products, processes and jobs: Activity cost is charged by multiplying the activity consumed and the activity cost driver rate.
Example: If the number of inspections for product AB is 20, then the inspection cost charged to this product = $20 \times 1000 = \text{Rs. } 20,000$

Difference Between Traditional Approach and Activity Based Costing:

Traditional Approach	Activity Based Costing Approach
It is assumed that end products consume resources in proportion to the volume of production.	It is assumed that end products consume resources in proportion to the volume of activities.
Overheads are absorbed based on volume measures like labour hours or machine hours.	Overheads are absorbed on the basis of activities consumed.
Overheads are calculated for functional cost centres.	Overheads are calculated for each activity.
It is less accurate system of costing than ABC.	It is more accurate.

B. CHECK YOUR PROGRESS:

1. What is a cost driver?
2. What is the weakness of traditional costing system?
3. What is product level activity?
4. Choose the correct option:
 - i. Plant depreciation is an example of which activity level group?

a) Unit level activity	c) Product level activity
b) Batch level activity	d) Facility level activity

- ii. Product design is an example of which activity level group?
 - a) Unit level activity
 - b) Batch level activity
 - c) Product level activity
 - d) Facility level activity
- iii. The costing system in which individual activities are identified as the cost object is considered as:
 - a) Manufactured costing
 - b) Activity based costing
 - c) Allocation costing
 - d) Base costing
- iv. In activity based costing, _____ are grouped into activities.
 - a) Overheads
 - b) Expenses
 - c) Costs
 - d) Indirect expenses
- v. The product which requires large amount of resources but has low per unit cost is classified as:
 - a) product over costing
 - b) product under costing
 - c) expected under cost
 - d) expected over cost
- vi. The approach in which the company under cost its one product and over cost its at least one product is classified as:
 - a) Service cost across subsidizing
 - b) Product price cross subsidizing
 - c) Product cost cross subsidizing
 - d) Product cross subsidizing

6.10 LET US SUM UP

Absorption is the process of distribution of overheads allotted to a particular department or cost centre over the units produced. The various methods of absorption of overheads are: Production unit method, Percentage methods and Hourly rate method.

When the overhead absorbed is higher than the overhead incurred, it is referred to as over absorption. And when the overhead absorbed is less than overhead incurred, it is under absorption. It means the overheads incurred are not fully recovered in the cost of the product or process.

Activity based costing is an alternative to traditional way of costing. Under this method, the costs of the products are determined more accurately. ABC helps in getting better grasp of the cost, allowing the companies to take appropriate pricing decision.

6.11 KEY WORDS

Absorption: Charging of overheads of production departments to the cost units is referred to as absorption.

Over absorption: when the overhead absorbed is higher than the overhead incurred, it is referred to as over absorption.

Under absorption: when the overhead absorbed is less than overhead incurred, it is under absorption.

Activities: It is a process or task with a specific purpose. For example, material handling, machine support, placing purchase order, after sales services, etc.

Cost object: It is an item for which cost is determined. For example, product, service, etc.

Cost driver: These are the factors that are significant determinants of costs. It influences the cost of an activity.

6.12 SOME USEFUL BOOKS

41. Charles T. Horngreen, Srikant M. Datar, Madhav V. Rajan, *Cost Accounting: A Managerial Emphasis*, Pearson Education.
42. JawaharLal, *Cost Accounting*. McGraw Hill Education
43. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. PHI Learning
44. Rajiv Goel, *Cost Accounting*. International Book House
45. Singh, Surender. *Cost Accounting*, Scholar Tech Press, New Delhi
46. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers
47. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi
48. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. ShriMahavir Book Depot, New Delhi
49. Iyengar, S.P. *Cost accounting*. Sultan Chand & Sons
50. H.V. Jhamb, *Fundamentals of Cost Accounting*, Ane Books Pvt. Ltd.

6.13 ANSWERS TO CHECK YOUR PROGRESS

- A. 4. i. a, ii. c, iii. c, iv. a
B. 4. i. d, ii. c, iii. b, iv. a, v. b, vi. c

6.14 TERMINAL QUESTIONS/EXERCISES

1. What is activity based costing? How are product cost determined under ABC?
2. What are the various methods which are used for computing overheads absorption rates?
3. Distinguish between traditional method of costing and activity based costing.
4. The production department of a factory furnishes the following information:

Materials used	Rs. 54,000
Direct wages	Rs.45,000
Labour hours worked	36,000 hours
Hours of machine operation	30,000 hours
Overhead chargeable to the department	Rs.36,000

For an order executed by the department during the period, the following relevant information was provided:

Materials used	Rs. 6,000
Direct wages paid	Rs. 3,200
Labour hours worked	3,200 hours
Hours of machine operation	2,400 hours

Calculate the overhead charges chargeable to the job by the following methods:

- i. Direct material cost percentage rate
 - ii. Labour hour rate
 - iii. Machine hour rate
- (i. 4,800; ii. 3,200; iii. 2,880)*

B. COM
SEMESTER IV
COURSE: COST ACCOUNTING

UNIT-7 UNIT COSTING

STRUCTURE

7.1 Objectives

7.2 Introduction

7.3 Concept of Unit Costing

7.4 Features of Industries Adopting Unit Costing

7.5 Objectives of Unit Costing

7.6 Cost Unit

7.7 Accounting Procedure

7.8 Presentation of Cost

7.9 Items not considered for Computing Cost

7.10 Preparation of Cost Sheet

7.11 Production Account

7.12 Tender and Quotation

7.13 Summary

7.14 Key Words

7.15 Answers for Check Your Progress

7.16 Terminal Questions

7.1 OBJECTIVES

After studying the unit, you would be able to:

- Understand the meaning and features of unit costing.

- Learn the procedure of ascertaining both the total cost and the unit costs of production during a period.
- Study the preparation and presentation of cost through Cost Sheet and Production Account.
- Study the role of cost sheet in submitting quotations in response to tenders.

7.2 INTRODUCTION

The methods of costing can be broadly classified into two groups, viz., specific order costing and operation costing. Unit costing is a method of costing that belongs to the group of operation costing. It is applied where the organizations produce single product and whole production process is involved in manufacture of single product. It is also called as ‘Single Costing’ or ‘Output Costing’. It is done generally in highly mechanized and routine productions environments. Most frequently different grades of identical products are produced.

7.3 CONCEPT OF UNIT COSTING

Unit costing is a form of operation costing method applicable where goods result from a series of continuous or repetitive operations to which costs are charged and the cost per unit is ascertained by dividing the total cost by the number of units produced during the period. Since the units are identical, they have identical costs and therefore, they bear identical amount of cost. This method is known as single costing method as industries, adopting this method, manufacture a single variety of product. It is termed as unit costing because cost units are identical. Though under this method of costing, a single variety of product is produced, it may vary in respect of size, grade, colour etc. The examples of industries which make use of this method of costing are: brick, quarries, sugar, cement, steel, paper, food canning etc.

7.4 FEATURES OF INDUSTRIES ADOPTING UNIT COSTING

Unit costing is applied in those industries where –

- a. They produce only one product (a single product) each or few varieties of same product with variations in shape, quality, size etc.
- b. The production involves only a single process or operation.
- c. Production is uniform and continuous.
- d. Goods are produced on a large scale basis.
- e. The end products are always homogenous or uniform in all respects.
- f. Units of output are identical.

7.5 OBJECTIVES OF UNIT COSTING

The specific objectives of this method of costing are-

1. To ascertain total cost and unit cost of production.

2. To compare cost of one period with another period to know efficiency.
3. To ascertain profit or loss from production.

7.6 COST UNIT

Unit of cost is the unit in which the output is measured. In order to ascertain the cost per unit it is necessary for the industrial enterprises to decide about the cost unit. A few examples of cost unit for different industries adopting unit costing are as follows:

SL NO	INDUSTRY	COST UNIT
1	Brick industry	Per 1000 bricks
2	Quarries	A tonne of stone
3	Sugar	Per bag/ per tonne
4	Cement	Per bag / per tonne
5	Steel	Per tonne

7.7 ACCOUNTING PROCEDURE

The accounting procedure of unit costing can be summarized under the following stages

1. The accumulation and tabulation various elements of cost for a given period, say, a month, quarter or year.
2. Measurement of output either in terms of number or quantity.
3. Calculating the cost per unit by dividing the total cost by number or quantity produced.

The basic equation used to ascertain cost per unit under unit costing is as follows:

$$\text{Cost per unit} = \frac{\text{Total cost for the period}}{\text{Number of units produced during the period}}$$

Since the cost ascertainment procedure involves the collection and analyses of different elements of cost, the same is analyzed and presented below:

- a. **Material Cost:** The material cost is accumulated from the materials abstract. Materials required for production are obtained by the production department from the stores department through material requisition notes.

Quantity of raw material consumed = (Quantity of opening stock of raw materials + Total quantity of raw materials purchased) - Quantity of closing stock of raw materials.

Cost of raw material consumed = (cost of opening stock of raw materials + total cost of raw materials purchased) - cost of closing stock of raw materials.

It may be noted that at this stage of analysis, any other expenses incurred to purchase the raw material should also be considered while computing the cost of raw materials consumed. Any normal loss of materials is adjusted by inflating the rate of good units of raw materials.

Thus, materials consumed can be calculated as:

Opening stock of raw material
+ Purchases
+ Carriage inward and other incidental charges
- Closing stock of raw material
- Scrap of raw material
- Materials returned to store or transferred to other departments

- b. Direct Labour:** The labour costs are collected periodically from the payrolls prepared separately for different sections or departments of the factory. The cost of abnormal idle time should be deducted.
- c. Direct Expenses:** Expenses other than direct material and direct labour are chargeable expenses which are incurred for production and which can be easily identified with the production charged to the output for the period. For example, excise duty, royalty, expenses on designs, patterns or models etc.
- d. Overheads:** It is the sum total of indirect material, indirect labour, indirect expenses incurred during the period of production. In most of the cases, overheads are charged at a pre-determined rate where quotation prices are to be prepared. Otherwise overheads are collected under the heads of factory, office and administration, selling and distribution for the period for which they relate. When more than one variety of products is produced the overheads are apportioned on some suitable basis.
- e. Stock of Work-In- Progress (W-I-P):** The incomplete units of production are known as work-in-progress or work-in-process. It is valued on the basis of materials consumed, wages paid for the concerned work and share of factory overheads. The opening stock of work-in-progress is added to the current factory cost and closing stock of work-in-progress is deducted from the above total. After this treatment is made, the office and administration overheads are added to arrive at cost of production.
- f. Stock of Finished Goods:** While calculating the total cost and the unit cost, it is necessary to adjust the cost of finished goods at the beginning and at the end of the period. The opening stock is added to and the closing stock is subtracted from the cost of production to get cost of goods sold.

g. **Treatment of Losses:** Some losses in different forms such as waste, scrap, spoilage and defectives are common at different stages in the manufacturing concerns. Such losses may be normal or abnormal in nature. The accounting treatment of such losses are as follows:

i. **Waste:** A portion of basic raw materials may be lost due to various reasons like evaporation, breaking of the bulk, loading and unloading, inefficient handling etc. This waste may be visible like unsalable residues or invisible like gases, smokes etc.

The accounting treatment of waste material depends upon whether the waste is normal or abnormal. The normal waste is unavoidable and inevitable which arises from breakage, evaporation, deterioration etc. The cost of normal waste is distributed over the good units. On the other hand, abnormal waste arises due to avoidable reasons like theft, careless handling etc. Therefore, the cost of abnormal waste is charged directly to costing profit and loss account.

ii. **Scrap:** It is an unavoidable and incidental residue material arising from certain types of manufacturing processes such as turning, boring, punching, molding etc. Scrap has a small realizable value without further processing.

The realizable value from the disposal of scrap is treated as deduction either from raw material consumed or from factory overhead while computing total cost and unit cost.

iii. **Spoilage:** Units of output which do not meet the production standards are considered as spoilage. The spoilage are either sold at their salvage value or discarded without further processing. The salvage value is deducted from the cost incurred up to the point of rejection to get cost of spoilage.

The cost of normal spoilage, which is inherent in the manufacturing process is distributed over the good units. On the other hand, the cost of abnormal spoilage is transferred to costing profit and loss account. However, if the spoilage is due to the specification and/or terms and conditions of the specific order, then the cost of such spoilage should be charged directly to that order.

iv. **Defectives:** The defectives may arise due to the use of sub-standard raw materials, poor workmanship, careless supervision etc. Thus, the units of output do not meet the production standards but can be made them saleable as good units through rectification. To rectify the defective units some additional costs are incurred.

If the defectives were due to normal reasons, the cost of rectification should be charged to factory overhead. On the other hand, if the defectives were due to abnormal reasons, the cost of rectification should be charged to costing profit and loss account. If the defective units are identifiable with a particular job, the cost of rectification should be charged directly to the concerned job.

7.8 PRESENTATION OF COST (PREPARATION OF COST SHEET OR STATEMENT OF COST)

The details about different items of cost collected by following the procedure are presented systematically in the form of a statement called cost sheet. In unit costing, it is prepared in columnar form showing the particulars of cost, cost per unit, total cost during the given period. Cost sheet is a memorandum statement. It is not an account. It doesn't form part of the double entry system.

In the words of **C.I.M.A., London**, "Cost sheet is a cost schedule or document which provides for the assembly of the estimated detailed cost in respect of a cost centre or cost unit"

Thus, cost sheet is a periodical statement of cost designed to show in detail the various elements of cost of goods produced like prime cost, factory cost of production and total cost. It is prepared at regular intervals, *e.g.*, weekly, monthly, quarterly, yearly etc. Comparative figures of the previous period may also be shown in the cost sheet so that assessment can be made about the progress of the business.

PURPOSES OF COST SHEET

Cost sheet serves the following purposes:

1. It reveals the total cost and cost per unit of goods produced.
2. It discloses the break-up of total cost into different elements of cost.
3. It provides a comparative study of the cost of current period with that of the corresponding previous period.
4. It acts as a guide to management in fixation of selling prices and quotation of tenders more competitively and accurately.

7.9 ITEMS NOT CONSIDERED FOR COMPUTING COST

The following items are not considered while ascertaining the total cost and the unit cost through preparing cost sheet because they are purely the items of financial accounting.

- Loss on sale of investment
- Loss on sale of fixed assets
- Fines and penalties
- Discount on issue of debentures and bonds
- Interest on debentures, mortgage and bank loan
- Interest on capital
- Underwriting Commission
- Debenture discount written off
- Expenses on raising capital
- Cash discount
- Loss by fire, Loss by theft
- Cost of abnormal wastage
- Donation and charities
- Writing off Goodwill, patent, underwriting commission, preliminary expenses etc.

- Income-tax
- Damages payable in contravention of law
- Transfer to general reserve
- Transfer to specific reserves like debenture redemption fund, dividend equalisation fund etc.

7.10 PREPARATION OF COST SHEET

Cost sheet can be prepared in the following ways as per the availability of information:

1. Simple Cost Sheet (without opening stock and closing stock of raw materials, work-in-progress and finished goods)
2. Adjusted Cost Sheet (with opening stock and closing stock of raw materials, work-in-progress and finished goods)

It becomes clear from the specimen presented below.

1. SIMPLE COST SHEET

Cost Sheet for the period output. Units

Particulars	Total cost ₹	Per unit ₹
Purchase of Raw Materials (Including carriage inwards, transit insurance etc.)		
Add: Direct labour		
Add: Direct expenses		
Prime Cost		
Add: Factory Overheads		
Factory Cost / Works Cost		
Add: Office and Administration Overheads		
Research and Development OH (apportioned), if any		
Cost of Production		
Add: Selling and Distribution Overheads		
Total Cost		
Add: Profit / Loss (Balancing Figure)		
Sales		

Illustration 7.1

Prepare a cost sheet from the following data given in rupees relating to AB Ltd. for the year ending 31.12.2015. Desired profit is 20% on sales.

Items of cost	Amount (₹)	Items of cost	Amount (₹)
Raw materials purchased	45,280	Factory rent	1,500
Indirect wages	7,500	Warehouse expenses	4,260
Power, fuel, and haulage	11,000	Office rent and taxes	3,600
Carriage inward	2,720	Traveller's wages and commission	5,000

Carriage outward	3,200	Income Tax	3,000
Drawing expense	2,000	Advertisement	6,000
Printing and Stationery	3,500	Donation	10,000
Factory manager salary	5,900	Employees state insurance	1,800
Office manager salary	6,500	Depreciation on plant	2,400
Direct wages	30,000		

Calculate: (a) Prime Cost (b) Factory Cost (c) Cost of Production (d) Total Cost
(a) Profit

Solution:

Cost Sheet
for the year ending 31.12.2015

Items of cost	Amount (₹)	Total Cost (₹)
Raw material purchased	45,280	
Add: carriage inward	2,720	48,000
Direct wages		30,000
Prime Cost		78,000
Add: Factory Overheads		
Indirect wages	7,500	
Power, fuel, and haulage	11,000	
Drawing expenses	2,000	
Factory Managers salary	5,900	
Factory Rent	1,500	
Depreciation on plant	2,400	
Employee's state insurance	1,800	32,100
Factory Cost		1,10,100
Add: Administrative Overhead		
Printing and Stationery	3,500	
Office Manager salary	6,500	
Office rent and taxes	3,600	13,600
Cost of Production		1,23,700
Add: Selling and distribution overhead		
Carriage out	3,200	
Warehouse expenses	4,260	
Traveller's wages and commission	5,000	
Advertisement	6,000	18,460
Total Cost / Cost of Sales		1,42,160
Add: Profit (20% on sales) i.e. 1/4th on cost		35,540
Sales		1,77,700

Note: Income Tax and donation are purely financial charges, hence excluded from cost sheet.

2. ADJUSTED COST SHEET

Cost Sheet (Adjusted) for the period output units

Particulars	Total cost ₹	Per unit ₹
Opening stock of Raw Materials		
Add: Purchases of Raw Materials (Including carriage inwards, transit insurance, etc.)		
Less: Closing stock of Raw Materials		
Value of Raw Materials consumed		
Add: Direct labour		
Add: Direct expenses		
Prime Cost		
Add: Factory Overheads		
Manufacturing cost of the current period/factory manufacturing cost		
Add: Opening stock of work-in-progress		
Less: Closing stock of work-in-progress		
Factory Cost / Work Cost		
Add: Office and Administration Overheads Research and Development OH (apportioned) if any		
Cost of Production		
Add: Opening stock of finished goods		
Cost of Goods Available for Sale		
Less: Closing stock of finished goods		
Cost of Goods Sold		
Add: Selling and Distribution Overheads		
Cost of Sales/ Total Cost		
Add: Profit / Loss (Balancing Figure)		
Sales		

Illustration 7.2

The following costing information relate to commodity 'P' for the half year ending 31st December 2018.

	₹		₹
Stock (1st July, 2018):		Work-in-progress	
Raw Materials	20,000	On 1st July, 2018	4,800
Finished products (1,000 tons)	16,000	On 31st Dec. 2018	16,000
Purchase of Raw Materials	1,20,000	Stock (31st Dec. 2018):	
Works Overheads	48,000	Raw Materials	22,240

Direct wages	1,00,000	Finished Products (2,000 tons)	32,000
Carriage on Purchases	1,440		

Selling and distribution overheads are Re.1 per ton sold. 16,000 tons of commodities were produced during the period. Desired profit is 25% on sales

You are to ascertain (i) Cost of raw materials consumed, (ii) Cost of production, (iii) Cost of Sales (iv) Net profit for the period and , and (v) Net profit per ton of the commodity.

Solution:

Statement of Cost and Profit
For the half year ending 31st December, 2018

	Units (Tons)	₹
Opening Stock of Raw Materials		20,000
Add: Purchase of Raw Materials		1,20,000
Add: Carriage on Purchases		1,440
		1,41,440
Less: Closing Stock of Raw Materials		22,240
(i) Value of Raw Materials consumed		1,19,200
Add: Direct wages		1,00,000
Prime Cost		2,19,200
Add: Works Overheads		48,000
Add: Opening Stock of Work-in-progress		4,800
		2,72,000
Less: Closing Stock of Work-in-progress		16,000
(ii) Factory cost / Cost of output for the period @ ₹16	16,000	2,56,000
Add: Opening Stock of Finished Goods	1,000	16,000
Less: Closing Stock of Finished Goods @ ₹16	2,000	32,000
Cost of Goods Sold	15,000	2,40,000
Selling and Distribution Overheads on 15,000 tons @ Re.1 per ton		15,000
(iii) Cost of sales		2,55,000
(iv) Net profit of the period		85,000
Sales		3,40,000
(v) Net profit per ton = $\frac{₹85,000}{₹15,000} = ₹5.67$ Approx.		

Note: Desired profit is 25% on sales, i.e., $33\frac{1}{3}\%$ on cost of sales

Illustration 7.3

From the following particulars, prepare a Cost Statement showing the components of total cost and the profit for the year ended 31st December, 2018.

Particulars	On 1 st January,2018	31 st December,2018
	₹	₹
Stock of Raw Materials	4,00,000	5,00,000
Stock of Finished Goods	60,000	1,50,000
Stock of Work-in-progress	1,50,000	1,00,000

Particulars	₹	Particulars	₹
Raw materials purchased	47,50,000	Sales for the year	90,00,000
Carriage inwards	1,25,000	Selling expenses	92,500
Wages	17,50,000	General expenses	3,20,000
Works Manager's salary	3,00,000	Debenture interest	50,000
Salary – factory Employees	3,00,000	Dividend paid	10,000
Salary – Office Staff	2,00,000	Income tax- provision	5,000
Salary – Salesman	1,00,000	Goodwill written off	1,00,000
Factory rent and insurance	72,500	Sales tax paid	1,60,000
Power Expenses	95,000	Transfer to machinery Replacement Fund	1,00,000
Other production expenses	4,20,000	Interest on Loan	75,000
Bad debts written off	15,000	Bank charges	5,000
Loose Tools written off	10,000	Discount allowed	27,000

Solution:**Cost Sheet for the year ended 31.12.18**

	Opening stock of Raw Materials	4,00,000
Add	Purchases & Carriage inwards (₹,4,75,000 + ₹1,25,000)	48,75,000
		52,75,000

Less	Closing stock of raw materials		(5,00,000)
		Value materials consumed	47,75,000
Add	Direct labour		17,50,000
		Prime Cost	65,25,000
Add	Factory Overheads (WN- 1)		11,97,500
Add	Opening stock of work-in-progress		1,50,000
			78,72,500
Less	Closing stock of work-in-progress		(1,00,000)
		Factory Cost	77,72,500
Add	Administration Overheads (WN- 2)		5,25,000
		Cost of Production	82,97,500
Add	Opening stock of finished goods		60,000
		Cost of goods available for sale	83,57,500
Less	Closing stock of finished goods		(1,50,000)
		Cost of goods sold	82,07,500
Add	Selling and Distribution Overheads (WN- 3)		1,92,500
		Cost of Sales	84,00,000
Add	Profit (Balancing Figure)		6,00,000
	Sales		90,00,000

Working Note:

1. Statement of Factory OH		2. Statement of Administration OH		3. Statement of Selling Dist. OH.	
Particulars of cost	₹	Particulars of cost	₹	Particulars of cost	₹
Works Manager's salary	3,00,000	Salary – Office staff	2,00,000	Salary – Salesman	1,00,000
Salary-Factory employees	3,00,000	General Expenses	3,20,000	Selling expenses	92,500
Factory Rent & Insurance	72,500	Bank charges	5,000	Total	1,92,500
Power Expenses	95,000	Total	5,25,000		
Other Production Expenses	4,20,000				
Loose tools written off	10,000				
Total	11,97,500				

4. The following items are excluded from the Cost Sheet for the reasons specified below-

Item	Reasons for exclusion
Bad debts written off	Represents Loss / inefficacy in credit granting and collection
Debenture interest	Financial item / expense
Dividend paid	Appropriation of profits
Income tax provision	Profit based outflow
Goodwill written off	Policy based / company – specific transfer entry in accounting system
Sales tax paid	Collection and Remittance on behalf of Govt. No revenue or cost is involved to the business entity
Transfer to Machinery Replacement Fund	In the nature of appropriation of profits
Interest on loan	Financial item / Expense
Discount allowed	Policy based / Company specific transaction

5. Profit as per Cost sheet represents profit before Interest and Tax, i.e., PBIT

Illustration 7.4

The following data relate to the manufacturing of a product for a month of July 2018.

	July 1 (₹)	July 31 (₹)
Stock of raw material	6,000	12,000
Stock of W.I.P.	12,000	15,000
Stock of finished goods	18,000	14,000

Direct labour ₹21,000/- (being 150% of factory overhead), Administrative expenses ₹13,000; Selling and distribution overhead ₹16,000; Sales for the month is ₹1,37,500 ; Cost of production ₹90,000/-.

Prepare a cost sheet for the month of July 2018.

Solution:

STATEMENT OF COST

For a month of July 2018

Particulars	Details (₹)	Total Cost (₹)
Opening stock of raw material	6,000	
Add: Purchase of raw material	51,000	
	57,000	
Less: Closing stock of raw material	12,000	
Cost of Raw Material Consumed		45,000
Add: Direct Labour		21,000
Prime Cost		66,000
Add: Factory Overhead	14,000	
Add: Opening stock of Work-in-progress	12,000	

Less: Closing stock of Work-in-progress	26,000	
	15,000	11,000
Factory Cost		77,000
Add: Administrative Overhead		13,000
Cost of Production		90,000
Add: Opening stock of finished goods		18,000
		1,08,000
Less: Closing stock of finished goods		14,000
Cost of goods sold		94,000
Add: Selling and distribution overhead		16,000
Cost of sales		1,10,000
Profit (Balancing Figure)		27,500
Sales		1,37,500

NOTES: Calculation of value of raw material purchased:

The cost of raw material purchased for the month is not given in the question..

Let the cost of raw material purchased = ₹x

Particulars	(₹)	Total Cost (₹)
Opening raw material	6,000	
Add: Purchase of raw material	x	
	6,000 + x	
Less: Closing raw material	12,000	
Raw Material Consumed	x - 6,000	
Add: Direct labour	21,000	
Prime Cost		x + 15,000
Add: Factory Overhead		14,000
Opening Work-in-progress		12,000
		x + 41,000
Less: Closing Work-in-progress		15,000
Factory Cost		x + 26,000
Add: Administrative overhead		13,000
Cost of Production		x + 39,000

As per question, cost of production for the month = ₹90,000

⇒ x + 39,000 = 90,000 or, x = 90,000 – 39,000 = ₹51,000

CHECK YOUR PROGRESS

1. Unit costing is applied in those industries where different products are produced simultaneously. (True/False)
2. In the cement industries, the unit cost is per tonne. (True/False)
3. Cost of production is also called office cost. (True/False)
4. There is no difference between costs of goods sold and cost of sales. (True/False)
5. Cost sheet is same as statement of cost and profit. (True/False)
6. When firms produce single product and the whole production process is involved in manufacture of single product, then system to be adopted is :
 - a. Job costing
 - b. Process costing
 - c. Output costing
 - d. Operating costing
7. For ascertainment of cost of production and profit, _____ are prepared on periodical basis?
 - a. Production statement
 - b. Production account
 - c. Cost sheet
 - d. Cost statement

7.11 PRODUCTION ACCOUNT

When the information relating to costs, sales and profit or loss are recorded in the form of a ledger account, it is known as Production Account. It is also called Manufacturing Account on double entry system. The details are presented in T-form with debit and credit sides. Production account is debited with opening stock and all items of cost are credited with sales and closing stock; the balancing figure shows either profit or loss. The objective of this account is, as in the case of cost sheet, to ascertain the cost of production along with the unit cost in a detailed and analytical manner.

DISTINCTION BETWEEN COST SHEET AND PRODUCTION ACCOUNT

Sl No.	Basis	Cost Sheet	Production Account
1	Meaning	Cost sheet is a document that provides for all the cost incurred by the company in the production of a product, during a particular period.	Production Account is a T-shaped account that combines the features of the cost sheet and the trading and profit and loss account.
2	Nature	It is a statement.	It is a ledger account.
3	Time of preparation	Before or after production	After production
4	Basis	It is based on actual and or estimated	It is based on actual figures.

		figures.	
5	Principle of Double entry system	It does not follow the rules of double entry system.	It follows the rules of double entry system.
6	Tenders and Quotations	It is helpful in the submission of tenders and quotations.	It does not play any role in the submission of tenders and quotations.

Illustration 7.5

From the following details of M/s. Sarojini Ltd. you are required to **prepare a Production Account** for the three months ending 31st March, 2019.

	1 Jan., 2019	31 March, 2019
	₹	₹
Raw materials	20,000	24,700
Finished Goods	14,300	8,400
Work-in-progress	6,200	6,900
Purchases on Raw Materials	17,600	
Direct wages	14,000	
Indirect wages	500	
Works expenses	7,400	
Office expenses	2,600	
Selling expenses	3,000	
Sales	56,800	

Assuming stock of finished goods at the end of the period is valued at cost, Calculate:

- | | |
|--------------------------------|------------------------|
| (a) Value of Material Consumed | (b) Works Cost |
| (c) Cost of Production | (d) Cost of Goods Sold |
| (e) Gross Profit, and | (f) Net Profit |

Solution:

In the Books of M/s. Sarojini Ltd.
Production Account
For three months ending 31st March, 2019

	₹		₹
To Opening Stock of Raw Materials	20,000	By Cost of production c/d	36,700
Add: Purchases	17,600		
	37,600		
Less: Closing Stock	(24,700)		

Raw Material consumed (a)	12,900		
To Direct Wages	14,000		
Prime Cost	26,900		
To Works Overheads:			
Indirect Wages	500		
Works Expenses	7,400		
To Work-in-progress (1 Jan.)	6,200		
	41,000		
Less: Work-in-progress (31st March)	(6,900)		
Works Cost (b)	34,100		
To Office Expenses	2,600		
	36,700		36,700
To Opening stock of finished goods	14,300	By Sales	56,800
To Cost of Production b/d (c)	36,700		
	51,000		
Less: Closing stock of finished goods	(8,400)		
To Cost of goods sold (d)	42,600		
To Gross Profit (e)	14,200		
	56,800		56,800
To Selling Expenses	3,000	By Profit	14,200
To Net Profit (f)	11,200		
	14,200		14,200

Check your progress

8. There is no difference between production account and manufacturing account.(True/False)
9. Scrap is a residue which arises in a manufacturing process but has no recoverable value. (True/False)
10. Output costing is a form of operation costing which is used when an organization produces only one product or only a few grades of similar products. (True/False)
11. Coal industry makes use of output costing. (True/False)
12. Cost of production is equal to prime cost plus works overhead.(True/False)
13. Cost sheet forms a part of double entry cost accounting record.(True/False)
14. Cost sheet is a ledger account.(True/False)
15. The information relating to cost incurred, selling price of the goods sold and profit or loss during a period is prepared in the form of account called :
 - a. Cost of production account
 - b. Overhead account
 - c. Job account

- d. Production account
16. Cost of production + opening stock of finished goods – closing stock of finished goods is called:
- Cost of goods sold
 - Cost of sales
 - Manufacturing cost
 - None of these
17. Direct material ₹ 30000, indirect material ₹ 5000, direct labour ₹20000, chargeable expenses ₹ 2000. The prime cost is :
- ₹ 57000
 - ₹50000
 - ₹ 52000
 - None of these

7.12 TENDER AND QUOTATION

Very often a producer is asked to submit a tender or cost – estimate for a supply of a product for the future. The price quoted for the future production is called quotation price or tender price. This price is ascertained on the basis of previous cost sheet or production account. When cost of same type and quality of commodity is to be calculated for tender price, normally cost per unit of each element of cost will be taken up with due regard to expected changes in the future. Estimated cost is increased by desired profit by taking into consideration the market condition to ascertain quotation price. When the quotation price is to be ascertained for a different product, the cost of direct material, direct wages and other direct expenses will be estimated. The total of these will be prime cost. The overheads will be added thereon on the basis of absorption rates. They are estimated as percentage i.e., works overhead on direct wages and administration, selling and distribution overheads on the basis of works cost. Then desired profit is added with the total cost to arrive at the quotation price. Hence, greater care should be taken while estimating quotation price as any flaw in it affects the corporate profit. It is because of the reason that if the tender price is quoted on the higher side then there is a threat of losing the business. On the other hand, if the tender price is quoted at the lower side, then the risk of not able to earn the desired profit.

Illustration 7.6

Pankajini Ltd. is planning to submit a tender for a new job that requires materials costing ₹20,000 and labour ₹12,000. For estimation of overhead, the company furnishes the following data in respect of the previous year-

Materials consumed = ₹2,91,200

Wages paid = ₹1,98,800

Works Overhead = ₹47,736,

Administration Overhead = ₹35,524.

What should be quotation for the new job, if the company desires a profit of 25% on total cost? (Absorb factory overhead on direct labour and administration overhead based on works cost).

Solution:

Cost Sheet

Particulars		₹
	Direct Materials	2,91,200
	Direct Labour	1,98,800
	Prime Cost	4,90,000
Add	Factory Overheads	43,736
	Factory Cost	5,33,736
Add	Administration OH	35,524
	Total Cost	5,69,260

Calculation of Tender price

Particulars of cost			₹
	Direct material		20,000
	Direct labour		12,000
	Prime Cost		32,000
Add	Factory OH 22% of 12,000		2,640
	Factory Cost		34,640
Add	Administration OH 6.65% of 34,640		2,304
	Total Cost		36,944
Add	25% on Cost of ₹36,944 as profit		9,236
	Tender price		46,180

Notes:

1. % of factory overhead on direct labour = $\frac{43,736}{1,98,800} \times 100 = 22\%$
2. % of administration overhead on works cost = $\frac{35,524}{5,33,736} \times 100 = 6.65\%$
3. In the question, selling and distribution overheads are not given. Therefore, tender price is calculated excluding selling and distribution overhead.

Illustration 7.7

Ansuman Ltd. is engaged in manufacture of leather items as per customers' specification. Summary of their accounts for the last year show the following information:

	₹		₹
Opening stock of raw materials	50,000	Production overhead	1,96,000
			0
Purchases of raw materials	12,60,000	Administration overhead	1,45,000
			0
Closing stock of raw materials	75,000	wages	7,00,000
			0

In the current year, the company has obtained a job from M/s. Satpathy. Estimates of material and labour cost for this job are ₹5,500 and ₹4,000 respectively. The company's costing system recognises that production overhead is recovered as a percentage of direct labour and administration overhead as a percentage of works cost.

Calculate the price that the company should quote for M/s. Satpathy, in order to earn a profit of 20% on sales.

Solution:

Cost Sheet

Particulars	Last year Actuals	Relationship	Calculation of quotation price For M/s. Satpathy
Direct Materials consumed (Note 1)	12,35,000	Actuals	5,500
Direct Labour	7,00,000	Actuals	4,000
Prime Cost	19,35,000		9,500
Add Factory Overheads	1,96,000	% of Factory Overhead on Direct Labour $(1,96,000 / 7,00,000) \times 100$ 28% of labour	28% of 4,000 = 1,120
Factory Cost	12,31,000		10,620
Add Administration OH	1,45,000	% of Admn. Overhead on works cost $(1,45,000 \div 21,31,000) \times 100$ 6.80% of works Cost	6.80% of 10,620 = 722
Total Cost	22,76,000		11,342
Add Profit		20% profit on sales = 25% profit on cost	$(11,342 \times 25\%) = 2,836$
Sales			14,178

Note:

- (1) Direct Material consumed = Opening Stock of materials + Purchases – Closing Stock of materials
= ₹50,000 + ₹12,60,000 – ₹75,000 = ₹12,35,000
- (2) In this question, Selling Overhead is not given. Hence, Total Cost is considered up to Cost of Production only.
- (3) Given that profit is 20% on sales i.e., 25% on cost.

Check your progress

18. Cost sheet is very useful in fixing the quotation price.(True/False)
19. Abnormal costs are charged to Costing profit and loss account. (True/False)
20. Cash discount is a non-cost item. (True/False)
21. Cost sheet is prepared at the end of the period.(True/False)
22. Closing stock of finished goods is valued at cost of production.(True/False)
23. Factory overhead is usually recovered as percentage on
- Direct material
 - Direct labor
 - Prime cost
 - None of these
24. Selling overhead is recovered as a percentage on
- Direct labour
 - Prime cost
 - Works cost
 - None of these
25. Profit of 40% on selling price is equal to:
- 25% of profit on cost price
 - 50% of profit on cost price
 - 66.67% of profit on cost price
 - 70% of profit on cost price
26. If direct labour is ₹15,000 and direct labour is 150% of works overhead then works overhead is
- ₹8,000
 - ₹10,000
 - ₹12,000
 - ₹18,000

27. The value of raw material consumed is ₹ 1,25,000. If opening stock of raw material is ₹ 18,000, closing stock of raw material is ₹ 12,000; find the value of raw material purchased.
28. Cost of production is ₹ 75,000, prime cost is ₹ 55,000. The ratio of works overhead and administrative overhead is 3:1. Find works cost.
29. Direct material ₹ 60,000. Direct wages ₹ 40,000. Factory overhead is 80% of direct wages. Administrative overhead is 15% on works cost. Find the value of works cost and cost of production.
30. Cost of production of 30,000 units is ₹ 1,20,000. If 25,000 units are sold for ₹ 1,50,000 and selling overhead is ₹ 1.50 per unit. Find the amount of profit.
31. **If** Cost production is ₹ 43,125 and selling and distribution overhead is 8% of cost of sales. Find the selling price of the product, if desired profit is ₹3,000.

7.13 SUMMARY

Unit costing is a method of operation costing adopted where production is uniform, units of output are identical and the cost units are physical and natural. It is also called single or output costing. The cost per unit is determined by dividing the total cost during a given period by the number of units produced during that period. Cost sheet or production account is prepared to present the cost incurred in an analytical and systematic manner. An adjusted cost sheet is prepared where there is opening and closing stock of raw materials, work-in-progress and finished goods. This method of costing is also useful in determining tender or quotation price with a desired amount of profit.

7.14 KEY WORDS

1. **Unit Costing:** It is a method of costing applied where the concern is engaged in the production and consists of a single product or a few varieties of the same product with variations in size, shape, quality etc. on continuous basis.
2. **Cost sheet:** It is a periodical statement of cost designed to show in detail the various elements of cost of goods produced. It is prepared in columnar form showing the particulars of cost, cost per unit, total cost during the given period.
3. **Production Account:** Production Account is a T-shaped account that combines the features of the cost sheet and the trading and profit and loss account.
4. **Waste:** The portion of raw materials lost in the process of manufacturing having no recovery or realizable value.
5. **Scrap:** The incidental residue obtained from the manufacturing process having minor recovery value.
6. **Spoilage:** The materials badly damaged in the process of manufacture which cannot be rectified or brought back to normal specification economically.
7. **Defectives;** The semi-finished or finished goods which do not conform to standard specification or quality. These can be rectified by incurring additional expenditure on material and labour.

7.15 ANSWERS TO CHECK YOUR PROGRESS

1. False
2. True
3. True
4. False
5. False
6. Output Costing
7. Cost Sheet
8. False
9. False
10. True
11. True
12. False
13. False
14. False
15. Production Account
16. Cost of Goods Sold
17. ₹52,000
18. True
19. True
20. True
21. False
22. True
23. Direct Labour
24. Works Cost
25. 66.67% on Cost Price
26. ₹10,000
27. ₹1,19,000
28. ₹70,000
29. ₹1,32,000 and ₹1,51,800
30. ₹12,500
31. ₹49,875

7.16 TERMINAL QUESTIONS

SHORT QUESTIONS

1. How would you calculate works cost?
2. Why cost sheet is prepared?
3. Distinguish between Cost Sheet and Production Account.
4. What are the components of total cost?

5. State the purposes for which cost sheet is prepared.
6. Mention any six items excluded from cost sheet.
7. How would you treat stock of raw material and w-i-p in cost sheet?
8. Give a specimen of cost sheet. Explain its purposes.
9. How work-in-progress is shown in the cost sheet?
10. How cost of goods sold and cost of sales are calculated in the cost sheet?

LONG QUESTIONS

1. What is meant by unit costing? Briefly explain the nature and industries that use unit costing.
2. Explain the procedure of ascertaining costs under unit costing.
3. Distinguish between a cost sheet and a production account. What advantages are derived from the preparation of cost sheet?
4. Explain and illustrate cost sheet with imaginary figures.
5. Explain with suitable example how quotation price is determined through cost sheet in unit costing.

NUMERICAL QUESTIONS

6. The following particulars are submitted by M/s. Krishna Manufacturing Co.

Particulars	₹	Particulars	₹
Wages of foreman	2,500	Depreciation:	
Electric power	500	Factory Plant	500
Direct Material	1,00,000	Office Premises	1,250
Direct Wages	30,000	Consumable stores	2,500
Lighting: Factory	1,500	Manager's Salary	5,000
Office	500	Directors Fee	1,250
Wages to Storekeeper	1,000	Office Stationery	500
Oil and water	500	Telephone Charges	125
Rent: Factory	5,000	Travelling Expenses	500
Office	2,500	Advertisement expenses	1,250
Repairs and Renewals:		Warehouse charges	500
Factory Plant	3,500	Sales	1,89,500
Office Premises	500	Carriage outward	375
Transfer to Reserves	1,000	Income Tax	10,000
Discount on shares written off	500	Bad debt	2,000
Dividend	2,000	Postage and Telegrams	250
		Salesman Salaries	1,250

Calculate:

(a) Prime Cost (b) Factory Cost (c) Cost of Production (d) Cost of Sales and (e) Profits.

Answers: (a) ₹1,30,000 (b) ₹ 1,47,500 (c) ₹1,59,375 (d) ₹1,63,250 (e) ₹26,250

7. The following data relate to the manufacturer of a standard product during four weeks to 31st March, 2017.

		₹
Raw materials consumed		2,000
Direct wages		1,200
Machines hours worked		950
Machine hour rate	20 paise	
Office overhead	10% on work cost	
Selling overhead	6 paise per unit	
Units produced		20,000 units
Units sold	@ 30 paise	1,8000 units

You are required to prepare a Cost Sheet in respect of the above showing:

- (a) The cost per unit
- (b) The profit for the period

Answers:(a) ₹0.30 (b) ₹ 964

8. From the following particulars relating to production and sales for the year ended 31st Dec.2020. prepare a statement of cost showing, interalia, the Prime Cost, Factory Cost, Cost of Production, Cost of Goods Sold and Sales Price.

Particulars	As on 01.01.2020	As on 31.12.2020
	₹	₹
Raw Material	16,000	19,600
Work-in-progress	12,600	4,600
Finished Goods (at cost)	16,400	-
	(3,000 units)	(2,500 units)

Other information for the year:

Purchase of Raw Materials	₹1,11,600
Sale of Finished Goods (40,500) units	₹2,83,500
Productive Wages	₹ 67,200
Office and Administrative Expenses	₹ 20,800
Selling and Distribution Expenses:	50 paise per unit sold
Machine Hours Worked:	
Machine Hour Rate@₹2,50	8,000 hours

Answers: Prime Cost=₹1,75,200 Factory Cost=₹2,03,200 Cost of Production =₹2,24,000 Cost of Goods Sold =₹2,26,400 and Sales Price =₹2,83,500

9. The following extract of costing information relates to commodity for the year ended 31st March, 2021.

	01.04.2020	31.03.2021
	₹	₹
Raw materials	5,000	5,560
Finished goods	4,000	8,000
	(1,000 tons)	(2,000 tons)
Work-in-progress	1,200	4,000
		₹
Raw materials purchased		30,000
Direct wages		25,000
Rent, Rates and Taxes of works		10,000
Carriage inwards		360
Cost of factory Supervision		2,000
Sales of finished goods		75,000

Advertisement and selling expenses amount to 0.25 paise per ton sold, 16,000 tonnes were produced during the year.

Prepare statement showing:

- (a) The value of raw materials used; (b) The cost of the output for the year;
(c) The cost of the turnover for the year; (d) The net profit for the year; and
(e) The net profit per ton of the commodity.

Answers: (a) ₹29,800 (b) ₹64,000 (c) ₹60,000 (d) ₹11,250 (e) ₹0.75

10. From the following details of M/s. Lucky Ltd. you are required to prepare a Production Account for the three months ending 31st March, 2020.

	1 Jan., 2020	31 March, 2020
	₹	₹
Raw materials	18,000	23,700
Finished Goods	15,000	9,000
Work-in-progress	6,800	7,200
Purchases on Raw Materials	28,000	
Direct wages	12,000	
Indirect wages	1,500	

Works expenses	8,400
Office expenses	2,800
Selling expenses	3,500
Sales	70,000

Assuming stock of finished goods at the end of the period is valued at cost, Calculate:

- (a) Value of Material Consumed (b) Works Cost
(c) Cost of Production (d) Cost of Goods Sold
(e) Gross Profit, and (f) Net Profit

Answers: (a) ₹.22,300 (b) ₹43,88 (c) ₹46,600 (d) ₹52,600 (e) ₹17,400 (f) ₹13,900

11. M/s Sourav Machines Ltd. gives you the following information. Prepare a statement showing (a) cost of materials used (b) prime cost © works cost (d) total cost (e) percentage of works overhead charges to wages and (f) percentage of administration and selling overhead charges to works cost.

Direct wages : ₹ 2,00,000	Stock of finished goods 31-12-2020 : ₹ 35,000
Purchase of raw materials : ₹ 3,50,000	Sales of finished goods : ₹ 6,25,000
Stock of new materials 1-1-2020 : ₹ 13,000	Works overhead charges : ₹ 45,000
Stock of raw materials 31-12-2020 : 15,000	Administration and selling overhead charges : ₹ 90,000

Stock of finished goods 1-1-2020 : ₹ 30,000

The company is about to send a tender for the supply of machine. It is estimated that the materials required would cost ₹ 35,000 and the direct wages would be 12,500. The tender is to be made at a profit of 20% on selling price. State what would be tender price based on the above percentages?

Answers: (a) ₹.3,48,000 (b) ₹5,48,000 (c) ₹5,93,000 (d) ₹6,78,000 (e)22.5% (f)15.177%

12. Lucky Cold Ltd. manufactured and sold 2,000 Refrigerators in the year ending 31.12.2020. The summarized trading and profit and loss account is given below:

	₹		₹

To Cost of materials	1,60,000	By Sales	8,00,000
To Direct Wages	2,40,000		
To Manufacturing Cost	1,00,000		
To Gross Profit	3,00,000		
	8,00,000		8,00,000
To Salaries	1,20,000		3,00,000
To Rent Rates etc.	20,000	By Gross Profit	
To Selling Expenses	60,000		
To General Expenses	40,000		
To Net Profit	60,000		
	3,00,000		3,00,000

For the year 2021 the company wants to produce 3,000 Refrigerators. From the following particulars prepare a statement showing the price at which Refrigerators would be marked so as to earn a profit of 10% on selling price.

- a. Price of material will rise by 20%.
- b. Wages will rise by 5%.
- c. Manufacturing cost will rise in proportion to the combined cost of materials and wages.
- d. Selling expenses per unit will remain unchanged.
- e. Other expenses will remain unaffected by the rise in output.

Answer: ₹12,25,000

13. The following figures have been obtained from the cost records of Prathana Manufacturing Company for the year 2018

Cost of materials : ₹ 2,40,000	Administration expenses ; ₹ 1,34,400
Wages for labour : ₹ 2,00,000	Selling expenses ; ₹ 89,600
Factory overhead : ₹ 1,20,000	Profit : ₹ 1,68,000
Distribution expenses : ₹ 56,000	

A work order was executed in 2019 and the following expenses were incurred - cost of materials: ₹ 32,000 and wages for labour: ₹ 20,000. Assuming that in 2019, the rate for factory overhead went up by 20%, distribution charges went down by 10%, and selling charges went up by 12.5%.

What price should the product of the job is quoted so as to earn the same (earlier) rate of profit on the selling price? Distribution, administration and selling charges are based on the factory cost. Show your workings.

Answer: ₹1,20,317

References

1. Hongren's Cost Accounting by Srikant M. Datar and Madhav V. Rajan published by Pearson India education services Pvt Ltd.
2. Cost and Management Accounting - Text and cases by Ravi M. Kishore - Taxmann publication (P Ltd)
3. Modern Cost and Management Accounting by M Hanif by McGraw Hill Education (India) Pvt. Ltd
4. Cost Accounting by M.Y. Khan and P.K Jain by McGraw Hill Publications
5. Cost and Management Accounting by M N Arora Himalaya Publishing House
6. Essentials of Cost Accounting (Theory and Practice) by A.K. Chakrabarti, publisher - New central book agency Pvt Ltd

B. COM
SEMESTER IV
COURSE: COST ACCOUNTING

UNIT-8 JOB COSTING AND CONTRACT COSTING

STRUCTURE:

- 8.1 Objectives**
- 8.2 Introduction**
- 8.3 Concept of Job Costing**
- 8.4 Features of Job Costing**
- 8.5 Application of Job Costing**
 - 8.6 Objectives of Job Costing**
- 8.7 Advantages of Job Costing**
- 8.8 Limitations of Job Costing**
- 8.9 Procedure of Job Costing**
- 8.10 Preparation of Job Cost Sheet**
- 8.11 Concept of Contract Costing**
- 8.12 Features of Contract Costing**
- 8.13. Application of Contract Costing**
- 8.14 Objectives of Contract Costing**
- 8.15 Distinction between Job Costing and Contract Costing**
- 8.16 Treatment of items requiring Special Attention**
- 8.17 Accounting of Profits in Incomplete Contract**
- 8.18 Procedure of Contract Costing**
- 8.19 Specimen of in-complete Contract Account**
- 8.20 Specimen of completed Contract Account**
- 8.21 Miscellaneous Illustration**
- 8.22 Key Words**
- 8.23 Answers to Check Your Progress**

8.24 Terminal Questions

8.1 OBJECTIVES

After studying this unit, you would be able to:

1. Learn the Features of Job Costing and Contract Costing.
2. Know the objectives of Job Costing and Contract Costing.
3. Understand the similarities and differences between Job Costing and Contract Costing.
4. Learn the method of computing cost of job and contract
5. Know the Process of Recording Contract Costs.
6. Learn the Terminologies Used in Contract Costing.
7. Study the Computation of Profit on Incomplete Contracts.
8. Understand the Procedure of Preparing Contract Account.

8.2 INTRODUCTION

Manufacturing industries are broadly classified into two categories, viz., job industries and process industries. Job industrial enterprises undertake the production of goods according to customer's specifications which are of diverse in nature. Since, there is no standard product, costs are ascertained for each job separately. On the other hand, in case of mass production industries, industrial undertakings undertake production of identical units on a continuous basis. The finished products are the result of successive operations and costs are accumulated for each process separately. Thus, costing methods are broadly classified into two- Job Costing (Specific Order Costing) and Process Costing. A contract is a big job / assignment/ work order where execution of work is spread over a long period. It takes a number of years and huge amount of money for its completion.

8.3 CONCEPT OF JOB COSTING

Job costing is a method of costing applied to industries where production is measured in terms of completed jobs. Industries where job costing is generally applied are printing press, ship building, repair workshops, foundry, automobile garage and other similar manufacturing units which manufacture as per the specific requirements of the customers. The production is against customer's orders and not for stock.

CIMA terminology defines job costing as "a form of specific order costing which applies where work is undertaken to customer's special requirement. As distinct from contract costing, each job is comparatively of a short duration". It implies that under job costing, production is always against the customer's special requirement.

8.4 FEATURES OF JOB COSTING

The features of job costing are as follows:

- (i) The production is generally against customer's order and not for stocks.
- (ii) The production is intermittent and not continuous.
- (iii) Each job has its own identity and needs special treatment.
- (iv) Each job is treated as a cost unit and identified with a distinct number.
- (v) The work-in-progress differs from period to period according to the number of jobs in hand.

8.5 APPLICATION OF JOB COSTING

Job Costing is applied in the following:

- i. Engineering workshops
- ii. Printing press
- iii. Construction companies
- iv. Furniture making
- v. Hardware and machine manufacturing industries
- vi. Repair shops, Automobile garages

8.6 OBJECTIVES OF JOB COSTING

- (i) To ascertain the cost as well as the profit or loss for each job,
- (ii) To provide a basis of determining the cost of similar jobs undertaken in future. Thus, it helps in future production planning,
- (iii) To find out the profitability of each job, i.e., those jobs which are more profitable and those which are not profitable or less profitable, and

8.7 ADVANTAGES OF JOB COSTING

The various advantages of job costing are as follows:

- (i) The advantages of budgetary control can be ensured by adopting predetermined overhead rates in job costing.
- (ii) It facilitates identification and control of spoilages and defectives with specific job and the responsibility can be fixed accordingly.
- (iii) It facilitates estimation of cost of similar jobs.
- (iv) It helps the management to know about the profitability of the jobs.
- (v) It is helpful to ascertain the cost as well as the profit or loss for each job separately.

8.8 LIMITATIONS OF JOB COSTING

The limitations of job costing are as follows:

- (i) It is quite expensive to operate as it requires considerable detailed official or clerical works for each job of diverse in nature which require separate estimation, designing and production schedule.
- (ii) With the increase in the official or clerical works, the chances of errors are increased.
- (iii) The costs ascertained are historical; job costing does not facilitate control of cost unless it is used with standard costing or budgetary control.
- (iv) Job costing cannot be efficiently operated without highly developed production control system. Job costing requires intricate factory organisation system.
- (v) To get accurate results, job costing requires some pre-requisites. In its absence, job costing will not give accurate results.

8.9 PROCEDURE OF JOB COSTING

The procedure that is commonly applicable to a normal sale transaction equally applies in case of job costing. The procedure of job costing involves the following:

- (i) **Receiving an Enquiry:** First of all a customer seeks an enquiry about the price, quality and other terms and conditions of the job before placing an order.
- (ii) **Estimation of the Price of the Job:** The cost accountant estimates the cost of job after considering the various elements of cost and keeping in mind the specification of customer. This is based on the cost of execution of similar jobs in the past year and considering the possible changes in the various elements of the cost. Estimated costs are also compared with the actual costs to find out the variation in the actual profit.
- (iii) **Receiving of Order:** The customer will then place the order, if he is satisfied with the quotation price, other terms and conditions of executing the job.
- (iv) **Job Order Number:** When an order is received from the customer, it is allotted a certain distinct number. Every job order is known by its number throughout its production process.
- (v) **Production Order:** When a job is accepted, the production planning department prepares a production order or job order. Production order or job order is a written order issued to the manufacturing department to proceed with the job.
- (vi) **Recording of Costs:** Cost is ascertained for each job separately. Costs are collected and recorded for each job. The costing department collects the costs and records them in the job cost sheet.

The sources of collection of various costs may be as under:

- a. **Material Cost:** Materials are classified into direct and indirect on the basis of traceability of materials to the job. Materials may have to be purchased or requisitioned from the store. The documents necessary for collection of costs are the Bills of Materials, Suppliers Invoices, Goods Received Notes, Material Requisition Notes, and Material Returned Notes and Material Transfer Notes etc.
- b. **Direct Labour Cost:** Direct labour costs are collected from Operation Schedule, Job Card or Wages Analysis Sheet, etc.

- c. **Direct Expenses:** Direct expenses are collected from various expenses vouchers and other records of job.
 - d. **Overheads:** Overheads are apportioned to the jobs on some suitable basis. Overheads are recovered as a percentage of direct material costs, percentage of direct labour cost, direct labour hours or machine hours etc.
- (vii) **Completion of the Job:** On completion of a job, the production department sends a completion report of job to the costing department. On the basis of the report, the costing department completes the job cost sheet and calculates profit or loss on each job. Actual cost recorded in the job cost sheet is compared with the budgeted cost so as to reveal the efficiency or inefficiency of operations.
- (viii) **Dispatch of Goods:** The finished products are then packed and delivered to the customer as per the delivery schedule. Payment is settled as per the agreed mode of payment.

8.10 PREPARATION OF JOB COST SHEET

A separate job cost sheet is prepared for every job undertaken. This is to facilitate the calculation of cost of the job separately. The main idea of preparing job cost sheet is to show in detail, the cost components of executing a job. Job cost sheet is used to record direct materials, direct wages and overheads applicable to the job.

A job cost sheet facilitates the determination of profit or loss on each job. Estimated costs are also recorded on the job cost sheet which facilitates comparison of actual costs with the estimated cost and thus, variation in the cost is known.

Irrespective of the type and nature of enquiry, if a job is accepted, then a number called **job order number** is given to each of the job undertaken. All production activities and related expenses are linked through this job order number.

PROFORMA OF JOB COST SHEET

Job Cost Sheet

MNP Company Job Cost Sheet					
Customer's Order No:				Quantity:	
Job Order No:				Date of Commencement:	
				Date of Completion:	
				Date of Delivery:	
Date	Description of Work Done	Reference No.	Material Cost (₹)	Labour Cost (₹)	Overhead Expenses (₹)
		Total			
	Cost Summary		Cost (₹)		Remarks
			Estimated	Actual	
	Direct material cost				
	Direct labour cost				
	Production overheads				
	Administration, and selling and distribution expenses				
	Total cost				
	Selling Price				
	Profit or loss				
Prepared by:					Checked By:

Illustration 8.1

A fire occurred in a factory and records containing information about the allocation of overhead charges were destroyed. It is, however, known that works overhead is absorbed at 100% of wages and office overhead as a fixed percentage of factory cost.

The following further information regarding two previous jobs are as follows:

Job No.	Materials ₹	Wages ₹	Direct Expenses ₹	Profit (% on total cost) ₹	Selling price ₹
1018	20,000	16,000	4,000	10%	80,080
1019	32,000	24,000	2,000	15%	1,22,590

Find out the percentage and actual office overhead.

Solution:**Job Cost Sheet**

Particulars	Job No. 1018	Job No.1019
	₹	₹
Materials	20,000	32,000
Wages	16,000	24,000
Direct Expenses	4,000	2,000
Prime Cost	40,000	58,000
Works overhead – 100% on wages	16,000	24,000
Factory Cost	56,000	82,000
Office overhead (Balancing figure)	16,800	24,600
Total cost	72,800	1,06,600
Profit	7,280	15,990
Sales	80,080	1,22,590

Working Notes:

- 10 % profit on cost = $\frac{10}{110}$ profit on sales for Job No. 1018
- 15% profit on cost = $\frac{15}{115}$ profit on sales for Job No. 1019
- Calculation of actual office overhead and % of office overhead on factory cost.

Particulars	Job No. 1018 (₹)	Job No. 1019 (₹)
Sales	80,080	1,22,590
(-) Profit	<u>7,280</u>	<u>15,990</u>
Total Cost	72,800	1,06,600
(-) Prime Cost	<u>40,000</u>	<u>58,000</u>
Total Overhead	32,800	48,600
(-) Factory Overhead	<u>16,000</u>	<u>24,000</u>
Office Overhead	<u>16,800</u>	<u>24,600</u>
% of Office OH on Factory Cost	$\frac{\text{Office OH}}{\text{Factory Cost}} \times 100$ $\frac{16,800}{56,000} \times 100 = 30\%$	$\frac{\text{Office OH}}{\text{Factory Cost}} \times 100$ $\frac{24,600}{82,000} \times 100 = 30\%$

Illustration 8.2

Prasad Ltd. is contemplating to launch a new product in the market. The estimated cost details are as follows:

- Material cost per unit - ₹40
- Labour cost per unit - ₹36
- Production overheads are to be calculated from the following data:

Production departments	Hourly overhead rate	Normal monthly hours for	Fixed Overhead included	Time to be taken
		overhead rates	in Overhead	by new product
	₹	Hours	₹	Hours
P	3.60	30,000	36,000	5
Q	4.80	20,000	12,000	2.5
R	6.00	40,000	60,000	4

(d) Annual Administration and Selling expenses – ₹2,50,000 (applicable to the new product)

(e) Estimated sales quantity – 50,000 per annum.

Based on the above information, prepare a cost sheet and find out the unit selling price with a profit margin of 40% on total cost.

Solution:

Calculation of variable and fixed overhead rates

Particulars	P(₹)	Q(₹)	R(₹)
Total monthly overhead (Normal hours × Overhead rate)	1,08,000	96,000	2,40,000
Less: Fixed overhead	36,000	12,000	60,000
Variable overhead	72,000	84,000	1,80,000
Variable overhead rate per hour (Variable OH / Normal hours)	2.40	4.20	4.50
Fixed overhead rate per hour (Fixed OH / Normal Hours)	1.20	0.60	1.50

Job Cost Sheet

Particulars	Amount Per Unit (₹)
Direct materials	40.00
Direct labour	36.00
Prime Cost	76.00
Variable Overhead:	
Department P = ₹2.40 × 5 hours	12.00
Department Q = ₹4.20 × 2.5 hours	10.50
Department R = ₹4.50 × 4 hours	18.00
Variable Overhead	40.50
Fixed Overhead:	
Department P = ₹1.20 × 5 hours	6.00
Department Q = ₹0.60 × 2.5 hours	1.50
Department R = ₹1.50 × 4 hours	6.00
Fixed Overhead	13.50
Factory cost	130.00
Administration and selling expenses	5.00

$\left(\frac{Rs.2,50,000}{50,000\ pieces}\right)$	
Total Cost	135.00
Profit 40% on total cost	54.00
Selling price	189.00

Illustration 8.3

Pankaj Company Ltd. has absorbed overheads by means a Blanket rate based on Direct labour Hours. From 1st January, 2019, it decides to adopt separate rate for the three main activities – (a) Store keeping and Material Handling (b) Machining and (c) Assembly. The estimates of costs and absorption rates for Selling and Distribution Costs remain unchanged. The overhead absorption rates are:

- (i) Prior to 1st January 2019: Production Overhead – ₹50 per Direct Labour Hour and Selling and Distribution Overhead – 25% of Production Cost.
- (ii) From 1st January, 2019:
 - (a) Production overhead – Store keeping and material handling – 10% of Direct material cost, Machining – ₹75 per machine hour , Assembly ₹30 per labour hour
 - (b) Selling and Distribution Overhead – 25% of production cost.

Direct costs of Job No.3704 are as under-

Direct materials ₹9, 000

Direct Labour:

Machining 200 hours at ₹60 ₹12, 000

Assembly 100 hours at ₹40 ₹ 4,000

Total Direct Costs ₹25, 000

Contract price of the job is ₹62,500 and it requires 180 machine- hours to complete.

Prepare Job Sheets for Job No.3704, as it would appear, if it had been completed:

- (1) Prior to 1st January, 2019 and
- (2) In January, 2019.

Solution:

Job Cost Sheet- Job No.3704

Particulars	If completed prior to Jan.2019 (₹)	If completed in Jan.2019 (₹)
Direct Materials (actual)	9,000	9,000
Direct Labour (actual)	16,000	16,000
Prime Cost	25,000	25,000
Add: Production Overhead:		
₹50 per hours × 300 Direct labourhours	15,000	-
Store Keeping – at 10% of ₹9,000	-	900
Machining at ₹75 × 180 machine hours	-	13,500

	Assembly at ₹30 × 300 labour hours (Total DLH)	-	9,000
	Factory Cost / Cost of production	40,000	48,400
Add:	Selling and Distribution Overhead at 25%	10,000	12,100
	Cost of sales	50,000	60,500
Add:	Profit (B/F)	12,500	2,000
	Sales	62,500	62,500

Illustration 8.4

The information given below has been taken from the costing records of an Engineering Works in respect of Job No.401

Materials	₹4, 010	
	Wages	Variable Overheads (estimated)
Department X	60 hours @ ₹3 per hour	₹5, 000 for 5,000 labour hours
Department Y	40 hours @ ₹2 per hour	₹3, 000 for 1,500 labour hours
Department Z	20 hours @ ₹5 per hour	₹2, 000 for 500 labour hours

Fixed Overheads estimated at ₹20, 000 for 10,000 normal working hours.

You are required to calculate the selling price of the job to get a desired profit of 25% on selling price.

Solution:

COST SHEET OF JOB NO.401

Particulars	Amount (₹)
Materials	4,010
Wages :	
Department X (60 hours × ₹3)	180
Department Y (40 hours × ₹2)	80
Department Z (20 hours × ₹5)	100
	360
Overheads :	
Variable Overheads:	
Department X (60 hours × Re.1)	60
Department Y (40 hours × ₹2)	80
Department Z (20 hours × ₹4)	80
	220
Fixed Overheads : (120 h₹ × ₹2)	240
	4,830
Total Cost	4,830
Profit (25% on Selling price or $33\frac{1}{3}$ % on cost)	1,610
Selling price	6,440

Working Note:

1. Calculation of variable overhead rate per labour hour

Department X	Department Y	Department Z
₹ $\frac{5,000}{5,000}$ labour hours = Re.1	₹ $\frac{3,000}{1,500}$ labour hours = ₹2	₹ $\frac{2,000}{500}$ labour hours = ₹4

2. Calculation of fixed overhead per hour = $\frac{20,000}{10,000}$ labour hours = ₹2 per hour
3. Total labour Cost used in the Job = 60 + 40 + 20 = 120 hours

Illustration 8.5

A factory uses job costing. The following data are obtained from its books for the year ended 31st December, 2019.

Direct materials	₹ 90,000	Selling and distribution overheads	₹ 52,500
Direct Wages	75,000	Administrative overheads	42,000
Factory overheads	45,000	Profit	60,900

- (a) Prepare a job cost sheet indicating the prime cost, works cost, production cost, cost of sale and the sale value.
- (b) In 2020, the factory receives an order for a number of jobs. It is estimated that direct materials required will be ₹ 1,20,000 and direct labour will cost ₹ 75,000. What should be the price for these jobs if the factory intends to earn the same rate of profit on sales assuming that the selling and distribution overheads have gone up by 15%? The factory recovers factory overheads as per percentage of direct wages, and administration and selling and distribution overheads as per percentage of works cost, based on cost rates prevailing in the previous year.

Solution:

Job cost Sheet for the year ended 31st December, 2019

Particulars	Amount (₹)	Remarks
Direct material cost	90,000	
Direct wages	75,000	
cost	1,65,000	
<i>Add:</i> Factory overheads	45,000	60% of direct wages
cost	2,10,000	
<i>Add:</i> Administrative overheads	42,000	20% of works cost
cost	2,52,000	
<i>Add:</i> Selling and distribution overheads	52,000	25% works cost
cost	3,04,500	
<i>Add:</i> Profit	60,900	20% of cost or $16\frac{2}{3}\%$ of sales
Cost of	3,65,400	
Sales		
<i>Add:</i> Profit		
Value		

Statement showing estimated cost and required price for Jobs in 2020

Particulars	Amount (₹)
Direct material cost	1,20,000
Direct Labour cost	75,000
	1,95,000
Prime cost	45,000
Add: Factory overheads(60% of direct wages)	2,40,000
	48,000
Works cost	69,000
Add: Administrative overheads (20% of works cost)	3,57,000
S & D overheads (25% of ₹ 2,40,000 + 15%) = (₹ 6,000 + ₹ 9,000)	71,400
Estimated cost	4,28,400
of sales	
Add: Desired profit ($16\frac{2}{3}\%$ sales or 20% of cost sales)	
Selling Price	

Illustration 8.6 A company has two manufacturing shops. The shop floor supervisor presented the following cost for Job No.89 to determine the selling price:

Particulars	Per unit
Materials	70
Direct wages (14 hours @ ₹2.50 per hour) (Deptt.P – 8 hours and Deptt. Q -6 hours)	35
Chargeable Expenses (store)	5
	110
Add: $33\frac{1}{3}\%$ of expenses (overheads)	37
	147

Analysis of the Profit and Loss Account shows the following:

Particulars	₹	Particulars	₹
Material used	1,50,000	Sales less returns	2,50,000
Direct wages:			
Department P	10,000		
Department Q	12,000		
Store expenses	4,000		
Overheads:			
Department P	5,000		
Department Q	9,000		
	1,90,000		
Gross profit c/d	60,000		

2,50,000

2,50,000

It is noted that average hourly rates for the two departments P and Q are similar.

You are required to:

- (a) Draw a job cost sheet
- (b) Calculate the revised cost using overhead figures as shown in the profit and loss account as the basis for charging overheads to Department P and Q.
- (c) Determine selling price with a desired profit of 20% of total costs.

Answer: Selling price = ₹157.50

KNOW YOUR PROGRESS

A. State whether statements are True or False.

1. In job costing, work is executed according to manufacturer's specifications.
2. In job costing, a production order is received from a customer for a particular job.
3. Job ticket is useful to ascertain the cost of a job.
4. In job costing, each job should be continuously identifiable from the raw materials stage to the stage of completion.
5. In job costing method, a cost sheet is prepared for each job,
6. In job costing, each job is treated as a cost unit.

Answers true: 2,4,5,6 false 1,3

CONTRACT COSTING

8.11 CONCEPT

Contract Costing is that form of specific order costing adopted by constructional type of industries engaged in the construction of roads, buildings, ships, dams etc. to ascertain the cost of each work separately. This method of costing is also known as **Terminal Costing** because the contract is terminated once the work is completed and contract account is closed. Contract Costing is a technique of ascertaining costs of a contract .It is a type of specific order costing under which there is an attribution of costs to individual contracts.

8.12 FEATURES OF CONTRACT COSTING

The main features of contract costing are as follows:

1. A contract is a **big Job of long duration**. Some of the contracts require more than one year for their completion and they are **completed in stages**.
2. Work on contracts is **executed mostly outside the factory premises** of the contractor.
3. Each contract is treated as a cost unit and a **distinct contract number is assigned** to identify the contract.
4. Contract is done for a **specific consideration** known as contract price which is mostly decided before the execution of work. A clause 'cost-plus contract' may be inserted in the agreement to compensate the contractor for any rise in prices of inputs.
5. **Separate contract account** is prepared in the books of contractor to ascertain profit or loss on each contract.
6. **Payment to the contractor** will be made, when contract is in progress based on work certified by the competent authority i.e. an architect, an engineer or surveyor etc. An amount, known as retention money, is withheld by the contractee as per the terms of the agreement.
7. In case of large contracts, the contractor may **employ or hire sub-contractors** for a part of the main contract to do some specialized jobs. For example, in a building contract, glass works, wooden work etc.
8. Each contract or work involved in contract costing is **executed or done as per the specifications** given by the contractee.

8.13 APPLICATION OF CONTRACT COSTING

Contract costing is applied in-

- (a) Industries engaged in construction of roads, buildings, bridges, railway tracks, dams, etc.
- (b) Industries engaged in engineering projects like ship building.
- (c) Industries engaged in interior decoration, glass works, etc.

8.14 OBJECTIVES OF CONTRACT COSTING

In contract costing, separate contract account is prepared for each contract in the books of Contractor. The purpose of preparing a contract account is to know the profit earned or loss suffered in each contract. Every contract is allotted a separate number and a separate account is opened for each contract. The objectives of preparing Contract Account are -

- To determine the total cost incurred for each contract,
- To determine the profit or loss for each contract, and
- To exercise control over cost on each contract.

8.15 JOB COSTING AND CONTRACT COSTING

Job costing and contract costing are **similar** in the following respects.

1. Production starts on receiving orders from customer.

2. They belong to the category of specific order costing.
3. There is no need to create demand, customers come on their own.
4. Profit is determined in respect of each job and contract separately.

DISTINCTION

SL NO.	BASIS	JOB COSTING	CONTRACT COSTING
1.	Concept	A Job refers to any specific assignment or work order wherein the work is executed as per the specification of customer.	A contract refers to a big job / assignment/ work order, the completion of which requires many years.
2.	Cost Unit	Each job is taken as a cost unit.	Each contract is treated as a cost unit.
3.	Fixation of Price	The price of a job is fixed based on its nature, costs involved and specification of the customer.	The pricing is generally through bidding and affected by external factors.
4.	Size	A job is a small contract.	A contract is a big job. Therefore, the number of contracts undertaken at a time and attended or completed during a period is less than the number of jobs.
5.	Time Duration	Time duration of the job is short.	Time duration of a contract is long.
6.	Amount Involved	Amount involved for a job is less.	It involves huge amount as per the size of the contract.
7.	Transfer of Profit	Profit or loss is transferred to P &L Account when the job is completed	Profit or loss is transferred to P&L Account in case of completed contract. In case of incomplete contract, a portion of profit is transferred to P&L Account and the balance is transferred to work-in- progress (Reserve) Account.

8.16 TREATMENT OF ITEMS REQUIRING SPECIAL ATTENTION

1. Material Cost

All the transactions relating to material are shown in the Contract Account as follows:

Contract Account

Particulars	Amount	Particulars
Amount		
To material purchased	By material at site	
To material issued from store	By material returned to store	
To material received from Other contracts	By material transferred to other contracts	
To Profit & Loss A/C (Profit on sale of materials)	By Bank (Sale of Materials) By Profit & Loss A/C (Loss on sale of materials)	
	By Material lost by fire By Material lost by accident	

2. Labour Cost

Labour costs are accounted for as follows:

Cases	Treatment
1. Wages paid to workers engaged on a particular contract.	1. Such wages are charged directly to respective contract account.
2. Wages paid to workers who move from one contract to another.	2. Such wages are distributed over the contracts on the basis of time spent by workers on each contract.
3. Any wages unpaid or prepaid during the period.	3. Unpaid or prepaid wages are adjusted in the wages account on the debit side of contract account.

3. Direct Expenses

The expenses incurred exclusively for a particular contract are treated as direct expenses and are chargeable to that contract for which it is incurred. For example, a plant hired for a special contract will be charged by the hire charges. Similarly, consultation fee to experts for a specific contract would be treated as direct expenses.

4. Indirect Expenses

When a contractor undertakes more than one contract simultaneously, he will set up a common office and engage common supervisory staff. The administration expenses incurred and the supervisor's salary are apportioned among the contracts on an equitable basis.

5. Cost of Maintenance

Sometimes contractors are required to look after or maintain the work for a specified period after completion, the cost of such maintenance is also debited to the contract account.

6. Accounting of plant and machinery

There are two ways of dealing with the plant and machineries used on a contract.

- Where a plant or machinery is specially purchased for a particular contract to be **used for long duration**, the contract account is debited with the value of plant. At the end of the accounting period, the depreciated value of the plant or machinery is credited to the contract account.

- When the plant or machinery is used relatively for a **short duration** on a contract, the contract account is charged with the depreciation amount of the plant or machinery.

Contract Account

Particulars	Amt	Particulars	Amt.
To Plant at the beginning(at site)		By plant	
To plant (Purchased during the year)		(Returned after depreciation)	
To Profit and Loss A/C(Profit on sale of plant)		By P&L A/C(plant lost , stolen or destroyed)	
		By Bank (plant sold)	
		By profit and loss A/C	
		(Loss on sale of plant)	
		By plant at the end (at site, after depreciation)	

1. Contractee's Account:

The contractee's account is opened by the contractor in his books. It records the amount (received from the contractee at different stages of contract. The contractee's account shows the total amount already received, amount due on completion of contract and final amount received on settlement.

Illustration 8.7

Calculate the cost of work uncertified in each of the following alternative cases:

Total costs incurred to date ₹1,20,000 , cost of work certified ₹1,00,000

Total cost incurred to date ₹1,20,000 to complete 60% of the contract work . However, architect gave certificate only for 50% of the contract price.

$$\begin{aligned} \text{Cost of work uncertified} &= \text{Total cost incurred to date} - \text{cost of work certified} \\ &= ₹1,20,000 - ₹1,00,000 = ₹20,000 \end{aligned}$$

$$\text{Cost of work uncertified} = \text{Total cost incurred till date} \times \frac{\% \text{ of work uncertified}}{\% \text{ of total work done till date}}$$

$$= ₹1,20,000 \times \frac{60\% - 50\%}{60\%} = ₹20,000$$

8.17 ACCOUNTING OF PROFITS IN INCOMPLETE CONTRACT

Following rules are followed while transferring profits to profit and loss account:

(A) Contracts which have just commenced:

(i) If the work certified is less than 1/4th of the contract, no profit should be transferred to profit and loss account. It means that entire notional profit should be treated as reserve for future contingencies.

(ii) If the work certified is 1/4th of contract price or more but less than 1/2 of the contract price, the profit transferred to profit and loss account should be 1/3rd of the notional profit: i.e

$$\text{Profit} = \frac{1}{3} \times \text{Notional profit}$$

If it is desired to transfer the realised profit to profit and loss account, it will be calculated as under:

$$\text{Profit} = \frac{1}{3} \times \text{National profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

(B) Contracts which have reasonably advanced: If the work certified is ½ or more than the contract price, the profit transferred to profit and loss account would be 2/3rd of the notional profit: i.e.,

$$\text{Profit} = \frac{2}{3} \times \text{Notional profit}$$

If it is desired to transfer the realised profit to profit and loss account, it will be calculated as under:

$$\text{Profit} = \frac{2}{3} \times \text{Notional profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

(C) Contracts which are almost completed: Sometimes, a contract is nearing completion, say, its physical progress is more than 90% and the contractor is in a position to estimate the future costs with high degree of accuracy. In such a case, it is desired to calculate the profit with reference to total estimated profit. Total estimated profit is excess of contract price over total estimated cost. The profit to be transferred to profit and loss account will be calculated as under:

$$\text{Profit} = \text{Estimated profit} \times \frac{\text{Work certified}}{\text{Contract Price}}$$

If it is desired to transfer the realised profit to profit and loss account, it will be calculated as under:

$$\text{Profit} = \text{Estimated profit} \times \frac{\text{Work certified}}{\text{Contract Price}} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

[**Important note:** If nothing is given in the problem, students are advised to use the concept of realised profit.]

Summary: Rules of transferring Notional profits to Profit & Loss Account in case of an incomplete contract

Description	Value of Work Certified	Amount of profit to be credited to Profit & Loss Account
Initial Stages	If less than 25% of the contract price	No profit is taken into account. The entire amount is treated as reserve.
Work performed but not substantial	If equal to or more than 25% but less than 50% of the contract price	$\frac{1}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$
Substantially completed	If equal to or more than 50% but less than 90% of the contract price	$\frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$
Almost Complete	If equal to or more than 90% of the contract price	A portion of Estimated Total Profit (ETP) is transferred to P&L A/C by adopting any of the following formula.*

1. Estimated total profit × % of Completion i.e., ETP × Work certified/ Contract price

2. Estimated total profit × % of completion × % of payment i.e. $\text{ETP} \times \text{Work certified} / \text{Contract price} \times \text{Cash received} / \text{Work Certified}$
3. Estimated total profit × % of Costs incurred i.e., $\text{ETP} \times \text{Cost till date} / \text{Estimated Total cost}$
4. Estimated total profit × % of cost incurred × % of payment i.e., $\text{ETP} \times \frac{\text{Cost of works to date}}{\text{Estimated Total Cost}} \times \frac{\text{Cash Received}}{\text{Work Certified}}$
5. Estimated Total profit $\times \frac{\text{Cash Received}}{\text{Contract price}}$

Note: (i) Estimated Total Cost = Cost already incurred+ Additional cost to be incurred to complete the contract

(ii) Estimated Profit = Contract Price – Estimated Total Cost

8.18 PROCEDURE FOR CONTRACT COSTING

The basic procedure for costing of contracts is as follows:

1. **Separate Contract Account:** Separate Contract Account is opened for each contract. A distinct number is assigned to each contract which is to be written at top of the contract account for easy identification.
2. **Accounting for Material Costs:** The material costs are accounted for as follows:
 - i. Materials purchased and directly supplied to a contract or materials supplied through the central store are debited to contract account.
 - ii. Materials returned from the contract will appear on the credit side of the contract account.
 - iii. If returns of materials are found to be uneconomical on account of cost of transactions, the same may be sold and the sale proceeds should be credited to contract account.
 - iv. Any profit or loss arising from the sale of materials should be transferred to Profit and Loss account.
 - v. Materials stolen or damaged by fire represent loss (abnormal loss) and as such the same should be transferred to Profit and Loss account.
 - vi. Sometimes, materials may be transferred from one contract to another. In that case, the contract receiving the materials should be debited and the contract transferring the materials should be credited.
 - vii. Sometimes, materials supplied by the contractee without affecting the contract price then such materials should not be charged to contract account.
 - viii. Materials in hand at the end of the year should be credited to contract account.
3. **Accounting for Labour Costs:** The labour costs are accounted for as follows:
 - i. All labour engaged at the contract site should be regarded as direct labour and charged direct to the concerned contract. For each contract, wages analysis sheet should be prepared and totals are debited to contract account.

- ii. In case, the workers move from one contract to another, detailed time sheets should be maintained and wages may be distributed on the basis of time spent on each contract.
4. **Accounting for Direct Expenses:** Most of the expenses like electricity, insurance, telephone charges, postages, hire charges of plant; engineers' fees etc. are treated as direct expenses and are directly debited to contract account.
 5. **Accounting for Indirect Expenses or Overheads:** Indirect Expenses or Overheads like expenses of engineers' surveyors, supervisors, storekeepers, administration etc. are distributed over different contracts on some equitable basis like percentage of material cost, percentage of labour cost, percentage of prime cost, per labour hour etc.
 6. **Accounting for charges for use of plant and machinery:** The charges for the use of plant and machinery may be accounted for as follows:
 - i. Where a plant is specifically purchased for the contract then the contract account is debited with the cost of plant at the time of purchase and is credited to the depreciated value of the plant (cost less depreciation) at the end of the accounting period.
 - ii. Where a plant is issued from store for a short period then the contract account is debited with the amount of depreciation for the period of use.
 - iii. Where a plant is taken on hire then the contract account is debited with the amount of hire charges.
 7. **Accounting for Sub-Contract Costs:**
 - i. The payment made by the contractor to the sub-contractor forms a direct charge to the contract (i.e., the main contract) and therefore, debited to the respective contract account.
 - ii. If the contractor supplies any materials, equipment etc. to the sub-contractor, the cost of such materials, depreciation etc. should also be debited to the concerned contract account.
 8. **Accounting for Extra work:**
 - i. If the extra work is not substantial then cost of extra work should be debited to the contract account and the amount payable for the extra work by the contractee should be added to the contract price.
 - ii. If the extra work is substantial then it should be treated as a separate contract and the cost of such extra work should be debited to that account.
 9. **Accounting for money received from contractee:**
 - i. On the completion of the contractor as per the terms and conditions agreed between both the parties, the contractee is required to pay the contract price. Contractee account appears on the credit side of contract account for the value of contract (i.e., for amount due).
 - ii. The contract account is now closed and profit or loss on contract transferred to Profit and Loss Account.

In case of large contract which requires more than one year for its completion, a slightly different procedure is followed to find the profit or loss periodically as follows.

- i. The architect or surveyor appointed by the contractee issues a certificate stating clearly the percentage of work completed and also the value of work completed. Based on the value of work certified, the contractor gets money from contractee which is posted in the contractee account.
- ii. When a part of work done remains to be certified by the contractee's surveyor at the end of the accounting period, it is referred to as work uncertified. It is always valued at cost.
- iii. Value of work certified and cost of works uncertified posted on the credit side of contract account under the heading Work -In- Progress and debited to Work -In- Progress Account.
- iv. The Contract Account is now closed to find out notional profit, if any.
- v. A part of this notional profit is transferred to Profit and Loss Account as per rule keeping in view the amount of cash received and value of work certified. The balance amount is transferred to Work -In- Progress (Reserve) Account.

8.19 SPECIMEN OF INCOMPLETE CONTRACT ACCOUNT

CONTRACT ACCOUNT	
Particulars	Particulars

<p>To Direct Expenses + Outstanding - Prepaid</p> <p>To Indirect Expenses + Outstanding - Prepaid -</p> <p>To plant To cost of Extra work To cost of sub -contract To Profit & Loss A/C (Profit on sale of plant , material) _____ To Profit& Loss A/C (B.F) Profit</p>	<p>By Profit & Loss A/C (Loss on sale of material, plant) By Contractee Account(Contract Price)</p>
--	--

SPECIMEN OF CONTRACTEE ACCOUNT

CONTRACTEE ACCOUNT

Particulars To Balance c/d To Contractee Account	 (Value of Contract)	Particulars By Bank Account By Balance b/d By Bank Account	(Amt. Received)
--	---------------------------------	---	-----------------

EXTRACTS OF ITEMS IN THE BALANCE SHEET OF THE CONTRACTOR

BALANCE SHEET OFAS ON

Liabilities Wages Outstanding Direct Expenses Outstanding Indirect Expenses Outstanding Profit & Loss Account: Profit on sale of materials		Assets Wages Prepaid Direct Expenses Prepaid Indirect Expenses Prepaid Material at site Plant at site (after depreciation)	
---	--	---	--

Profit on sale of plant	Work in Progress :
Profit on Contract	
	Value Work Certified
	+ Cost of Work Uncertified
	- Cash Received
	- Work- in- Progress Reserve (Reserve Profit)

8.21 MISCELLANEOUS ILLUSTRATIONS

Illustration 8.8 A company undertook a contract for construction of a large market complex. The construction work commenced on 1st April 2017 and the following data are available for the year ended 31st March 2018:

	<u>Rs, '000</u>
Contract Price	35,000
Work certified	20,000
Progress payments received	15,000
Materials issued to site	7,500
Planning and Estimating Costs	1,000
Direct wages paid	4,000
Materials returned from site	250
Plant hire charges	1,750
Wages related costs	500
Site office costs	678
Head office expenses(Apportioned)	375
Direct Expenses Incurred	902
Work not certified	149

The contractors own a plant, which originally cost ₹20lacs, has been continuously used in this contract throughout the year. The residual value of the plant after 5 years of life is expected to be ₹5 lacs .Straight-line Method of depreciation is in use.

As on 31st March 2018, the direct wages due and payable amounted to ₹2,70,000 and the materials at site were estimated at 2,00,000.

You are required to:

- (i) Prepare the Contract Account for the year ended 31st March, 2018
- (ii) Show the calculation of Profit to be taken to the profit and loss account of the year;
and
- (iii) Show the relevant extracts in Balance Sheet.

Solution:

(i) Contract Account
For the year ended 31st March, 2008

Particulars	₹ '000	Particulars	₹ '000
To Material consumed (7,500-250-200)	7,050	By Cost of contract to date c/d	16,825

To Direct wages paid	4,000		
To Direct wages accrued	270		
To Wage related costs	500		
To Direct Expenses incurred	902		
To Planning and estimating costs	1,000		
To Site office costs	678		
To Head office expenses apportioned	375		
To Plant hire charges	1,750		
To Plant Depreciation (Refer to working Note)	300		
	16,825		16,825
To Cost of Contract b/d	16,825	By Work in Progress:	
To Notional Profit c/d	3,324	Work Certified	20,000
		Work uncertified	149
	20,149		20,149
To Profit and Loss A/c (see Ans. (ii) below)	1,662	By Notional Profit b/d	3,324
To Work in progress c/d (Reserve)	1,662		
	3,324		3,324

(iii) An Extract of Balance Sheet as at 31st March, 2008

Liabilities	₹ '000	Assets	₹ '000
Profit and Loss A/c	1,662	Plant at site (₹2,000 - ₹300)	1,700
Wages accrued	270	Materials at the site	200
		Work in progress :	
		Work certified	20,000
		Work uncertified	149
		Less: Profit (1,662)	
		Less: Cash Received (15,000)	3,487

Working Note: Plant Depreciation = $(₹2,000 - 500)/5 = ₹300$

(ii) Profit to be transferred to Profit and Loss Account: (fig in ₹'000). Since the Contract is between 50% and 90% completion, therefore, two third of the notional profit, reduced by the proportion of cash received to work certified is to be transferred to Profit and Loss account as shown below.

$$= \frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

$$= \frac{2}{3} \times ₹3,324 \times \frac{Rs.15,000}{Rs.20,000} = ₹1,662$$

Illustration 8.9A A firm of building contractors began to trade on 1st April, 2018. The following was the expenditure on a contract of ₹30,00,000 .

Particulars	₹
Materials issued to contract	51,000
Plant used for contract	15,000
Wages incurred	81,000
Other expenses incurred	5,000

Cash received on account by 31st March, 2019 amounted to ₹1,28,000 being 80% of the work certified. Of the plant and materials charged to the contract, plant which cost ₹3,000 and materials which cost ₹2,000 were lost. On 31st March, 2019 plant which cost ₹2,000 was returned to store. The cost of work done but uncertified was ₹1,000 and materials costing ₹2,300 were in hand at site. Charge 15% depreciation on plant.

Prepare a contract account from the above particulars.

Solution:

Contract Account

Particulars	₹	Particulars	₹
To Materials	51,000	By Profit and Loss A/c:	
To Plant	15,000	Loss on Plant	3,000
To Wages	81,000	Loss on Materials	2,000
To Other expenses	5,000	By Plant returned to stores	2,000
To Notional profit c/d	26,500	<i>Less:</i> Depreciation	300
		By Plant at site (Note)	
		By Work-in-progress:	
		Work certified	1,60,000
		(1,28,000 × $\frac{100}{80}$)	
		Work un- certified	1,000
		By Materials at site	
	1,78,500		1,78,500
To P&L A/c (Transfer)	14,133	By Notional profit b/d	26,500
($\frac{2}{3} \times 26,500 \times \frac{1,28,000}{1,60,000}$)			
To Work-in-progress Reserve (B.F)	12,367		
	26,500		26,500

Note:

Value of plant at the end:

Particulars	₹
-------------	---

Cost of plant	15,000
Less: Plant Lost	3,000
	12,000
Less: Plant returned	2,000
	10,000
Less: Depreciation @ 15%	1,500
Value of plant at the end	8,500

Illustration 8.10 M/S Kabita Contractor has undertaken two contracts, one at Bhubaneswar and another at Sambalpur. The details of the contracts are given below for the year ended 31st March, 2019:

Particulars	Contract at Bhubaneswar	Contract at Sambalpur
Date of commencement	1 st July, 2019	1 st October, 2019
	₹	₹
Contract price	10,00,000	15,00,000
Direct labour	2,55,000	1,82,000
Materials issued from store	2,20,000	2,00,000
Materials returned to store	10,000	15,000
Plant installed at site	2,00,000	3,50,000
Direct expenses	40,000	30,000
Office overheads	15,000	10,000
Materials sold (cost ₹8,000)	10,000	-
Materials at site	18,000	16,000
Cash received from contractee (representing 80% of work certified)	4,80,000	2,40,000
Work uncertified	13,000	9,000
Architects Fees	7,000	3,000

- (i) Provide depreciation on plant at 20% p.a.
- (ii) During the year, materials costing ₹10,000 were transferred from Sambalpur contract to Bhubaneswar contract.

You are required to prepare Contract Account at Bhubaneswar and Sambalpur

Solution:

Contract A/c (At Bhubaneswar)

Particulars	₹	Particulars	₹
To Materials issued	2,20,000	By Materials returned to stores	10,000
To Direct Labour	2,55,000	By Materials sold	10,000
To Plant sent to site	2,00,000	By Materials at site	18,000
To Direct Expenses	40,000	By Work-in-progress:	

To Office overheads	15,000	Work certified	6,00,000
To Profit and Loss A/c (Profit on sale of materials)	2,000	Work uncertified	13,000
To Architect's Fees	7,000	By Plant at site	1,70,00
To Materials transferred from Sambalpur contract	10,000		
To Notional Profit c/d	72,000		
	8,21,000		8,21,000
To Profit and Loss A/c (Transfer)		By Notional profit b/d	72,000
$\frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash received}}{\text{Work certified}}$	38,400		
$\frac{2}{3} \times 3,35,000 \times \frac{80}{100}$			
To work-in-progress (Reserve) b.f	33,600		
	72,000		72,000

Contract A/c (At Sambalpur)

Particulars	₹	Particulars	₹
To Materials issued from store	2,00,000	By Materials returned to store	15,000
To Direct labour	1,82,000	By Materials at site	16,000
To Plant issued	3,50,000	By Work-in-progress:	
To Direct expenses	30,000	Work certified	2,40,000
To Office overheads	10,000	Work uncertified	9,000
To Architect's fees	3,000	By Material transferred to Bhubaneswar Contract	10,000
		By Plant at site	3,15,000
		By Profit & Loss Account (b.f)	1,70,000
	7,75,000		7,75,000

Illustration 8.11 Prakash Ltd. undertook a contract for ₹5,00,000 on 1st January, 2018. The company furnishes the following details for the year ended 31st December, 2018.

Particulars	₹
Materials consumed	1,65,000
Direct Expenses	5,000
Wages	30,000
Materials returned to store	5,000

Materials stolen from site	10,000
Insurance claim admitted	6,000
Other work expenses @ 20% on wages	
Office expenses @10% on work cost	
Materials in hand on 31 st December, 2018	15,000
Cash received to the extent of 90% of work certified	2,70,000
Cost of work uncertified	11,000

Plant sent to site at cost ₹60,000 with a scrap value of ₹10,000 and a useful life of 5 years . The plant was in the contract for 146 days.

Prepare Contract Account showing therein the cost of materials issued to site and amount of profit or loss to be transferred to the Profit and Loss Account. Show the value of work-in-progress separately.

Solution:

Contract A/c

Particulars	₹	Particulars	₹
To Materials sent to site (Note1)	1,95,000	By Materials returned to store	5,000
To Wages	30,000	By Profit and Loss A/c	10,000
To Direct Expenses	5,000	(Materials stolen)	
To Other Works expenses	6,000	By Material on hand	15,000
(20% on wages)		By Plant at the end (Note- 2)	56,000
To Office Expenses (Note- 3)	21,000	By Work-in-progress:	
To Plant sent to site	60,000	Work certified	3,00,000
To Notional Profit c/d	80,000	Work Uncertified	11,000
	3,97,000		3,97,000
To Profit & Loss A/c (Transfer)	48,000	By Notional Profit b/d	80,000
(Note-4)			
To Work-in-progress (Reserve)	32,000		
	80,000		80,000

Working Notes:

1. Calculation of Cost of Materials issued to site:

Particulars	₹
Closing stock of materials as on 31-12-2018	15,000
Materials returned to stores	5,000
Materials stolen at site	10,000
Materials consumed	1,65,000
Materials sent to site	1,95,000

2. Calculation of Depreciation:

$$= \frac{Rs.60,000 - Rs.10,000}{5 \text{ years}} \times \frac{146}{365} = ₹4,000$$

Plant at the end = = 60,000 – 4,000 = 56,000

3. Calculation of Office expenses:

Particulars	₹
Materials consumed	1,65,000
Wages	30,000
Direct expenses	5,000
Other works expenses	6,000
Depreciation	4,000
Works Cost	2,10,000

Office expenses @ 10% on **works cost** = ₹2,10,000 × $\frac{10}{100}$ = ₹21,000

4. Profit transferred to Profit and Loss A/c :

$$= \text{Notional Profit} \times \frac{2}{3} \times \frac{\text{Cash received}}{\text{Work certified}}$$

$$= 80,000 \times \frac{2}{3} \times \frac{2,70,000}{3,00,000} = ₹48,000$$

Illustration 8.12 The following information relate to a Road Contract of ₹10,00,000 :

Particulars	2018 (₹)	2019 (₹)
Materials issued from store	3,00,000	84,000
Direct wages	2,30,000	1,05,000
Direct expenses	22,000	10,000
Indirect expenses	6,000	1,400
Work certified	7,50,000	10,00,000
Work not certified	8,000	-
Materials at site	5,000	7,000
Plant purchased	14,000	2,000
Cash received from Contractee	6,00,000	4,00,000

The value of plant at the end of the year 2018 and 2019 were ₹7,000 and ₹5,000 respectively.

Prepare (i) Contract A/c (ii) Contractee A/c for the years 2018 and 2019 taking into consideration such profit for transfer to Profit and Loss A/c as you think proper.

Solution:

Contract A/c (Year 2018)

Particulars	₹	Particulars	₹
To Materials issued	3,00,000	By Material at site	5,000
To Direct wages	2,30,000	By Plant at site	7,000
To Direct expenses	22,000	By Work-in-progress:	

To Indirect expenses	6,000	Work certified	7,50,000
To Plant purchased	14,000	Work uncertified	8,000
To Notional Profit c/d	1,98,000		
	7,70,000		7,70,000
To Profit & Loss A/c (Transfer)	1,05,600		
$\frac{-2}{3} \times 1,98,000 \times \frac{6,00,000}{7,50,000}$			
To Work-in-progress (Reserve)	92,400	By Notional Profit b/d	1,98,000
	1,98,000		1,98,000

Contract A/c (Year 2019)

Particulars		₹	Particulars	₹
By Work-in-progress:			By Material at site	7,000
Work certified	7,50,000		By Plant at the end	5,000
Work uncertified	8,000		By Contractee A/c(Contract price)	10,00,000
	7,58,000			
Less: Reserve	(92,400)	6,65,000		
To Material at site		5,000		
To Material issued from store		84,000		
To Plant at site		7,000		
To Plant purchased		2,000		
To Direct wages		1,05,000		
To Direct expenses		10,000		
To Indirect expenses		1,400		
To Profit and Loss A/c		1,32,000		
		10,12,000		10,12,000

Contractee A/c

2018	Rs	2018	₹
To Balance c/d	6,00,000	By Cash	6,00,000
	6,00,000		6,00,000
2019			
To Contract A/c(Contract price)	10,00,000	By Balance b/d	6,00,000
		By Cash (B.F)	4,00,000
	10,00,000		10,00,00

Illustration 8.13 A company of contractors began to trade on 1st January, 2018. During 2018 the company was engaged on only one contract of which the contract price was ₹5,00,000.

Of the plant and materials charged to contract, plant costing ₹5,000 and materials costing ₹4,000 were lost in an accident.

On 31st December, 2018 plant costing ₹5,000 was returned to the stores. Cost of work uncertified, but finished ₹2,000 and materials costing ₹4,000 were in hand on site.

Charge 10% depreciation on plant. Prepare Contract Account and Balance Sheet from the following:

Particulars	Dr. (₹)	Cr. (₹)
Share capital		1,20,000
Creditors		10,000
Cash received (80% work certified)		2,00,000
Land and Buildings	43,000	
Bank Balance	25,000	
Charge to contract:		
Materials	90,000	
Plant	25,000	
Wages	1,40,000	
Expenses	7,000	
	3,30,000	3,30,000

Solution:

Contract Account for the year ended 31st December, 2018

Particulars	₹	Particulars	₹
To Materials	90,000	By Profit and Loss A/c:	
To Wages	1,40,000	Plant lost	5,000
To Plant	25,000	Materials lost	4,000
To Expenses	7,000		9,000
To Notional Profit c/d	21,000	By Plant returned	5,000
		Less: Depreciation @ 10%	500
			4,500
		By Materials in hand	4,000
		By Plant	25,000
		Plant lost	5,000
		Plant Returned <u>5,000</u>	10,000
			15,000
		Less: Depreciation @ 10%	1,500
			13,500
		By Work-in-progress:	
		Work certified ($2,00,000 \times \frac{100}{80}$)	2,50,000
		Work uncertified	2,000
	2,83,000		2,83,000
To Profit and Loss /c		By Notional profit b/d	21,000

$21,000 \times \frac{2}{3} \times \frac{80}{100}$	11,200		
To W.I.P(Reserve)(B.F)	9,800		
	21,000		21,000

Balance Sheet as on 31st December, 2018

Particulars		₹	Particulars		₹
Share capital		1,20,000	Land and buildings		43,000
Profit and loss	11,200		Plant at stores	4,500	
Less: Loss of plant and materials	(9,000)	2,200	Plant at site	13,500	18,000
Creditors		10,000	Materials at site		4,000
			Work-in-progress:		
			Work Certified	2,50,000	
			work Uncertified	2,000	
				2,52,000	
			Less: Cash Received	2,00,000	
				52,000	
			Less: Reserve	9,800	42,200
			Bank		25,000
		1,32,200			1,32,200

Illustration 8.14 M/S Gupta Construction was engaged on building contract during the year 2019. The contract price was ₹4,00,000. The trial balance expected from its books as on 31st December, 2019 stood as follows:

Particulars	Dr. (₹)	Cr. (₹)
Share Capital		80,000
Sundry Creditors		8,000
Land and Buildings	34,000	
Bank Balance	9,000	
Contract Account:		
Materials	75,000	
Plant	20,000	
Wages	1,05,000	
Expenses	5,000	
Cash received being 80% of work certified	-	1,60,000
	2,48,000	24,8000

Of the plant and materials charged to the contract, Plant costing ₹3,000 and materials costing ₹2,400 was destroyed by an accident.

On 31st December, 2019 Plant which cost ₹4,000 was returned to the store. The value of materials on site was ₹3,000 and the cost of work done but not certified was ₹2,000. Charge 10% depreciation on plant. Prepare Contract Account and Balance Sheet as on 31st December, 2019.

Solution:

Contract A/c

Particulars	Rs	Particulars	₹
To Materials	75,000	By Profit and Loss A/c:	
To Plants	20,000	Material lost	2,400
To Wages	1,05,000	Plant lost	3,600
To Expenses	5,000	By Plant returned	4,000
		Less: Depreciation	400
		By Plant at site:	13,000
		Less: Depreciation	1,300
		By Materials at site	3,000
		By Work-in-progress:	
		Work certified $1,60,000 \times \frac{100}{80}$	2,00,000
		Work uncertified	2,000
	2,25,700		2,25,700
To Profit and Loss A/c			
$\frac{2}{3} \times 2,00,000 \times \frac{80}{100}$	11,040		
To Reserve (B.F)	9,660	By Notional profit b/d	20,700
	20,700		20,700

Balance Sheet of M/S Gupta Construction as on 31st December, 2019

	Rs		₹
Share capital		Land and Building	34,000
Sundry Creditors		Plant at store	3,600
Profit and Loss A/c:		Plant at site	11,700
Profit on contract	11,040	Materials at site	3,000
Loss of material and plant	5,400	Bank	9,000
		Work-in-progress:	
	80,000	Work certified	2,00,000
	8,000	Work uncertified	2,000
			2,02,000
	5,640	Less: Reserve	(9,600)
			1,92,340
		Less: Cash Received	(1,60,000)
	93,640		32,340
			93,640

KNOW YOUR PROGRESS

State whether the following statements are True or False.

7. In cost-plus contract, the contractor runs a risk of incurring a loss.
8. When a contract is spread over more than one accounting year, profit is calculated only after the completion of the contract.
9. When the contract is completed, the contract price is credited to the contractee's a/c.
10. There is no difference between notional profit and estimated profit in relation to contracts.
11. In contract costing, profit on each contract is computed when the contract is completed.
12. Escalation clauses in contracts are often provided as safeguards against any likely upward changes in price of materials and labour rates.

Fill in the blanks with an appropriate word

13. In contract costing, the cost unit is
14. A contract which guarantees a certain percentage of profit is called.....contract.
15. Contract costing is also known as
16. When a contract is not complete at the end of the year, loss on incomplete contract is
17. Profit in an incomplete contract is known as

8.22 KEY WORDS

1. **Specific order costing:** It is the category of basic costing methods that are applicable where the work consists of separate jobs, batches or contracts each of which is authorized by a specific order or contract. It includes job costing, batch costing and contract costing.
2. **Job costing:** It is a method of costing where cost is compiled for a job. The production is against customers' orders and not for stock.
3. **Job ticket:** It is a document which contains several detachable portions, each of which is detached and sent to the foreman to the production control department on the completion of each job.
4. **Job cost sheet:** It is used to record direct materials, direct wages and overheads incurred in executing a job. It facilitates the determination of profit or loss in each job.
5. **Fixed price contract:**

Fixed price contract is one where the contract price is fixed and determined in advance at the time of entering into the agreement by the contractor and contractee. Such type of contract is entered into when contract costs can be reasonably estimated with a degree of accuracy.

6. Cost- plus contract:

Cost- plus contract refers to that contract under which the contract price is ascertained by adding a fixed percentage of profit or a specified amount to the total cost of the contract. This type of contract is entered in those cases where it is not possible to estimate the contract price well in advance with a reasonable degree of accuracy due to unstable conditions of market price of materials, labour rate, etc.. Govt. and Semi Govt. organizations usually prefer to assign contract on cost- plus basis.

7. Escalation Clause

In fixed price contracts, the contract price is fixed and pre-determined. If there is an increase in the costs of input during the period of execution of a contract, the total contract cost may also rise and the profit of the contractor is reduced thereby. The agreement generally contains a stipulation that the contract price will be increased by an agreed amount or percentage, if the prices of input factors increase beyond a particular limit. Such a stipulation / clause is called escalation clause.

8. Contract Account-When a contract has been accepted by the contractor, a separate account is opened for each contract in order to bring together all costs relating to a particular contract and a serial number is given to each contract which is called contract account. It is opened in the books of the Contractor.

9. Contractor-The person who undertakes the contract.

10. Contractee- The person for whom the contract is done.

11. Contract price-The price agreed between the contractor and the contractee for the contract work.

12. Work certified –It is that portion of the work completed which has been certified by the architect or engineer of the contractee for payment. Work Certified is valued at contract price and includes an element of profit.

13. Work uncertified– This is that part of work completed which has not been certified by the architect or engineer of the contractee. It is valued at cost and thus, does not include an element of profit.

14. Retention Money: Usually the contractee does not make payment the full amount of work certified. The amount so withheld by the contractee while making progress payments is known as retention money. Thus, Retention money = Value of work certified - payments made by the contractee.

Retention money is withheld by contractee to ensure timely completion of entire contract and comply with the terms of the contract. It provides a safeguard against the risk of loss due to faulty workmanship.

15. Sub- Contract Cost:When a portion of the contract is given to another subordinate contractor for completion, that portion is said to have been sub- contracted. Sub- contract costs are debited to the contract account as such.

16. Incomplete Contract- When a contract takes more than one financial year to complete then it is called an incomplete contract for that financial year. Profit on such incomplete contract is transferred to profit and loss account as per rule.

17. Cost of Extra Work: Sometimes the contractee may desire to get some additions or alterations made which may not have been included in the original contract. The contractor will charge extra money for such extra work. account as “cost of extra work” and extra price realized is credited to the contract account.

18. Notional Profit:Notional profit is the difference between the value of work-in-progress certified and the cost of work-in-progress certified. It is the excess of credit side over debit side of a contract account. It arises in case of an incomplete contract.

Notional profit is computed as follows:

Notional profit = Value of Work Certified – Cost of Work Certified

8.23 ANSWERS TO CHECK YOUR PROGRESSs

True / False statements

True:2,4,5,6,8,12 **False:**1,3,7,9,10,11

Fill in the blanks:

Answer-13.contract 14.Cost-plus 15.Terminal Costing 16.Transferred to P&L Account 17.

Notional profit

8.24 TERMINAL QUESTIONS

SHORT QUESTIONS

1. Write the objectives of Job Costing.
2. State the advantages of Job Costing.
3. State the disadvantages of Job Costing.
4. Write the features Job Order Costing.
5. Write the features of contract costing.
6. What do you mean by cost -plus -contracts?
7. How loss in an incomplete contract is treated?
8. What do you mean by work certified and work un-certified in contract costing?
9. What is escalation clause in contract costing?
10. How sub-contract cost is treated in contract costing?
11. How notional profit is calculated in contract costing?
12. What do you mean by retention money?
13. State the principles of transfer of profit in case of incomplete contracts.

LONG QUESTIONS

1. Discuss the procedure of Job Costing.
2. Discuss the advantages and disadvantages of Job Costing. Write the industries using Job Costing.
3. What is Job order number? How costs are booked against job order number.
4. How would you control the cost of a job? Explain.
5. What is Job cost sheet? Give a specimen of it.
6. What is Contract costing? Distinguish between job costing and contract costing
7. What is contract costing? Explain the special features of contract costing.
8. How the profits are determined in case of incomplete contracts? Explain briefly the principals involved in transferring profit in case of incomplete contracts.
9. Give a specimen of Contract Account with imaginary figures.
10. Explain the procedure followed in preparing Contract Account.

NUMERICAL QUESTIONS

(JOB COSTING)

1: The following direct expenses were incurred on **Job No. 55** of Gala TV Company.

- (a) Materials: ₹ 15,030.
- (b) Wages paid: Department A: 40 hours at ₹ 8 per hour, Department B: 50 hours at ₹ 9 per hour, and Department C: 60 hours at ₹ 5 per hour.
- (c) Works overhead expenses of these departments were estimated as under – Department A: ₹ 9,000 for 6,000 working hours, Department B: ₹ 10,000 for 5,000 working hours, and Department C: ₹ 12,000 for 3,000 working hours.
- (d) Office expenses were ₹ 75,000 when total direct wages paid in all three departments came to ₹ 2, 50,000.

It is a practice followed in Gala TV Company to recover office overhead as a percentage of direct wages. You are required to calculate the cost of Job No. 55, and its price to be quoted which would include 20% profit on selling price.

Answer: ₹16,500 , ₹21,026

2. A job manufacturing company has received an enquiry for the supply of 2, 00,000 number of a special type of machine screw. Capacity exists for manufacture of the screws in the company's department but a fixed investment of ₹60,000 and working capital to the extent of 25% of the sale value will be required if the job is undertaken. The costs are estimated as follows:

Raw materials- 20,000 kgs.at ₹2.30 per kg.

Labour hours – Direct 18,000 of which 2,000 would be overtime hours payable at double the labour rate.

Labour rate – Re.1 per hour

Factory overhead – ₹1 per direct labour hour

Selling and distribution on cost – ₹23, 000

Material recovered as scarp at the end of the operation is estimated at ₹2,000

The company expects a net return of 25% on the capital employed.

Prepare a job cost sheet indicating the price which should be quoted to the customer.

Answer: ₹1,28,000

3. Mamun Ltd. operates a job costing system in which production overhead is estimated as a percentage of direct labour and administration overhead are absorbed as a percentage of works cost. The following data relating to the previous year is given:

Particulars	₹	Particulars	₹
To Materials Consumed	65,000	By Sales	2,46,000
To Wages:			
Department I	10,000		
Department II	8,000		
Department III	12,000		
	30,000		
To Factory Overheads:			
Department I	8,000		
Department II	4,000		
Department III	7,200		
	19,200		
To Administration Overheads	11,420		
To Net profit	1,20,380		
Total	2,46,000		2,46,000

The job requires materials ₹6,800 and labour of ₹2,000, ₹1,500 and ₹3,000 in the three departments respectively. What will be the quotation for a new job? The company desires a profit 20% on selling price

Answer: ₹ 23,993.75

4. A factory uses job costing. The following data are obtained from its books for the year ended 31st December, 2018.

	₹		₹
Direct Materials	90,000	Selling and Distribution Overheads	52,500
Direct Wages	75,000	Administrative overheads	42,000
Profit	60,900	Factory Overheads	45,000

- (i) Prepare a Job Cost Sheet indicating the prime cost, works cost, production cost, Cost of Sales and Sales Value.

In 2019, the factory receives an order for a number of jobs. It is estimated that direct materials required will be ₹1,20,000 and direct labour will cost ₹75,000. The factory recovers factory overheads as a percentage of direct wages, administration and selling and distribution overheads as a percentage of works cost, based on cost rates prevailing in the previous year.

What should be the price for these jobs if factory intends to earn the same rate of profit on sales assuming that the selling and distribution overheads have gone up by 15%?

Answer: ₹4,28,400

CONTRACT COSTING

5. Rima Company undertakes a large contract. On 31st December, 2018 when annual accounts were prepared the position of the contract which commenced on 1st April, 2018 was as follows:

Particulars	Amount (₹)
Materials purchased	6,00,000
Wages paid	7,00,000
Sundry expenses	30,000
Plant sent to site (cost)	1,00,000
Wages accrued	10,000
Materials on hand	24,000

The value of certified work was ₹14,40,000 of which ₹10,80,000 has been received. The work finished but uncertified was valued at ₹40,000. The plant on the site on 31st December 2018 was valued at ₹80,000. The contract price was ₹24,00,000 and the cost of the work to date was within the estimates.

Prepare Contract Account showing the profit which should reasonably be transferred to the Profit and Loss Account and show how the particulars relating to the contract should appear in the Balance Sheet of the Company as on 31st December, 2018.

Answer: [Profit ₹72,000]

6. L&T construction company undertook the construction of a building at a contract price of ₹12,00,000. The date of commencement of contract was 1st April, 2018.

The following cost information is given for the year ended 31st March, 2019.

Particulars	₹
Materials sent to the site	3,00,000
Wages	4,40,000
Architect fees	55,500
Office and Administrative overheads	1,51,000
Uncertified work	55,000
Materials at the site at the end of the year	10,000
Cash received from the contractee (being 90% of the work certified)	9,45,000
Materials destroyed by fire	5,000
Plant and machinery at cost (Date of purchase 1 st July, 2018. The estimated working life of the plant – 10 years and its estimated scrap value at the end ₹20,000)	2,00,000
Supervisor's salary	60,000

You are required to prepare a contract account for the year ended 31st March, 2019.

Answer: [Profit ₹60,000]

7. Megha Ltd. was engaged on a contract during the year 2018. The contract price was ₹2,00,000. The trial balance extracted from the books on 31-12-2018 stood as follows:

Particulars	Dr. (₹)	Cr. (₹)
Share capital		40,000
Sundry creditors		4,000
Building	17,000	
Cash at Bank	4,500	
Contract A/c:		
Materials	37,500	
Plant	10,000	
Wages	52,500	
Cash received from contractor (80% of work certified)		80,000
Expenses	2,500	
	1,24,000	1,24,000

Of the plant and materials charged to the contract, plant costing ₹1,500 and materials costing ₹1,200 were destroyed by an accident. On 31-12-2018 plant costing ₹2,000 was returned to

stores and material at site was valued at ₹1,500. Cost of uncertified work was ₹1,000. Charge 10% depreciation on plant. Prepare Contract Account for the year 2018 and Balance Sheet as on 31-12-2018.

[Answer: Profit ₹5,520]

8. Sharma Construction Ltd. provides you the following information. You are required to prepare a Contract Account showing the profit on the contract 30th April, 2019 from the following particulars. Also show the values that would appear in the next year's Contract Account.

Particulars	Amount (₹)
Contract price	1,00,000
Materials sent to site	32,250
Labour engaged on site	27,400
Plant installed at site	5,650
Work certified	71,500
Cash received from contractee	65,000
Value of plant (30 th April)	4,100
Cost of work done but not certified	1,700
Direct expenditure	1,200
Establishment charges	1,625
Wages outstanding on 30 th April	900
Materials in hand on 30 th April	700
Direct expenses outstanding on 30 th April	100
Materials returned to stores	200

[Answer: Profit ₹5,500]

9. The following information relate to a building contract of ₹10,00,000 for which 80% of the value of work-in-progress as certified by the architect is being paid by the contractee.

Particulars	I Year	II Year	III Year
	₹	₹	₹
Materials issued	1,20,000	1,45,000	84,000
Direct wages	1,10,000	1,55,000	1,10,000
Direct expenses	5,000	17,000	6,000
Indirect expenses	2,000	2,600	500
Work certified	2,35,000	7,50,000	10,00,000
Work uncertified	2,800	8,000	-
Plant issued	14,000	-	-
Materials at site	2,000	5,000	8,000

The value of the plant at the end of I, II and III year was ₹11,200; ₹7,000; ₹3,000 respectively. Prepare Contract Account for these years, taking into account such profit as you think proper on incomplete contract.

[Answer: Ist Year – Nil, IInd Year- Profit ₹1,06,347, IIIrd Year Profit ₹1,33553]

10. The following information relate to two contracts of Radha Ltd. for the year ending, 2018.

Particulars	Contract A (₹)	Contract B (₹)
Materials sent to site	1,70,698	1,46,534
Labour	1,48,750	1,37,046
Plant	30,000	25,000
Direct expenses	6,334	5,718
Establishment charges	8,252	7,704
Materials returned to stores	1,098	1,264
Work certified	3,90,000	2,90,000
Work uncertified	9,000	6,000
Materials at site (31-12-2018)	3,766	3,472
Wages accrued (31-12-2018)	4,800	4,200
Direct expenses accrued (31-12-2018)	480	360
Value of plant (31-12-2018)	22,000	19,000

The contract price was ₹5,00,000 for A and ₹4,00,000 for B. The cash received from the contractee was 80% of the value of work certified.

Prepare the Contract Accounts and the Contractee's Account.

[Answer: Notional profit ₹30,160 , Balance in the Contractee A/c ₹2,32,000]

11. The following information is given for Contact No. 103 as on 31.12.2015.

Particulars	₹
Direct Material	1,36,000
Direct Wages	20,800
Store issued	15,200
Store returned	2,200
Sub-contract Cost	25,200
Plant	48,000

The contract was started on 1.1.2015. The contract price was ₹ 2,40,000. On 1st Dec 2015.

Engineer certified that $\frac{4}{5}$ th of the contract price has been completed. Depreciation on plant upto 1st Dec.2015 was ₹ 19,200. Expenses paid after 1st Dec. 2015 is: material ₹ 6,480, wages ₹ 2,800. Establishment charges are 50% of

wages. On 31st Dec.2015, Materials and stores on site are ₹ 20,000 and ₹ 1,600 respectively. As the agreement was to complete the contract up to 2015, the likely fine for delay in project tbe provided ₹ 7,500. Prepare the Contract Account.

Answer: Loss ₹ 320

-----X-----
-

B.COM
SEMESTER IV
COURSE: COST ACCOUNTING

UNIT- 9 PROCESS COSTING
(PROCESS LOSSES, VALUATION OF W-I-P, JOINT PRODUCTS AND BY-PRODUCTS)

STRUCTURE

- 9.0 Objectives**
- 9.1 Introduction**
- 9.2 Concept of process costing**
- 9.3 Features**
- 9.4 Distinction between Job costing and Process costing**
- 9.5 Ascertainment of Cost in relation to Processes**
- 9.6 Specimen of Process accounts**
- 9.7 Loss on Process**
 - 9.7(a) Normal Loss**
 - 9.7(a)(i) Accounting Treatment of Normal Loss**
 - 9.7(b) Abnormal Loss**
 - 9.7(b)(i) Computation of Abnormal Loss**
 - 9.7(b)(ii) Accounting Treatment of Abnormal Loss**
 - 9.7(b)(iii) Distinction between Normal loss and Abnormal Loss**
 - 9.7(c) Abnormal Gain/ Abnormal Effectives**
 - 9.7(c)(i) Computation of Abnormal Gain**
 - 9.7(c)(ii) Accounting Treatment of Abnormal Gain**
 - 9.8 Sequence of Closing the Process Accounts**
 - 9.9 Advantages of Process Costing**
 - 9.10 Limitations of Process Costing**
 - 9.11 Miscellaneous Illustrations**
 - 9.12 Valuation of W-I-P (Equivalent Production)**
 - 9.13 Computation of Equivalent Units**
 - 9.14 Steps involved in preparing Process Accounts**
 - 9.15 Preparation of Process Accounts**
 - 9.15(a) when there is Opening Stock of W-I-P and Process loss or Gain**
 - 9.15(b) when there is Opening Stock, Closing Stock of W-I-P and Process Loss or Gain**
 - 9.16 Joint Product and By-product**

- 9.16(i) Features of Joint Product**
- 9.16(ii) Features of Co-products**
- 9.17 Distinction between Joint Products and Co-products**
- 9.18 Objectives of Joint Product Analysis**
- 9.19 Joint Cost and Subsequent Cost**
- 9.20 Methods of Apportionment of Joint Cost**
- 9.21 By-products**
- 9.21(i) Features of By-products**
- 9.22 Distinction between Joint Products and By-products**
- 9.23 Accounting Treatment of By-products**
- 9.24 Decision as to Further Processing of By-products**
- 9.25 Summary**
- 9.26 Keywords**
- 9.27 Terminal Questions**

9.0 OBJECTIVES

After studying this unit, you will be able to:

- Know the concept of process costing.
- Understand the differences between process costing and job costing.
- Learn the procedure of preparing process accounts.
- Know the accounting treatment of process losses and gains.
- Study the valuation of Work-in-Progress in process costing.
- Study the treatment and cost allocation of joint products and by-products.

9.1 INTRODUCTION

Process is a distinct stage in production, wherein raw materials are converted from one identifiable form into another, before it is finally converted into the sale-able finished product. Process costing is a method of costing followed where raw materials pass from one process to another till the finished product is obtained. It represents method of cost procedure applicable to continuous or mass production industries. The distinct processes are in a sequential order; and the output (finished product) of one process becomes the raw material of the immediate next process and so on until the final product is obtained. In most of the firms manufacturing on a continuous basis the problem of work in progress is quite common. So valuation of work in progress (expressed into equivalent production) is made at the end of the year. There are certain industries where two or more products are simultaneously produced in the same process which may be joint products or by-products.

9.2 CONCEPT OF PROCESS COSTING

Process costing represents a type of cost procedure for continuous production industries. In such industries, output consists of likely units and each unit being processed in the same manner. Therefore, it is assumed that the same amount of raw materials, labour and overhead are chargeable to each unit processed. The cost per unit at the end of each manufacturing process can be easily determined.

According to CIMA, “The basic costing method applicable where goods or services result from a sequence of continuous or repetitive operations or processes, costs are averaged over the units produced during the period”.

Process costing is also known as **Continuous Costing** because the industries who have adopted this method of costing undertake manufacturing of goods on a continuous basis. This method is also known as **Average Costing** because the total cost of the production is charged to all the units produced in the process at an average cost.

9.3 FEATURES OF PROCESS COSTING

The distinct features of process costing are as follows:

1. The **factory is divided into various processes**, departments which perform a certain limited operations. Each process or department is known as cost center.
2. All types of **costs** (direct or indirect) **relating to process** are collected and recorded process wise.
3. **The production is continuous**. The output of one process is the raw material for the immediate **next process** at value with output and this procedure continues till the final product is obtained.
4. **The products and processes are standardized**. The finished products are uniform in all respects like shape, size, weight, colours, quality, chemical contents etc.
5. It is quite common to incur **normal loss and wastage**. Sometimes, owing to abnormal conditions even abnormal loss or gain may also happen.
6. The **costs are collected process-wise**. The total cost of the final product comprises of all costs incurred in all the processes.
7. In certain industries, the production of **main product is often accompanied by secondary products** which are termed as **joint products or by-products** depending on their realisable value.
8. If there is a stock of semi-finished goods, it is expressed in terms of **equivalent units**.
9. The **cost per unit** is calculated at the end of the period by dividing the total process cost by the normal output produced.

APPLICATION OF PROCESS COSTING

Process Costing is applicable in:

- | | | |
|-----------------------|------------------------------|---------------------|
| * Textile Industries | * Food Processing Industries | * Sugar Industries |
| * Chemical Industries | * Crude Oil Refineries | * Cement Industries |

9.4 DISTINCTION BETWEEN JOB COSTING AND PROCESS COSTING

The main differences between Job Costing and Process Costing are as follows:

SL. NO.	Basis	Job Costing	Process Costing
1	Concept	Job refers to specific contract, work order or arrangement where work is executed as per the requirements of the customer.	Process refers to a stage in manufacturing where raw materials are converted from one form to another.
2	Nature of production	Production is executed against specific order from customers.	Production is continuous in anticipation of sales. Thus, there is mass production.
3	Time of costing	In job costing, costs are calculated when a job is completed or finished.	In process costing, costs are calculated at the end of the period under each process.
4	Nature of work	It is based on specialised production based on customers' specification. So each job may be different.	Here, products are homogeneous and standardized.
5	Relationship	Each job is separate and independent.	Processes are related to each other. Products also lose their individual identity.
6	Cost centre	The cost centre is the job itself.	The cost centre is the concerned process.
7	Work-In-Process(W-I-P)	There may or may not be work-in-process.	There is always some work- in-process because of continuous flow of production.
8	Valuation in W-I-P	Different jobs might be completed at different degrees. Hence, W-I-P consists of job-wise cost incurred till date.	Equivalent production units to be ascertained. It is presumed that all units of closing W-I-P are uniformly semi-finished on an average.
9	Computation of cost	Costs are collected and ascertained for each job separately.	Cost are collected and ascertained for each process separately.
10	Transfer of cost	There is no need of transferring cost from one job to another.	Cost of one process is transferred to the next process.
11	Control of losses and wastage	Losses and wastages can be controlled being job needs individual attention.	Only abnormal losses can be controlled and not the normal losses.

9.5 ASCERTAINMENT OF COST IN RELATION TO PROCESSES

Sl. No.	Particulars of Cost	Treatment
1	Direct Materials	<ul style="list-style-type: none">• Cost of materials and supplies for each process are drawn from material requisitions or bill of materials and debited to cost.• When the finished product of one process becomes the raw material of next process, the account of the receiving process should be debited with the cost of transfer and in addition to the cost of additional materials, if any.
2	Direct Labour	<ul style="list-style-type: none">• Labour cost is ascertained from the job cards and wages analysis sheet.• Wages paid to the labourers who are engaged in particular processes are directly allocated to the process .• When workers are engaged in a number of processes , their wages are apportioned over different processes on the basis of time booking, i.e., time spent on different processes.
3	Direct Expenses	<ul style="list-style-type: none">• Direct Expenses such as royalty based on output, excise duty based on output, hiring charges for machine, tools and equipment etc., ascertained through payment vouchers are directly allocated to the respective process accounts.
4	Production Overhead	<ul style="list-style-type: none">• Production overheads like factory rent, lighting, gas, water etc. which are common to one or more processes, may be apportioned to the various processes on a suitable basis. Generally, these overheads are recovered at predetermined rates or based on percentage of direct labourcosts,labour hour rate etc.

Note- Office and Administrative overheads, Selling and Distribution overheads may be treated as period costs, and directly debited to Profit and Loss Account.

9.6 SPECIMEN OF PROCESS ACCOUNTS

Process A Account

Particulars	Qty.	Amount	Particulars	Qty.	Amount
To Material			By Loss of Weight		
To Labour			By Normal Loss (...% @ ₹		
To Direct Expenses			...)		
To Production Overhead			By Transfer to Process B @		

Process B Account

Particulars	Qty.	Amount	Particulars	Qty.	Amount
To Transfer from Process A			By Loss of Weight		
To Material			By Normal Loss		
To Labour			\(...% @ ₹ ...)		
To Direct Expenses			By Abnormal Loss		
To Production Overhead			By Transfer to Process C		
			@		

Process C Account

Particulars		Amount	Particulars	Qty.	Amount
To Transfer from Process B			By Loss of Weight		
To Material			By Normal Loss		
To Labour			(...% @ ₹		
To Direct Expenses			...)		
To Production Overhead			By Transfer to finished		
To Abnormal Gain			stock Account		

9.7 LOSS ON PROCESS

In the industries using process costing, a certain amount of losses of materials occur at different stages of production. Such losses may arise due to changes in chemical reaction, evaporation, inefficiency etc. It is, therefore, necessary to keep proper records of both input and output of each process. $\text{Process Loss} = \text{Quantity of Input} - \text{Quantity of Output}$.

Thus, process loss may be classified into:

- a. Normal Loss , and
- b. Abnormal Loss

9.7(a) Normal Loss

Normal loss is the loss of material due to its inherent nature. Such type of loss is unavoidable. However, normal loss can be reduced by taking timely precautionary measures. It can be anticipated based on nature of material, nature of operation, past experience and technical data. Normal loss can be calculated in any of the following ways:

1. Based on Input:

$$\text{Normal Loss} = \text{Quantity of Input} \times \text{Percentage of Normal Loss}$$

2. Based on production:

$$\text{Normal Loss} = (\text{Opening W-I-P} + \text{Units Introduced} - \text{Closing W-I-P}) \times \text{Percentage of Normal Loss}$$

9.7(a)(i) ACCOUNTING TREATMENT OF NORMAL LOSS

1. For Realizable Value of Normal Loss	Normal Loss A/c Dr. To Process A/c (Units of Normal Loss × scrap value per unit)
2. For Adjustment of Abnormal Gain against Normal Loss	Abnormal Gain A/c Dr. To Normal Loss A/c (Units of Abnormal Gain × scrap value of Normal Loss per unit in the same process)
3. For Closing the Normal Loss Account and the Balance Transferred to Cash/Debtors A/c	Cash/Debtors A/c Dr. To Normal Loss A/c

9.7(b) ABNORMAL LOSS

Sometimes the percentage of wastage or loss may exceed the standard percentage of normal wastage. Any wastage exceeding the normal percentage is termed as abnormal loss or wastage. Such loss or wastage is not forming a part of production. It is credited to the concerned process account. Such losses cannot be estimated in advance. Such losses arise when actual losses are more than the expected losses, i.e., normal losses. It occurs due to abnormal reasons like using sub-standard materials, carelessness of workers, breakdown of machinery, poor or defective design of plant etc.

9.7 (b) (i) COMPUTATION OF ABNORMAL LOSS

$$\text{Units of Abnormal Loss} = \text{Units of Actual Loss} - \text{Units of Normal Loss}$$

Or,

$$= \text{Expected Output (i.e., Input - Normal Loss)} - \text{Actual Output}$$

$$\text{Value of Abnormal Loss} = \frac{\text{Normal cost of Normal output}}{\text{Normal Output}} \times \text{Units of Abnormal Loss}$$

$$= \frac{\text{Total Cost Incurred} - \text{Scrap value of Normal loss}}{\text{Total Input} - \text{Units of Normal Loss}} \times \text{Units of Abnormal Loss}$$

9.7 (b) (ii) ACCOUNTING TREATMENT OF ABNORMAL LOSS

1. For Value of Abnormal Loss	Abnormal Loss A/c Dr. To Process A/c
2. For Scrap Value Realized	Cash A/c..... Dr. To Abnormal Loss A/c (Units of Abnormal Loss × scrap value per unit of Normal Loss in that process)
3. For closing the Abnormal Loss Account and transferring the balance to Costing P&L Account.	Costing P& L A/c.....Dr. To Abnormal Loss A/c

9.7 (b) (iii)DISTINCTION BETWEEN NORMAL LOSS AND ABNORMAL LOSS

SL NO.	BASIS	NORMAL LOSS	ABNORMAL LOSS
1	Concept	It is an unavoidable loss but can be reduced by taking proper precaution.	It is an avoidable loss.
2	Cause	It arises due to the inherent nature of materials and production process.	It arises due to carelessness of workers, use of substandard materials etc.
3	Estimation	It can be estimated on the basis of past experience.	It cannot be estimated.
4	Quantity of loss	Quantity of Normal Loss = Input × % of Normal Loss	Units of Abnormal Loss = (Total Input – Normal Loss) – Actual Output or = Total Loss – Normal Loss
5	Accounting treatment of cost of loss	The cost of Normal loss is treated as a part of cost of production. It is absorbed by the good units produced by inflating the cost per unit.	Costing P/L A/c .....Dr. To Abnormal Loss A/c

9.7 ABNORMAL GAIN OR ABNORMAL EFFECTIVES

If the quantity of loss is less than the expected normal loss then the difference is called as abnormal gain or abnormal effectives. Abnormal gain is the unexpected gain in production under normal conditions.

9.7 (c) (i) Computation of Abnormal Gain:

Quantity of Abnormal Gain = Actual Output-- Expected Output

Or,

Quantity of Abnormal Gain = Normal Output – Actual Output

Where, Normal Output = Total Input – Normal Loss

$$\text{Value of Abnormal Gain} = \frac{\text{Normal cost of Normal output}}{\text{Normal Output}} \times \text{Units of Abnormal Gain}$$

$$= \frac{\text{Total Cost Incurred} - \text{Scrap value of Normal loss}}{\text{Total Input} - \text{Units of Normal Loss}} \times \text{Units of Abnormal Gain}$$

9.7 (c) (ii) ACCOUNTING TREATMENT OF ABNORMAL GAIN

The value of the abnormal gain is debited to the concerned process account and credited to the abnormal gain account. This value is calculated at the rate at which the effective output would have been valued if normal loss had taken place according to expectation. At the end of the accounting year, the abnormal gain account is transferred to the credit side of profit and loss account.

1. For Value of Abnormal Gain	Process A/c Dr. To Abnormal Gain A/c
2. For Adjustment of Abnormal Gain against Normal Loss	Abnormal Gain A/c Dr. To Normal Loss A/c (Units of Abnormal Gain × Scrap Value of Normal Loss per unit in the same process)
3. For closing the Abnormal Gain Account by transferring the balance to Costing P&L Account.	Abnormal Gain A/c .....Dr. To Costing P&L A/c

9.8 SEQUENCE OF CLOSING THE PROCESS ACCOUNTS

1. Quantity column to be closed at first. The balancing figure will be the quantity of Abnormal Loss or Abnormal Gain.
2. Find out the value of Abnormal Loss or Abnormal Gain by using the formula.
3. Close the amount column and fill up the amount as balancing figure.
4. Find out the cost of per unit transferred to next process or finished stock account.

$$\text{Cost per Unit} = \frac{\text{Value of Units transferred to next process}}{\text{No.of units transferred to next process}}$$

9.9 ADVANTAGES OF PROCESS COSTING

The advantages of Process costing are as follows:

1. Costs are calculated periodically at the end of the period. So, it is easy to exercise control over cost.
2. It is easy to allocate the expenses to processes in order to have accurate costs.
3. Process costing helps in preparation of tenders and quotations.
4. Since cost data are available for each process, operation and department, good managerial control is possible.
5. It enables the correct valuation of closing inventories.

9.10 LIMITATIONS OF PROCESS COSTING

The limitations of Process costing are as follows:

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. Valuation of work-in-progress is generally done on estimate which leads to inaccuracy in total cost calculations.
4. The computation of average cost is more difficult in those cases where more than one type of products is manufactured and a division of the cost element is necessary.
5. It does not evaluate the efforts of individual workers or supervisors.

9.11 MISCELLANEOUS ILLUSTRATIONS

Illustration 9.1 A product passes through three processes X, Y and Z. The normal loss of each process is : Process X = 3%, Process Y = 5%, Process Z = 8%. Wastage of process 'X' was sold at 25 paise per ton, that of 'Y' at 50 paise per ton and that of 'Z' at ₹1.00 per ton. 10,000 Tons were introduced in process 'X' @ ₹2.00 per unit. The other expenses were as follows:

Particulars	Process		
	X	Y	Z
Sundry Materials (₹)	1,000	1,500	500
Labour (₹)	5,000	8,000	6,500
Direct expenses (₹)	1,050	1,188	2,009
Actual Output (in tons)	9,500	9,100	8,100

Prepare Process Accounts assuming that there was no opening and closing stocks.

Solution:**Process X A/c**

Particulars	Quantity (Tons)	Amount (₹)	Particulars	Quantity (Tons)	Amount (₹)
To Material introduced	10,000	20,000	By Normal loss	300	75
To Sundry Materials		1,000	By Abnormal Loss	200(BF)	556
To Labour		5,000	By Transferr to Process Y	9,500	26,419
To Direct Expenses		1,050	@₹ 2.78 per ton		(BF)
	10,000	27,050		10,000	27,050

Note:

$$1. \text{ Value of Normal Loss} = 10,000 \text{ tons} \times \frac{3}{100} = 300 \text{ tons}$$

$$2. \text{ Value of Abnormal loss} = \frac{\text{Normal cost of Normal output}}{\text{Normal Output}} \times \text{Units of Abnormal loss}$$

$$= \frac{\text{Total Cost Incurred} - \text{Scrap value of Normal loss}}{\text{Total Input} - \text{Units of Normal Loss}} \times \text{Units of Abnormal loss}$$

$$= \frac{₹27,050 - ₹75}{9,700 \text{ tonnes}} \times 200 \text{ tons} = ₹556$$

Process Y A/c

Particulars	Quantity (Tons)	Amount (₹)	Particulars	Quantity (Tons)	Amount (₹).
To Process X A/C	9,500	26,419	By Normal Loss	475	238
To Sundry materials		1,500	By Transfer to process Z	9,100	37,175(BF)
To Labour		8,000	@ ₹ 4.08		
To Direct expenses		1,188			
To Abnormal Gain	75(BF)	306			
	9,575	37,413		9,575	37,413

Note:

$$3. \text{ Value of Normal Loss} = 9,500 \text{ tons} \times \frac{5}{100} = 238 \text{ tons}$$

$$4. \text{ Value of Abnormal Gain} = \frac{\text{Rs.}37,107 - \text{Rs.}238}{9,500 \text{ tonnes} - 475 \text{ tonnes}} \times 75 \text{ tons} = ₹306$$

Process Z A/c

Particulars	Quantity	Amount	Particulars	Quantity	Amount
-------------	----------	--------	-------------	----------	--------

	(Tons)	(₹)		(Tons)	(₹)
To Process Y A/c	9,100	31,175	By Normal Loss	728	728
To Sundry Materials		500	By Abnormal Loss	272(BF)	1,476
To Labour		6,500	By Finished stock A/c	8,100	43,975(BF)
To Direct expenses		2,009	@ ₹ 5.43		
	9,100	46,184		9,100	46,184

Note:

5. Value of Normal Loss = $9,100 \text{ tons} \times \frac{8}{100} = 728 \text{ tons}$

6. Value of Abnormal Loss = $\frac{Rs.46,184 - Rs.728}{9,100 \text{ tons} - 728 \text{ tons}} \times 272 = ₹1,476$

Illustration 9.2 Product 'P' is obtained after it passes through three distinct processes .You are required to prepare Process Accounts from the following information:

Particulars	Total	Process I	Process II	Process III
Material (₹)	15,084	5,200	3,960	5,924
Direct wages (₹)	18,000	4,000	6,000	8,000
Production overheads (₹)	18,000	-	-	-

1,000 units @ ₹6 per unit were introduced in process I, Production overhead to be distributed as 100% on Direct Wages. Actual Output, Normal loss, Value of scrap per unit is as follows.

Particulars	Unit	Normal loss	Value of scrap per unit (₹)
Process I	950	5%	4
Process II	840	10%	8
Process III	750	15%	10

Solution:

Process I A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Units introduced @ ₹6	1,000	6,000	By Normal Loss (5%) @ ₹4	50	200
To Direct materials		5,200	By Transfer to Process II @ ₹20	950	19,000
To Direct Wages		4,000			
To Production overheads		4,000			
	1,000	19,200		1,000	19,200

Process II A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Transfer from Process I	950	19,000	By Normal Loss (10%) @ ₹8	95	760
To Direct Materials		3,960	By Abnormal Loss (Note)	15	600
To Direct Wages		6,000	By Transfer to Process III	840	33,600
To Production Overheads		6,000	@ ₹40 per unit		
	950	34,960		950	34,960

$$\text{Value of Abnormal Loss} = \frac{\text{₹34,960} - \text{₹760}}{950 \text{ units} - 95 \text{ units}} \times 15 \text{ units}$$

$$= \frac{\text{₹34,200}}{8,55 \text{ units}} = \text{₹ 600}$$

Process III A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Transfer from Process II	840	33,600	By Normal Loss (15%) @ ₹10	126	1,260
To Direct Materials		5,924	By Finished goods @ ₹76 per unit	750	57,000
To Direct Wages		8,000			
To Production Overheads		8,000			
To Abnormal Gain (Note)	36	2,736			
	876	58,260		876	58,260

$$\text{Value Abnormal Gain} = \frac{\text{₹55,524} - \text{₹1,260}}{840 \text{ units} - 126 \text{ units}} \times 36 \text{ units}$$

$$= \frac{\text{₹54,264}}{714 \text{ units}} \times 36 \text{ units} = \text{₹2,736}$$

Normal Loss A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Process I A/c	50	200	By Abnormal Gain	363	60
To Process II A/c	95	760	By Cash(BF)	235	1,860
To Process III A/c	126	1,260			
	271	2,220		271	2,220

Abnormal Loss A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Process II A/c	15	600	By Cash A/c	15	120
			By Costing P&L A/c(BF)		480
	15	600		15	600

Abnormal Gain A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Normal Loss A/c	36	360	By Process III A/c	36	2,736
To Costing P&L A/c(BF)		2,376			
	150	1,02,000		36	2,736

Illustration 9.3 A product passes through three processes. The following relate to the three processes during September, 2018:

Particulars	Total	Process I	Process II	Process III
Material (₹)	5,625	2,600	2,000	1,025
Labour (₹)	7,330	2,250	3,680	1,400
Production Overhead (₹)	7,330	-	-	-
Output (units)	-	450	340	270
Normal loss (% of input)	-	10	20	25
Scrap value (₹ per unit)	-	2	4	5

500 units @ ₹4 per unit were introduced in process I. Production overhead is absorbed in the ratio of labour. Prepare the necessary Accounts.

Solution:

Process I A/c

Particulars	Units	Amount ₹	Particulars	Units	Amount ₹
To Units introduced @ ₹4	500	2,000	By Normal Loss (10%) @ ₹2	50	100
To Materials		2,600	By Transfer to Process II @ ₹20	450	9,000(B.F)
To Labour		2,250			
To Production overheads		2,250			
	500	9,100		500	9,100

Process II A/c

Particulars	Units	Amount ₹	Particulars	Units	Amount ₹
To Transfer from Process I @ ₹20	450	9,000	By Normal Loss (20%) @ ₹4	90	360
To Materials		2,000	By Abnormal Loss (Note)	20(B.F)	1,000
To Labour		3,680	By Transfer to Process III @ ₹50 per unit	340	17,000(B.F)
To Production Overheads		3,680			
	450	18,360		450	18,360

Value of Abnormal Loss = $\frac{₹18,360 - ₹360}{450 \text{ units} - 90 \text{ units}} \times 20 \text{ units}$

= $\frac{₹18,000}{360 \text{ units}} \times 20 \text{ units} = ₹1,000$

Process III A/c

Particulars	Units	Amount ₹	Particulars	Units	Amount ₹
To Transfer from Process II @ ₹50	340	17,000	By Normal Loss (25%) @ ₹5	85	425
To Materials		1,025	By Finished goods @ ₹ 80 per unit	270	21,600
To Labour		1,400			
To Production Overheads		14,00			
To Abnormal Gain (Note)	15	1,200(B.F)			
	355	22,025		355	22,025

$$\text{Value of Abnormal Gain} = \frac{\text{₹}20,825 - \text{₹}425}{340 \text{ units} - 85 \text{ units}} \times 15 \text{ units}$$

$$= \frac{\text{₹}20,400}{255 \text{ units}} \times 15 \text{ units} = \text{₹}1,200$$

Note: Production overheads are apportioned on the basis of Labour Cost Ratio.

Normal Loss A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Process I A/c	50	100	By Abnormal Gain	15	75
To Process II A/c	90	360	By Cash (BF)	210	810
To Process III A/c	85	425			
	225	885		225	885

Abnormal Loss A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Process II A/c	20	1,000	By Cash A/c	20	80
			By Costing P&L A/c(BF)		920
	20	1,000		20	1,000

Abnormal Gain A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Normal Loss A/c	15	75	By Process III A/c	15	1,200
To Costing P&L A/c(BF)		1,125			
	15	1,200		15	1,200

Illustration 9.4 Product 'X' is obtained after it is processed through process A, B and C. The following cost information is available for the month ended on 31st March, 2019.

Particulars	Process		
	A	B	C
Number of units introduced in the process	500	-	-

Rate per unit of units introduced (₹)	4	-	-
Cost of material (₹)	2,600	2,000	1,025
Direct wages (₹)	2,250	3,680	1,400
Production overheads (₹)	2,250	3,680	1,400
Normal loss (% on units introduced in each process i.e. input)	10%	20%	25%
Value scrap per unit (₹)	2	4	5
Output in units	450	340	270

There is no stock in any process.

You are required to prepare-

- (i) The Process Accounts.
- (ii) The Normal Loss A/C, Abnormal Loss and Abnormal Gain Account.

Solution:

Process A A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Units introduced	500	2,000	By Normal Loss	50	100
To Material		2,600	By Transfer to Process B @ ₹20	450	9,000
To Direct Wages		2,250			
To Production overheads		2,250			
	500	9,100		500	9,100

Process B A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Transfer from Process A A/c	450	9,000	By Normal Loss	90	360
To Material		2,000	By Abnormal Loss	20	*1,000
To Direct Wages		3,680	By Transfer to Process C A/c @ ₹50	340	17,000
To Production Overheads		3,680			
	450	18,360		450	18,360

$$\begin{aligned}
 * \text{ Value of Abnormal Loss} &= \frac{\text{₹}18,60 - \text{₹}360}{450 \text{ units} - 90 \text{ units}} \times 20 \text{ units} \\
 &= \frac{\text{₹}18,000}{360 \text{ units}} \times 20 \text{ units} = \text{₹} 1,000
 \end{aligned}$$

Process C A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Transfer from Process B	340	17,000	By Normal Loss (15%) @ ₹10	85	425

To Material		1,025	By Finished goods @ ₹80	270	21,600
To Direct Wages		1,400			
To Production Overheads		1,400			
To Abnormal Gain	15	1,200			
	355	22,025		355	22,025

$$\text{Value of Abnormal Gain} = \frac{\text{₹}20,825 - \text{₹}425}{340 \text{ units} - 85 \text{ units}} \times 15 \text{ units}$$

$$= \frac{\text{₹}20,400}{255 \text{ units}} \times 15 \text{ units} = \text{₹} 1,200$$

Normal Loss A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Process A A/c	50	100	By Abnormal Gain	15	75
To Process B A/c	90	360	By Cash (B.F)	210	810
To Process C A/c	85	425			
	225	885		225	885

Abnormal Loss A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Process B A/c	20	1,000	By Cash A/c @ ₹4	20	80
			By Costing P&L A/c(B.F)		920
	20	1,000		20	1,000

Abnormal Gain A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Normal Loss A/C	15	75	By Process III A/c	15	1,200
To Costing P&L A/c(B.F)		1,125			
	15	1,200		15	1,200

Illustration 9.5 Madhu Industries Ltd. is manufacturing a product which passes through three consecutive processes P, Q and R. The following figures have been taken from their books for the year ending on 31st march, 2018.

Particulars	Process P	Process Q	Process R
Quantitative details			
Basic input @ ₹300 per unit	9,000	-	-
Output during the year	8,000	6,000	5,000
% of Normal waste	10%	25%	15%
Process Stock-opening	300	500	300
Process Stock-closing	500	300	400
Monetary Information	₹	₹	₹
Process Materials	4,20,000	6,60,000	8,73,000
Wages	2,67,000	3,73,500	3,11,000
Manufacturing Overheads	2,40,000	2,53,500	2,41,900

Value of opening stock per unit	420	680	900
Scrap value per unit	250	300	400

Closing stock is to be valued at respective cost of each process (as per the respective process accounts for the year ended 31st March, 2018).

You are required to prepare (i) Process Accounts, (ii) Process Stock Accounts (iii) Normal loss Account (iv) Abnormal Loss Account and (v) Abnormal Gain Account

Solution:

Process P A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Units introduced	9,000	27,00,000	By Normal Loss @ ₹250	900	2,25,000
To Process Materials		4,20,000	By Abnormal Loss @ ₹420	100	42,000
To Wages		2,67,000	By P Stock A/c @ ₹420	8,000	33,60,000
To Manufacturing overheads		2,40,000			
	9,000	36,27,000		9,000	36,27,000

$$\text{Abnormal Loss and cost per unit} = \frac{\text{₹}36,27,000 - \text{₹}2,25,000}{9,000 \text{ units} - 900 \text{ units}} = \frac{\text{₹}34,02,000}{8,100 \text{ units}} = \text{₹}420 \text{ per unit}$$

Process P Stock A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Opening stock @ ₹420	300	1,26,000	By Process Q A/c @ ₹420	7,800	37,26,000
To Process P A/c @ ₹420	8,000	33,60,000	By Closing stock @ ₹420	500	2,10,000
	8,300	34,86,000		8,300	34,86,000

Process Q A/c

Particulars	Units	Amount	Particulars	Units	Amount
To P Stock A/c	7,800	32,76,000	By Normal Loss @ ₹300	1,950	5,85,000
To Process materials		6,60,000	By Q stock A/c @ ₹680	6,000	40,80,000
To Wages		3,73,500			
To Manufacturing overheads		2,53,500			
To Abnormal Gain @ ₹680	150	1,02,000			
	7,950	46,65,000		7,950	46,65,000

$$\text{Abnormal Gain and cost per unit} = \frac{\text{₹}45,63,000 - \text{₹}5,85,000}{7,800 \text{ units} - 1,950 \text{ units}} = \frac{\text{₹}39,78,000}{5,850 \text{ units}} = \text{₹}680 \text{ per unit}$$

Process Q Stock A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Opening stock @ ₹680	500	3,40,000	By R Process A/c	6,200	42,16,000
To Q Process A/c @ ₹680	6,000	40,80,000	By Closing stock @ ₹680	300	2,04,000
	6,500	44,20,000		6,500	44,20,000

Process R A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Q stock A/c	6,200	42,16,000	By Normal Loss @ ₹400	930	3,72,000
To Process materials		8,73,000	By Abnormal Loss @ ₹1,000	270	2,70,000
To Wages		3,11,000	By R Stock @ ₹1,000	5,000	50,00,000
To Manufacturing overheads		2,41,900			
	6,200	56,42,000		6,200	56,42,000

Abnormal Loss and cost per unit = $\frac{₹56,42,000 - ₹3,72,000}{6,200 \text{ units} - 930 \text{ units}} = \frac{₹52,70,000}{5,270 \text{ units}} = ₹1,000 \text{ per unit}$

Process R Stock A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Opening stock @ ₹900	300	2,70,000	By Cost of sales	4,900	48,70,000
To Process R A/c @ ₹1,000	5,000	50,00,000	By Closing stock @ ₹1000	400	4,00,000
	5,300	52,70,000		5,300	52,70,000

Normal Loss A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Process P A/c	900	2,25,000	By Abnormal Gain	150	45,000
To Process Q A/c	1,950	5,85,000	By Cash A/c (B.F)	3,630	11,37,000
To Process R A/c	930	3,72,000			
	3,780	11,82,000		3,780	11,82,000

Abnormal Loss A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Process R A/c	270	2,70,000	By Cash A/c	270	1,08,000
			By Costing P&L A/c(B.F)		1,62,000
	270	2,70,000		270	2,70,000

Abnormal Gain A/c

Particulars	Units	Amount	Particulars	Units	Amount
To Normal Loss A/c	150	45,000	By Process Q A/c	150	1,02,000
To Costing P&L A/c(B.F)		57,000			
	150	1,02,000		150	1,02,000

Illustration 9.6 A product passes through two distinct processes P and Q then to finished stock.

The normal loss in each process is as follows:

Process P – 3% of the units entering the process.

Process Q – 5% of the units entering the process.

Wastage of Process P was sold at ₹0.50 per unit and that of Process Q at ₹1 per unit. 10,000 units were issued to process P at a cost of ₹2 per unit.

The other expenses were as follows:

Particulars	Process P	Process Q
	₹	₹
Sundry Materials	2,000	3,000
Wages	10,000	16,000
Overhead Expenses	2,100	2,375
Actual output	9,500 (units)	9,100 (units)

Prepare necessary accounts.

Solution:

Process P A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Raw Materials	10,000	20,000	By Normal Loss(3 %) @ ₹0.50 per unit	300	150
To Sundry Materials	-	2,000	By Abnormal Loss	200	700
To Wages	-	10,000	By Process Q A/c (@ ₹3.50)	9,500	33,250
To Overhead Expenses	-	2,100			
	10,000	34,100		10,000	34,100

$$\text{Value of Abnormal Loss} = \frac{\text{Rs.34,100} - \text{Rs.150}}{(10,000 - 300)\text{units}} \times 200 \text{ units} = ₹700$$

Process Q A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process P A/c	9,500	33,250	By Normal Loss(5%) @₹1.00 per unit	475	475
To Sundry Materials	-	3,000	By Final stock A/C @ ₹6	9,100	54,600
To Wages	-	16,000			
To Overhead Expenses	-	2,375			
To Abnormal Gain A/C	75	450			
	9,575	55,075		9,575	55,075

$$\text{Value of Abnormal Gain} = \frac{\text{Rs.}54,625 - \text{Rs.}475}{(9,500 - 475)\text{units}} \times 75 \text{ units} = ₹450$$

Normal Loss A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process P A/c	300	150	By Abnormal Gain	75	75
To Process Q A/c	475	475	By Bank / Debtors(B.F)	700	550
	775	625		775	625

Abnormal Loss A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process P A/c	200	700	By Bank 200 units @ ₹ 0.50 per unit	200	100
			By Costing P&L A/c (BF)	-	600
	200	700		200	700

Abnormal Gain A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Normal Loss A/c	75	75	By Process Q A/c	75	450
To Costing P&L A/c (BF)		375			
	75	450		75	450

KNOW YOUR PROGRESS

Fill in the blanks.

1. In Process costing, each process or department is known as
2. In process costing, the products and processes are and
3. In process costing, the production of main product may be accompanied by secondary products which are termed asand
4. The total cost of each process is divided by the of that process to find out cost per unit of that process.
5. The output of one process is the.....for the immediate next process.
6. Abnormal gain appears on the.....side of Process Account .
7. Unrealized portion of abnormal loss is transferred to Account.
8. loss may or may not have scrap value.
9. Abnormal loss appears on the side of Process Account.
10.overheads only are included in Process costing.

STATE WHETHER THE FOLLOWING STATEMENTS ARE TRUE OR FALSE

1. Process costing method is suitable for large paper manufacturing plant.

2. Process costing is ordinarily used where all the operations are performed in one department.
3. In process costing, normal process loss is transferred to Costing Profit & Loss Account.
4. The cost of abnormal process loss is not included in the cost of process.
5. In Process costing, there is a transfer of cost from one process to another as the product moves from one process to another.
6. Normal process loss does not increase the cost per unit of production.
7. Normal losses are avoidable losses arising from the nature of production process.
8. Abnormal gain appears on the credit side of Process Account.
9. The output of one process may be transferred to next process at cost or at market price.
10. Process costing is suitable for Oil Refinery Industries.

9.12 VALUATION OF WORK-IN-PROGRESS: EQUIVALENT PRODUCTION

In process type industries where production is continuous, there may be some incomplete work at the end of accounting period. Incomplete production units represent those production units on which percentage of completion with regard to all elements of cost is not 100%. Such incomplete production units are known as work-in-progress. Work-in-progress is valued in terms of equivalent or effective units. Equivalent production units represent incomplete production units expressed in terms of equivalent completed units. This is done on the basis of an estimate or a percentage of degree of completion in respect of materials consumed, machine hours, labour-hours etc.

9.13 COMPUTATION OF EQUIVALENT UNITS

Equivalent Units = No. of incomplete units × % of completion

Equivalent production units should be calculated separately for each element of cost (viz. material, labour and overheads) because the percentage of completion with regard to different elements of cost may be different.

METHOD-1

Opening W.I.P. × % of work not completed	***
Add: Units completed during the period (Units introduced – Closing W.I.P)	***
Add: Closing stock × % of work completed	***
Equivalent Units	***

METHOD-2

Units completed during the period (Units introduced + Opening W.I.P units – Closing W.I.P units)	***
Add: Closing W.I.P units × % of work completed	***
Less: opening W.I.P. units × % of work completed	***

Equivalent Units	***
-------------------------	-----

METHOD-3

Opening W.I.P. × % of work not completed	***
<i>Add:</i> Units introduced	***
<i>Less:</i> Closing W.I.P. units × % of work not completed	***
Equivalent Units	***

Illustration 9.7

In December 2016 the following is available relating to process-2 Account
 Opening WIP 9000 units (60% of work completed),
 Units produced during the period 4,000 units,
 Closing WIP 5,000 units (70% of work completed),
 Calculate equivalent production units under different methods.

ANSWER (METHOD-1)

	<u>UNITS</u>
Opening WIP ($9,000 \times \frac{40}{100}$)	3,600
Add: Units introduced and completed (40,000 – 5,000)	35,000
Add: Closing WIP ($5,000 \times \frac{70}{100}$)	<u>3,500</u>
Equivalent Units	<u>42,100</u>

ANSWER: (METHOD-2)

	<u>UNITS</u>
Units completed during the period (40,000 + 9,000 – 5,000)	44,000
Add: Closing WIP ($5,000 \times \frac{70}{100}$)	3,500
Less: Closing WIP ($9,000 \times \frac{60}{100}$)	<u>5,400</u>
Equivalent Units	<u>42,100</u>

ANSWER: (METHOD-3)

	<u>UNITS</u>
Opening WIP ($9,000 \times \frac{40}{100}$)	3,600
Add: Units introduced	40,000

Less: Closing WIP ($5,000 \times \frac{30}{100}$)	<u>1,500</u>
Equivalent Units	<u>42,100</u>

9.14 STEPS INVOLVED IN THE PREPARATION OF PROCESS ACCOUNT

Step-1 – Prepare statement of Equivalent production

(To find out equivalent production units for the period)

Step-2 – Prepare statement of cost per Equivalent unit

(To calculate cost per unit for each element of cost)

Step-3 – Prepare statement of evaluation

(To find out the cost of equivalent units of opening stock, completed units and Closing stock)

Step-4 – Prepare Process Account.

9.15 PREPARATION OF PROCESS ACCOUNT

9.15(a) (WHEN THERE IS NO OPENING STOCK OF W-I-P BUT THERE IS PROCESS LOSS AND GAIN)

Practical steps involved in the preparation of Process Account where there is no Opening Stock of Work-in-Progress but there is Process Loss and Gain.

Step-1- Format of Statement of Equivalent Production is as follows:

Output	Units	Material		Labour		Overheads	
		% Completion	Units	% Completion	Units	% Completion	Units
A. Units introduced & completely processed
B. Closing WIP
C. Abnormal Loss
D. (Abnormal Gain)	(...)		(...)		(...)		(...)
E. Equivalent Units (A +B+C-D)

Step-2 – Format of Statement of Cost per Equivalent Unit is as follows:

Element of Cost	Cost (Rs.)	Equivalent Units	Cost per Equivalent Unit (Rs.)
Net Material Cost
Labour Cost
Overheads

Net Material Cost = Material Cost – Scrap Value of Normal Loss

Step-3 – Format of Statement of Evaluation is as follows:

Particulars	Elements of Cost	Equivalent Units	Cost per Equivalent Unit (Rs.)	Cost of Equivalent Units (Rs.)	Total
Units introduced and completed	Material
	Labour	....	....	....
	Overhead	....	....	....
Closing WIP	Material
	Labour	....	....	....
	Overhead	....	....	....
Abnormal Loss	Material
	Labour	....	....	....
	Overhead	....	....	....

Step-4 – Format of Process Account is as follows:

Particulars	Units	Rs.	Particulars	Units	Rs.
To Direct Material	By Normal Loss		
To Direct Labour	By Abnormal Loss	....	....
To Overheads	By Process II A/c (transfer to next process)	....	....
	By Closing WIP		

Tutorial Notes:

- (a) **Normal loss** is not added to equivalent production. However, the realizable value of normal loss is deducted from cost of materials so as to calculate the net material cost which is used as basis for calculating the material cost per equivalent unit.

- (b) **Abnormal loss** is added to equivalent production on the basis of degree of completion in respect of each element of cost. **Unless the degree of completion is specified**, it may be assumed that abnormal loss units are 100% complete in respect of all elements of cost.

9.15(b) (WHEN THERE ARE BOTH OPENING STOCK AND CLOSING STOCK OF W-I-P AND FIFO METHOD IS USED)

The following points are worth noticing in this regard:

- (a) Equivalent units of opening work-in-progress are calculated with reference to the percentage of work needed to complete the unfinished work of the previous period. For Example, if there are 800 units of opening WIP which are 100% complete as to materials, 60% as to labour and 40% as to overheads, then equivalent units will be Nil as to materials (since there is no incomplete work as to materials), 320 units (i.e., 40% of 800 units) as to labour and 480 units (i.e., 60% of 800 units) as to overheads.
- (b) Complete Cost units of opening WIP is calculated as follows:
= Cost of opening WIP incurred during previous period + Proportionate cost incurred during current period to complete the incomplete work of previous period.
- (c) Complete cost of units completed and transferred is calculated as follows:
= Complete cost of units of Opening WIP + Cost of units introduced and completed during the current period.

Illustration 9.8 From the following information prepare: (a) Statement of Equivalent production; (b) Statement of Cost per Equivalent unit; (c) Statement of Evaluation; (d) Process Account:

1. Opening work-in-progress : 800 units valued as under:
Material Rs.3,200 , Labour Rs.960, Overheads Rs.320
2. Input Materials : 9,200 units
3. Current cost incurred in process:

Material	Rs.36,800
Labour	Rs.16,740
Overhead	Rs.7,930
4. Normal loss : 8% of total input (i.e., opening WIP + units put in)
5. Scrap realized @ Rs.40 per 10 units
6. Closing Work-in-progress : 900 units
7. Transfer to next process : 7,900 units
8. Degree of completion :

	Opening Stock (%)	Closing Stock (%)	Scrapped units (%)
Material	100	100	100
Labour	60	70	80
Overheads	40	30	20
9. Method of valuation:	FIFO		

SOLUTION:

(a) Statement of Equivalent Production

Output	Units	Material		Labour		Overheads	
		% Completion	Units	% Completion	Units	% Completion	Units
A. Opening WIP	800	-	-	40	320	60	480
B. Units introduced & completely processed (7,900-800)	7,100	100	7,100	100	7,100	100	7,10
C. Closing WIP	900	100	900	70	630	30	270
D. Abnormal Loss	400	100	400	80	320	20	80
E. Equivalent Units (A+B+C+D)	9,200		8,400		8,370		7,930

(b) Statement of Cost per Equivalent Unit

Element of Cost	Cost (Rs.)	Equivalent Units	Cost per Equivalent Unit (Rs.)
Net material Cost*	33,600	8,400	4
Labour Cost	16,740	8,370	2
Overheads	7,930	7,930	1

*Net Material Cost = Rs.36,800 – Rs.3,200 = Rs.33,600

(c) Statement of Evaluation

Particulars	Elements of Cost	Equivalent Units	Cost per Equivalent Unit (Rs.)	Cost of Equivalent Units (Rs.)	Total
Opening WIP (800 units) cost introduced during previous period:					4,480
cost incurred during current period:		-	-	-	
	Material	320	2	640	
	Labour	480	1	480	1,120
	Overhead				
Units introduced and completed (7,100 units)	Material	7,100	4	28,400	
	Labour	7,100	2	14,200	
	Overhead	7,100	1	7,100	49,700
Total cost of 7,900					55,300

units to next process: Closing WIP (900 units)	Material	900	4	3,600	5,130
	Labour	630	2	1,260	
	Overhead	270	1	270	
Abnormal Gain (400 units)	Material	400	4	1,600	2,320
	Labour	320	2	640	
	Overhead	80	1	80	

(d) Process I Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	800	4,480	By Normal Loss	800	3,200
To Direct Material	9,200	36,800	By Abnormal Loss A/c	400 (B/F)	2,320
To Direct Labour	-	16,740	By Process II A/c		
To Overheads	-	7,930	(transfer to next process)	7,900	55,300
			By Closing WIP	900	5,130
	10,000	65,950		10,000	65,950

Abnormal Loss Account

Particulars	Units	Rs.	Particulars	Units	Rs.
By Process I	400	2,320	By Bank A/c	400	1,600
			By Costing P&L A/c		720
			(B/F)		
	400	2,320		400	2,320

Illustration 9.9 From the following information prepare: (a) Statement of Equivalent production; (b) Statement of Cost per Equivalent unit; (c) Statement of Evaluation; (d) Process Account:

10. Opening work-in-progress : 800 units valued as under:

Material Rs.3,200 , Labour Rs.960, Overheads Rs.320

11. Input Materials : 9,200 units

12. Current cost incurred in process:

Material	Rs.36,800
Labour	Rs.16,900
Overhead	Rs.8,250

13. Normal loss : 8% of total input (i.e., opening WIP + units put in)

14. Scrap realized @ Rs.40 per 10 units

15. Closing Work-in-progress : 900 units

16. Transfer to next process : 8,700 units

17. Degree of completion :

Opening Stock (%) Closing Stock (%)

Material	100	100
Labour	60	70
Overheads	40	30

18. Method of valuation: FIFO

SOLUTION:

(c) Statement of Equivalent Production

Output	Units	Material		Labour		Overheads	
		% Completion	Units	% Completion	Units	% Completion	Units
A. Opening WIP	800	-	-	40	320	60	480
B. Units introduced & completely processed (8,700-800)	7,900	100	7,900	100	7,900	100	7,900
C. Closing WIP	900	100	900	70	630	30	270
D. Less: Abnormal Gain	(400)	100	(400)	100	(400)	100	(400)
E. Equivalent Units (A+B+C-D)	9,200		8,400		8,450		8,250

(d) Statement of Cost per Equivalent Unit

Element of Cost	Cost (Rs.)	Equivalent Units	Cost per Equivalent Unit (Rs.)
Net Material Cost*	33,600	8,400	4
Labour Cost	16,900	8,450	2
Overheads	8,250	8,250	1

*Net Material Cost = Rs.36,800 – Rs.3,200 = Rs.33,600

(c) Statement of Evaluation

Particulars	Elements of Cost	Equivalent Units	Cost per Equivalent Unit (Rs.)	Cost of Equivalent Units (Rs.)	Total
Opening WIP 800 units cost incurred during previous period					4,480
Cost incurred during current period:	Material	-	-	-	
	Labour	320	2	640	
	Overhead	480	1	480	1,120

Units introduced and completed (7,900 units)	Material	7,900	4	31,600	55,300
	Labour	7,900	2	15,800	
	Overhead	7,900	1	7,900	
Total cost of 8,700 units to next process:					60,900
Closing WIP (900 units)	Material	900	4	3,600	5,130
	Labour	630	2	1,260	
	Overhead	270	1	270	
Total cost of 900 units					

(d) Process I Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening WIP	800	4,480	By Normal Loss	800	3,200
To Direct Material	9,200	36,800	By Process II A/c		
To Direct Labour	-	16,900	(transfer to next process)	8,700	60,900
To Overheads	-	8,250	By Closing WIP	900	5,130
To Abnormal Gain @7	428	2,800			
	10,400	69,230		10,400	69,230

Abnormal Gain Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Normal Loss A/c	400	1,600	By Process I A/c	400	2,800
To Costing P/L a/c	-	1,200			
	400	2,800		400	2,800

Normal Loss Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process I	800	3,200	By Normal Loss A/c	400	1,600
			By Cash/Debtors A/c	400	1,600
	800	3,200		800	3,200

Illustration 9.10 From the following information prepare: (a) Statement of Equivalent production; (b) Statement of Cost per Equivalent unit; (c) Statement of Evaluation; (d) Process Account:

1. Input materials : 10,000 units
2. Current cost incurred in process:

Material	Rs.40,000
Labour	Rs.17,700
Overhead	Rs.8,250
3. Normal loss : 8% of total input (i.e., opening WIP + units put in)
4. Scrap realized @ Rs.40 per 10 units
5. Closing Work-in-progress : 900 units
6. Transfer to next process : 7,900 units
7. Degree of completion :

	Closing Stock (%)	Scrapped units (%)
Material	100	100
Labour	70	80
Overheads	30	20

8. Method of valuation: FIFO

(a) Statement of Equivalent Production

Output	Units	Material		Labour		Overheads	
		% Completion	Units	% Completion	Units	% Completion	Units
A. Units introduced & completely processed	7,900	100	7,900	100	7,900	100	7,900
B. Closing WIP	900	100	900	70	630	30	270
C. Abnormal Loss	400	100	400	80	320	20	80
D. Equivalent Units (A+B+C)	9,200		9,200		8,850		8,250

(c) Statement of Cost per Equivalent Unit

Element of Cost	Cost (Rs.)	Equivalent Units	Cost per Equivalent Unit (Rs.)
Net Material Cost*	36,800	9,200	4
Labour Cost	17,700	8,850	2
Overheads	8,250	8,250	1

*Net Material Cost = Rs.40,000 – Rs.3,200 = Rs.36,800

Realization Value of Normal Loss $10,000 \times 8\% \times \text{Rs.} \frac{40}{10 \text{ units}} = \text{Rs.}3,200/-$

(c) Statement of Evaluation

Particulars	Elements of	Equivalent	Cost per	Cost of	Total
-------------	-------------	------------	----------	---------	-------

	Cost	Units	Equivalent Unit (Rs.)	Equivalent Units (Rs.)	
Units introduced and completed (7,900 units)	Material	7,900	4	31,600	55,300
	Labour	7,900	2	15,800	
	Overhead	7,900	1	7,900	
Closing WIP (900 units)	Material	900	4	3,600	5,130
	Labour	630	2	1,260	
	Overhead	270	1	270	
Abnormal Loss (400 units)	Material	400	4	1,600	2,320
	Labour	320	2	640	
	Overhead	80	1	80	

(d) Process I Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Direct Material	10,000	40,000	By Normal Loss	800	3,200
To Direct Labour	-	17,700	By Abnormal Loss	400	2,320
To Overheads	-	8,250	By Process II A/c (transfer to next process)	7,900	55,300
			By Closing WIP	900	5,130
	10,000	65,950		10,000	65,950

Abnormal Loss Account

Particulars	Units	Rs.	Particulars	Units	Rs.
By Process I	400	2,320	By Bank A/c	400	1,600
			By Costing P&L A/c (B/F)	-	720
	400	2,320		400	2,320

Tutorial Note: Abnormal gain is deducted to obtain equivalent production. Abnormal gain units are always taken as 100 % complete in respect of all elements of cost.

Know your progress

State whether the following statements are true or false

11. Equivalent production represents production process in terms of completed units.

12. FIFO and average cost are the methods of calculating equivalent production.
13. Equivalent production means production in terms of completed units.
14. The stage of production at which separate products are identified is called split-off point.
15. Common costs are identical costs or another name of common costs.
16. The W-I-P at the end is 600 units which are complete up to 70%. Its equivalent units are 520.

9.16 JOINT PRODUCTS AND BY-PRODUCTS

There are certain industries where two or more products of equal importance are simultaneously produced. They are regarded as joint products. They are produced from the same basic raw materials, are comparatively of equal importance, are produced simultaneously by a common process and may require further processing after the split off point i.e., the point of separation. These products may be saleable without further processing or after further processing.

9.16(a) FEATURES OF JOINT PRODUCTS

1. Joint products are produced simultaneously with respect to common raw material.
2. These are produced simultaneously in the same manufacturing process.
3. These are produced in natural proportions.
4. These are of equal importance.

Examples of Joint products

Industry	Joint products
1. Oil Refinery	Petrol, diesel, gasoline, kerosene, paraffin
2. Dairy	Butter, ghee, cheese
3. Flour mill	White flour, brown flour animal feeding stuff

9.17 CO-PRODUCTS

When two or more major products appear in a jointly produced combination, these products are called co-products to indicate that they are produced of like importance. Co-products are manufactured in different varieties by the same industry. They may not arise from the same operation or raw material but are produced in different quantities without any co-relation to the other

EXAMPLES OF CO- PRODUCTS

Industry	Co-products
1. Furniture making	Tables, chairs, benches, desks, almirahs
2. Fan manufacturing	Ceiling fans, table fans, exhaust fans
3. Automobile	Buses, lorries, tractors, cars,

9.18 DISTINCTION BETWEEN JOINT PRODUCTS AND CO-PRODUCTS

Basis	Joint Products	Co-products
--------------	-----------------------	--------------------

1. Production Process	These are produced in natural proportions in the same process.	These are not produced in natural proportions in the same process.
2. Material	These are produced from the same material.	These are not necessarily be produced from the same material.
3. Role of Management	The proportion of production cannot be changed by the management.	The proportion of production can be changed as per desire of the management. They may be produced in different quantities depending upon their demand.
4. Importance	These are of almost equal importance.	These need not necessarily be of same importance.
5. Relationship	There exists a linear relationship in terms of quantities among various joint products.	No such relationship exists under coproducts

9.19 OBJECTIVES OF JOINT PRODUCT ANALYSIS

Following are some important objectives of joint product analysis.

1. To determine the cost per unit of product.
2. To determine selling price of each product.
3. To determine profit or loss on each line of production at the point of split-off and after further processing.
4. To determine the profitable pattern of production.
5. To advise management whether further processing of the products are profitable or not.
6. To value the closing inventory of each product.

9.20 JOINT COST AND SUBSEQUENT COST

Joint cost refers to the total cost incurred up to the split off point when the product gets separated. Joint cost is the sum total of common material cost plus common processing cost. Since these costs cannot directly be allocated to individual products produced, their arises a problem of apportioning joint cost to various products produced

Subsequent cost refers to the total cost incurred after the split off point on further processing of products. It is the sum total of subsequent material cost plus subsequent processing cost plus selling and distribution costs. Since, these costs can be directly allocated to individual products produced, there is no problem

9.21 METHODS OF APPORTIONMENT OF JOINT COST

There are no scientific methods of apportionment of joint cost. However the following methods are commonly used for apportionment of Joint costs up to the point of separation.

1. **Physical Unit Method:** As per this method, joint cost is apportioned on the basis of physical volume of the joint products at the split off point. For example if there is 40% beef in product X and 60% beef in product Y then joint cost will be charged in the ratio of 4:6 between X and Y.
2. **Average Unit Cost method:** Under this method, total joint cost up to the point of separation are accessed and divided by the total units produced of all the products yielding an average unit cost.
3. **Survey Method / Point Values Method:** Under this method, Joint cost are apportioned on the basis of point values/ percentages assigned based on technical survey to the products according to their relative importance.
4. **Contribution Margin Method:** Under this method, the marginal cost (variable portion) of joint cost is apportioned on the basis of weight or quantity of each product produced and fixed cost portion of the total joint cost is apportioned on the basis of contribution margin ratio. Contribution margin is the difference between total sales value and the variable cost. This method provides useful information on maximization of profit by rearrangement of products and sales mix.
5. **Market Value Method:** Under this method ,Joint costs are apportioned in the ratio of Market value on any of the following:
 - a. Market Value at the point of separation
 - b. Market Value after further processing
6. **Net Realizable value Method:** Under this method, joint cost is apportioned in the ratio of net realizable value of joint product at the separation point.
NRV = Sales value after further processing- Further processing cost.
This method is suitable where all the joint products are subject to further processing and further processing costs are incurred dis -proportionately.

Illustration 9.11

JRS Enterprises operates a chemical process which produces four products – P, Q, R and S from a basic raw material and provides you the following data:

1. Basis raw material 1,25,000 units @ Rs.2
2. Initial processing wages Rs.1,50,000
3. Initial processing overheads Rs.1,00,000
4. Output, selling prices and additional processing costs:

Products	Output (units)	Selling per unit at split-off point (Rs.)	Selling price per unit after further processing (Rs.)	Additional Processing Costs after split off (Rs.)
P	10,000	40	70	2,50,000
Q	20,000	30	65	3,00,000
R	30,000	20	40	7,50,000
S	40,000	10	20	2,00,000

You are required to

- (a) Prepare a statement showing the apportionment of joint costs **on the basis of net realizable value at split off point.**
- (b) Prepare a statement showing the product -wise and total profitability if all the products are **sold at split-off point.**
- (c) Prepare a statement showing the product-wise and total profitability if all the products are **sold after further processing.**
- (d)

Solution:

(a) Statement showing the Apportionment of Joint Costs

Products	Output (units)	Selling price per unit after further processing (Rs.)	Sales Value Rs.	Further processing Costs Rs.	Net Realizable Value at Split of point Rs.	Joint cost apportioned (in the ratio of 45:100:45:60) Rs.
	A	B	C = A×B	D	E = C-D	F =
P	10,000	70	7,00,000	2,50,000	4,50,000	90,000
Q	20,000	65	13,00,000	3,00,000	10,00,000	2,00,000
R	30,000	40	12,00,000	7,50,000	4,50,000	90,000
S	40,000	20	8,00,000	2,00,000	6,00,000	1,20,000
					25,00,000	5,00,000

(b) Statement showing the Profitability

(if all products are sold at split off point)

Products	Output (units)	Sales Value Rs.	Selling price per unit after further processing (Rs.)	Joint Cost Appportioned	Profit
	A	B		C	D = B - C
P	10,000	4,00,000	70	90,000	3,10,000
Q	20,000	6,00,000	65	2,00,000	4,00,000
R	30,000	6,00,000	40	90,000	5,10,000
S	40,000	4,00,000	20	1,20,000	2,80,000
		20,00,000		5,00,000	15,00,000

(c) Statement showing the Profitability

(if all products are sold after further processing)

Products	Output (units)	Sales value after further processing (Rs.)	Joint costs appportioned (Rs.)	Further processing costs(Rs.)	Total Costs(Rs.)	Profit (Loss) (Rs.)
	A	B	C	D	E = C+ D	F = B - E
P	10,000	7,00,000	90,000	2,50,000	3,40,000	3,60,000
Q	20,000	13,00,000	2,00,000	3,00,000	5,00,000	8,00,000
R	30,000	12,00,000	90,000	7,50,000	8,40,000	3,60,000
S	40,000	8,00,000	1,20,000	2,00,000	3,20,000	4,80,000
		40,00,000	5,00,000	15,00,000	20,00,000	20,00,000

7. **Reverse cost method:** Under this method, joint costs are appportioned in the ratio of net values of the joint products at the separation point. Net value is calculated as follows.

A. Sales value after further Processing	
B. Less: Estimated Profit	
C. Total Cost of Sales (A-B)	
D. Less: Selling and Distribution Expenses	
E. Cost of Goods Sold (C- D)	
F. Less: Further Processing Costs	
G. Net Value(E- F)	

Illustration 9.12 In processing a basic raw material, three joint products, P, Q, R are produced after incurring joint costs of Rs.5,10,000. All the three products are processed further after separation and sold as per details given below.

Particulars	P	Q	R
-------------	---	---	---

Output (units)	10,000	20,000	30,000
Selling price per unit	Rs.30	Rs.20	Rs.10
Further processing Costs	Rs.7	Rs.6	Rs.2
Estimated profit as % of sales	10%	20%	30%

Assume the selling expenses are apportioned over the products as a percentage to **cost of sales**.

You are required to (a) Prepare a statement showing the apportionment of joint costs.

(b) Prepare a statement showing product-wise and total cost of production,

cost of sales and profitability.

Solution:

(a) Statement showing the Apportionment of Joint Costs

Particulars	P Rs.	Q Rs.	R Rs.	Total Rs.
A. Sales value after further processing	3,00,000	4,00,000	3,00,000	10,00,000
B. Less : Estimated profit	30,000	80,000	90,000	2,00,000
C. Total Cost of Sales (A - B)	2,70,000	3,20,000	2,10,000	8,00,000
D. Less : Selling Distribution expenses @ 5%	13,500	16,000	10,500	40,000
E. Total Cost of goods sold (C - D)	2,56,500	3,04,000	1,99,500	7,60,000
F. Less: Further processing costs.	70,000	1,20,000	60,000	2,50,000
G. Net Value (E - F)	1,86,500	1,84,000	1,39,500	5,10,000

(b) Statement showing the cost of production, cost of Sales and Profitability

Particulars	P Rs.	Q Rs.	R Rs.	Total Rs.
A. Joint Costs	1,86,500	1,84,000	1,39,500	5,10,000
B. Further processing costs	70,000	1,20,000	60,000	2,50,000
C. Cost of production (A + B)	2,56,500	3,04,000	1,99,500	7,60,000
D. Selling Expenses	13,500	16,000	10,500	40,000
E. Cost of Sales (C + D)	2,70,000	3,20,000	2,10,000	8,00,000
F. Sales	3,00,000	4,00,000	3,00,000	10,00,000
G. Profit (F - E)	30,000	80,000	90,000	2,00,000

Working Note: Calculation of selling expenses.

A. Total cost of sales (Total Sales – Total Profit) 8,00,000

B. Less: Total cost of production (Joint Cost + Further Processing Costs)
(5,10,000 + 2,50,000)

7,60,000

C. Selling Expenses

40,000

D. Selling expenses as % of cost of sales = $\frac{Rs.40,000}{Rs.8,00,000} \times 100 = 5\%$

9.22 BY-PRODUCTS

In some industries where two or more products are produced simultaneously from the same raw material, from the same process but one product (main product) is having very high value in the market in comparison to other products (by-product). The first one is called main product and the second one is called by-product. Thus, by-products are products of relatively small value which emerges incidentally in the course of manufacturing the main product.

Features:

1. By-products emerge incidentally in the course of manufacturing the main product.
2. By-products yield only minor sales value as compared to main product.
3. The quantity of by-product obtained is less than the main product.
4. They require further processing to make it more acceptable by customer.

Example:

Industry	Main product	By-Product
1. Dairy	Butter	Lasi
2. Sugar	Sugar	Molasses, Bagasse
3. Cotton	Cotton	Cotton Seed
4. Rice Mill	Rice	Husk
5. Meat packing	Meat	Fats ,bones
6. Coke making	Coke	Cole tar, benzol
7. Soap making	Soap	glycerin

9.23 DISTINCTION BETWEEN JOINT PRODUCTS AND BY-PRODUCTS

Sl No.	Basis	Joint Products	By products
1	Concept	Joint products are two or more products produced in the same	By products are produced incidentally while manufacturing the main

		process.	product.
2	Value	Joint products have significant value.	By products have of negligible value.
3	Common costs	Common costs are allocated amongst the joint products.	No common costs are allocated to the by-products.
4	Separation	Joint products are separated at the time of processing in the common process.	By-products may arise before the starting of the process as well as during the common process. For example, groundnut shell is available as by product before the starting of process of manufacturing groundnut oil.
5	Further Processing	Generally, joint products are processed further to get the final products. Example – crude oil and CNG (Compact Natural Gas) are joint products . Crude oil is processed further to get petrol, diesel, kerosene but CNG can be sold without further processing.	By products are generally sold without further processing. Example: Rice husk is sold without further processing.

9.24 ACCOUNTING TREATMENT OF BY-PRODUCTS

Case	Treatment
I. Where by-products are of small total value (a) Joint Costs (b) Sale proceeds	(a) No portion of joint cost is apportioned to by products. (b) Sale proceeds of by-products may be treated in any one of the following two ways: (i) It may be treated as Miscellaneous Income and credited to Costing Profit and Loss Account (ii) It may be credited to the Process Account in which the buy-product has arisen.

<p>II. Where by-products are of considerable total value</p> <p>(a) Joint Costs (b) Sale Proceeds (c) Profit/Loss</p>	<p>(a) Joint costs are apportioned to by-products by any of the methods of accounting for joint products discussed earlier.</p> <p>(b) Sale proceeds of by-products are credited to the by-product Account.</p> <p>(c) Profit/loss arising in by-product Account is transferred to Costing profit and Loss Account.</p>
<p>III. Where by-products require further processing</p> <p>(a) Total sales value is of small amount (b) Total sales value is of considerable amount</p>	<p>Treat as discussed under I Treat as discussed under II</p> <p>Note: Joint Cost may be apportioned in the ratio of net realizable value at split-off point.</p>
<p>IV. Whether by-products are used by the undertaking itself</p>	<p>Replacement price of by-product used should be debited to the process account in which the by-product has been used and should be credited to by-product account.</p> <p>The replacement price is the price at which the same by-product can be purchased in the market.</p>

Illustration 9.13 A factory producing article P also produces a by-product Q which is further processed into finished product. The joint cost of manufacture is given below:

	Rs.
Material	5,000
Labour	3,000
Overheads	2,000

Subsequent costs are given below:

	P	Q
	Rs.	Rs.
Material	3,000	1,500
Labour	1,400	1,000
Overheads	600	500

Selling prices are: P – Rs.16,000 Q – Rs.8,000

Estimated profits on selling prices are 25% for P and 20% for Q. Assume that selling and distributing expenses are in proportion of sales price (2:1)

You are required to (a) Show how you would apportion joint cost of manufacturer, and

(b) Prepare a statement showing cost of production of P and Q.

Solution:

(a) Statement showing the Apportionment of Joint Costs

Particulars	Main product	By-product	Total
	P	Q	
	Rs.	Rs.	Rs.
A. Sales revenue	16,000	8,000	24,000
B. Less: Estimated profit	4,000	1,600	5,600
C. Estimated Total Cost	12,000	6,400	18,400
D. Less: Selling Expenses (2:1)	267	133	400
E. Cost of Production (C-D)	11,733	6,267	18,000
F. Less: Subsequent Costs	5,000	3,000	8,000
G. Apportionment of Joint Costs (E-F)	6,733	3,267	10,000

Working Note: Calculation of Selling Expenses

A. Total costs (Sales – Profit)	18,400
B. Less: Costs other than selling expenses (10,000 + (5,000 + 3,000))	<u>18,000</u>
C. Selling expenses (A - B)	400 (between P and Q is 2:1)

Statement showing the cost of production of P and Q

Particulars	Main product	By-product	Total
	P	Q	
	Rs.	Rs.	Rs.
A. Joint Cost: (on the basis of 6733:3267)			
Material	3,367	1,633	5,000
Labour	2,020	980	3,000
Overheads	1,346	654	2,000
	<u>6,733</u>	<u>3,267</u>	<u>10,000</u>
B. Subsequent Costs:			
Material	3,000	1,500	4,500
Labour	1,400	1,000	2,400

Overheads	600	500	1,100
	5,000	3,000	8,000
C. Cost of production (A + B)	11,733	6,267	18,000

Illustration 9.14

In the course of manufacturer of the main product 'P', by-products 'A' and 'B' also merge. The joint expenses of manufacturer amount to Rs.1,19,550. All the three products are processed further after separation and sold as per details given below:

		Main products		By Products	
		P	A	B	
Sales	Rs.	90,000	60,000	40,000	
Cost incurred after separation	Rs.	6,000	5,000	4,000	
Profit as percentage on sales	%	25	20	15	

Total fixed selling expenses are 100% of **total cost of sales** which are apportioned to the three products in the ratio of 20:40:40.

You are required to: (i) Prepare a statement showing the apportionment of joint costs to the main product and the two by products,
(ii) If the by-product 'A' is not subject to further processing and is sold at the point of separation for which there is a market, at Rs.58,500 Without incurring any selling expenses, would you advise its disposal at this stage ?

Statement showing Apportionment of joint Costs to Main Product and By-Products

Particulars	Main Product	By-Products		Total
	Rs.	A (Rs.)	B (Rs.)	Rs.
A. Sales	90,000	60,000	40,000	1,90,000
B. Less: profit	22,500	12,000	6,000	40,500
C. Cost of sales (A – B)	67,500	48,000	34,000	1,49,500
D. Less: Selling Expenses	2,990	5,980	5,980	14,950
E. Cost of Production (C – D)	64,510	42,020	28,020	1,34,,550
F. Less: Costs after separation	6,000	5,000	4,000	15,000
G. Value of the stage of separation (E – F) (Joint Cost)	58,510	37,020	24,020	1,19,550

Working Notes:

- Total cost of sales Rs.1,49,500,
- Selling expenses (10% of Rs.1,49,500) = Rs.14,950

Statement showing the profitability of By-Product A

Particulars	At Split off stage	After further processing
A. Sales	58,500	60,000
B. Less: Costs	37,020	42,020 (i.e 37,020 +5,000)
C. Profit	21,480	17,980

Since the profit earned is more, if the by product is not processed further, it is advisable to sell the same before processing.

(iv) Selling expenses have not been taken in to consideration as without that the choice is apparent.

9.25 DECISION AS TO FURTHER PROCESSING OF BY-PRODUCTS

To decide whether to process further or not incremental revenue after further processing should be compared with further processing costs as follows:

Case	Decision
I. If incremental revenue exceeds further processing costs	Products should be processed further and should be sold after further processing because the overall income will increase by the difference between the incremental revenue and further processing costs.
II. If incremental revenue is less than the further processing costs	Product should not be processed further and should be sold at split-off point because the overall income will decrease by the difference between the further processing costs and incremental revenue if the products are processed further.

Note: Apportionment of joint costs is not relevant in decision making regarding further processing of joint or by-product.

Illustration 9.15 XYZ Ltd. Operates a chemical process which produces four products – P, Q, R and S from a basic raw material. It provides you the following data:

1. Basic raw material 1,25,000 units @ Rs.2
2. Initial processing wages Rs.1,50,000
3. Initial processing overheads Rs.1,00,000
4. Output, selling prices and additional processing costs:

Product	Output (units)	Selling price per unit at split off point (Rs.)	Selling price per unit after further processing (Rs.)	Additional processing Costs after split off (Rs.)
P	10,000	40	70	2,50,000
Q	20,000	30	65	3,00,000
R	30,000	20	40	7,50,000
S	40,000	10	20	2,00,000

You are required to :

- State with supporting calculations as to **whether any or all the products should be further processed or not** so that the company can maximize in profits.
- Prepare a statement showing the product-wise and total profitability based on your recommendation in part (a).

Solution:

Statement showing the calculation of processing decision

Particulars	P Rs.	Q Rs.	R Rs.	S Rs.
A. Selling price per unit after further processing	70	65	40	20
B. Selling price per unit at split-off point	40	30	20	10
C. Incremental Selling price (A – B)	30	35	20	10
D. Total incremental revenue (C x units)	3,00,000	7,00,000	6,00,000	4,00,000
E. Less: Further processing cost	2,50,000	3,00,000	7,50,000	2,00,000
Incremental profit (Loss) D) – E)	50,000	4,00,000	(1,50,000)	2,00,000

Recommendation: Product ‘R’ should not be further processed since its further processing results in a loss of Rs.1,50,000 and hence, it should be sold at split off point. Product ‘P’, ‘Q’ and ‘S’ should be sold after further processing.

Statement showing the profitability

(If products ‘P’, ‘Q’ and ‘S’ are sold after

Further processing and product ‘R’ is sold at split off point.

Product	Output (units) A	Sales Value B	Joint costs apportioned C	Further processing Costs D	Total costs E = C + D	Profit (loss) F = B - E
P	10,000	7,00,000	1,00,000	2,50,000	3,50,000	3,50,000
Q	20,000	13,00,000	1,50,000	3,00,000	4,50,000	8,50,000
R	30,000	6,00,000	1,50,000	-	1,50,000	4,50,000
S	40,000	8,00,000	1,00,000	2,00,000	3,00,000	5,00,000

		3,40,000	5,00,000	7,50,000	12,50,000	21,50,000
--	--	----------	----------	----------	-----------	-----------

Comment: The overall profit will increase by Rs.1,50,000 if recommendation are accepted.

Illustration 9.16 A company buys a chemical compound and refines it in the refining process. Input-output relationship is: 100 liters of input will yield 50% A, 30% B and 10% C and the balance is a waste having no residual value. The raw material costs Rs.18 per litre. Conversion cost is Rs.36 per litre processed, while the fixed overheads are Rs.36 lakhs per year. The usual sales areas follow on yearly basis:

Compound	A	B	C
Quantity sold (litres)	1,00,000	60,000	20,000
Selling price (Rs. Per litre)	80	100	200

The manager of the company suggests that compound A should be processed further at a cost of Rs.35 per litre on account of labour and overheads and would then fetch Rs.120 per litre.

You are required to: Work out the cost per litre on the compound A, B and C after apportioning the cost on the basis of relative sale values. Also state whether compound A is to be processed further?

Solution: Statement showing the computation of Joint Cost

Particulars	Rs. ('000)
A. Raw materials (100 litres x Rs.18)	1,800
B. Conversion cost (100 litres x Rs.36)	3,600
C. Fixed Overheads	1,800
$\frac{Rs. 36,00,000 \times 100 \times 0.9}{1,00,000 + 60,000 + 20,000}$	
D. Total Joint costs (A + B +C)	7,200

Statement showing the Computation of Cost per litre of the Compounds A, B, and C (on the basis of Relative Sales Value)

Particulars	A	B	C	Total
A. Selling piece per litre (Rs.)	80	100	200	
B. Output (in litres) per 100 litres	50	30	10	

C. Sales value (Rs.) (A x B)	4,000	3,000	2,000	9,000
D. Joint cost operational (Rs.) on the basis of relative sales value i.e., in the ratio of (4:3:2)	3,200	2,400	1,600	7,200
E. Cost per litre (Rs.) (D/B)	64	80	160	-

Whether to process compound a further?

a. Additional revenue earned after further processing (Rs.120 – Rs.80)	40
b. Less: additional processing Cost	<u>35</u>
c. Additional profit (per litre) (A – B)	5

Recommendation: Compound A should be processed further as there is a clear margin of Rs.5 per litre

Illustration 9.17 PQR Ltd. manufacturers product A which yields two by-products B and C .The actual joint expenses of manufacture for a period were Rs.8,000. It was estimated that the profit on such product as a percentage of sale would be 30%, 25%, and 15% respectively. Subsequent expenses were as follows:

	Product A	Product B	Product C
	Rs.	Rs.	Rs.
Materials	100	75	25
Direct Wages	100	125	50
Overheads	150	125	75
Sales	6,000	4,000	2,500

You are required to prepare a statement showing the apportionment of the joint expenses and statement showing the actual profit.

Solution:

Statement showing the Apportionment of Joint Expenses

Particulars	Products			Total Rs.
	A Rs.	B Rs.	C Rs.	
A. Sales	6,000	4,000	2,500	12,500
B. Less : Estimated profit (30%, 25% and 15% respectively)	1,800	1,000	375	3,175
C. Cost of sales (estimated)	4,200	3,000	2,125	9,325
D. Less: Subsequent expenses	150	325	150	925
E. Joint expenses estimated	3,750	2,675	1,975	8,400

F. Joint expenses (actual) apportioned in proportion to 3750:2675:1975	3,571	2,548	1,881	8,000
G. Total Cost (D + F)	4,021	2,873	2,031	8,925
H. Profit (A – G)	1,979	1,127	469	3,575

Illustration 9.18 A Ltd. manufactures one main product and two by-products. During January 1993 the following data is available:

	Main Product	By – product	
		A	B
Sales	₹ 4,00,000	32,000	48,000
Joint cost	₹ 1,55,200		
Subsequent expenses	₹ 40,000	6,400	7,200
Percentage of profit to sales		10%	15%
Selling expenses as % of sales value	10%	5%	6%

No Stock exists. Prepare a statement showing profit under joint cost method.

Solution: Statement showing apportionment of Joint Cost

	A	B
Sales	32,000	48,000
Less: Profit	<u>3,200</u>	<u>7,200</u>
	28,800	40,800
Less: Separation cost	<u>6,400</u>	<u>7,200</u>
	22,400	33,600
Less: Selling expenses	<u>1,600</u>	<u>2,800</u>
Share in the joint cost	20,800	<u>30,800</u>
Joint cost to be borne by main product		1,55,200
Less: Share of by- product A & B (20,800 + 30,800)		<u>51,600</u>
		<u>1,03,600</u>

Statement showing profit

	Main Product	A	B
Share of Joint expense	1,03,600	20,800	30,800
Post separation cost	40,000	6,400	7,200
Selling expenses	<u>40,000</u>	<u>1,600</u>	<u>2,800</u>
	1,83,600	<u>28,800</u>	40,800
Profit	<u>2,16,400</u>	<u>3,200</u>	<u>7,200</u>
Sales	<u>4,00,000</u>	<u>32,000</u>	<u>48,000</u>

Illustration 9.19 In a manufacturing concern, production of A yields by-products B and C. The joint expenses of manufacture are:

Material ₹ 8,500, Labour ₹ 9,000, Overheads ₹ 7,500. Subsequent expenses are follows:

	Material	Labour	Overhead
A	₹ 2,500	1,900	1,500
B	₹ 1,200	1,600	900
C	₹ 1,400	2,000	1,050

Selling price: A ₹ 30,000, B ₹ 20,000, C ₹ 15,000

Profit on S.P.: A 40%, B 30% , C 25%

Show how you would apportion the joint expenses and ascertain profit of each product.

Solution: Statement showing apportionment of Joint Cost

	A	B	C	D
Sales	30,000	20,000	15,000	65,000
Less: Profit	<u>12,000</u>	<u>6,000</u>	<u>3,750</u>	<u>21,750</u>
Cost of production	18,000	14,000	11,250	43,250
Less: Subsequent expenses	<u>5,900</u>	<u>3,700</u>	<u>4,450</u>	<u>14,050</u>
	12,100	10,300	6,800	29,200
Less: Selling & distribution oh.	<u>1,938</u>	<u>1,291</u>	<u>971</u>	<u>4,200</u>
Share in the joint cost	<u>10,162</u>	<u>9,009</u>	<u>5,829</u>	<u>25,000</u>

Note: The total joint cost given in the problem is ₹ 25,000. Whereas the total as per the above statement is ₹ 29,200. The difference of ₹ 4,200 (29,200 – 25,000) is selling and distribution overheads apportioned on the basis of sales value.

Main product 'A' A/c

Particulars		Particulars	Amount (₹)
To material	8,500	By by-product B a/c	9,009
Add: Addition	<u>2,500</u>	By by- Product C a/c	5,829
To Labour	9,000	By Sales	30,000
Add: Addition	<u>1,900</u>		
To overheads	7,500		
Add: Addition	<u>1,500</u>		
To Selling & distribution			
To Profit	1,630		
	<u>12,000</u>		
	<u>44,838</u>		<u>44,838</u>

By-product B A/c

To main product A a/c	9,009	By Sale	20,000
To Material	1,200		
To Labour	1,600		
To Overheads	900		
To Share of Selling distribution oh.	1,291		
To Profit	<u>6,000</u>		
	<u>20,000</u>		<u>20,000</u>

By- product C A/c			
Particulars	Amount	Particulars	Amount
	(₹)		(₹)
To main product A a/c	5,829	By Sale	15,000
To Materials	1,400		
To Labour	2,000		
To Overheads (Self)	1,050		
To Selling & distribution oh.	971		
To Profit	<u>3,750</u>		
	<u>15,000</u>		<u>15,000</u>

Illustration-9.20

Two by-products B and C are produced in the course of manufacture of product A. The joint costs of the manufactures are:

Material	₹ 8,500
Labour	9,000
Overheads	<u>7,500</u>
	<u>25,000</u>

The subsequent costs are as under:

	A	B	C
	(₹)	(₹)	(₹)
Material	2,500	1,200	1,400
Labour	1,900	1,600	2,000
Overheads	1500	900	1,050
	<u>5,900</u>	<u>3,700</u>	<u>4,450</u>
Sales value	30,000	20,000	15,000
Profit on sales	40%	30%	25%

Apportion the joint cost of the products and prepare the necessary accounts.

Solution:

Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
Selling Price	30,000	20,000	15,000	65,000
Less: Profit	12,000	6,000	3,750	21,750
Cost	<u>18,000</u>	<u>14,000</u>	<u>11,250</u>	<u>43,250</u>
Less: Subsequent Cost	5,900	3,700	4,450	14,050
	<u>12,100</u>	<u>10,300</u>	<u>6,800</u>	<u>29,200</u>

Note: The difference in the calculated joint Cost i.e., ₹ 29,200 and the given joint cost i.e., ₹ 25,000 is ₹ 4,200. This difference will be considered as the cost of selling and distribution overheads and this will be divided (apportioned) in A, B and C on the basis of their sales price.

Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
Estimated Joint Cost	12,100	10,300	6,800	29,200
Less: Selling and Distribution overheads (30:20:15) or (6:4:3)	<u>1,938</u>	<u>1,292</u>	<u>970</u>	<u>4,200</u>
Share of Joint Expenses	<u>10,162</u>	<u>9,008</u>	<u>5,830</u>	<u>25,000</u>

Product A Account

Particulars	Amount(₹)	Particulars	Amount(₹)
To Joint Cost (Total)	25,000	By Share of Joint Cost	
To Material (Self)	2,500	Product-B	9,008
To Labour (Self)	1,900	Product-C	5,830
To Overheads (Self)	1,500	By Sales (A)	30,000
To Selling Overheads (Apportioned)	1,938 12,000		
To Profit			
	<u>44,838</u>		<u>44,838</u>

Product B Account

Particulars	Amount(₹)	Particulars	Amount(₹)
To Share of Joint Cost	9,008	By Sales	20,000
To Material (Self)	1,200		
To Labour (Self)	1,600		
To Overheads (Self)	900		
To Share of Selling Overheads	1,292		
To Profit	6,000		
	<u>20,000</u>		<u>20,000</u>

Product C Account

Particulars	Amount(₹)	Particulars	Amount(₹)
To Share of Joint Expenses	5,830	By Sales	15,000
To Material (Self)	1,400		
To Labour (Self)	2,000		
To Overheads (Self)	1,050		

To Share of Selling Overheads	970		
To Profit	3,750		
	<u>15,000</u>		<u>15,000</u>

Working Notes

Share of joint Expenses of each product has been taken in their respective accounts after deducting the Selling and distribution overheads of the respective product.

Illustration -9.21

A factory is engaged in the production of chemical 'X' and in the course of its manufacture a by-product 'Y' is produced, which after a separate process has been a commercial value. For the month of June,2020 the following are data:

	Joint Expenses	Separate	Expenses
		X	Y
	(₹)	(₹)	(₹)
Material	19,200	7,360	780
Labour	11,700	7,680	2,642
Overheads	3,450	1,500	544

The output for the month was 142 tons of 'X' and 49 tons 'Y' and the selling price of 'Y' averaged ₹ 280 per ton. Assuming that the profit on 'Y' is estimated at 50% of the selling price. Prepare the necessary y accounts showing the Cost per ton of X.

Solution:

First of all 'Y' share of Joint Cost is to be calculated.

	Product – Y
	(₹)
Sales (49 tons @ ₹ 280 per ton)	13,720
Less: Profit (50% on sales)	<u>6,860</u>
Total Cost of Y	6,860
Less: Separate Cost Y= (₹ 780 + ₹ 2,648 + ₹ 544)	3,966
Joint Cost Share of Y	<u>2,894</u>

Main Product 'X' Account

Particulars	Amount	Particulars	Amount
To Material		By - By Product 'Y' (Share of joint cost)	2,894
Joint		By Cost of Production of X for 142 tons @ ₹ 338 per ton	
19,200			
Separate	26,560		
<u>7,360</u>			
			47,996

To Labour			
Joint		19,380	(47,996) = 338/- 142
11,700			
Separate			
<u>7,680</u>		4,950	
To Overheads		<u>50,890</u>	
	Joint		<u>50,890</u>
	3,450		
Separate			
<u>1,500</u>			

By- Product 'Y' Account

Particulars	Amount	Particulars	Amount
To main product –X (share of joint cost)	2,894	By Sales ₹ 280 per tons	13,720
	780		
To Material	2,642		
To Labour	544		
To Overheads	6,860		
To Profit			
	<u>13,720</u>		<u>13,720</u>

Illustration-9.22

In a production process with the main product a company processes the incidental waste into two by-products A and B. From the following data relating to the products, prepare a comparative profit and loss statement showing the individual cost and other details. The joint cost are ₹ 3,10,400.

Particulars	Main product ₹	By Product A ₹	By product B ₹
Sales	8,00,000	64,000	96,000
Separate cost after Split off	80,000	12,800	14,400
Profit % to Sales	--	20%	30%
Selling and Distribution Overhead as a percentage to sales	20%	10%	15%

Apply reserve cost method for separation of joint cost.

Solution:

Statement showing allocation of joint cost of ₹ 3,10,400 to by-product

Particulars	Product	By Product
	A ₹	B ₹
Sales	64,000	96,000
Less: Profit	<u>12,800</u>	<u>28,800</u>
	51,200	67,200
Less: Separate cost after Split off	<u>12,800</u>	<u>14,400</u>
	38,400	52,800
Less: Selling Overhead	<u>6,400</u>	<u>14,400</u>
Share of Joint cost	<u>32,000</u>	<u>38,400</u>

Statement Showing Share of Main Product in Joint Cost

Total Joint Cost	₹ 3,10,400
Less: Share of A = 32,000	
Share of B = <u>38,400</u>	<u>70,400</u>
Share of Main Product in Joint Cost	<u>2,40,000</u>

Comparative Profit Statement of the Products

Particulars	Main product	A	B
	₹	₹	₹
Sales	8,00,000	64,000	96,000
Less: Share of Joint cost	<u>2,40,000</u>	<u>32,000</u>	<u>38,400</u>
	5,60,000	32,000	57,600
Less: Separate cost after Split off	<u>80,000</u>	<u>12,800</u>	<u>14,400</u>
Gross profit	4,80,000	19,200	43,200
Less: Selling and Distribution Overhead	<u>1,60,000</u>	<u>6,400</u>	<u>14,400</u>
Net profit	<u>3,20,000</u>	<u>12,800</u>	<u>28,800</u>

Illustration-9.23

A company manufacture product P which result into two by-products Q and R. The joint expenses for the manufacturing for the period were ₹ 64,000. Separate Expenses were as below:

Particulars	P	Q	R
	₹	₹	₹
Material	800	600	200
Labour	1,600	1,000	400
Overhead	<u>1,200</u>	<u>1,000</u>	<u>600</u>
	<u>3,600</u>	<u>2,600</u>	<u>1,200</u>
Selling Price	48,000	32,000	20,000
Profit on Sales	30%	25%	15%

Show the apportionment of Joint Expenses.

Solution:

Particulars	P ₹	Q ₹	R ₹	Total
Sales	48,000	32,000	20,000	1,00,000
Less: Profit on Sales	14,400	8,000	3,000	25,400
	33,600	24,000	17,000	74,600
Less: Separate Exp.	3,600	2,600	1,200	7,400
	30,000	21,400	15,800	67,200
Less: Selling Overheads	<u>1,536</u>	<u>1,024</u>	<u>640</u>	<u>3,200</u>
	<u>28,464</u>	<u>20,376</u>	<u>15,160</u>	<u>64,000</u>

Note: As the calculated joint cost ₹ 67,200 while the given joint cost is ₹ 64,000. There is a difference of ₹ 3,200 (i.e., 67,200 – 64,000) which is to be considered as selling and distribution overhead and is to be apportioned in the ratio of sales. (i.e., 48: 32: 20) = 12: 8:5

So the selling overhead will be calculated as:

$$\text{Product P} = \frac{12}{25} \times 3,200 = ₹ 1,536$$

$$Q = \frac{8}{25} \times 3,200 = ₹ 1,024$$

$$R = \frac{5}{25} \times 3,200 = ₹ 640$$

KNOW YOUR PROGRESS

State whether the following statements are true or false

17. Cost per unit of each product is the same if joint costs are apportioned on the basis of the physical measure of product.
18. Under the relative sales value method of allocating cost to joint products, each of the joint products will show the same gross margin percentage if sold at the split-off point.
19. The allocation of joint cost to joint and by – products doesn't affect the total profit or loss.
20. It is possible for a main product of industry to be the by – product of another.
21. Individual products, each of a significant value, produced simultaneously from the same raw material is known as joint product.
22. A bakery producing cakes, biscuits and breads should be treated as main products.
23. By – products may be sold in their original form i.e., without further processing.
24. By – products are of limited sales value produced simultaneously with the product with a greater value.
25. The management may treat a joint product as by – product.
26. Costs incurred up to the point where individual products can be identified are called joint costs.
27. By – product is a product which is recovered incidentally from the materials used in the manufacturing of recognised main products.

28. In dairy industry milk, butter and cheese are joint products.
29. When a particular type of product is manufactured in different varieties and grades, they are called co – products.
30. Furnace slag is a by-product in iron and steel industry.
31. Costs incurred after split-off stage are called post separation cost.

SUMMARY

Process Costing is a method of costing used in the industries like cement, sugar, oil refining where production is continuous and the final product is the result of a sequence of processes. The goods produced are identical and standardized. The cost per unit produced is the average cost which is calculated by dividing the total process cost by the number of units produced. Certain amount of loss of material occurs at different stages of production. The process losses are classified into normal loss (expected under normal conditions) or abnormal loss (loss due to abnormal reasons). If actual loss is less than normal loss, a gain is obtained which is called as abnormal gain or effectiveness. The value of abnormal gain is calculated in a manner similar to the abnormal loss. Due to continuous production, at the end of the accounting year, there may be some work in progress. The valuation of such WIP is done in terms of equivalent or effective production i.e. production of a process in terms of completed units. In the course of production, in some industries, two or more products are unavoidably produced from the same process and same raw materials. Such products are produced in natural proportions which cannot be changed at the desire of the management. Some products have almost equal value called joint products and some are incidentally produced called by-products. The manufacturing cost incurred prior to the split off point is called joint cost and the cost incurred after split off point is called post separation cost. Joint products have relatively higher sales value than by-products. The by-products may be sold in their original form with or without further processing.

9.27 KEY WORDS

1. **Process Costing:** It is that form of operation costing which applies where standardized goods are produced. The output of one process becomes input of another process. Cost per unit is calculated at the end of the period by dividing the total process cost by the normal output produced.
2. **Normal Loss:** It is a loss expected during the normal course of operations and they are unavoidable. It is uncontrollable in short term. It can be estimated in advance on the basis of past experience of the industry.
3. **Abnormal Loss:** It is an avoidable loss which occurs due to abnormal reasons like substandard materials, carelessness of workers, unplanned operations etc. It is the excess of actual loss over expected loss. It is charged to costing profit and loss account.

4. **Abnormal Gain:**It arises when actual output is more than the expected output or when actual losses are less than expected normal losses. It is also called abnormal effectiveness. It is credited to costing profit and loss account.
5. **Equivalent Production:** When there is work – in – progress, which is partly completed remains at the end of the accounting period, the costs so incurred will be converted into equivalent production so as to ascertain the unit cost of production. Equivalent production units represent incomplete production units expressed in terms of equivalent completed units.
6. **Joint Products:**It represents two or more products of almost equal importance which are produced in natural proportions simultaneously from the same material in the same process. Joint products may be saleable without further processing or after further processing.
7. **By- Products:** By- products are products of relatively small value which emerges incidentally in the course of manufacturing the main product. For example – in a rice mill husk is the by a product, rice is main product.
8. **Co- Product:** when a particular type of product is manufactured in different varieties and grades, they are called co – products.
9. **Split -Off Point (Separation Point):** It is the point in the manufacturing process at which the products get separated and become separately identifiable.
10. **Joint Costs:** Joint cost refers to the total cost incurred up to the split – off point when the products get separated. Joint costs = common material cost + common processing cost.
11. **Subsequent Cost:**Subsequent cost refers to the total cost incurred after the split - off point on further processing of products. Subsequent costs = subsequent material costs + subsequent processing costs + selling and distribution costs.

ANSWERS TO CHECK YOUR PROGRESS

Fill in the Blanks: 1. Cost center 2. Standardized and homogeneous 3. Joint product and By-product 4. Normal output 5. Input/ Raw material 6. Debit 7. Costing Profit and Loss 8. Normal 9. Credit 10. Production

True/False statements

True:1,4,5,9,10,11,12,13,14,18,19,20,21,23,24,25,26,27,29,30,31

False:2,3,6,7,8,15,16,17,22,28,

9.28 TERMINAL QUESTIONS

Short Questions

1. What is process costing?
2. State any four features of process costing.
3. Distinguish between Job Costing and process Costing.
4. Distinguish between Normal Loss and Abnormal Loss in process costing.
5. What is abnormal effectiveness?

6. Give the accounting treatment of normal loss in process costing.
7. What do you mean by abnormal loss? How is it treated in process cost accounts?
8. How an abnormal gain is treated in process cost accounts?
9. How normal and abnormal losses are calculated (in quantity and value)?
10. How abnormal gain (quantity and value) is computed?
11. Explain Joint product and By-product.
12. Explain the features of joint product.
13. Distinguish between joint product and by-product.
14. Distinguish between joint product and co-product
15. Explain the features of by-product.

Long Questions:

1. Define process costing. What are its features? Distinguish between Job costing and Process Costing.
2. What do you meant by normal loss, abnormal loss and abnormal gain in process costing? How are they treated in cost accounting?
3. What is process costing? Give a specimen of process accounts with losses and gains.
4. Explain the steps followed in valuation of work-in progress.
5. What do you mean by equivalent production? Using imaginary figures, show how equivalent production is calculated?
6. What do you mean by joint products and by-products? What are their relevance in process costing? Explain the sale value method of apportionment of joint cost.
7. Explain the accounting treatment of apportioning joint costs.
8. Explain the accounting treatment of by-products.

Numerical Questions

(Process loss)

1. Product A is obtained after it is processed through three district processes. The following information is available for the month of March, 2019.

Particulars	Total	Process		
		X	Y	Z
Materials consumed (₹)	22,500	10,400	8,000	4,100
Direct labour (₹)	29,320	9,000	14,720	5,600
Production Overheads (₹)	29,320	-	-	-

2,000 units at ₹4 per unit were introduced in Process A. Production overheads to be distributed as 100% on direct labour among three processes.

The actual output and normal loss of the respective processes are:

Process	Output in units	Normal loss on inputs	Value of scrap per unit (₹)
Process X	1,800	10%	2.00
Process Y	1,360	20%	4.00
Process Z	1,080	25%	5.00

There is no stock or work-in-progress in any process. You are required to prepare Process Accounts.

[Answer: Process Y: Abnormal Loss- 80units, Value: ₹4,000]

[Process Z: Abnormal Gain- 60 units, Value: ₹4,800]

2. Liza Manufacturing Company supplies you the following information for the year ended 31st March, 2018.

Particulars	Process		
	X	Y	Z
Raw materials introduced in the process (units)	12,000	2,440	2,600
Cost of Raw material per unit (₹)	5	5	5
Direct wages (₹)	34,000	24,000	15,000
Production overheads (₹)	16,160	16,200	9,600
Normal loss (% on number of units entering to the process having no realisable value)	4%	5%	3%
Wastage (% on number of units entering to the process having scrap values)	6%	5%	4%
Scrap value per unit of wastage (₹)	3	4	5
Output transferred to subsequent process	70%	60%	-
Output sold at the end of the process	30%	40%	100%
Selling price per unit of the output sold at the end of the process (₹)	12.00	16.00	17.00

You are required to prepare the process X, Y and Z accounts showing the profit earned at each process.

Answer: [Process X: Transferred to Process Y- 7,560 units, Value: ₹75,600, Profit earned ₹6,480]

[ProcessY: Transferred to Process Z- 5,400units, Value: ₹75,600, Profit earned ₹7,200]

[ProcessZ: Transferred to Sales Deptt.- 7,440 units, Value : ₹1,11,600, Profit earned ₹14,800]

3. Prepare necessary Process Accounts from the following details:

Particulars	Process X ₹	Process Y ₹
Materials	30,000	3,000

Labour	10,000	12,000
Overheads	7,000	8,600
Input (units)	20,000	17,500
Normal loss	10%	4%
Sale of wastages per unit	₹1	₹2

There was no opening or closing stock or work-in-progress. Final output of Process Y was ₹17,000 units.

[Answer: Process X: Abnormal Loss- 500units, Value:₹1,250]

Process Y: Abnormal Gain- 200 units, Value: ₹785]

4. The Bhubaneswar Chemical Co. Ltd. produced three chemicals during the month of July 2014 by the consecutive processes. In each process, 2% of the total weight put in is lost and 10% is scarp which is from process I and II realised ₹ 100 per ton and from process III ₹ 20 per ton. The products of three processes are dealt with as follows:

Process	I	II	III
Passed to Next Process	75%	50%	---
Stock Kept for sale	25%	50%	100%
Expenses Incurred			

Particulars	Process I		Process II		Process III	
	(₹)	Tons	(₹)	Tons	(₹)	Tons
Materials	1,20,000	1,000	28,000	140	1,07,840	1,348
Manu.& Gen. Exp	30,800	---	25,760	---	18,100	---

Prepare process cost accounts showing the cost per ton of each product.

Answer:

Process	Transferred to stock	Transferred to next process
I	220 units at ₹35,200	660 units at ₹1,05,600
II	352 units at ₹75,680	352 units at ₹75,680
III	1496 units at ₹1,98,220	

5. From the following particulars prepare Process Cost Account showing the cost of the output and the cost per unit at each stage of production.

A	B	C
(₹)	(₹)	(₹)

Material consumed	48,000	--	--
Wages	12,800	24,000	58,500
Manufacturing Expenses	7,200	6,000	7,200
Other expenses	4,000	4,500	4,800
Gross Production	37,000 units		
Wastage	1,000 units	1,500 units	500 units
Opening Stock units	--	4,000 units	16,500
Closing Stock units	--	1,000 units	5,500

Answer:

Process A-36,000 units were transferred to process B @ ₹2 per unit

Process B-37,500 units were transferred to process C @ ₹3 per unit

Process c-48,000 units were transferred to Finished Stock A/C @ ₹4.50per unit

Valuation of Work-In-progress

6. From the following information prepare: (a) Statement of Equivalent production; (b) Statement of Cost per Equivalent unit; (c) Statement of Evaluation; (d) Process Account:

1. Input materials	: 1,000 units		
2. Current cost incurred in process:		Material	₹ 40,000
		Labour	₹ 19,460
		Overhead	₹9,370
3. Closing work-in-progress :	900 units		
4. Transfer to next process :	9,100 units		
5. Degree of completion :			
		Closing Stock (%)	
Material		100	
Labour		70	
Overheads		30	
Method of valuation:		FIFO	

Answer:

- 1. Equivalent Units (Materials-10,000 units, Labour-9730 units and overheads 9370 units)**
- 2. Units transferred to next process-9,100 units amounting to ₹.63,700**
- 3. Closing W-I-P 900 units amounting to ₹.5,130**

7. From the following information prepare: (a) Statement of Equivalent production; (b) Statement of Cost per Equivalent unit; (c) Statement of Evaluation; (d) Process Account:

1. Input materials : 10,000 units
2. Current cost incurred in process:

Material	₹ 40,000
Labour	₹ 17,860
Overhead	₹ 8,570
3. Normal loss : 8% of total input (i.e., opening WIP + units put in)
4. Scrap realized @ ₹ 40 per 10 units
5. Closing Work-in-progress : 900 units
6. Transfer to next process : 8,700 units

7. Degree of completion :

	Closing Stock (%)
Material	100
Labour	70
Overheads	30

8. Method of valuation: FIFO

Answer:

- 1. Equivalent Units (Materials-9,200 units, Labour-8,930 units and overheads- 8,570 units)**
- 2. Units transferred to next process-8,700 units amounting to ₹60,900**
- 3. Closing W-I-P 900 units amounting to ₹5,130**
- 4. Abnormal gain-400 units amounting to ₹2,800**

Joint products and by-Products

8. In producing the main product M, a company processes the resulting waste material into two by-products P and Q using the method of working back from sales value to an estimated cost, you are required to prepare a comparative profit and loss statement of the three products from the following data:

Total cost up to separation point was ₹1,36,000

Particulars	Product M	Product P	Product Q
Sales (all production)	₹3,28,000	₹32,000	₹48,000
Cost after separation(₹.)	-	9,600	14,400

Estimated net profit % to sales value	-	20%	30%
Estimated selling expenses as % of sales value	20%	20%	20%

Answer: Profit Product 'M' ₹ .1,45,600

Product 'P' Rs. 6,400 and product' ₹ 14,400

9. In a manufacturing concern, certain product A yields by-products B and C. The joint expenses of the manufacture are;

Materials ₹. 8,500

Labour ₹9,000

Overheads ₹7,500

Subsequent expenses are as follows:

Particulars	A (₹.)	B (₹.)	C (₹.)
Materials	2,500	1,200	1,400
Labour	1,900	1,600	2,000
Overheads	1,500	900	1,050
Total	5,900	3,700	4,450

Selling expenses are: A ₹. 30,000; B ₹.20,000 and C ₹ 15,000. Estimated profits on selling prices are: A 40%, B 30% and C 25%. Show how you would apportion the joint costs of manufacture and prepare the product accounts.

Answer:

	A (₹.)	B (₹.)	C (₹.)
Joint cost	10,162	9,007	5,831
Profit	12,000	6,000	3,750

10. A factory producing article A also yields B and C as by-products. The joint cost of manufacture is:

Materials ₹ 10,000

Labour ₹ 2,000

Overheads ₹8,000

Total ₹ 20,000

Subsequent costs are as under

Particulars	A(₹)	B(₹)	C(₹)
Materials	1,500	1,300	1,000
Labour	200	150	100
Overheads	800	550	400
Total	2,500	2,000	1,500
Selling price	30,000	24,000	20,000
Estimated profit on selling price	30%	25%	20%

Show how you would propose to apportion the joint cost of manufacture and prepare the necessary statements in respect of A, B, C.

Answer

	A (₹.)	B (₹.)	C (₹.)
Joint cost	6,743	6,595	6,662
Profit	9,000	6,000	4,000

11. The yield of a certain process is 80% as the main product and 15% as to the by – product and 5% as to the process loss. The material put in process (5000 units costs ₹23.75 per unit and all other charges are ₹14,250 of which power cost accounted for $33\frac{1}{3}$ %. It is ascertained that power is chargeable to main and by – product in the ratio of 10:9. Draw up a statement showing the cost of the by – product.

Answer

Cost of main product = ₹ 1,10,000; by- product = ₹ 22,500

12. A factory is engaged in the production of chemical X and in the course of its manufacture, by – product Y is produced, which after separate process has a commercial value. For the month of January the following are the summarised costing data:

Particulars	Joint Expenses	Separate expenses (X)	Separate expenses (Y)
Materials (₹)	19,200	7,360	780

Labour (₹)	11,700	7,680	2,642
Overhead (₹)	3,450	1,550	544

The output for the month was 142 tonnes of X and 49 tonnes of Y. The selling price of Y was averaged ₹. 280 per tonne.

Assuming that the profit on Y is estimated at 50% of the selling price, prepare process account showing the cost per tonne of main product and by – product.

Answer :

Cost per ton of main product X = ₹ 338

Cost of by-product Y = ₹140

13. A concern while producing product A, also produces a by-product B. The by-product can be sold after a separate process.

From the under-mentioned information prepare accounts to show the cost per kg. of A and profit earned on product B.

	Joint expenses	Separation expenses	
		A	B
Material	₹ 60,000	22,000	2,500
Labour	₹ 35,000	24,000	8,000
Overhead	₹ 10,000	4,000	1,500
Output	--	450	150 kgs
		kgs.	

The selling price of B is Rs. 300 kg. It is estimated that profit is 50% of selling price.

Answer: Cost per Kg. of product A ₹ 321.11 and profit on B ₹22,500

14. :calculate the estimated cost of production of by-product X and Y at the point of separation from the main product.

	By Product	
	X	Y
Selling price per unit		
Cost per unit after separation from main product	₹ 12	₹ 24
Units produced	₹ 3	₹ 5
	500	200

Selling expenses amount to 25% of the total Work cost – i.e., including both pre- separation and post-separation work cost.

Selling prices are arrived at by adding 20% to total cost—i.e., the sum of works cost and selling expense

Answer: Product X ₹2,250 and Product Y ₹2,000

15 A Ltd. manufactures one main product and two by-products. During January 1993, the following data is available:

	Main Product	By – product	
		A	B
Sales	₹ 4,00,000	32,000	48,000
Joint cost	₹ 1,55,200		
Subsequent expenses	₹ 40,000	6,400	7,200
Percentage of profit to sales		10%	15%
Selling expenses as % of sales value	10%	5%	6%

No stock exists. Prepare a statement **showing profit under joint cost method.**

Answer: Main products ₹ 2,16,400 By-product 'A'= ₹ 3,200 Product B = ₹ 7,200

16. In the course of the production of main product P the by-product A and B also emerge. The joint cost of the production amount to ₹ 1,19,550. All the three products are processed further after separation and sold per details given below.

Particulars	P ₹	Q ₹	R ₹
Sales	90,000	60,000	40,000
Cost after separation	6,000	5,000	4,000
Profit (% on sales)	25%	20%	15%

Fixed selling expenses are 10% of the total cost of sales. These fixed cost are to be apportioned among three products in the ratio of 20: 40: 40. Prepare a statement showing the apportionment of joint cost.

[Ans: Share in joint cost P: ₹ 58,510 A: ₹ 37,020 B: ₹ 24,020]

17. A factory producing product A also produces by-product B and C. The information given below:

Particulars	Joint Expenses (₹)	Products		
		A (₹)	B (₹)	C (₹)
Material	10,000	1,500	1,300	1,000
Labour	2,000	200	150	100
Overheads	<u>8,000</u>	<u>800</u>	<u>550</u>	<u>400</u>
	<u>20,000</u>	<u>2,500</u>	<u>2,000</u>	<u>1,500</u>
Sales		30,000	24,000	20,000
Profit (% on sales)		30%	25%	20%

Show the apportionment of joint expenses and prepare the necessary accounts.

[Ans: Share in Joint Expenses: A- ₹ 6743, B- ₹ 6,595, C- ₹ 6,662

Selling and Distribution Overheads: A ₹ 11,757, B- ₹ 9,405, C- ₹ 7,838.]

B. COM
SEMESTER IV
COURSE: COST ACCOUNTING

UNIT-X OPERATING COSTING

STRUCTURE

- 10.1 Objectives**
- 10.2 Introduction**
- 10.3 Concept of Operating Costing**
- 10.4 Features of Operating Costing**
- 10.5 Selection of Appropriate Cost Unit**
- 10.6 Transport Costing**
- 10.7 Cost Unit for Transport Undertaking**
- 10.8 Classification of Cost**
- 10.9 Log Book**
- 10.10 Steps Involved in Transport Costing**
- 10.11 Statement of Operating Cost**
- 10.12 Summary**
- 10.13 Key Words**
- 10.14 Answer to Check Your Progress**
- 10.15 Terminal Questions**

10.1 OBJECTIVES

After studying this unit, you would be able to:

- Understand the concept of operating costing.
- Learn the features of operating costing.
- Know the classification of cost in operating costing.
- Learn the practical steps involved in transport costing.
- Learn the preparation of statement of operating cost.

10.2 INTRODUCTION

An analysis of industrial sector from the point of view of output reveals two categories of industries. They are industries which are engaged in the manufacture and sale of goods and the industries which are engaged in generating and rendering of services. For the purpose of exercising control over cost and determination of cost of services, the second categories of industries use operating costing which is also known as service costing.

10.3 MEANING AND CONCEPT OF OPERATING COSTING

Operating costing is that form of operation costing which applies where standardized services are provided to consumers directly by undertakings such as Transport services like Railways, Tramways, Bus transport etc.; Utility services like Hospital, Canteens, Libraries etc.; Distribution services like Supply of Electricity, Supply of Gas, Supply of Water etc.

CIMA London defines operating costing as “that form of operation costing which applies where standardized services are rendered either by an undertaking or by a service cost centre within an undertaking”. The cost of providing a service is known as operating cost and the method used to ascertain the cost of such service is known as operating costing.

Service output possess following unique features.

1. **Perishability:** Service output cannot be produced in advance and it cannot be stored like other tangible items.
2. **Intangibility:** Services do not have a physical form-that allows them to be seen or stored or touched.
3. **Heterogeneity:** Service output is different. In hospital, service provided to one patient is different from another patient.
4. **Simultaneity:** Production and consumption move simultaneously. There is no time lag between production of service and supply of service.

10.4 FEATURES OF OPERATING COSTING

The basic features of operating costing are as follows.

1. It is applied where the industries do not produce any tangible goods but providing standardized services to the public at large.
2. It is applied for determining the cost of service output.
3. Investment in fixed assets is more than working capital.
4. Classification of cost into fixed and variable plays an important role. The cost of rendering additional service is affected by variable cost.
5. Major portion of total cost is fixed cost. Hence, the cost per unit of service decreases, if more units of services are rendered and vice versa.

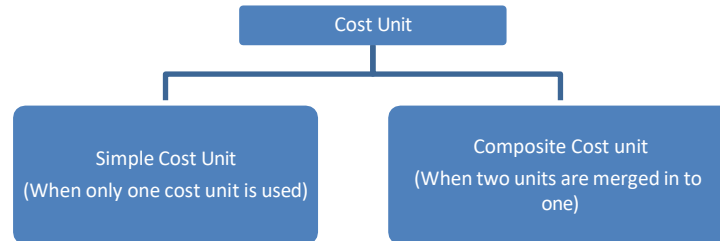
For example, in a transport company, if buses run full capacity, the cost per passenger will be lower than that if buses do not run at full capacity.

6. Calculation of cost of service output is easier as there is no stock or work-in-progress to be valued.
7. The service providing industries use composite cost unit as compared to the use of simple cost unit by other industries.

10.5 SELECTION OF APPROPRIATE COST UNIT

The unit for which the operating cost is to be computed should be decided after considering all the technical and other factors affecting the operating cost.

The cost unit may be of two types as follows:



<u>Undertaking</u>	<u>Cost Unit</u>	<u>Undertaking</u>	<u>Cost Unit</u>
Transport	Per km.	Transport (Passenger)	Per passenger km.
Canteen	Per item, per meal	Transport (goods)	Per tonne-km.
Telephone	per pulse rate	Hotel	per room per day
Internet	Per hour connection	Hospital	Per bed per day
Water	Per 1,000 Liters	Electricity	per kilowatt hour

10.6 TRANSPORT COSTING

Transport costing is a method of ascertaining the cost of operating each vehicle by a transport undertaking and applying this cost to a particular unit, e.g., per ton, per km, per ton-km, passenger-km etc.

OBJECTIVES OF TRANSPORT COSTING

The objectives of transport costing are as follows:

1. To ascertain the operating cost of running a vehicle per kilometer (km.)
2. To calculate the fare or freight to be charged for carrying passenger for certain distance or for carrying goods to different places.
3. To fix the hire charges where vehicles are given on hire.
4. To compare the cost of using own vehicles with that of using alternative mode of transport.
5. To determine what should be charged to different departments who are using the services.
6. To compare cost of maintaining own fleet of vehicles with the cost of hiring the vehicles from outside agency.
7. To decide whether to own a vehicle or to hire a vehicle.
8. To know the efficiency by comparing the cost of maintaining and running one vehicle with similar type of other vehicle.
9. To choose between two modes of transport (Lorry/Railway) in order to deliver goods to customers.

10. To avoid idleness of vehicles.
11. To prevent waste of capacity.

10.7 COST UNIT FOR TRANSPORT UNDERTAKING

It is advisable to use a composite cost unit to transport undertakings. Operating costs are influenced by two important variables viz., distance and the number of passengers or weight of goods carried. Therefore, if the undertaking is a passenger undertaking the cost unit will be Passenger-kilometers and in case of a goods transport undertaking the corresponding cost unit will be Tonne- kilometers.

In case of goods transport undertaking cost units can be calculated in the following two manners:

- (a) Commercial tonneKms.
- (b) Absolute tonneKms.

Commercial tonneKms. is arrived at by multiplying total distance kms.by average load quantity. Thus, **Commercial tonneKms.= (Total Distance Covered x Average Load carried)**
 Absolute tonneKms. is the sum total of tonne-kms. arrived at by multiplying various distances by respective load quantities carried. Thus, **Absolute tonneKms.= Distance covered x Load carried**

Illustration 10.1 M/s Shyamla carriers Ltd provides you the following information

Place covered	Distance travelled (Kms)	Weight carried (Tonnes)
Ambala to Chandigarh	70	12
Chandigarh to Rajpura	50	7
Rajpura to Ambala	90	5

Calculate **commercial tone Kms and absolute tonneKms. of distance travelled**

Solution:

$$\text{Commercial tonneKms} = \frac{(12+7+5)}{3} \times (70+50+90) = 8 \times 210 = 1680 \text{ Tonne km}$$

$$\begin{aligned} \text{Absolute tonneKms} &= (70 \times 12) + (50 \times 7) + (90 \times 5) \\ &= 840 + 350 + 450 = 1640 \text{ tonne km} \end{aligned}$$

Illustration 10.2 From the following information, calculate total Km and Passenger Km.

No. of Buses 5; days operated in the month 30; Trip made by each bus-3 round trips; Distance of route 20 km(one side); Capacity of Buses – 60 Passengers, but it runs at 90 per cent capacity.

Solution:

Total Km	= No. of Buses X Days X Trips X 2 X (Distance of the single trip)
Total Km	= 5 X 30 X 3 X 2 X 20 = 18,000 Km.
Total Passenger Km	= (Total Km) X Passenger X (capacity used)
Total Passenger Km	= 18,000 X 60 X 90/100
	= 9,72,000 Passengers- Km

10.8 CLASSIFICATION OF COST

Costs are classified and accumulated under three categories as follows:

1. **Standing Cost / Fixed Cost:**All costs which are incurred irrespective of running of the vehicles are included under this head. These include:
 - a. Depreciation of vehicles
 - b. Salaries of managers, accountants, drivers, conductors, mechanics etc. (if payment is made at fixed sum without taking into account the distance covered or number of trips made.)
 - c. Garage rent
 - d. Taxes and insurances of vehicles.
 - e. Interest on capital, establishment expenses of workshop and head office.

2. **Maintenance Cost/Semi-variable cost :**These include:
 - a. Cost of tyres and tubes
 - b. Cost of repairs and paints
 - c. Cost of spares and accessories

3. **Running Cost / Operating Charges:**All variable costs which are incurred for running of the vehicles are included under this head. These include:
 - a. Cost of fuel (petrol/diesel/ gas)
 - b. Cost of engine oil, lubricating oil
 - c. Wages of driver, conductor, helper etc., if payment is related to time or distance of trips.
 - d. Depreciation, if it is allocated on the basis of mileage run.
 - e. Toll tax

Note: 1.The above classification is not a matter of rule. The classification is guided by the nature of expenditure.

2. In many organizations total cost is divided into two categories i.e., standing charges/fixed costs and running and maintenance cost/variable costs.

10.9 Log Book

A log book is maintained for each vehicle to record details of a trip made by a vehicle during a specified period of time, usually on daily basis. Following is a specimen.

Daily Log Sheet

Vehicle No.....

Date.....

Licence No.....
 Registration No.....
 Departure.....
 Route No.....
 Arrival.....

Time of:

Details of Trip

Trip No.	Station		Goods/ Packages		Km	Time		Remarks
	From	To	Out to	Collected en route		Out	In	

Supplies

Times of Workers

Analysis of Lost of Time

Traffic

Petrol.....
 delays.....
 Oil.....
 Loading.....
 Grease.....
 Unloading.....
 Machanics.....

Driver.....
 Conductor.....
 Cleaner.....

Accidents.....

Other.....

The details shown in the log book enable the management to make suitable allocation of vehicle, to avoid unnecessary or duplicate trips and to avoid waste or idle running capacity. The records also provide data for proper allocation of costs and in this respect they may be compared with the production details available in a manufacturing concern.

10.10 PRACTICAL STEPS INVOLVED IN TRANSPORT COSTING

The practical steps involved in transport costing are as follows:

1. Select the composite cost unit (per tonne km., per passenger km.)
2. Calculate the number of units for a particular period(say week, month quarter or year)
 - a. Effective kms

- b. Effective passenger kms (in case of passenger transport)
- c. Absolute tonnes km
- d. Commercial tonne km.
3. Calculate total standing charges for a particular period. (year/quarter/month/week)
4. Calculate standing charges per unit of service.
5. Calculate total maintenance charges for the period.
6. Calculate maintenance charges per unit of service.
7. Calculate total variable/running charges.
8. Calculate variable/running charges per unit of service.
9. Calculate operating cost per unit of service. i.e., standing charges per unit plus maintenance charges per unit plus operating charges per unit.

10.11 STATEMENT OF OPERATING COST

The cost of each vehicle, suitably analysed under the three heads are compiled periodically in cost sheet or statement of cost. The specimen follows:

Name of the Concern.....

Statement of operating cost for.....

<i>Expenses</i>	<i>Vehicle No.</i>				<i>Total</i>
	<i>Capacity</i>				
A. Standing Charges/Fixed Charges	--	--	--	--	--
Garage Rent	--	--	--	--	--
Insurance	--	--	--	--	--
Vehicle Tax	--	--	--	--	--
Licence Fees	--	--	--	--	--
General Supervision	--	--	--	--	--
Interest Capital	--	--	--	--	--
Total					
B. Maintenance Cost	--	--	--	--	--
Tyres and Tubes	--	--	--	--	--
Repairs	--	--	--	--	--
Servicing & Cleaning	--	--	--	--	--
Painting	--	--	--	--	--
Spares parts and Components	--	--	--	--	--
Terminal Office Expenses.	--	--	--	--	--
Total					
C. Operating Cost/ Running Cost	--	--	--	--	--
Petrol	--	--	--	--	--
Engine Oil,	--	--	--	--	--
Lubricating oil, greases	--	--	--	--	--
Wages of operators	--	--	--	--	--
Depreciation	--	--	--	--	--

Insurance on transit Goods	--	--	--	--
Total				
D. Total Operating Cost: (A + B + C)				

PURPOSE OF DETERMINING OPERATING COST

Determining operating cost for each vehicle serves the following purposes.

- (i) Control of running or operating cost
- (ii) Avoidance of waste of fuel and other consumable material.
- (iii) Cost of running own vehicle may be compared with hired or other forms of transport
- (iv) Operating cost facilitates preparing quotations for outside parties.
- (v) Running cost of different vehicles may be compared.
- (vi) If transportation is a service department, its costing and allocation among production departments become easier.

Illustration 10.3 A transport service co. is running 8 buses between 2 cities which are 40 Km apart. Seating capacity of each bus is 50 passengers while the actual occupancy rate is 80% of the seating capacity. All the buses run on all the days of the month of August 2021. Each bus makes one round trip per day. Calculate total Km and total passenger km for the month.

Solution:

Total km covered

$$= \text{Total number of buses} \times \text{No. of days} \times \text{No. of trips} \times \text{Distance of the cities (trip)}$$

$$= 8 \times 31 \times 2 \times 40 = 19,840 \text{ km.}$$

Total passenger km.

$$= \text{km.} \times \text{Seating Capacity} \times \text{Occupancy per Trip.}$$

$$= 19840 \times 50 \times \frac{80}{100} = 7,93,600 \text{ Passengers Km}$$

Illustration 10.4 A transport company runs 5 buses between two places covering a distance of 25 kms. Seating capacity of each bus is 50 passengers. Generally 80% seating capacity is utilized in each bus. All buses run 25 days a month, each making 4 round trips daily. If total operating cost during a month for all the five buses is ₹16 lakhs and profit on takings is assumed to be 20%, calculate the bus fare to be charged for each passenger-km.

Solution:

Calculation of Passenger- kilometers

Passenger-km

$$= \text{Distance} \times \text{Seating capacity} \times \text{Occupancy rate} \times \text{No. of days} \times \text{No. of trips} \times \text{No. of buses}$$
$$= 25 \text{ kms.} \times 50 \times 80\% \times 25 (4 \times *2) \times 5 = 10,00,000 \text{ passenger-km}$$

*1 round trip is equal to 2 one-way trips.

$$\text{Cost per passenger -km} = \frac{\text{Total Operating Cost}}{\text{Total Passenger-km}} = \frac{16,00,000}{10,00,000} = ₹1.60 \text{ per passenger-km}$$

Let, fare per passenger-km = x

$$x = \text{Rs.}1.6 + 20\% \text{ of } x$$

$$\text{Or, } x - 0.2x = ₹1.60$$

$$\text{Or, } x = ₹2.00$$

Bus fare to be charged = ₹2.00 for each passenger.

Illustration 10.5

X & Company runs a bus between two places covering a distance of 30kms. Seating capacity of the bus is 30 passengers. The expenses for the month of May 2017 were as follows:

	₹
Salaries of driver, conductor and other staff:	10,000
Diesel, oil and lubricants	6,000
Repair & maintenance	1,600
Depreciation	4,000

The bus ran 25 days in May 2017 making two round trips per day, 60% of the capacity was utilized.

- (a) Find cost per passenger-km
- (b) What will be the fare per passenger if the company wants to maintain a profit @20% on sales?

Solution:

Calculation of Passenger-km

$$\text{Passenger-km} = \text{Distance} \times \text{Seating capacity} \times \text{Occupancy rate} \times \text{No. of days} \times \text{No. of trips}$$
$$= 30 \times 30 \times 60\% \times 25 \times 4^*$$
$$= 54,000 \text{ passenger-km}$$

* Two round trips means 4 onward trips

Operating Cost Sheet for the period.....

Particulars	₹	₹
Standing Charges :		
Depreciation		4,000
Running and maintenance charges:		
Salaries of driver, conductor and other staff	10,000	
Diesel, oil and lubricants	6,000	
Repairs & maintenance	<u>1,600</u>	17,600
Total Operating Costs		21,600

Cost per passenger –km = $\frac{\text{Total Operating Cost}}{\text{Total Passenger-km}} = \frac{21,600}{54,000} = ₹0.4$ per passenger-km

Let, fare per passenger-km = x

$$X = ₹0.4 + 20\% \text{ of } x$$

$$\text{Or, } x - 0.20x = ₹0.40$$

$$\text{Or, } x = ₹0.5$$

$$\text{Fare per passenger for travelling on a way} = ₹0.5 \times 30 = ₹15$$

KNOW YOUR PROGRESS

State whether the following statements are true or false

1. There is no difference between operating costing and process costing (**True/ False**)
2. Operating costing unit is not a simple cost unit. (**True/ False**)
3. Service costing is applicable in canteens. (**True/ False**)
4. Motor cost for passengers is ascertained with reference to per passenger per km. (**True/ False**)
5. Service costing is one of the basic methods of operation costing. (**True/ False**)
6. In a transport company, salaries to truck drivers are a fixed charge. (**True/ False**)
7. Repairs and maintenance is an example of running cost. (**True/ False**)
8. Accumulation and control of cost in transport costing can be achieved through daily log sheet and operating cost sheet. (**True/ False**)

Illustration 10.6 A transport Company is running four buses between Delhi and Alwar covering a distance of 100 kms. The seating capacity of each bus is 40 passengers. The following particulars are obtained from its books for the month of October, 2017.

	₹
Wages of drivers, conductors	48,000
Salaries of office staff	15,000
Honorarium of Accountant	5,000
Diesel, Oil etc.	80,000
Repairs and maintenance	16,000
Road tax insurance	32,000

Depreciation 52,000
Interest and other charges 40,000

Actual passengers carried were 75% of the seating capacity. All the buses ran for 30 days. Each bus made one round trip per day. Find out the fare, the company should charge per passenger /km if it wants a profit of 20% on cost.

Solution:

Calculation of Passenger-km

Passenger-km

$$= \text{Distance} \times \text{Seating capacity} \times \text{Occupancy rate} \times \text{No. of days} \times \text{No. of trips} \times \text{No. of buses}$$

$$= 100 \text{ kms} \times 40 \text{ passengers} \times 75\% \times 30 \text{ days} \times 2^* \times 4$$

$$= 7,20,000 \text{ passenger-km}$$

*One round trip = 2 one way trips

Operating Cost Sheet for the month of October 2012

Particulars	₹.	₹
Standing Charges :		
Wages of drivers, conductors	48,000	
Salaries of office staff	15,000	
Honorarium of Accountant	5,000	
Road tax and insurance	32,000	
Depreciation	52,000	
Interest and other charges	<u>40,000</u>	1,92,000
Running and maintenance charges:		
Diesel, Oil etc.	80,000	
Repairs and maintenance	<u>16,000</u>	96,000
Total Operating Costs		2,88,000

$$\text{Cost per passenger-km} = \frac{\text{Total Operating Cost}}{\text{Total Passenger-km}} = \frac{2,88,000}{7,20,000} = ₹0.40 \text{ per passenger-km}$$

Let, fare per passenger-km = x

$$x = \text{Rs.}0.4 + 20\% \text{ of } x$$

$$\text{Or, } x - 0.2x = ₹0.4$$

$$\text{Or, } x = ₹0.50$$

Bus fare to be charged per passenger-km = Rs.0.50

Illustration 10.7 From the following data relating to two different vehicles, Cauvery and Krishna, compute the cost per running mile. Charge interest at 5% per annum on the cost of vehicles. The vehicles run 30 miles per hour on an average.

Particulars	Cauvery	Krishna
Mileage run (annual)	30,000	20,000
Cost of vehicle	₹ 50,000	₹ 30,000
Licence fee(annual)	₹ 1,500	₹ 1,500
Insurance(annual)	₹ 1,400	₹ 800
Rent (annual)	₹ 1,200	₹ 1,000
Salaries and wages	₹ 2,400	₹ 2,400
Drivers wages per hour	₹ 6	₹ 6
Cost of diesel per-litre	₹ 1.20	₹ 1.20
Miles run per liter	8 miles	8 miles
Repairs and maintenance	₹ 3.50	₹ 3
Tyre allocation per mile	₹ 0.75	₹ 0.50
Estimated life of vehicles (miles)	2,00,000	1,50,000

Solution:

Operating Cost Statement showing Cost per Running Mile

Particular	Amount (₹)	
	Cauvery	Krishna
Fixed Costs (per annum)		
Licence fee(annual)	1,500	1,500
Insurance(annual)	1,400	800
Rent (annual)	1,200	1,000
Salaries and wages	2,400	2,400
Interest Charge (at 5%)	2,500	1,500
	9,000	7,200
Total	0.30	0.36
cost per mile ¹	2.00	2.00
Variable Expenses (per mile)		12.00
Drivers wages (₹ 60 ÷ 30 miles)	12.00	3.00
Cost of diesel per-litre(₹ 96 ÷ 8 miles)	3.50	0.50
Repairs and maintenance expenses	0.75	0.20
Tyre Cost allocated	0.25	
Depreciation ((₹ 50,000 ÷ 2,00,000; ₹ 30,000 ÷ 1,50,000)	18.50	17.70
Variable Cost per mile	18.80	18.06
Total cost per running mile		

1. (₹ 9,000 ÷ 30,000 miles) and (₹ 7,200 ÷ 20,000 miles).

Illustration 10.8 Mr. Bata Krishana owns a fleet of taxis and the following information is available from the records maintained by him.

Number of taxis: 10	Garage rent: ₹ 1600 p. m
Cost of each taxi: ₹ 4,00,000	Insurance Premium: 5% p.a
Salary of manager: ₹ 6000 p.m	Annual tax: ₹ 600 per taxi
Salary of accountant: ₹ 5000 p.m	Driver's salary : ₹ 3000 p.m per taxi
Salary of cleaner: ₹ 2000 p.m	Annual repairs: ₹ 1,600 per taxi
Salary of Mechanic: ₹ 4000p.m	

Total life of taxi is about 2,00,000kms. A taxi runs, in all, 3,000 kms in a month of which 30% it runs empty. Petrol consumption is one litre for 10 kms at ₹ 102.00 per litre. Oil and other sundries are ₹ 50 per 100 kms. Calculate the cost of running a taxi per km.

Solution:

Statement of Operating Costs

Particular	Cost (₹) per tax per.....	
	Month	Eff. km
Common Costs (for all taxis)		
Salary of: Manager	₹ 6000	
Accountant	5000	
Cleaner	2000	
Mechanic	4000	
Garage Rent	<u>1,600</u>	
	1,860	
(₹18,600 ÷ 10 taxis)		8.8571 ¹
Fixed Charges (Direct)	83	
Insurance premium [(₹ 20,000 x 5 %) ÷ 12 months]	50	
Tax (₹ 600 ÷ 12 months)		
Driver's salary	4,000	
Repairs (₹ 1,600 ÷ 12 months)	133	
	4,266	2.0341
Running Costs		
Cost of petrol ²		14.5714
Oil and sundries ³		0.7143
Depreciation ⁴		2.8571
		<u>29.0340</u>

1. Effective monthly kms = (number of kms per month 3,000 – 30% empty) = 2,100.

Therefore, common costs per effective km = (₹18,600 ÷ 2,100 kms) = ₹ 8.8571

2. [(₹ 102 ÷ 10 kms) x 3,000 kms] ÷ 2,100 kms= 14.5714

3. [(₹ 50 ÷ 100 kms) x 3,000 kms] ÷ 2,100 kms=0.7143

$$4. [(\text{₹ } 4,00,000 \div (2,00,000 \text{ kms} - 30 \% \text{ empty})) = (\text{₹ } 4,00,000 \div 1,40,000 \text{ kms}) = 2.8571$$

Illustration 10.9 From the following information, calculate total kilometres and total passenger kilometres:

Number of Buses: 5

Days operated in the month: 25

Trips made by each bus: 4

Distance of route: 25 Km. (One side)

Capacity of Bus: 50 passengers.

Normal Passenger travelling: 90% of capacity.

Solution:

Calculation of Total Kilometres

Kilometres covered by one bus per day:

$$\text{Distance of route} = 25 \text{ Kms.} \times 2 = 50 \text{ Kms. (Going and Coming)}$$

$$\text{Distance covered in 4 trips} = 50 \text{ Kms.} \times 4 = 200 \text{ Kms.}$$

Kilometres covered during the month by one bus:

$$200 \text{ Kms.} \times 25 \text{ days} = 5,000 \text{ Kms}$$

Kilometres covered in a month by buses:

$$5,000 \text{ Kms.} \times 5 = \mathbf{25,000 \text{ Kms.}}$$

Calculation of total Passenger Kilometres

Capacity of Bus : 50 passengers

Normal Travelling : 90% of 50 passengers = 45 passengers

Passengers Kilometres : 45 passengers X 25,000 =

11,25,000 Passenger Kilometres

Illustration 10.10 A transport company is running two buses between two places 100 kilometres apart. The seating capacity of each bus is 50 passengers. The following particulars are taken from their books for a month.

	₹
Wages of drivers, conductors and cleaners	3,000
Salary of supervisory and office staff	1,500
Diesel oil etc.	6,000
Repair and maintenance	1,500
Taxation and insurance	2,000
Depreciation	3,000
Interest and other charges	2,500

The actual passengers carried were 80% of the capacity. The buses ran on all the days. Each bus made a to and fro trip. Find out the cost per passenger kilometre.

Solution:

Statement of operating Cost for the month

	Expenses for the month ₹	₹
Fixed/standing charges:		
Wages of drivers, conductor and cleaners	3,000	
Salary of supervisory and office Staff	1,500	
Taxation and insurance	2,000	
Interest and other charges	2,500	9,000
Variable or running Charges:		
Diesel oil etc.	6,000	
Repair and maintenance	1,500	
Depreciation	3,000	10,500
		19,500

For 4, 80,000 passenger-kilometres the cost is ₹19,500

For 1 passenger-kilometre $\frac{19,500}{4,80,000} = ₹ 0.04$

(Passenger kilometre = $2 \times 200 \times 30 \times 50 \times \frac{80}{100} = 4,80,000$)

Illustration 10.11 A transport service company is running 4 buses between two towns 50 miles apart. Seating capacity of each bus is 40 passengers. The following particulars were obtained from their books:

	₹
Wages of drivers, conductors and cleaners	2,400
Salaries of office and supervisory staff	1,000
Diesel oil and other oils	4,000
Repair and maintenance	800
Taxation, insurance etc.	1,600
Depreciation	2,600
Interest and other charges	2,000
	14,400

Actual passengers carried were 75% of the seating capacity. All the four buses ran on all the days of the month. Find out the cost per passenger mile.

Solution:

Statement of operating Cost for the month

Particulars	₹
Fixed or standing charges:	
Wages of drivers, conductors and cleaners	2,400
Salaries of officers and supervisory Staff	1,000
Taxation and insurance etc.	1,600
Interest and other charges	2,000
	7,000
Variable or Running Charges:	
Diesel and other oils	4,000
Repair and maintenance	800
Depreciation	2,600
Total Cost	14,400

$$\text{Cost per passenger mile working} = \frac{14,400}{3,60,000} = ₹ 0.04$$

Calculation of Passenger-miles

Passenger miles = No. of buses X actual passengers carried X distance of to and fro trip X days

$$= 4 \times \left(\frac{75}{100} \times 40 \right) \times (50 \times 2) \times 30 = 3,60,000$$

$$= 4 \times 30 \times 100 \times 30 = 3,60,000$$

Illustration 10.12 Mr. Ahuja runs a tempo service in the town and has two vehicles. He furnishes you the following data and wants you to compute the cost for running mile.

	Vehicle A ₹	Vehicle B ₹
Cost of vehicle	25,000	15,000
Road licence per year	750	750
Supervision and salary (yearly)	1,800	1,200
Driver's wages per hour	4	4
Cost of fuel per litre	1.50	1.50
Repair and maintenance per mile	1.50	2.00
Tyre cost per mile	1.00	0.80
Garage rent per year	1,600	550
Insurance premium yearly	850	500
Mile runs per litre	6	5
Mileage run during the year	15,000	6,000
Estimated life of vehicle miles	1,00,000	75,000

Charged interest at 10% p.a. on the cost of vehicle. The vehicles run 20 miles per hour on an average.

Solution

Operating Cost Statement for the period ending.....

	Vehicle A ₹	Vehicle B ₹
Fixed or standing charges p.a		
Road licence fee	750	750
Supervision and salary	1,800	1,200
Garage rent	1,600	550
Insurance	850	500
Interest @ 10% of cost	2,500	1,500
	7,500	4,500
Total	15,000	6,000
Mileage per annum miles	0.50	0.75
Fixed expenses per mile	0.20	0.20
Variable or Running Charges per mile:		
Driver's Wages ₹ 4/20	0.25	0.30
Fuel cost	1.50	2.00
Repair and maintenance	0.25	0.20
Depreciation $\frac{25,000}{1,00,000}$ and $\frac{15,000}{75,000}$	1.00	0.80
Tyre Cost		
Operating cost per mile	3.70	4.25

Illustration 10.13 Ranchi Transport Company supplies the following details in respect of a truck of 5 ton capacity.

Cost of truck	₹ 1, 00,000 p.m.
Estimated life	₹ 10 years
Diesel, oil, grease ₹ 20 per trip each way	
Repair and maintenance	₹ 800 p.m
Driver's wages	₹ 1,000 p.m.
Cleaner's wages	₹ 500 p.m
Insurance	₹ 7200 p.a
Taxes	₹ 3600
General super vision charges	₹ 7200 p.a

The truck carries goods to and from the city covering a distance of 100 miles. Each way outward trip freight is available to the full capacity and on return journey only 20% load of the capacity. Assuming that truck runs on an average 25 days in a month. You are required to work out:

- (1) Operating cost per ton-miles
- (2) Rate per ton trip that company should charge if a profit of 50% on freightage is to be earned.

Solution:

First of all calculation of ton miles

Outward trip 5 ton X 100 miles = 500 ton miles
 Inward trip 1 ton X 100 miles = 100 ton miles
 $\left(\frac{5 \times 20}{100} = 1 \text{ ton}\right) = \underline{600}$ ton miles

Total ton miles for the month (i.e., for 245 days)
 600 X 25 days = 15,000 ton miles.

Operating cost sheet Capacity 5 tons

Ton miles

15,000

Particulars	Cost per month (₹)	Cost per ton-mile (₹)
(A) Standing Charges		
Driver's Wages	1000	
Cleaner's wages	500	
Insurance	$\frac{7200}{12}$ 600	
Taxes	$\frac{3600}{12}$ 300	
General Supervision charges	$\frac{7200}{12}$ 600	
Total (A)	<u>3,000</u>	
(B) Maintenance Charges		
Repairs	<u>800</u>	
Total (B)	<u>800</u>	
(C) Running Charges		
Diesel, Oil & Grease (20 X 2 X 25)	1,000	
Depreciation $\frac{1,00,000}{10} \times \frac{1}{12}$	833	
Total Operating cost (A) + (B) + (C)	<u>1,833</u>	
Total (C)	<u>5,633</u>	0.375
Cost per ton mile = $\frac{5633}{15,000}$		<u>0.357</u>
Profit 50% on freight (charges)		<u>0.75</u>
Or 100% on cost		

Charges per ton Km

(Freight per km)

Freight per trip:

Outward 5 ton X 100 km X .75 = ₹ 375

Inward 1 ton X 100 km X 7.5	= ₹ 75
Rate per Trip	= ₹ 450
(Freight per Trip)	<u>₹ 450</u>

Illustration 10.14 Prepare a statement of operating cost per tonne-mile and per passenger-mile for vehicle A and vehicle B respectively for the year ended on 1st December, 2020 from the following:

Vehicle	A	B
	(₹)	(₹)
Cost of Vehicle	80,000	50,000
Insurance	800	500
Garage rent	1,500	1,000
Supervision & Staff salaries	2,000	1,800
Road Tax	400	250
Repair and maintenance	1,900	1,500
Spare parts	1,500	1,800
Oil and Grease	200	150
Depreciation of Tyres	500	400
Licences Fees	100	80
Interest on cost of vehicle per year	15%	20%
Salaries of driver, conductor, & cleaners	5,000	4,000
Insurance of Goods in Transit	1,000	--
Cost of fuel per litre	4	4
Mileage run per litre	20 miles	30 miles
Total cost of fuel (Per year)	₹ 10,000	₹ 12,000
Life of vehicle	16,00,000 miles	20,00,000 miles
Average passengers carried	--	20 daily
Average weight carried during the year	200 tones	--

Solution:

Statement of Operating Cost

Particulars	Vehicle A	Vehicle B
(A) Standing Charges	(₹)	(₹)
Insurance	800	500
Road Tax	400	250
Licences Fees	100	80
Interest on cost of vehicle	<u>12,000</u>	<u>10,000</u>
Total	<u>13,300</u>	<u>10,830</u>
(B) Maintenance Charges		
Supervision & Staff Salaries	2,000	1,800
Repair & Maintenance	1,900	1,500
Garage Rent	1,500	1,000
Spare Parts	<u>1,500</u>	<u>1,800</u>

	<u>6,900</u>	<u>6,100</u>
(C) Running Charges		
Oil & Grease		
Dep. Of Tyre	200	150
Depreciation of vehicle	500	400
Salary of Driver & Conductor	2,500	2,250
Insurance on transit goods	5,000	4,000
Cost of fuel	1,000	--
	<u>10,000</u>	<u>12,000</u>
Total	<u>19,200</u>	<u>18,800</u>
Total Operating (A+B+C)	<u>39,400</u>	<u>35,730</u>
Total Units	10,00,000	18,00,000
	Tonne-Miles	Passenger-Mile
Operating cost per unit	0.394 paise	1.99 paise
Working Notes		

Total unit for vehicle during the year is calculated as follows:

Total mileage during the year = $\frac{\text{Total Cost of fuel}}{\text{cost of fuel per litre}} \times \text{per litre mileage}$

Vehicle A = $\frac{10,000}{4} \times 20 = 50,000$ miles

Vehicle B = $\frac{12,000}{4} \times 30 = 90,000$ miles

Total Unit

A = Mileage during the year X weight carried
= 50,000 X 200 = 10,00,000 tonne miles

B = Mileage during the year X Passenger carried daily
= 90,000 X 20 = 18,00,000 passengers-mile

Depreciation = $\frac{\text{Cost of vehicle}}{\text{Expected Life}} \times \text{mileage during the year}$

Vehicle (A) = $\frac{80,000}{16,00,000} \times 10,00,000 = ₹ 2,500$

Vehicle (B) = $\frac{50,000}{20,00,000} \times 18,00,000 = ₹ 2,250$

KNOW YOUR PROGRESS

9. Operating costing is also known as _____ costing
10. In transport costing, _____ expenses will not be in direct proportion to kms run.
11. A bus carries 25 passengers daily for 25 days and its mileage per month is 2000 kms. Its passenger kms are _____.

12. If the present cost of a car is ₹ 5,00,000, residual value at the end of 5th year is ₹1,00,000.
The monthly depreciation is _____.
13. In hospitals, the cost unit is _____.
14. Composite unit is distinctive feature of _____ costing.
15. Cinema houses must adopt _____ costing.

10.12 SUMMARY

An analysis of industrial sector from the point of view of output reveals two broad categories of industries. They are industries engaged in manufacturing of goods and industries engaged in generating and rendering services. Operating costing is a method of costing used to ascertain the cost of generating and rendering services. It is generally applied in transport undertakings, hotels, hospitals, electricity supply companies etc. In transport undertaking, a log sheet is maintained for each vehicle to record the details of the trip to avoid the idleness of vehicles, to prevent waste of capacity and to ascertain the operating cost. Operating cost is the sum total of standing charges, maintenance charges and running charges which is calculated by preparing an operating cost sheet. Operating cost is calculated to ascertain the cost of running a vehicle and accordingly rates of carriage of goods and passengers are fixed.

10.13 KEY WORDS

1. **Operating costing:** It is a method ascertaining the cost of providing or operating a service within or outside the undertaking. It is also known as service costing.
2. **Cost unit:** It is a unit of product, service or time in terms of which costs are ascertained or expressed. It may be simple cost unit like number (Bricks-per 1000 bricks), weight (Gold-per 10 grams) and compound cost unit which is used in service industries like transport (passenger Kms., tonne Kms., hospitals (per bed per day), hotel (per room per day).
3. **Transport Costing:** It is a method of ascertaining the cost of providing service (carriage of goods or passengers) by a transport undertaking.
4. **Log Sheet:** A log sheet is a record which is maintained for each vehicle to record the details of trips, running time, capacity, distance covered, cost of fuel etc. on daily basis.
5. **Operating Cost Sheet:** Operating cost sheet is prepared to accumulate costs of operating vehicles for a certain period.
6. **Standing Charges:** Standing charges refer to the expenses which are incurred irrespective of operation. They are fixed in nature. Examples – monthly salary of employees, license fees, insurance premium, garage rent, interest on capital etc.
7. **Maintenance Charges:** These are the expenses which are necessarily to be incurred to keep the vehicles in good condition for undertaking the revenue generating trips. These expenses are semi-variable in nature because they are usually influenced by both the time and the volume of operation.

8. **Running Charges:** These are the expenses which are very essential for operating vehicles. These expenses are variable in nature being they vary with operation in the same direction. Examples – costs of petrol or diesel, grease, oil etc.

10.14 ANSWER FOR CHECK YOUR PROGRESS

1. **False**
2. **True**
3. **True**
4. **True**
5. **True**
6. **True**
7. **True**
8. **True**
9. **Service**
10. **Standing**
11. **50,000**
12. **₹6,667**
13. **bed per day**
14. **operating**
15. **operating**

10.15 TERMINAL QUESTIONS

SHORT QUESTIONS

1. Define operating costing.
2. What is meant by unit of operating cost?
3. Give a Classification operating costs.
4. What do you mean by composite cost unit?
5. Give the names of any five industries which make use of operating costing.
6. Mention the basis of classifying costs in transport costing.
7. What is a log sheet?
8. What do you mean by absolute tonne km?
9. What do you mean by commercial tonne km?
10. What is an operating cost statement?

LONG QUESTIONS

1. Define operating costing? State its objectives .Write the name of five industries where operating costing is adopted.
2. Write the features of industries adopting operating costing.
3. Draw up a Performa of cost statement of a transport undertaking with imaginary figures.

4. What is daily log sheet? What is its usefulness? Give the format of daily log sheet?
5. State the procedure of preparing transport operating cost sheet.

NUMERICAL QUESTIONS

6. From the following information, calculate kilometre and total passenger kilometre

Number of buses: 4

Days operated in a month: 30

Trip made by each bus: 4

Distance of route: 30 kilometres long (one way)

Capacity of bus: 60 passengers

Normal passengers travelling: 80% of the capacity

Answer: Total Kilometres Covered = 28,800

Total passenger kilometre covered = 13,82,400

7. Atul Transport Co., supplies the following information in respect of truck of five-tonne capacity.

Cost of truck: ₹ 90,000

Estimated life: 10 years

Insurance: ₹ 4,800 a year

Tax: ₹ 2,400 a year

Driver's wages: ₹ 500 per month

Cleaner's wages: ₹ 250 per month

Diesel, oil and grease: ₹ 15 per trip each way

Repair and maintenance: ₹ 500 per month

General supervision charges: ₹ 4,800 a year

The truck carries goods to and from the city covering a distance of 50 miles on each way. While going to the city, freight is available to the extent of full capacity and on return, 20% of the capacity. The truck runs, on an average, 25 days a month.

Find:

(i) Operating cost per tonne-mile.

(ii) The rate per tonne per trip that the company should charge, if profit of 50% on freightage is to be earned.

Answers: Operating cost per tonne-mile = ₹ 0.50,

The rate per tonne per trip = ₹ 1.00

8. A transport service company is running 10 buses between Hubli and Dharwad. The distance from Hubli to Dharwad is 25 kms. Seating capacity of bus is 50 passengers. The following particulars were obtained from their books for November 2018.

Salary of drivers	₹ 6,000	Insurance	₹ 4,000
Staff salaries	₹ 3,000	Depreciation	₹ 5,625
Diesel	₹ 2,000	Interest and other charges	₹ 5,500
Repairs	₹ 2,000		

Actual passengers carried were 75% of the seating capacity. All the buses ran on all days of the month. Each bus made one round trip per day. Find out the cost per passenger-km.

Answer: Cost per passenger-km. = ₹ 0.05

9. The following figures are extracted from the books of a firm having five passenger buses for the year 2012. The costs of buses are ₹ 50,000, ₹ 1,20,000, ₹ 45,000, ₹ 55,000 and ₹ 80,000.

Depreciation:	20% of the cost p.a	Rent of six garages	₹ 100 p.m each
Annual repairs:	80% of depreciation	Diesel, Oil etc., for the year	₹ 1,87,200
Wages of 10 drivers:	₹ 600 each per p.m	Office establishment	₹ 600 p.m
Wages of 10 cleaner:	₹ 300 each per p.m	Licences and taxes:	₹ 4,000 half-yearly
Interest:	8% on capital	Realization of old tyres& tubes:	₹ 3,600 half-yearly
Directors fees:	₹ 900 p.m		

900 passengers were carried over 1,600 kms during the year. Prepare an operating cost sheet for the year 2012 showing the unit cost per passenger k.m.

Answer: cost per passenger-km. = ₹ 0.33

10. From the following data, calculate the cost per km of a vehicle.

Estimated life: 2,00,000 kms	Insurance charges per annum: ₹ 150
Estimated annual kms: 7,500 kms	Garage rent per annum: ₹ 1,800
Value of vehicles: ₹ 25,000	Driver's Salary per month: ₹ 500
Road licence per annum: ₹ 700	Cost of petrol per litre: ₹ 8
Proportionate charge for tyres& maintenance per k.m: ₹ 0.7 kms per litre: 16	

Answer: cost per -km. = ₹ 2.478

11. Friends Bus Service running the following fleet of buses within the limits of this city.

No. of Buses	Carrying Capacity
20	60
15	50
10	40

On an average each bus makes 5 trips a day covering a distance of 20Km. In each trip 80% of capacity the seats are occupied. Generally 9 buses to be kept away from road each day for repair. Calculate the passenger km. for the month of January 2014.

Answer: The passenger km. = 46,62,400 km

12. Rama has been promised a contract to run a tourist car on a 20km long route for the chief executive of a multinational firm. He buys a car costing ₹ 1,50,000. The annual cost of insurance and taxes are ₹ 4500 and ₹ 900 respectively. He has to pay ₹ 500 p.m for a garage as a rent. The annual repair costs are estimated at ₹ 4,000. The car is estimated to have a life of 10 year, at the end of which the scarp value is likely to be ₹ 50,000.

He hires a driver who is to be paid ₹ 300 per month plus 10% of the taking as commission. Other incidental expenses are estimated to be ₹ 200 p.m.

Petrol and oil will cost ₹ 100 per 100 km. The car will make 4 round trips each day. Assuming that a profit of 15% on taking is desired and the car will be on road for 25 days on an average per month, what should be the charges per round trip?

Answer: charges per round trip = ₹ 8

13. A transport company runs 5 buses between two places covering a distance 25 kms. Seating capacity of each bus is 50 passengers. Generally 80% seating capacity is utilized in each bus. All buses run 25 days a month, each making 4 round trips daily. If total operating cost during a month for all the five buses is ₹ 16 lakh and profit on taking is assumed to be 20%, calculate the bus fare to be charged for each passenger-km.

Answer: ₹ 2.00

14. X & Company runs a bus between two places covering a distance of 30Kms. Seating capacity of the bus is 30 passengers. The expenses for the month of May 2017 were as follows:

	₹
Salaries of driver, conductor and other staff:	10,000
Diesel, oil and lubricants	6,000
Repair & maintenance	1,600
Depreciation	4,000

The bus ran 25 days in May 2017 making two round trips per day, 60% of capacity was utilized.

(a) Find out per passenger-km

(b) What will be the fare per passenger if company wants to maintain a profit @ 20% on sales?

Answer: (a) 54,000 passenger Km.54, (b) ₹ 15.00

B. COM
SEMESTER IV
COURSE: COST ACCOUNTING

UNIT-11 NON-INTEGRAL AND INTEGRAL SYSTEM OF ACCOUNTING

STRUCTURE

- 11.0 Objectives**
- 11.1 Introduction**
- 11.2 Concept of Non-Integral Accounting System**
- 11.3 Basic features**
- 11.4 Important ledgers**
- 11.5 Advantages**
- 11.6 Limitations**
- 11.7 Journal entries to record transactions**
- 11.8 Integral Accounting System – Introduction**
- 11.9 Features**
- 11.10 Advantages**
- 11.11 Books of accounts**
- 11.12 Pre-requisites**
- 11.13 Distinction**
- 11.14 Journal entries to record transactions**
- 11.15 Summary**
- 11.16 Summary of accounting entries under both the systems**
- 11.17 Key words**
- 11.18 Answer to check your progress**
- 11.19 Terminal Questions**

11.0 OBJECTIVES

After studying this unit you will be able to:

- Know the concept of both the systems of accounting .
- Learn about the accounts maintained under both the systems of accounting .
- Know the significance and limitations of both the systems of accounting .
- Know the differences between these two systems of accounting .

11.1 INTRODUCTION

Accounting is the systematic recording of business transactions in monetary value. In the early stages, cost data were mainly collected for cost ascertainment from various cost departments. The same documents were also used by financial accounts for the preparation of profit loss account and balance sheet. Small firms used to obtain their cost information from financial records. Since, cost accounting has developed as a separate branch of accounting, it should have separate accounting system of its own in order to facilitate the analysis of cost.

Basically there are two systems of accounting to keep the cost books :

1. Non-integral or cost ledger accounting
2. Integral or integrated accounting

11.2 CONCEPT OF NON-INTEGRAL ACCOUNTING SYSTEM

Under non -integral accounting system, two separate sets of books are maintained; one for the financial accounts and another for cost accounts. The financial accountant looks after the financial transactions and cost accountant looks after the cost accounting transactions. Both the systems of accounting follow the principle of double entry system. It is also known as **non-integrated system** or **inter-locking system** or **cost ledger accounting system**. CIMA London defines Non-integral system as, “a system in which the cost accounts are distinct from financial accounts, the two sets of accounts being kept continuously in agreement by the use of control accounts or made readily reconcilable by other means.”

11.3 BASIC FEATURES

The basic features of non-integral system are as follows:

1. Cost accounts are concerned with **impersonal accounts**.
2. Under this system, one main ledger (i.e., cost ledger) and various **subsidiary ledgers** are maintained.
3. **Two different sets** of accounting records are maintained for financial accounting and cost accounting.

4. The **principal ledgers** maintained under this system are cost ledger, stores ledger, WIP ledger and finished goods ledger.

11.4 IMPORTANT LEDGERS

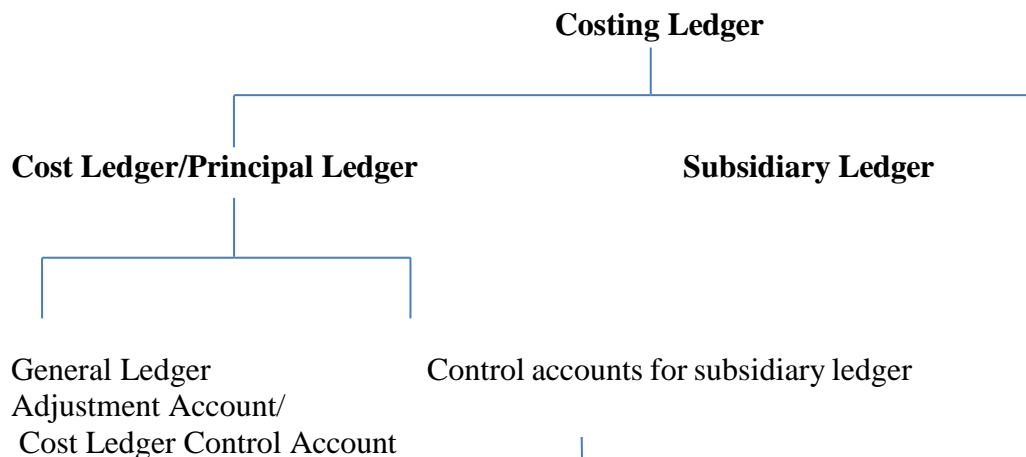
The important ledgers maintained in the **financial books** are as follows:

1. General ledger
2. Debtors ledger
3. Creditors ledger

Similarly the important ledgers maintained in **cost books** are as follows:

1. **Cost Ledger:** It is the principal ledger containing all impersonal accounts. It is made self-balancing by maintaining therein a control account for each of the other three ledgers. It is similar to general ledger in financial accounts. All nominal accounts are transferred from the financial books. The transfers from cost books to financial books are also posted.
2. **Stores Ledger:** This contains all the stores accounts. A separate account is opened for each item of stores. The basis for recording the transactions are material received note, material requisition note, material transfer note and material return note.
3. **Work-in-Progress Ledger:** This contains accounts of various jobs. The accounts of all the jobs or processes are separately opened in the ledger. This ledger is also known as job ledger. The main purpose of this ledger is to record the cost of materials, wages and overheads incurred in each job undertaken. Every job is assigned a number and separate account for each job is maintained.
4. **Finished Goods Ledger:** This contains accounts of all types of finished goods or completed jobs. A separate account is opened for each type of finished product, job etc.

Of the four ledgers, the cost ledger is the principal ledger and the other three are subsidiary ledgers. The various control accounts prepared under the cost ledger are as follows:



1. Stores Ledger
2. Work-in-progress Ledger
3. Finished Goods Ledger

1. Stores Ledger Control Account
2. Work-in-progress Ledger Control Account
3. Finished Goods Control Account
4. Wages Control Account
5. Factory Overhead Control Account
6. Office Overhead Control Account
7. Selling and Distribution Overhead Control Account
8. Cost of Sales Account
9. Costing Profit and Loss Account
10. Overhead Suspense / Adjustment Account

1. **General Ledger Adjustment Account:** It is also called cost or financial ledger control account. All transfers from cost books to finance books and vice versa are passed through this account.
2. **Stores Ledger Control account:** The total of stores ledger is entered in this account. It deals with transactions of materials. All receipts are debited and issues are credited, the balance shows the stock of raw materials.
3. **Work-in-progress Ledger Control Account:** This account is debited with the opening balance of work in progress, materials, labour and factory overheads recovered and credited with the cost of finished goods. Balance will be the closing work- in- progress. This account represents cost ledger in summary form.
4. **Finished Goods Control Account:** This account is debited with the opening balance of finished goods, the cost of finished goods for the period transferred from the WIP control account and the amount of administrative overhead recovered. This account represents finished goods, stock ledger transactions in total form. The closing balance will show unsold stock carried over.
5. **Wages Control Account:** In this account, the wages accrued and paid are recorded. Direct wages will be transferred to work –in- progress account and indirect wages to respective overheads accounts. Postings are made in this account from wages analysis sheet.
6. **Factory Overhead Control Account:** This account deals with manufacturing overhead expenses. It is debited by the amount of indirect material, indirect wages and indirect expenses incurred. This account is credited by the amount of overhead recovered.

7. **Office Overhead Control Account:** Office and administration overhead is debited to this account and the amount of overhead recovered in the finished goods is credited to this account. The balance represents overhead under or over absorbed which are transferred to costing profit and loss account.
8. **Selling and Distribution Overhead Control Account:** This account is debited with selling and distribution cost and credited with overhead recovered from goods sold. Difference, if any, is transferred to costing profit and loss account.
9. **Cost of Sales Account:** This account is debited with cost of goods sold and selling and distribution overhead recovered and is closed by transferring to profit and loss account.
10. **Costing Profit and Loss Account:** This account records the transfer of under or over recovered overheads, abnormal loss of profit or gains and profit and loss transferred from sales account. The closing balance represents the net profit or loss and is transferred to general ledger adjustment account.
11. **Overhead Suspense / Adjustment Account:** This account is used to record under or over absorption of overheads.

11.5 ADVANTAGES

The following are some of the advantages of Non-integral accounting system:

- a) When separate set of costing books are maintained it facilitates **ready accomplishment of its objectives.**
- b) It **avoids the complications of recording** the entries if it is integrated with financial accounts.
- c) It can be maintained according to convenience as it need not be statutorily maintained.

11.6 LIMITATIONS

The following are some of the advantages of Non-integral accounting system:

- a) When cost accounts are independently maintained, it amounts to **duplication of expenses** along with financial accounts.
- b) The profits shown by cost books may vary with that shown by financial accounts. This **requires reconciliation** which involves time and effort.

11.7 JOURNAL ENTRIES TO RECORD TRANSACTIONS

The Journal entries to record transactions under Non -Integral Accounting System are as follows:

Sl.NO	Transactions	Particulars	Dr	Cr
1.	Material purchased for stock	Stores Ledger Control A/c.....Dr To General Ledger Adjustment A/c		

2.	Materials purchased for special jobs	Work – In - progress control A/c....Dr To General Ledger Adjustment A/c		
3.	Entry for direct materials issued to production	Work – In - progress control A/c....Dr To Stores Ledger Control A/c		
4.	Indirect material issued to production	Production overhead control A/c To Stores Ledger Control A/c		
5.	Materials returned to supplier	General Ledger Adjustment A/c...Dr To Stores Ledger Control A/c		
6.	Materials returned from production department to store	Stores Ledger Control A/c.....Dr To Work – In - progress control A/c		
7.	Materials transferred from job to another job	No entry in control account In work in progress ledger : Transferee job A/c..... Dr To Transferor job A/c		
8.	Labour: Salaries and wages paid	Wages control A/c.....Dr To General Ledger Adjustment A/c		
9.	Allocation of direct wages	Work-in-progress control A/c....Dr To Wages control A/c		
10.	Allocation of indirect wages	Respective wages control A/c....Dr To Wages Control A/c		
11.	Direct expenses: Direct expenses paid	Work – In - progress control A/c....Dr To General Ledger Adjustment A/c		
12.	Overheads: Overheads incurred and accrued	Respective overhead control A/c.....Dr To General Ledger Adjustment A/c		
13.	Overhead recovered	Work – In - progress control A/c....Dr (for works overhead) Finished goods ledger control A/c....Dr (for administration overhead) Cost of sales A/c Dr (for selling and distribution overhead) To respective overhead control A/c		
14.	Over absorption of overheads	Respective overhead control A/c.....Dr To Costing profit and loss A/c		
15.	Under absorption of overhead	Costing profit and loss A/c..... Dr To respective overhead control A/c		
16.	Finished stock produced	Finished goods stock ledger A/c.....Dr		

		To Work – In - progress control A/c		
17.	Cost of goods sold	Cost of sales A/c.....Dr To Finished goods stock ledger A/c		
18.	Cost of sales	Sales A/c..... Dr To cost of sales A/c		
19.	Sales	General Ledger Adjustment A/c...Dr To Sales A/c		
20.	Profit on goods sold	Sales A/c.....Dr To Costing profit and loss A/c		
21.	Recording sales return	Costing profit and loss A/c.....Dr To General Ledger Adjustment A/c		
22.	For net profit	Costing profit and loss A/c.....Dr To General Ledger Adjustment A/c		
23.	Repair work on completion	Respective overhead control A/c....DR To repair order A/c		
24.	For recording under-absorption of overheads	Costing profit and loss A/c.....Dr To overhead control A/c		
25.	For recording over-absorption of overheads	Overhead control A/c To Costing profit and loss A/c		
26.	Transfer of net profit	Costing profit and loss A/c.....Dr To General Ledger Adjustment A/c		

Illustration 11.1 The following figures have been ascertained from the costing records. You are the required the passed the necessary entries in the Cost journal. Assume that a system of maintaining control account prevails in the organisation.

	₹
(1) Purchase	3,90,000
(2) Carried inward	5,850
(3) Stores issued	3,58,800
(4) Production wages	3,46,320
(5) Unproductive wages	1,21,680
(6) Works on cost	3,48,400
(7) Materials used in repairs	3,120
(8) Cost of completed jobs	12,80,630

Solution:

Cost Journal

	Dr.	₹	₹
(1)Stores Ledger Control A/C To General Ledger Adj. A/C (Being the entry for purchase the materials)	Dr.	3,90,000	3,90,000
(2)Stores Ledger Control A/C To General Ledger Adj. A/C (Being carriage inward treated as part of the cost of materials purchased)	Dr.	5,850	5,850
(3)Work-in-Progress Ledger Control A/C To Stores Ledger Control A/C (Being materials issued for production)	Dr.	3,58,800	3,58,800
(4)Wages Control A/C Dr. To General Ledger Adj. A/C (Being payments of wages)		3,46,320	3,46,320
(5)Factory Overhead Control A/C To Cost Ledger Control A/C (Being indirect wages incurred)	Dr.	1,21,680	1,21,680
(6)Factory Overhead Control A/C To Cost Ledger Control A/C (Being works overhead other then indirect wages)	Dr.	3,48,400	3,48,400
(7)Factory Overhead Control A/c To stores ledger control A/c (Being material used in repair)		3,120	3,120
(8)Finished Stock Ledger Control A/C To work-in-Progress ledger Control A/c (Being completed production transferred finished stock)	Dr.	12,80,630	12,80,630

Illustration 11.2 From the following figures ascertained from Costing records and financial books of a factory you are required to pass necessary entries in the cost journal (assume that a system of maintaining control accounts prevails in the organisation)

	₹
Purchases	3,90,000
Carried Inward	5,850
Stores issued	3,58,800
Productive wages	3,46,320
Unproductive labour	1,21,680
Work on cost	3,48,400
Materials used in repairs	3,120
Cost of completed jobs	12,80,630

Solution:

Stores Ledger Control A/c Dr. To General Ledger Adjustment. A/c (Being purchases made)	₹ 3,90,000 5,850	₹ 3,90,000 5,850
Stores Ledger Control A/c Dr. To General Ledger Adjustment A/c (Being carriage inward incurred)	3,58,800	3,58,800
Work-in-Progress ledger Control A/c Dr. To Stores Ledger Control A/c (Being stores issued for production)	4,68,000	4,68,000
Wages Control A/c Dr. To General Ledger Adjustment A/c (Being wages paid 3,46,320 + 1,21,680)	3,46,320 1,21,680	4,68,000
Work-in-Progress Ledger Control A/c Dr. Factory Overhead Control A/c Dr. To Wages Control A/c (Being allocation of wages made to production and factory overheads)	3,48,400 3,120	3,48,400 3,120
Wages Overhead Control A/c Dr. To General Ledger Adjustment A/c (work on cost incurred)	12,80,630	12,80,630
Factory Overhead Control A/c To Stores Ledger Control A/c (material used for repairs)		
Finished Stock Ledger Control A/c Dr. To Work-in-Progress Ledger Control A/c (Transferring completed job to finished stock)		

Illustration 11.3 Enter the following transactions in the cost books.

	₹
1. Direct Expenses	500
2. Analysis of overheads (services by creditors):	
Works overhead	2,000
Administration Overhead	1,000
Selling and distribution overhead	2,000
3. Analysis of petty cash reveals:	
Works overhead	120
Administration Overhead	10
Selling and distribution overhead	70
4. Overhead is absorbed as under:	
Works overhead	1,900
Administration Overhead	1,050
Selling and distribution overhead	2,000

Solution:

Cost Books

	₹	₹
1. Works-in-progress Ledger Control A/c Dr. To General Ledger Adjustment A/c (Being amount of direct expenses)	500	500
2. Works overhead Control A/c Dr. Administration Overhead Control A/c Dr. Selling and Distribution overhead Control A/c Dr. To General Ledger Adjustment A/c (Being amount of direct expenses)	2,000 1,000 2,000	5,000
3. Works Overhead Control A/c Dr. Administration Overhead Control A/c Dr. Selling and distribution Overhead Control A/c Dr. To General Ledger Adjustment A/c (Being amount of overhead as per petty cash)	120 10 70	200
4. Works-in-progress Ledger Control A/c Dr. To Works Overhead Control A/c (Being amount of direct expenses)	1,900	1,900
Finished Goods Ledger Control A/c Dr. To Administration Overhead Control A/c (Being administration overhead recovered by finished goods)	1,050	1,050
Cost of Sales A/c Dr. Selling and Distribution Overhead Control A/c (Being Selling and distribution overhead recovered)	2,000	2,000
Costing Profit and Loss A/c Dr. To Works Overhead Control A/c To Selling and Distribution Overhead Control A/c (Being the amount of under absorption transferred to costing P&L A/c.)	290	220 70

Administrative Overhead Control A/c To Costing P&L A/c (Being the amount of over absorption transferred to costing P&L A/c.)	Dr.	40	40
--	-----	----	----

From the above, it will be observed that works overhead and selling and distribution overhead are under recovered and administration overhead is over recovered.

	<i>Overhead Incurred</i>	<i>Overhead absorbed</i>	<i>Under recovery</i>	<i>Over Recovery</i>
Works overhead	2120	1900	220	--
Administration Overhead	1010	1050	--	40
Selling and Distribution overhead	2070	2000	70	--

Note: Over recovery or under recovery may be put as balances of Overhead Control Account i.e. not transferred to Costing P/L A/c.

Illustration 11.4 As at 31st March 2021, the following balance existed in a company's cost ledger

	Dr.	Cr.
Stores Ledger Control A/C	6,02,870	
Work-in-Progress control A/C	2,44,730	
Finished Stock Ledger Control A/C	5,03,890	
Manufacturing Overhead Control A/C		21,050
Administration on Cost		13,30,440
Cost Ledger Control A/C	<u>13,51,490</u>	<u>13,51,490</u>

During the next three months the following items arose

	₹
(1) Raw material purchased	2,46,000
(2) Materials returned to suppliers	5,800
(3) Material issued to production	2,54,630
(4) Factory wages	1,01,060
(5) Manufacturing Overhead Incurred	1,83,020
(6) Indirect labour	43,330
(7) Manufacturing oh. Charge to production	1,54,400
(8) Cost of sales	3,71,780
(9) Sales return at cost	10,760
(10) Finished product at cost	4,21,670

Pass the necessary entries, open ledger accounts and prepare trial balance

Cost Journal

		₹	₹
(1) Stores Ledger Control A/c	Dr.	2,46,000	
To General Ledger Adj. A/c			2,46,000
(Being materials purchased)			
(2) General Ledger Adj. A/c	Dr.	5,800	
To Stores Ledger Control A/c			5,800
(Entry for materials return to suppliers)			
(3) Work-in-Progress Control A/c	Dr.	2,54,630	
To Stores Ledger Control A/c			2,54,630
(Entry for issued of materials to suppliers)			
(4) Wages Control A/c	Dr.	1,01,060	
To General Ledger Adj. A/c			1,01,060
(Entry for direct wages incurred)			
(5) Work-in-progress Control A/c	Dr.	1,01,060	
To Wages Control A/c			1,01,060
(Entry for direct wages charged to production)			
(6) Work Overhead Control A/c	Dr.	1,83,020	
To General Ledger Adj. A/c			1,83,020
(Entry for works overhead incurred)			
(7) Work overhead control A/c	Dr.	43,330	
To General Ledger Adj. A/c			43,330
(Entry for indirect wages incurred)			
(8) Work-in-progress Control A/c	Dr.	1,54,400	
To Work Overhead Control A/c			1,54,400
(Entry for oh. charged to production)			
(9) General Ledger Adj. A/c	Dr.	3,71,780	
To Finished Stock Ledger Control A/c			3,71,780
(Entry for cost of sales)			
(10) Finished Stock Ledger Control A/c	Dr.	10,760	
To General Ledger Adj. A/c			10,760
(11) Finished Stock Ledger Control A/c	Dr.	4,21,670	
To Work-in-Progress Control A/c			4,21,670
(Entry for finished goods transferred)			

General Ledger Adj. A/C

To Stores Ledger Control A/C	5,800	By balance c/d	13,30,440
		By Stores Ledger Control A/C	2,46,000
To Finished Stock Ledger Control A/C	3,71,780	By Wages control A/C	1,01,060
To balance c/d	15,37,030	By works oh. Control A/C	1,83,020
		By works oh. Control A/C	43,330
		By Finished Stock Ledger Control A/C	10,760
	<u>1,9,14,610</u>		<u>1,9,14,610</u>

Stores Ledger A/c

To balance b/d	6,02,870	By General Ledger Control A/C	5,800
To General Ledger Adj. A/C	2,46,000	By Work-in-Progress Control A/C	2,54,630
			<u>5,88,440</u>
		By balance c/d	
	<u>8,48,870</u>		<u>8,48,870</u>

Manufacturing overhead control A/c

To General Ledger Control A/c	1,80,020	By balance c/d	21,050
		By Work-in-Progress Control A/c	1,54,000
To General Ledger Control A/c	<u>43,300</u>	By balance c/d	<u>50,900</u>
	<u>2,26,350</u>		<u>2,26,350</u>

Work-in-Progress Account

	₹		₹
To Balance b/d	2,44,730	By Finished Ledger Control A/c	4,21,670
To Store Ledger control A/c	2,54,630	By Balance c/d	3,33,150
To Wages control A/c	1,01,060		
To Mfg overhead Control A/c	<u>1,54,400</u>		
	7,54,820		<u>7,54,820</u>

Finished Goods Account

	₹		₹
To Balance b/d	5,03,890	By Cost Ledger Control A/c	3,71,780
To Work-in-Progress Control A/c	4,21,470	By Balance c/d	5,64,540
To Gen Ledger Adj. A/c	10,760		
	9,36,320		9,36,320

Trial Balance as on 31st March 2021

	Dr.	Cr.
Cost Ledger Control A/c		15,37,030
Stores Ledger Control A/c	5,88,440	
Mfg oh. Control A/c	50,900	
WIP control A/c	3,33,150	
Finished stock ledger control A/c	<u>5,64,540</u>	
	15,37,030	15,37,030

Illustration 11.6: On 31.03.2019, the following balances were extracted from the books of the Supreme manufacturing company.

	Dr.(₹)	Cr.(₹)
Stores Ledger Control A/c	35,000	
WIP Control A/c	38,000	
Finished goods control A/c	25,000	
Cost Ledger Control A/c	98,000	98,000

The following transactions took place in April 2019:

	(₹)
Raw materials:	
Purchased	95,000
Returned to suppliers	3,000
Issued to production	98,000
Returned to stores	3,000
Productive wages	40,000
Indirect labour	25,000
Factory overhead expenses incurred	50,000
Selling and administration expenses	40,000
Cost of finished goods transferred to warehouse	2,13,000
Cost of goods sold	2,10,000
Sales	3,00,000

Factory overheads are applied to production at 150% direct wages and under or over absorbed overhead being carried forward for adjustment in the subsequent months. All administrative and selling expenses are treated as period cost and charged to the profit and loss account of the month in which they are incurred:

Show the following accounts.

- (a) Cost Ledger Control A/c
- (b) Stores Ledger Control A/c
- (c) WIP Control A/c
- (d) Finished Goods Stock Control A/c
- (e) Factory Overhead Control A/c
- (f) Costing P & L A/c
- (g) Trail balance as at 30.04.2019

Solution:

Cost Ledger Control A/c

To costing P & L A/c	3,00,000	By balance b/d	98,000
(sales)	3,000	By stores ledger control a/c	95,000

To stores ledger control A/c	95,000	By wages control A/c (production and indirect)	65,000
To balance c/d		By factory overhead control A/c	50,000
		By selling & adm. Overhead control A/c	40,000
		By costing P & L A/c	<u>50,000</u>
	<u>3,98,000</u>		<u>3,98,000</u>

Stores Ledger control A/c

To balance b/d	35,000	By cost ledger control A/c	3,000
To cost ledger control A/c	95,000	By work-in-progress control A/c	98,000
To WIP control A/c	<u>3,000</u>	By balance c/d	<u>32,000</u>
	<u>1,33,000</u>		<u>1,33,000</u>

Work-in-Progress control A/c

To balance b/d	38,000	By Stores Ledger control A/c	3,000
To Store ledger control A/c	98,000	By Finished goods A/c	2,31,000
To wages control A/c	40,000	By balance c/d	20,000
To factory overhead control A/c	<u>60,000</u>		
	<u>2,36,000</u>		<u>2,36,000</u>

Finished Goods control A/c

To balance b/d	25,000	By Cost of goods sold A/c	2,10,000
To Work-in-Progress ledger control a/c	<u>2,13,000</u>	By balance c/d	<u>28,000</u>
	<u>2,38,000</u>		<u>2,38,000</u>

Factory overhead control A/c

To wages control A/c (indirect labour)	25,000	By WIP control A/c	60,000
To cost ledger control A/c	<u>50,000</u>	By balance c/d	<u>15,000</u>
	<u>75,000</u>		<u>75,000</u>

Costing Profit & Loss A/c

To Cost of goods sold A/c	2,10,000	By Cost ledger control A/c	3,00,000
To Selling & Adm. Overhead control A/c	40,000		
	<u>50,000</u>		
To Cost ledger control a/c (costing)	<u>3,00,000</u>		<u>3,00,000</u>

profit)

Trial Balance as on 30.04.2019

	Dr.	Cr.
Stores Ledger Control a/c	32,000	
Work-in-progress control A/c	20,000	
Finished goods Control a/c	28,000	
Factory overhead control a/c	15,000	
General ledger control a/c	<u>95,000</u>	<u>95,000</u>

Working Notes:

Wages control A/c

To Cost ledger control a/c	65,000	By WIP control a/c	40,000
		By Factory overhead Control A/c	<u>25,000</u>
	<u>65,000</u>		<u>65,000</u>

Cost of goods sold A/c

To Finished goods control A/c	<u>2,10,000</u>	By Costing P & L A/c	<u>2,10,000</u>
	<u>2,10,000</u>		<u>2,10,000</u>

Selling and distribution overhead A/c

To Cost ledger control a/c	<u>40,000</u>	By Costing P & L A/c	<u>40,000</u>
----------------------------	---------------	----------------------	---------------

Illustration 11.7 The cost ledger of a company showed the following balances as at 1st January 2020:

Stores ledger Control A/c	₹ 1,05,000	₹
Work-in-Progress Account	78,400	
Finished Goods Account	55,800	
Work on Cost Account		1,000
Administration on Cost	600	
Cost Ledger Control A/C or General Ledger Adjustment A/c		2,39,800

Further balances resulting from the operations for the year ended 31st December 2020 were:

Stores Purchase	₹ 3,60,000
-----------------	------------

Stores Issued to Production Order	3,93,000
Stores Issued to Works and Repair Order	15,000
Wages	6,15,000
Production Labour	5,90,000
Unproductive Labour	25,000
Carriage Inwards	6,000
Works on Cost Allocated to Production Order	1,79,000
Work Expenses	1,40,000
Administration Expenses	18,000
Administration on Cost Allocation to Production Order	18,400
Goods Finished During the year	11,72,000
Finished Goods Sold (Cost)	12,00,000
Sales Expenses	13,400

Prepare the necessary accounts in the cost ledger schedule of balances for the year ended 31st December, 2020.

Solution:

Note: It may be noted that

1. Stores ledger Control A/c = Stores ledger Control A/c
2. Work-in-Progress Account = Work- in- progress ledger Control A/c
3. Finished Goods Account= Finished Goods ledger Control A/c
4. Work on Cost Account = works overhead Control A/c
5. Administration on Cost A/c= Administration Overhead Control A/c
6. Cost Ledger Control A/c = General Ledger Adjustment A/c.
7. Wages A/c = Wages Control A/c

Stores Ledger Account

	₹		₹
To Balance b/d	1,05,000	By Work-in-Progress A/c	3,93,000
To Cost Ledger Control Accounts(Purchases)	3,60,000	By Work on Cost (Stores issued to works And repair order)	15,000
To Cost Ledger Control A/c (Carriage inwards)	6,000	By balance c/d	63,000
	4,71,000		4,71,000

Work-in-Progress Account

	₹		₹
To Balance b/d	78,400	By Finished Goods A/c	11,53,600
To Store Ledger Account	3,93,000	By Balance c/d	86,800
To Wages A/c	5,90,000		
To Work on cost A/c	1,79,000		
	12,40,400		12,40,400

Finished Goods Account

	₹		₹
To Balance b/d	55,800	By Cost of Sales A/c	12,00,000
To Work-in-Progress A/c	11,53,600	By Balance c/d	27,800
To Administration on Cost A/c	18,400		
	12,27,800		12,27,800

Work on cost Account

	₹		₹
To Store Ledger A/c	15,000	By Work-in-Progress A/c	1,79,000
To Wages A/c	25,000	By Balance b/d	1,000
To Cost Ledger Control Accounts (Expenses)	1,40,000		
	1,80,000		1,80,000

Administration on cost Account

	₹		₹
To Balance b/d	600	By Goods A/c	18,400
To Cost Ledger Control Accounts (expenses)	18,000	By Balance c/d	200
	18,600		18,600

Wages Account

	₹		₹
To Cost Ledger Control Accounts	6,15,000	By Work-in-Progress A/c	5,90,000
		By Work on cost A/c	25,000
	6,15,000		6,15,000

Cost of Sales Account

	₹		₹
To Finished Goods Account	12,00,000	By Cost Ledger Control A/c	12,13,400
To Cost Ledger Control Accounts (expenses)	13,400		
	12,13,400		12,13,400

Cost Ledger Control Account

To Cost of Sales A/c	₹ 12,13,400	By Balance b/d	₹ 2,38,800
To Balance c/d	1,77,800	By stores A/c (Purchase)	3,60,000
		By wages	6,15,000
		By stores A/c (Carried inwards)	6,000
		By Work Expenses A/c	1,40,000
		By Administration Expenses A/c	18,000 13,400
	13,91,200	By Sales A/c	12,13,400

Trial Balance as at 31st December, 2020

Store Ledger A/c	₹ 63,000	₹ -
Work-in-Progress A/c	86,800	-
Finished Goods Account	27,800	-
Administration on cost Account	200	
Cost Ledger Control Account	-	1,77,800
	1,77,800	1,77,800

Illustration 11. 8 The following are the cost ledger balances as on 1st Jan. 2021

	Dr. ₹	Cr. ₹
Cost ledger control Account	-	22,000
Stores ledger control Account	8,500	-
Work-in-progress control Account	6,600	-
Finished goods control Account	7,000	
Works overhead control Account	-	100

The transaction made during the year were as follows:

purchases	₹ 40,000
Stores issued: Production	38,000
Works Repairs	750
Not chargeable	250
Wages: Productive	45,000
Works Repairs	800
Unproductive	45,000
Work expenses, including wages and materials	15,000

Works overhead recovered	21,000
Administration Expenses	4,500
Administration overhead recovered	5,000
Goods sold	1,30,000
Finished goods in stock (Closing)	5,000
Work-in-progress at the end	3,100

Write up the cost books, in summarised form and prepare a Profit and Loss Account.

Solution:

COST BOOKS

Cost ledger control A/c

	₹		₹
To Costing P & L A/c (Sales)	1,30,000	By Balance b/d	22,000
To Balance c/d	17,600	By Stores Ledger Control A/c	40,000
		By Wages Control A/c	50,300
		By Works Overhead Control A/c	15,000 4,500
		By Adm. Overhead Control	15,800
	1,47,600	A/c	<u>1,47,600</u>
		By Costing P & L A/c	1,47,600

Stores Ledger Account

	₹		₹
To Balance b/d	8,500	By WIP control A/c	38,000
To cost Ledger control A/c	40,000	By Work overhead control A/c	750
		By costing P & L A/c	250
		By Balance c/d	9,500
	48,500		<u>48,500</u>

Wages control A/c

	₹		₹
To Cost Ledger Overhead A/c	50,300	By WIP control a/c	45,000
		By Work overhead control a/c	800
		By Work overhead control a/c	4,500
	50,300		<u>50,300</u>

Works overhead control A/c

	₹		₹
To Cost Ledger control A/c	15,000	By balance b/d	100
To Stores Ledger Control A/c	750	By Work-in-progress Control	21,000
To Wages Control A/c (₹ 800 + 4,500)	5,300	A/c	
To Overhead Suspense A/c	50		
	21,100		<u>21,100</u>

Administration overhead control A/c

To Cost Ledger control A/c	₹ 4,500	By Work-in-progress Control A/c	₹ 5,000
To Overhead Suspense A/c	500		
	<u>5,000</u>		<u>5,000</u>

Work-in-progress Ledger control A/c

To balance b/d	₹ 6,600	By finished goods Control A/c	₹ 1,12,500
To Stores Ledger control A/c	38,000	By Balance c/d	3,100
To Wages Control A/c	45,000		
To Work overhead control A/c	21,000		
To Adm. Overhead Control A/c	5,000		
	<u>1,15,600</u>		<u>1,15,600</u>

Finished Goods control A/c

To balance b/d	₹ 7,000	By Cost ledger control A/c	₹ 1,14,500
To Work-in-Progress control A/c	<u>1,12,500</u>	By balance c/d	<u>5,000</u>
	<u>1,19,500</u>		<u>1,19,500</u>

Cost of sales A/c

To finished goods control a/c	₹ <u>1,14,500</u>	By costing P & L a/c	₹ <u>1,14,500</u>
	1,14,500		1,14,500

Overhead suspense A/c

To costing P & L A/c (Transfer)	₹ 550	By works overhead control A/c	₹ 50
	<u>550</u>	By Adm. Overhead Control A/c	<u>50</u>
			<u>0</u>
			<u>550</u>

Costing Profit & Loss Account

To cost of sales	₹ 1,14,500	By Cost ledger control A/c	₹ 1,30,000
To Stores Ledger Control A/c	250	By Overhead suspense A/c	550
To Cost Ledger Control			

A/c (Profit)	15,800		1,30,550
	1,30,550		

Trial Balance as on 31st. Dec. 2021

	₹	₹
Cost Ledger Control a/c	-	17,600
Stores Ledger Control a/c	9,500	-
Work-in-progress control A/c	3,100	-
Finished goods Control a/c	5,000	-
	17,600	17,600

KNOW YOUR PROGRESS

a. State whether the following statements are TRUE OR FALSE

1. In cost ledger, accounting transactions are recorded on the basis of double entry.
2. Control accounts are the total accounts maintained in the cost ledger.
3. Cost ledger accounting is a system of integrating cost and financial accounts.
4. General ledger adjustment account represents the personal accounts shown in financial books.
5. Debit balance of production overhead control account represents over-absorption of production overheads.
6. Postings in the wage control account are made from wages analysis sheet.

b. Fill in the blanks

1. _____Account makes the cost ledger self-balancing.
2. In _____ ledger, an account is maintained for each job.
3. _____Account doesn't record the balance of stores ledger control account.
4. The closing balance of cost of sales account is transferred to _____account.
5. The amount of under or over absorbed production overheads is debited or credited to _____Account.
6. At the end of any period, the total balance of jobs accounts should be equal to the balance in _____Account.

INTEGRAL ACCOUNTING

11.8 INRODUCTION

The reconciliation of cost and financial accounts is frequently a task calling for considerable expenditure of time and effort, much of which can be avoided if books are suitably designed into one. The concept of separate Profit and Loss account for financial and costing purposes is discarded in favour of a unified accounting system which will serve the purposes of both financial accounting and cost accounting. Such a system of recording financial and costing transactions in one self-contained ledger is called the Integrated Ledger.

11.9 FEATURES

The features of Integrated Accounting System are as follows:

1. Only one set of book is maintained for both financial and cost accounts.
2. The General Ledger Adjustment Account is dispensed with under this system.
3. Transactions which affect cost accounts are recorded in general ledger just as they are recorded in cost accounts.
4. Transactions which affect financial accounts are recorded in the general ledger just as they are recorded in financial accounts.
5. Instead of a double entry for every transaction in the financial books and further double entry in cost books, this system requires only one debit and credit.

11.10 ADVANTAGES

The main advantages of Integral Accounting are as follows:

1. The preparation of reconciliation statement does not arise as only one profit and loss account is prepared.
2. It avoids duplication of work which is involved in non-integral accounts.
3. It results in economy in maintaining accounts.
4. It facilitates control of accounting procedure and coordination of accounting function in different departments.
5. The accounting procedure is simplified because of centralization principle.
6. It facilitates quick reporting as all accounting information is readily available.

11.11 BOOKS OF ACCOUNTS

The following are the subsidiary ledgers that are maintained under integral accounting system:

1. **Sales Ledger:** This ledger consists of accounts of customers. The account that is prepared in this ledger is known as sales ledger control account.
2. **Bought Ledger:** This ledger is maintained to record the accounts of suppliers. The account that is maintained in this ledger is known as bought ledger control account.

3. **Stores Ledger:** This ledger is maintained for recording accounts relating to individual items of materials and stores kept in stock. The account maintained in this ledger is known as stores ledger control account.
4. **Stock Ledger:** This ledger is maintained for recording accounts relating to individual items of finished goods in stock. The account maintained in this ledger is stock ledger control account.
5. **Job Ledger:** This ledger contains accounts of individual jobs on hand. The account maintained in this ledger is known as works-in- progress account.
6. **Expenses Ledger:** This ledger contains accounts of expenses kept separately for factory, office and selling and distribution expenses.
The accounts maintained in this ledger are: a) works overhead account b) office overhead account c) selling and distribution overhead account.

11.12 PRE-REQUISITES OF INTEGRAL ACCOUNTING

The following principles shall be taken into consideration while designing such a system:

1. The degree of integration must be determined. Some undertakings find it satisfactory merely to integrate up to the stage of prime cost or factory cost while other concerns integrate the whole of the records in which cost and financial accounts cannot be distinguished.
2. The degree of integration will determine the classification of expenditure. The expenditure is classified here according to function as office expenses, selling expenses etc. and not according to nature. However, control accounts are maintained for each element of cost.
3. Full details of items posted to the control accounts are supplied to the cost office at convenient intervals. This information is then dealt with by the cost office in accordance with the system of costing in force.
4. For preparation of interim accounts, there must be an agreed routine for treatment for accruals, prepaid expenses for other necessary adjustments.
5. There should be a perfect coordination between the staff responsible for the financial and cost aspects to ensure an efficient processing of accounting documents.

11.13 DISTINCTION BETWEEN NON-INTEGRAL SYSTEM AND INTEGRAL SYSTEM OF ACCOUNTING

Non-integral system differs from Integral system in the following respects:

Basis of Distinction	Non-Integral System	Integral System
1. No of sets of Books	Two separate set of books are maintained; one to record cost transaction and other to record financial transaction.	Only one set of books is maintained to record both the cost transaction and financial transactions.
2. Cost Ledger	Here Cost Ledger is maintained.	Here Cost Ledger is not maintained.
3. Control Accounts	Control Accounts are opened in	Control Accounts are opened

	the Cost Ledger.	in the General Ledger.
4. Economical	It is expensive because of duplication of recording the transactions in two sets of books.	It is economical because it avoids the duplication of recording the transactions in two sets of books.
5. Balances of Overheads Control Accounts	Balances of Overheads Control Accounts which represent under/over absorption of overheads are transferred to Costing Profit & Loss Account.	Balances of Overheads Control Accounts which represent under/over absorption of overheads are transferred to Profit and Loss Account.
6. Need of Reconciliation	There are two figures of Profit/Loss – one as per cost books and another as per financial books. So, need for reconciliation of cost accounts and financial accounts is needed.	There is only one figure of Profit/Loss because only one set of books is maintained. So there is no need for reconciliation of cost accounts and financial accounts

11.14 JOURNAL ENTRIES TO RECORD TRANSACTIONS

The Journal entries to record transactions under Integral Accounting System are as follows:

Sl. no	TRANSACTION	PARTICULARS	DR	CR
1.	Material purchased for stock	Stores ledger control A/C.....Dr To Sundry creditors or cash A/c		
	Material purchased for jobs	Work – in – progress control A/c.....Dr To Sundry creditors or cash A/c		
2.	Material issued – direct material	Work – in – progress control A/c.....Dr To stores ledger control A/c		
	Material issued – indirect material	Overhead control A/c Dr To stores ledger control A/c		
3.	Materials returned from shop floor	Stores ledger control A/c.....Dr To Work – in – progress control A/c		
4.	Material returned to supplier	Sundry creditors A/c.....Dr To stores ledger control A/c		
5.	Material transferred from one job to another job	No entry		
6.	Salary and wages to be paid	Wages control A/c.....Dr To Wages payable A/c		
7.	Salary and wages allocated – Direct and Indirect	Work – in – progress control A/c.....Dr Overhead control A/c Dr		

		To Wages Control A/c		
8.	Direct expenses	Work – in – progress control A/c.....Dr To sundry creditors or cash A/c		
9.	Overhead incurred	Overhead control A/c .....Dr To sundry creditors or cash A/c		
10.	Overhead recovered – production, administration, selling & distribution	Work – in – progress control A/c.....Dr Finished goods control A/c... Dr Cost of sales A/c.....Dr To overhead control A/c		
11.	Overhead on work-in-progress	Work-in-progress control A/c.....Dr To overhead control A/c		
12.	Finished goods produced	Finished stock ledger control A/c..... Dr To work- in- progress control A/c		
13.	Finished goods sold: i) Factory cost ii) Sales value	Cost of sales A/c.....Dr To Finished stock ledger control A/c Sundry ledger A/c To cost of sales A/c		
14.	Sales return	Cost of sales A/c To Sundry debtors A/c		
15.	Capital work	Sundry assets A/c.....Dr To work – in – progress control A/c		
16.	Repair work	Overhead control A/c To work – in – progress control A/c		
17.	Special jobs completed and billed at: i) Factory cost ii) Selling price	Cost of sales A/c.....Dr To work – in – progress control A/c Sundry debtors A/c To Cost of sales A/c		
18.	Under absorption of overheads	Profit and loss A/c.....Dr To overhead control A/c		
19.	Over absorption of overheads	Overhead control A/c.....Dr To profit and loss A/c		
20.	Profit	No entry		

Illustration 11.10 Mishra Enterprises operates an integral system of accounting. You are required to pass the journal Entries for the following transactions that took place for the year ended 30-06-2021. (Narrations are not required)

	₹
Raw material Purchased (50% on credit)	6,00,000
Material issued to Production	4,00,000
Wages paid (50% Direct)	2,00,000
Wages Charged to Production	1,00,000
Factory overheads incurred	80,000
Factory overheads Charged to Production	1,00,000
Selling and Distribution Overheads Incurred	40,000
Finished Goods at Cost	5,00,000
Sales (50% Credit)	7,50,000
Closing Stock	Nil
Receipt from Debtors	2,00,000
Payment to creditors	2,00,000

Solution:

1(a) Stores Ledger Control A/c	Dr.	₹	₹
To Sundry Creditors A/c		6,00,000	3,00,000
To Cash/ Bank A/c			3,00,000
(b) WIP Control A/c	Dr.	4,00,000	4,00,000
To Stores Ledger Control A/c			
2. (a) Wages Control A/c	Dr.	2,00,000	2,00,000
To Cash/ Bank A/c			
(b) WIP Control A/c	Dr,	1,00,000	2,00,000
Factory overhead Control A/c	Dr.	1,00,000	
To wages Control A/c			
3. (a) Factory overheads Control A/c	Dr.	80,000	80,000
To Cash/ Bank A/c			
(b) WIP Control A/c	Dr.	1,00,000	1,00,000
To Factory overhead Control A/c			
4.(a) S.& D Overheads Control A/c	Dr.	40,000	40,000
To cash or Bank A/c			
5(a) Finished Goods Control A/c	Dr.	5,00,000	5,00,000
To WIP Control A/c			
(b)Cost of Sales A/c	Dr.	5,40,000	5,00,000
To Finished Goods Control A/c			40,000
To S & D Overheads Control A/c			

6. Sundry Debtors A/c	Dr.	3,75,000	
Cash/ Bank A/c	Dr.	3,75,000	
To Sales A/c			7,50,000
1. cash/Bank A/c		2,00,000	
To Sundry Debtors A/c			2,00,000
8. Sundry Creditor A/c	Dr.	2,00,000	
To Cash/Bank A/c			2,00,000

Illustration 11.11 Journalise the following transactions assuming that cost and financial accounts are integrated:

	₹
Raw materials purchased	1,50,000
Direct materials issued to production	1,12,500
Wages paid (30% Indirect)	90,000
Wages charged to production	75,000
Manufacturing expenses incurred	63,000
Manufacturing overhead charged to production	69,000
Selling and Distributive costs	15,000
Finished Product at cost	1,50,000
Sales	2,25,000
Receipts from customers	52,500
Paid to creditors	82,500
Closing Stock	Nil

Journal Entries

		₹	₹
Stores Ledger Control A/c	....Dr.	1,50,000	
To Creditors A/c			1,50,000
(Being raw material purchased)			
Work-in-Progress Ledger Control A/c	..Dr.	1,12,500	
To Stores Ledger Control A/c			1,12,500
(Being materials issued for production)			
Wages Control A/c	....Dr.	63,000	
Factory overhead Control A/c	...Dr.	27,000	
To Bank A/c			90,000
(Being wages paid)			
Work-in-progress Ledger Control A/c	...Dr.	75,000	
To Wages Control A/c			52,500
To factory overhead control A/c			22,500
(Being the allocation of wages production)			
Factory overhead Control A/c	...Dr.	63,000	
To Bank Account			63,000
(Being the manufacturing expenses incurred)			

Work-in-Progress Ledger Control A/c.....Dr. To factory overhead Control A/c (Being overhead chard to production)	69,000	69,000
Selling and Distributive Overhead Control A/c ...Dr. To Bank A/c (Being Selling and distributive cost incurred)	15,000	15,000
Finished Stocks Control A/c ...Dr. To Work-in-Progress Ledger Control A/c (Being Cost of production of completed job)	1,50,000	1,50,000
Cost of Sales A/c..... Dr. To Finished Stocks Ledger Control A/c To Selling and Distributive Overhead Control A/c (Being the Cost of products sold)	1,65,000	1,50,000 15,000
Sales Ledger Control A/c / Debtors A/c Dr. To Sales (Being the amount of sales)	2,25,000	2,25,000
Bank A/c ...Dr. To Sales Ledger Control A/c / Debtors A/c (Being amount received from customers)	52,500	52,500
Creditors Account ...Dr. To Bank A/c (Being amount paid to creditors)	82,500	82,500

Illustration 11. 13 journalise the following truncations a under the integral accounting system

	₹
1. Direct wages paid in cash	60,000
2. Indirect wages paid in cash	30,000
3. Purchase made in cash	15,000
4. Purchases (credit)	2,90,000
5. Stores issued against production order	2,75,000
6. Work expenses incurred and paid in cash	55,000
7. Work expenses allocated to jobs	80,000
8. Administration expenses paid in cash	40,000
9. Administration expenses allocated to jobs	48,000
10. Finished goods transferred to warehouse	4,50,000

Solution:

	₹		
₹			
1	Wages Control A/c Dr. To Cash A/c (Being Cash paid towards direct wages ₹ 60,000 + Indirect wages ₹ 30,000)	90,000	90,000
2	Work-in-Progress control A/c Dr. To Wages Control A/c	60,000	60,000

	(Being Direct wages transferred to WIP)	30,000	
3	Work expenses control A/c Dr. To Wages Control A/c (Being Indirect wages transferred to work expenses control a/c)	3,05,000	30,000
4	Stores ledger control A/c Dr. To Creditors A/c To Cash A/c (Being record made for cash and credit purchases)	2,75,000	2,90,000 15,000
5	WIP Control A/c Dr. To Stores ledger control A/c (Being record made for transfer of store issued to production)	55,000	2,75,000
6	Work expenses control A/c Dr. To Cash A/c (Being record made for work expenses disbursed in cash)	80,000	55,000
7	WIP Control A/c Dr. To Work expenses control A/c (Being work expenses allocated to jobs)	40,000	80,000
8	Administration expenses control A/c Dr. To cash A/c (Being administration expenses paid in cash)	48,000	40,000
9	WIP Control A/c Dr. To Administration expenses A/c (Being administration expenses charged to production)	4,50,000	48,000
10	Finished Goods Control A/c Dr. To WIP Control A/c (Being finished goods transferred)		4,50,000

Illustration 11.14 In the absence of the chief account, you have been asked to prepare a month's cost accounts for a company which operates a batch costing system fully integrated with the financial accounts. The following relevant information is provided to you.

Balances at the beginning of the month:

₹

Stores ledger control A/c	25,000
Work-in-progress control A/c	20,000
Finished goods control A/c	35,000
Prepared production overhead brought forward from the previous month	3,000
Transaction during the month:	
Material Purchased	75,000
Material Issued	
To production 30,000	
To factory maintenance <u>4,000</u>	34,000
Materials transferred between batches	5,000

Total wages paid		
To direct workers	25,000	
To Indirect works	<u>500</u>	30,000
Direct wages charged to batches		20,000
Recorded non-productive time of direct workers		5,000
Selling and distribution overhead incurred		6,000
Other production overhead incurred		12,000
Sales		1,00,000
Cost of finished goods sold		80,000
Cost of finished goods transferred during the month		65,000
Physical value of work-in-progress at the end of the month		40,000

The production overhead absorption rate is 150% of direct wages charged to work-in-progress:

Prepare the following accounts for the month:

- Stores ledger control A/c
- Work-in-progress control A/c
- Finished goods control A/c
- Production overhead control A/c
- Profit & loss A/c

Solution:

Stores Ledger control A/c

	₹		₹
To balance b/d	25,000	By WIP control A/c	30,000
To creditors (or bank)	75,000	By Production oh. control A/c	4,000
		By balance c/d	66,000
	1,00,000		1,00,000

WIP control A/c

	₹		₹
To balance b/d	20,000	By finished goods control A/c	64,000
To Store ledger control A/c	30,000	By balance c/d (Physical value)	40,000
To wages control A/c	20,000		
To Production overhead control A/c	30,000		
(150% of direct wages)	5,000		
To P & L A/c (Stock gain)	1,05,000		1,05,000

Finished Goods control A/c

	₹		₹

To balance b/d	35,000	By Cost of goods A/c or P & L A/c	80,000
To Work-in-Progress control A/c	65,000	By balance c/d	20,000
	1,00,000		1,00,000

Production Overhead control A/c

	₹		₹
To balance b/d (Prepaid amount)	3,000	By WIP control A/c	30,000
To Stores ledger control A/c	4,000	(150% of direct wages)	
To wages control A/c			
Direct workers	5,000		
Indirect workers	5,000		
To bank	12,000		
To P & L A/c			
(over absorption-balancing figure)	1,000		
	30,000		30,000

Profit & Loss A/c

	₹		₹
To Finished goods control A/c or Cost of goods sold A/c	80,000	By sales A/c	1,00,000
To selling and distribution overhead A/c	6,000	By Production Overhead A/c	1,000
To balance c/d	20,000	By Work-in-progress control A/c (stock gain)	5,000
	1,06,000		1,06,000

Notes:

- (1) Materials transferred between batches will not affect the control A/c
- (2) Non- production time of direct workers is a production overhead and therefore will not be charged to WIP control A/c.
- (3) Production overheads absorbed in WIP control A/c will then equal ₹ 30,000 (150% of ₹ 20,000).
- (4) In the WIP control A/c the excess physical value of stock is taken resulting in stock gain. Stock gain is transferred to P & L A/c.

Illustration 11. 15 The cost ledger of a company show the following balance as on 1st January,2020.

	₹
Work-in-Progress control A/c	7,840
Finished stock ledger control A/c	5,860
Work overhead suspense A/c	400
Office and Administration Overhead suspense A/c	200
Stores ledger control A/c	10,500
General ledger Adjustment A/c	24,800
Transaction for the year:	--
Wages -----direct labour	61,200
Wages -----Indirect labour	2,800
Works overhead allocated to production	18,700
Office and Administration overhead allocated	6,200
Stores issued to production	39,300
Goods finished during the year	1,20,000
Finished goods sold (no stock were left at the end of the year)	1,32,000
Stores purchased	36,000
Stores issued to factory repair orders	1,500
Carriage inward on stores issued to production	600
Works expenses	14,000
Office and Administration expenses	6,000

You are required to write Cost Ledger accounts recording the above transactions and make necessary transfer to control accounts; and prepare the trail balance as on 31st December 2020.

Solution

General Ledger Adjustment A/c

	₹		₹
To Closing Profit & Loss A/c (Sales)	1,32,000	By Balance b/d	24,800
To Closing Profit & Loss A/c	60	By Stores Ledger control A/c	36,000
To Balance c/d	13,340	By Wages Control A/c	64,000
		By Work overhead Control A/c (Carriage)	600
		By Work overhead Control A/c (Works)	14,000
		By office Adm. Overhead Control A/c	6,000
	1,45,400		1,45,400

Stores Ledger Control A/c

	₹		₹
To balance b/d	10,500	By Work-in-Progress control a/c	39,300
To General Ledger Adjustment A/c	36,000	By work overhead control a/c	1,500
		By Balance c/d	5,700
	46,500		46,500

Wages control A/c

	₹		₹
To General Ledger Adjustment A/c	64,000	By Work-in-Progress a/c	61,200
		By Work overhead control A/c	2,800
	64,000		64,000

Works Overhead Control A/c

	₹		₹
To work overhead suspense A/c	400	By Work-in-progress Control	18,700
To Wages Control A/c	2,800	A/c By Work overhead control	600
To stores Ledger Control A/c	1,500	A/c	
To General Ledger Adjustment A/c (Carriage)	600		
To General Ledger Adjustment A/c (Works)	14,000		
	19,300		19,300

Works Overhead Suspense A/c

	₹		₹
To balance b/d	400	By Work-in-progress Control A/c	400
To work overhead control A/c	600	By balance c/d	600
	1,000		1,000

Office and Administration Overhead Suspense A/c

	₹		₹
To balance b/d	200	By Office and Adm. Overhead Control A/c (transferred)	200
	200		200

Work in Progress Control A/c

	₹		₹
To balance b/d	7,840	By finished stock a/c	1,20,000
To wages control A/c	61,200	By balance c/d	7,040
To Store ledger control a/c	39,300		
To work overhead control a/c	18,700		

	1,27,040		1,27,040
--	----------	--	----------

Office and Administration Overhead Control A/c

To General Ledger Adjustment A/c	₹ 6,000	By Finished Goods Ledger A/c	₹ 6,200
To Office and Adm. Overheadsuspense A/c	200		
	6,200		6,200

Finished Goods Control A/c

To balance b/d	₹ 5,860	By cash of sales A/c	₹ 1,32,060
To Office and Adm. Overheadcontrol A/c	6,200		
To Work-in-progress Control A/c	1,20,000		
	1,32,060		1,32,060

Wages Control A/c

To Finished Goods control A/c	₹ 1,32,060	By General Ledger Adjustment A/c By costing Profit & Loss A/c	₹ 1,32,000
	1,32,060			60
			1,32,060

Costing Profit & Loss A/c

To cost of Sales A/c	₹ 60	By General Ledger Adjustment a/c (Loss)	₹ 60
	60		

Trail Balance as on 31st December,2020

Store Ledger Control A/c	Dr. ₹ 5,700	Dr. ₹ -
Work-in-progress Control A/c	7,040	-
Works General Ledger Adjustment a/c	600	-
Overhead Suspense A/c	-	13,340
	13,340	13,340

Illustration 11.16 From the following particulars, pass journal entries in an integral accounting system:

- (a) Issued materials ₹ 3,00,000 of which ₹ 2,80,000 (standard ₹ 2,40,000) is direct material.
- (b) Net wages paid ₹70,000 deductions being ₹ 12,000 (Standard ₹ 75,000).
- (c) Gross salaries payable for the period is ₹ 26,000 (standard ₹ 25,000). Deduction ₹ 2,000.
- (d) Sales (credit) ₹ 8,00,000.
- (e) Discount allowed ₹ 5,000.
- (f) Salaries and wages allocation: ₹ 60,000 direct (standard ₹ 62,000) and out of the balance 50% production, 30% administration and 20% selling and distribution overheads.

Solution:

Journal Entries

	₹		₹
(a) WIP Control A/c Dr. Material Price Variance A/c Dr. Production Overheads Control A/C Dr. To Stores Ledger Control A/C (Being issue of materials and debit to WIP Account Standard Materials Cost of ₹ 2,40,000)	2,40,000 40,000 20,000		3,00,000
(b) Wages Control A/c Dr. Wages Variance A/c Dr. To Deductions A/c To Cash A/c (Being payment of net wages ₹ 70,000 and gross wages ₹ 82,000 of which debit to wages Control Account at standard wages ₹ 75,000)	75,000 7,000		12,000 70,000
(c) Salaries Control A/c Dr Salaries Variance A/c Dr To Deductions A/c To Cash Account (Being gross salaries ₹ 26,000 and standard ₹ 25,000)	25,000 1,000		2,000 24,000

(d) Debtors Control A/c To Sales A/c (Being credit sales made)	Dr.	8,00,000	8,00,000
(e) Discount A/c (selling Overheads) To Debtors A/c (Being discount allowed to Debtors)	Dr	5,000	5,000
(f) WIP Control A/c Production Overhead A/c (₹ 40,000 X 50%) Administration Overhead A/c (₹ 40,000 X 30%) Selling and Distribution Overhead A/c (₹ 40,000 X 20%) To Wages Control A/c To Salaries Control A/c To Wages Variance A/c (Being allocation of Salaries and wages)	Dr. Dr.	62,000 20,000 12,000 8,000	75,000 25,000 2,000

Illustration 11.17 You are required to pass journal entries for the following transactions that took place as the year ended 31st December: (Narrations may be omitted)

	₹
1. Raw materials purchased (50% on credit)	8,00,000
2. Materials issued to production	4,00,000
3. Wages paid (50% direct)	2,00,000
4. Wages charged to production	1,00,000
5. Factory overheads incurred	80,000
6. Factory overheads charged to production	1,00,000
7. Selling and distribution overheads incurred	40,000
8. Finished goods at cost	5,00,000
9. Sales (50% credit)	7,50,000
10. Closing Stock	Nil
11. Receipt from debtors	2,00,000
12. Payment to creditors	3,00,000

Solution:

Journal Entries

1. Stores Ledger Control A/c To sundry Creditors A/c To Bank Account	Dr.	₹ 80,000	₹ 40,000 40,000
2. WIP Control A/c Stores Ledger Control A/c	Dr.	400,00 0	400,00

3. Wages Control A/c To Bank A/c	Dr.	2,00,0	0
4. (a) WIP Control A/c To wage Control A/c		00	2,00,0
_____		1,00,0	00
(b) Factory Overhead Control A/C To wages Control A/C	Dr.	00	1,00,0
5. Factory Overhead Control A/c To Bank A/c	Dr.	1,00,0	00
6. WIP Control A/c To Factory Overhead Control A/C	Dr.	00	1,00,0
7. Selling & Distribution Overheads A/c To Bank A/c	Dr.	80,000	00
8. (a) Finished Stock Ledger Control A/c To WIP Control A/c	Dr.	1,00,0	00
_____		40,000	80,000
(b) Cost of sales A/C To Finished Stock Ledger Control A/C To Selling & Distribution Overheads A/C	Dr.	5,00,0	00
9. Sundry Debtors A/C Bank A/c To Sales A/c	Dr. Dr.	5,40,0	00
10. No entry		00	5,00,0
11. Bank A/c To Sundry Debtors A/c	Dr.	40,000	00
12. Sundry Creditors A/c To Bank A/c	Dr.	3,75,0	00
		00	3,75,0
		2,00,0	00
		00	2,00,0
		3,00,0	00
		00	3,00,0

KNOW YOUR PROGRESS

STATE WHETHER THE FOLLOWING STATEMENTS ARE TRUE OR FALSE

7. The need of reconciliation arises only under integrated accounting system.
8. There is only one figure of profit under integral accounting system.

9. Integrated accounts eliminate the necessity of operating general ledger controlling account.
10. No account for debtors and creditors are opened in integrated accounts.
11. Under integral accounting system, cost and financial accounts are merged in one ledger.
12. There is a need for reconciling cost and financial accounts under integrated accounts.
13. There will be equal status for cost accountant and financial accountant under integrated accounts.
14. Control accounts are maintained under non – integral system but not under integral system. F
15. Cost ledger control account always has credit balance.
16. Accounting control system under which there is no need for reconciliation of cost and financial accounts is known as non – integral system.
17. Integral accounts merge financial and cost accounts in one set of accounts.

11.15 SUMMARY

Under the non-integral accounting system, two separate sets of books are maintained: one for financial accounts – to record financial transactions and another for cost accounts- to record cost transactions. The important ledgers maintained in financial accounts books are general ledger, debtors’ ledger and creditor ledger. Similarly, the important control accounts maintained in cost accounts books are general ledger adjustment account, Stores ledger control account, Work- in- progress ledger control account, Finished goods control account, Wages control account, Factory control overhead account, Office overhead control account, Selling and distribution overhead control account, Cost of sales account, Costing profit and loss account, Overhead suspense / adjustment account. This system of accounting facilitates ready accomplishment of objectives of financial accounting and cost accounting. However, it suffers from the limitation that the profits shown by cost accounts may vary with that shown by financial accounts. This requires reconciliation periodically to test the reasons and reliability of both sets of accounts but it involves time and effort. On the other hand, accounts can be maintained under integral system where recording of financial and costing transactions are maintained in one self-contained ledger, called the integrated ledger. Under integral system, there is no need to prepare reconciliation statement. This system avoids the duplication of recording transactions and conditions which are eminently suitable for the introduction of mechanized accounting.

11.16 SUMMARY OF ACCOUNTING ENTRIES UNDER BOTH THE SYSTEMS OF ACCOUNTING

Transactions	Non-Integral Accounting/Cost Ledger Accounting	Integral Accounting
1. Purchase of material	Stores ledger control A/c.....Dr To General ledger adjustment A/c	Stores ledger control A/c.....Dr To creditors/ cash A/c

2. Purchase of materials for direct use in job or process	WIP A/c.....Dr To General ledger adjustment A/c	WIP A/c Dr To creditors/cash A/c
3. Purchase of materials for immediate repair work	Factory overhead control A/c.....Dr To General ledger adjustment A/c	Factory overhead control A/c.....Dr To creditors/cash A/c
4. Return of materials to suppliers	General ledger adjustment A/c....Dr To Stores ledger control A/c	Creditors or cash A/c....Dr To Stores ledger control A/c
5. Payment to creditors	No entry	Creditors A/c.....Dr To Cash/Bank
6. Issue of direct materials for production	WIP A/c.....Dr To Stores ledger control A/c	WIP A/c Dr To Stores ledger control A/c
7. Issue of materials for capital order	Capital WIP A/c Dr To Stores ledger control A/c	Capital WIP A/c.....Dr To Stores ledger control A/c
8. Issue of indirect materials to shops	Factory overhead control A/c.....Dr To Stores ledger control A/c	Factory overhead control A/c.....Dr To Stores ledger control A/c
9. Return of direct materials to stores	Stores ledger control A/c....Dr To WIP A/c	Stores ledger control A/c....Dr To WIP A/c
10. Return of indirect materials to stores	Stores ledger control A/c....Dr To WIP A/c	Stores ledger control A/c....Dr To WIP A/c
11. Materials transferred between jobs	No entry required except internal recording in the respective job ledger. Entry however is required for transfer involved in capital or service orders.	No entry required except internal recording in the respective job ledger. Entry .however is required for transfer involved in capital or service orders.
12. Normal loss of material	Factory overhead control A/c.....Dr To Stores ledger control A/c	Factory overhead control A/c.....Dr To Stores ledger control A/c
13. Abnormal loss of material, pilferage, spoilage etc.	Costing profit and loss A/c.....Dr To Stores ledger control A/c	Profit and loss A/c.....Dr To Stores ledger control A/c
14. Payment of wages	Wages control A/c.....Dr To General ledger adjustment A/c	Wages control A/c.....Dr To Bank A/c To recovery A/c

15. Analysis and distribution of wages	WIP A/c.....Dr Capital WIP A/c Dr Service order A/c...Dr Factory overhead A/c..... Dr Admn. overhead control A/c..... Dr S & D overhead control A/c..... Dr To wages control A/c	WIP A/c..... Dr Capital WIP A/c.....Dr Service order A/c...Dr Factory overhead A/c .....Dr Admn. overhead control A/c Dr S & D overhead control A/c..... Dr To wages control A/c
16. Payment of expenses/ providing for depreciation	Factory overhead A/c.....Dr Admn. overhead control A/c.....Dr S & D overhead control A/c.....Dr To General ledger adjustment A/c	Factory overhead A/c.....Dr Admn. overhead control A/c.....Dr S & D overhead control A/c.....Dr To creditors or cash A/c To Capital Asset A/c
17. Absorption of factory overheads	WIP A/c.....Dr To Factory overhead A/c	WIP A/c.....Dr To Factory overhead A/c
18. Transfer of manufactured goods	Finished goods control A/c....Dr To WIP A/c	Finished goods control A/c....Dr To WIP A/c
19. Absorption of administration overhead	Finished goods control A/c....Dr To Admn. overhead control A/c	Finished goods control A/c....Dr To Admn. overhead control A/c
20. Cost of goods sold	Cost of sales A/c....Dr To Finished goods control A/c	Cost of sales A/c....Dr To Finished goods control A/c
21. Absorption of selling and distribution overheads	Cost of sales A/c....Dr To S & D overhead control A/c	Cost of sales A/c....Dr To S & D overhead control A/c
22. Sales	General ledger adjustment A/c...Dr To sales A/c	Cash or debtor A/c...Dr To sales A/c
23. Transfer of cost of sales	Costing profit and loss A/c.....Dr To cost of sales A/c	Profit and loss A/c.....Dr To cost of sales A/c
24. Transfer of sales	Sales A/c....Dr To Costing profit and loss A/c	Sales A/c....Dr To Profit and loss A/c
25. Under-absorption of overheads	Costing profit and loss A/c.....Dr Finished goods control A/c.....Dr WIP A/c.....Dr Overhead Suspense A/c.....Dr To Respective Overhead Control A/c	Profit and loss A/c.....Dr Finished goods control A/c.....Dr WIP A/c..... Dr Overhead Suspense A/c..... Dr To Respective Overhead Control A/c

26. Over-absorption of overheads	Reverse of entry no.25	Reverse of entry no.25
27. Transfer of Capital Asset	General ledger adjustment A/c...Dr To Capital WIP A/c	Capital asset A/c.....Dr To Capital WIP A/c
28. Transfer of Profit	Capital profit and loss A/c.....Dr To General ledger adjustment A/c	Profit and loss A/c.....Dr To Proprietor's capital A/c

11.17 KEY WORDS

- 1. Non-integral Accounting System:** It is a system of accounting under which two separate sets of account books are maintained. They are financial accounts-to record financial transactions and cost accounts- to record cost transactions. It is also known as non-integrated system or inter-locking system or cost ledger accounting system.
- 2. Integral System:** It is a system of accounting under which only one set of account books is maintained to record both the cost and financial transactions. It is also known as integrated system.
- 3. Inter-Locking of Accounts:** It is a system in which cost accounts are maintained separately but they are reconciled with financial accounts on periodical basis.

11.18 ANSWER TO CHECK YOUR PROGRESS

True/False Statements:

True: 1,2,4,6,8,9,11,13,15 ,17 **False:** 3,5,7,10,12,14,16

Fill in the blanks:

Answer: 1. General Ledger Adjustment 2. Work- in-Progress 3.Profit and Loss 4.Costing Profit and Loss 5.Overhead Adjustment 6. Work-in- Progress Ledger control

11.19 TERMINAL QUESTIONS

Short questions

1. What is cost ledger accounting?
2. What are the control accounts prepared in non – integrated accounting system?
3. What do you understand by integral accounting?
4. Distinguish between integral and non – integral accounting systems?
5. Discuss the advantages of maintaining cost ledger?

6. Explain the system of non – integral accounting and state the principal ledgers and principal accounts that are to be maintained.
7. What do you understand by integrated accounts? State the advantages of integrated accounts.
8. Explain the basic requirements of an integrated system of accounting.
9. What is integrated accounting system? State its advantages and pre -requisites.
10. What is meant by non- integral accounting? State its basic features.
11. What is meant by integral system? State its basic features, advantages and pre-requisites.

Numerical questions

1. The following balances appear in the books of Sarthak. co. Ltd. On 1.1.2020

	(₹)	(₹)
General ledger adjustment A/c		15,200
Stores ledger control A/c	8,750	
WIP ledger control A/c	4,280	
Finished goods ledger control A/c	<u>2,170</u>	
	<u>15,200</u>	<u>15,200</u>
On 31.12.2020, the following information was supplied:		
Purchase of stores		60,640
Purchase for special job		1,950
Direct wages	38,627	
Indirect factory wages	9,543	
Administrative salaries	6,731	
Selling and distribution salaries	<u>4,252</u>	59,153
Production expenses		40,432
Administration expenses		9,546
Selling and distribution expenses.		6,430
Stores issued to production		56,501
Stores issued to maintenance a/c		2,556
Returns of suppliers		312
Production overhead absorbed by production		23,410
Administration overhead absorbed by finished goods		15,150
Selling overhead recovered on sales		9,515
Products finished during the year		1,18,517
Finished goods sold at cost		1,33,382
sales		1,55,000

You are required to record the entries in cost ledger for the year 2020 and prepare a trial balance.

Answer: Total of the Trial Balance ₹

2. The balances in Cost Ledger of manufacturing company on 1st January 2004 were:

	₹
Stores Ledger Control A/c	7,000
Work-in-progress ledger Control A/c	12,800
Finished stock ledger control A/c	2,000
Cost ledger control A/c	21,800
You are given the following information for 2004	
Purchase of materials	40,000
Direct factory wages	60,000
Manufacturing Expenses	34,600
Selling and Distribution Expenses	5,400
Material issued to production	37,200
Manufacturing expenses recovered	34,440
Selling and distribution Expenses recovered	5,320
Sales	1,50,000
Stock of material on 31 st Dec. 2004	9,800
Stock of finished goods on 31 st Dec. 2004	4,700
Work-in-progress at 31 st Dec. 2004	14,700

You are required to show the accounts in the cost ledger for the year 2004 to prepare the costing profit and loss account for the year and extract a trail balance.

Answers: Total of the Trial Balance ₹29,440

3. During the month of January, following transaction regarding materials took place in Hind Co.

	₹
1. Material Purchased:	
(a) Credit Purchases	18,000
(b) Credit purchase for a Special Job	800
(c) Cash Purchased	2,000
2. Return to Suppliers	1,000
3. Direct Materials issued to production	12,000
4. Indirect materials issued	1,200
5. Material returned from production to stores	200
6. Material transferred (from Job. No.1 to Job. No.2)	400

You are required to enter these transactions in the cost books (under cost control account system)

4. The Balances in cost Ledger of a manufacturing company on January 1, 2018 ware:

	₹
Stores Ledger Control Account	7,000
Work-in-Progress Ledger Control Account	12,800

Finished Stock Ledger Control Account	2,000
Cost Ledger Control Account ¹	21,800
<i>You are given the following information for the year</i>	
Purchase of materials	40,000
Direct factory wages	60,000
Manufacturing expenses	34,600
Selling and distribution expenses	5,400
Materials issued to production	37,200
Manufacturing expenses recovered	34,440
Selling and distribution expenses recovered	5,320
Sale	1,50,000
Stock of material at December 31, 2018	9,800
Stock of finished goods at December 31, 2018	4,700
Work-in-Progress at December 31,2018	14,700

You are required to show the accounts in the Cost Ledger for the year 2018, to prepare the Costing Profit and Loss Account for the year and extract a trail balance.

Answer: Total of the Trial Balance ₹ 29,440

5. Journalise the following transactions assuming that the cost and financial records are integrated Prepare necessary ledger accounts and trail balance.

₹

1. Raw material purchased on credit	14,800
2. Direct material issued to production	12,800
3. Wages paid	16,800
4. Wages- Productive	14,800
5. Wages- Unproductive	2,000
6. Factory Expenses	6,500
7. Factory Expenses charged to production	8,600
8. Administration Expenses	4,400
9. Administration expenses charged to Production	4,350
10. Selling Expenses charged to sales	4,500
11. Finished goods at cost	30,000
12. Cash sales	39,000

Answer: Total of the trail balance ₹19,350

6. Journalise the following transactions assuming cost and financial accounts are integrated.

₹

Wages paid (30% indirect)	12,000
Raw material purchased	20,000
Direct materials issued to production	15,000
Wages charged to production	9,500
7. BPR limited keeps on integrated accounting system. The following balance appears in the books as on April 1, 2020:	

	Dr. ₹	Cr. ₹
Stores Ledger Control A/c	40,950	--
Work-in-Progress A/c	38,675	--
Finished Goods A/c	52,325	--
Bank A/c	--	22,750
Creditors A/c	--	18,200
Fixed Assets A/c	1,47,875	--
Debtors A/c	27,300	--
Share Capital A/c	--	1,82,000
Provision for Depreciation A/c	--	11,375
Provision of Doubtful Debts A/c	--	3,725
Factory Overheads outstanding A/c	--	6,250
Pre-Paid Administration overheads A/c	9,975	--
Profit & Loss A/c	--	72,800
	3,17,100	3,17,100

The transaction for the year ended March 31, 2021, were as given below:

₹	₹
Direct Wages	2,09,300
1,97,925	2,27,500
Indirect Wages	2,50,250
<u>11,375</u>	4,550
Purchase of materials (on credit)	4,89,125
Material issued to production	6,82,500
Material issued for repairs	5,00,500
Goods finished during the year (at cost)	1,09,200
Credit sales	91,000
Cost of Goods sold	7,775
Production overheads absorbed	27,300
Production overheads paid during the year	31,850
Production overhead outstanding at the end of year	2,29,775
Administration overheads paid during the year	6,59,750
Selling overhead incurred	14,789
Payment to creditors	2,225
Payment received from debtors	4,590
Depreciation of machinery	
Administration overheads out standing at the end of year	
Provision for doubtful debts at the end of the year	

You are required to write up the account in the integrated ledger of BPR Limited and prepare a trial balance.

Answer: Total of the Trial Balance ₹ 4,46,725

B. COM

SEMESTER IV

COURSE: COST ACCOUNTING

UNIT-12 RECONCILIATION OF COST AND FINANCIAL ACCOUNTS

STRUCTURE

12.1 OBJECTIVES

12.2 INTRODUCTION

12.3 CONCEPT OF RECONCILIATION STATEMENT

12.4 NEED FOR RECONCILIATION

12.5 REASONS OF DISAGREEMENT

12.6 PROCEDURE OF RECONCILIATION

12.7 METHODS TO RECONCILE THE RESULTS OF COST AND FINANCIAL ACCOUNTS

(A) RECONCILIATION STATEMENT

(B) MEMORANDUM RECONCILIATION ACCOUNT

12.8 TYPES/ CLASSIFICATION OF PROBLEMS

12.9 CIRCUMSTANCES IN WHICH RECONCILIATION CAN BE AVOIDED

12.10 SUMMARY

12.11 KEY WORDS

12.13 ANSWER TO CHECK YOUR PROGRESS

12.14 TERMINAL QUESTIONS

12.1 OBJECTIVES

After studying this unit you would be able to

- Understand the concept of reconciliation of cost and financial accounts
- Know the need for reconciliation
- Learn the reasons for disagreement of profits
- Study the procedure and methods of reconciliation

12.2 INTRODUCTION

Basically there are two systems of accounting to maintain cost of accounts. They are Integral and Non-Integral Accounting System. Under Integral Accounting System, both cost and financial accounts are merged into one i.e., only one set of books of account is kept and maintained to solve the purposes of both cost accounting and financial accounting. On the other hand, under Non-Integral Accounting System, two separate sets of books are kept and maintained. The accounting principles, methods and practices are different under financial accounting and cost accounting. Therefore, the final results shown as per cost accounting and financial accounting are different. Hence, there is a need to reconcile the profit and loss as shown by these two accounting systems.

12.3 CONCEPT OF RECONCILIATION STATEMENT

The cost accounts and financial accounts which are maintained in different principles and approaches show different results at the end. To find out the reasons of differences in results by these two sets of accounts, a statement is prepared periodically known as reconciliation of cost and financial accounts. This statement aims at tallying the profits or losses revealed by the two sets of books.

12.4 NEED FOR RECONCILIATION

The important objectives necessitating the reconciliation of cost and financial accounts are as follows:

1. To ensure mathematical accuracy and reliability of cost accounts in order to have cost ascertainment, cost control and to have a check on financial accounts.
2. To find out the causes of the differences in the results of the two systems (cost accounts and financial accounts).
3. To promote coordination and cooperation between cost accounting and financial accounting department in generating accurate and reliable data for managerial decision making.
4. To establish better internal control system in the organization.
5. To standardize policies of the organization regarding valuation of stock, charging depreciation, absorption of overhead etc.

12.5 REASONS OF DISAGREEMENT

The difference in profit or loss ascertained in cost accounts and financial accounts are due to the following reasons:

1. **Items Included Only in Financial Accounts:** There are certain items of incomes, expenditures, appropriation of profits and abnormal losses etc. which are not considered

while preparing cost sheet because they are purely the items of financial accounting. The examples are as follows.

Purely Financial Expenses/ Charges	Purely Financial Incomes	Appropriations of Profits
<ul style="list-style-type: none"> • Loss on sale of investment • Loss on sale of fixed assets • Fines and penalties • Discount on issue of debentures and bonds • Interest on debentures, mortgage and bank loan • Interest on capital • Underwriting Commission • Debenture discount written off • Expenses on raising capital • Cash discount • Loss by fire, Loss by theft • Cost of abnormal wastage of materials • Provision for doubtful debts • Damages payable in contravention of law 	<ul style="list-style-type: none"> • Profit on sale of investments • Profit on sale of fixed assets • Dividend on investment received • Brokerage received • Interest on bank deposit, investment received • Brokerage, Commission received • Transfer fee received • Cash discount received • Damages received through court of law • Rent received 	<ul style="list-style-type: none"> • Transfer to general reserve • Transfer to specific reserves like debenture redemption fund, dividend equalisation fund etc. • Transfer to sinking fund • Dividend distribution tax • Donation and charities • Writing off Goodwill, Patent, Underwriting commission, Preliminary expenses etc. • Income-tax

2. Items Included Only in Cost Accounts

There are certain items of notional value which are shown only in cost accounts and are not having any treatment in financial accounts. These items are shown just to calculate the true value of cost of production. The examples are as follows:

- Notional interest on capital (interest on capital invested by the owner from his own sources)
- Notional rent (rent of premises owned by the proprietor/partner)
- Notional salary (salary of the proprietor/partner for managing the business)

3. Difference due to the use of different methods of stock valuation

Using different methods of valuation of stocks adopted in cost accounts and financial accounts may also cause a difference in the results shown by the two sets of books.

In cost accounts, stock of work-in-progress is usually valued at factory cost but in financial accounts it is generally valued at prime cost.

Similarly, in cost accounts, closing stock is valued at cost for balance sheet purpose; while in financial accounts the basis is cost price or market price whichever is less.

Inventories are valued in accordance with the Generally Accepted Accounting Principles (GAAPs) in financial accounts. In cost accounts, the issue and valuation rates are different (such as FIFO, LIFO etc.). This causes difference in results as per two books of accounts.

The effects of over/under valuation of stock on profit are as follows:

Sl No.	Particulars	Effects on Profits	
		Cost Accounts	Financial Accounts
1	Over valuation of opening stock in Cost Accounts.	Less	More
2	Under valuation of opening stock in Cost Accounts.	More	Less
3	Over valuation of closing stock in Cost Accounts.	More	Less
4	Under valuation of closing stock in Cost Accounts.	Less	More

4. Difference due to the use of different rates and methods of depreciation

Use of one depreciation method for cost accounts and another method for financial accounts also results in difference in the reported profit and loss. For example, Straight Line Method or Reducing Balance Method (as per provisions of Companies Act or Income Tax Act) is adopted in financial accounts whereas in cost accounts Machine Hour Rate or Production Hour or Unit Method may have been adopted.

5. Disagreement due to under/over absorption of overheads

In financial accounts, actual overhead expenses are charged. But in Cost Accounts, overhead expenses are normally recovered at predetermined rates like percentage on direct materials, percentage on direct wages etc. which may be more or less than the actual amount incurred. Thus, under or over absorption of overheads leads to difference in two accounts.

The effect of over/under absorption of overheads on profits is as follows:

Sl No.	Particulars	Effects on Profits	
		Cost Accounts	Financial Accounts
1	Over absorption of overheads in Cost Accounts.	Less	More
2	Under absorption of overheads in Cost Accounts.	More	Less

6. Abnormal losses and gains

Abnormal items like loss by fire or theft, cost of abnormal idle time, abnormal wastage of materials, exceptional bad debts, abnormal gain in manufacturing etc. may be shown in financial accounts but are excluded from the cost accounts and are taken directly to costing profit and loss account. So, there is difference in profits as per two books of accounts.

12.6 PROCEDURE OF RECONCILIATION

There are three important steps in the process of reconciliation as presented below:

- Ascertainment of profit as per Cost Accounting (by preparing Income Statement or Costing Profit or Loss Account)
- Ascertainment of profit as per Financial Accounting (by preparing Profit and Loss Account in the financial books)
- Reconciliation of both the profits (by preparing a Reconciliation Statement which explains the reasons for the difference in the profits between the two sets of books)

12.7 METHODS TO RECONCILE THE RESULTS OF COST AND FINANCIAL ACCOUNTS

There are two methods to reconcile cost and financial accounts. They are (a) Reconciliation Statement and (b) Memorandum Reconciliation Account.

(A) RECONCILIATION STATEMENT– Under this method, a Reconciliation Statement is prepared by following the procedure given below:

- i. The profit or loss of any one accounting system is taken as the base. If profit or loss as per cost accounts is taken as base i.e. the starting point, then profit or loss as per financial accounts is arrived at the end and vice versa.
- ii. The reasons of difference in profit or loss are analysed and listed.
- iii. Additions or deductions, to and from the profits shall be made as per the base book and explained briefly in the statement.
- iv. If the given profit is less in the base book then the find-out profit will be more, so add the difference to the profit in the base book.

In the same way, if the given profit is more in the base book, then the find-out profit will be less, so deduct the difference from the profit in the base book.

Thus, we can start our question either with profit or loss as per cost accounts or financial accounts and can arrive at the result of the other accounts at the end.

PROFORMA OF RECONCILIATION STATEMENT

Particulars	₹	₹
A. Profit as Cost Accounts(or Loss as per Financial Accounts)		
B. Add: Items having the effect of higher profit in financial accounts		
1. Expenses shown in cost accounts not in financial accounts		
2. Expenses overcharged in cost accounts		
3. Overvaluation of opening stock in cost accounts		
4. Income shown in financial account but not in cost accounts		
5. Undervaluation of closing stock in cost accounts		
6. Over absorption of overhead in cost accounts		
7. Excess depreciation charged in cost accounts		
C. Less : Items having the effect on lower profit in financial accounts		
1. Expenses shown in Financial accounts but not in cost accounts		
2. Expenses under charged in cost accounts		
3. Under valuation of opening stock in cost accounts		
4. over valuation of closing stock in cost accounts		
5. Income recorded in cost account but not in financial accounts		
6. Depreciation under charged in cost accounts		
7. Under absorption of overhead in cost accounts		
D.Profit as per financial accounts(A+B-C)		

Note: 1.If profit as per financial accounts (or loss as per cost accounts) is taken as the base, then items added shall be deducted and items to be deducted shall be added i.e., the procedure shall be reversed.

2. In case of loss, the amount shall appear as a minus sign.

(B) MEMORANDUM RECONCILIATION ACCOUNT

This is the second method of reconciliation which is done in the form of an account. It is not a part of double entry system because all items posted in this account do not have their corresponding debits/ credits in the books of accounts. The profit as per cost accounts (which is the starting point) is shown in the credit side of the account and loss as per cost accounts is shown in the debit side of this account. All items which are added in the reconciliation statement are shown on the credit side and all those items which are deducted are shown on the debit side of this account. The balance of this account will show the profit or loss as per financial accounts. The proforma is given below:

Format of Memorandum Reconciliation Account

MEMORANDUM RECONCILIATION ACCOUNT

Particulars	Amount (₹)	Particulars	Amount (₹)
To loss as per cost accounts		By profit as per cost account	
To financial expenses shown in financial accounts not in cost accounts		By expenses shown in cost accounts not in financial accounts	
To expenses under charged in cost accounts		By expenses overcharged in cost accounts	
To undervaluation of opening stock in cost accounts		By overvaluation of opening stock in cost accounts	
To overvaluation of closing stock in cost accounts		By income shown in financial accounts but not in cost accounts	
To income recorded in cost accounts but not in financial accounts		By undervaluation of closing stock in cost accounts	
To depreciation undercharged in cost accounts		By over absorption of overhead in cost accounts	
To profit as per financial accounts		By excess depreciation charged in cost accounts	
		By loss as per financial accounts	

KNOW YOUR PROGRESS

State whether the following statements are true or false

1. Cost and financial accounts are reconciled under non integral accounting.
2. Costing profit and loss account includes all items of financial nature (like interest) which are not included in cost ascertainment.
3. In reconciliation statement, dividend received is added as per cost accounts.
4. If a businessman is owner of the premise, rent is not included in cost of products.
5. Income tax is provided in cost accounts only.

12.8 TYPES/ CLASSIFICATION OF PROBLEMS

Problems relating to reconciliation may be classified into four broad categories as presented below:

1. Problems which furnish the profit as per one set of accounts and require the computation of profit as per another set through reconciliation.
2. Problems which furnish the profit under both the systems of accounts and require only reconciliation of these.
3. Problems which require the computation of profit under one accounts and reconciling it with the given profit as per another accounts.

4. Problems requiring the computation of profit under both cost and financial accounts before they are reconciled.
5. Memorandum Reconciliation Account

The above categories of problems are solved through the following illustrations:

1. **Problems which furnish the profit as per one set of accounts and require the computation of profit as per another set through reconciliation.**

Illustration 12.1

From the following data, compute profit or loss as per Financial Accounts and a reconciliation statement.

	₹
Profit as per cost accounts	1,45,500
Works over heads under-recovered	9,500
Administrative overhead under recovered	22,750
Selling overhead over recovered	19,500
Overvaluation of opening stock in cost books	15,000
Overvaluation of closing stock in cost books	7,500
Interest earned during the year	3,750
Rent received during the year	27,000
Bad debts written off during the year	9,000
Preliminary expenses written off during the year	18,000

Solution:

Reconciliation Statement

Particulars	(₹)	(₹)
Profit as per cost accounts		1,45,500
Add:		
1. Over recovery of selling overheads	19,500	
2. Overvaluation of opening stock in Cost accounts	15,000	
3. Interest earned not recovered in Cost accounts	3,750	
4. Rent Received recorded only in financial accounts	<u>27,000</u>	<u>65,250</u>
		2,10,750
Less:		
1. Under recovery of works overheads	9,500	
2. Under recovery of Administrative overheads	22,750	
3. Over-valuation of closing stock in cost accounts	7,500	
4. Bad Debts written off (shown in financial accounts)	9,000	
5. Preliminary expenses written off	<u>18,000</u>	<u>66,750</u>
Profit as per financial accounts		<u>1,44,000</u>

Illustration 12.2

The profit as per Cost Accounts is ₹82,650. The following points are found on comparison of records between Cost Accounts and Financial Accounts:

	Cost Accounts ₹	Financial Accounts ₹
1. Opening Stock:		
Materials	16,300	16,500
Work-in-Progress	10,000	10,500
2. Closing Stock:		
Materials	18,000	17,200
Work-in-Progress	8,000	7,600
3. Dividend and interest received: ₹ 400.		
4. Loss on sale of Motor car ₹ 500.		
5. ₹3,000 interest charged, not considered in financial books.		
6. Goodwill ₹6,000 has been written off during the year.		
7. Overheads incurred ₹ 60,000, but overheads recovered amounted to ₹ 63,000		

Find out the profit or loss as per Financial Accounts. Verify your result by preparing Memorandum Reconciliation Account.

Solution:

(A) Statement of Reconciliation

	₹	₹
Profits as per Cost Accounts		82,650
Add: Dividend and Interest recorded in financial books	400	
Add: interest not recorded financial books	3,000	
Add: Over-recovery of overheads in cost Accounts: ₹ 63,000 – ₹60,000	2,400	(+)5,800
		88,450
Less: Under-Valuation of Opening Stock of Materials and Work-in-Progress in cost books: (₹27,000 – ₹ 26,300)	700	
Less: Over-Valuation of Closing Stock of Materials and Work-in-Progress in cost books: (₹26,000 – ₹ 24,800)	1,200	
Less: Loss on motor car, not charged in cost books	500	
Less: Goodwill written off, but not in Cost Accounts.	6,000	(-)8,400
Profit as per Financial Accounts		80,050

Verification:**(B) Memorandum Reconciliation Account**

To Difference in Opening Stock and Work-in-Progress (₹ 27,000 – ₹ 26,300)	700	By profit as per Cost Accounts	82,650
To Difference in Closing Stock and Work-in-Progress (₹26,000 – ₹24,800)	1,200	By Interest and dividend	400
To Loss on Sale of Car	500	By interest not entered in Financial Accounts	3,000
To Goodwill written off	6,000	By Over-recovery of overheads in Cost Accounts (₹ 63,000 – ₹60,600)	24,00
To Profit as per Financial Accounts	80,050		
	88,450		88,450

Illustration 12.3

From the following figures, prepare Reconciliation Statement:

	₹
Net loss as per costing records	1,72,400
Works overhead under recovered in costing	3,120
Administrative overhead recovered in excess	1,700
Depreciation charged in financial records	11,200
Depreciation recovered in costing	12,500
Interest received not included in costing	8,000
Obsolescence charged (Loss) in financial books	5,700
Income tax provided in financial books	40,300
Bank interest credited in financial books	750
Stores adjustments (Cr.) in financial books	475
Value of opening stock in cost accounts	52,600
Value of opening stock in financial accounts	54,000
Value of closing stock in cost accounts	52,000
Value of closing stock in financial accounts	49,600
Interest charged in cost accounts but not in financial accounts	6,000
Provision for doubtful debts in financial books	150
Preliminary expenses written off in financial books	800

Solution

Reconciliation Statement

	₹	₹
Loss as per costing records		(-) 1,72,400
Add: Administrative overhead recovered in excess	1,700	
Add: Interest received not included in costing records	8,000	
Add: Bank interest credited in financial books	750	
Add: Stores adjustments in financial books	475	
Add: Depreciation over- charged in cost accounting: (₹ 12,500 – ₹11,200)	1,300	
Add: Interest charged in cost accounts	6,000	(+) 18,225
		(-) 1,54,175
Less: Works overheads under recovered in costing	3,120	
Less: Obsolescence charged in financial books	5,700	
Less: Income tax provided in financial books	40,300	
Less: Opening stock under-valued in cost (₹54,000 – ₹ 52,600)	1,400	
Less: Closing stock over-valued in cost (₹52,000 – ₹49,600)	2,400	
Less: Preliminary expenses written off in financial books	800	
Less: Provision for doubtful debts	150	(-) 53,870
Loss as per Financial Books		(-) 2,08,045

2. Problems which furnish the profit under both the systems of accounts and require only reconciliation of these.

Illustration 12.4

The financial books of a company show a net profit of ₹2,57,510 for the year ending 31st December. The cost accounts show a net profit of ₹ 3,44,800 for the same period. The following facts are brought to light.

	₹
Under-recovery of factory overheads in Cost Accounts	6,240
Over-recovery of overheads in Cost Accounts	3,400
Depreciation in Financial Accounts	22,500
Depreciation in Cost Accounts	25,000
Interest on investments not included in cost	16,000
Loss of obsolescence charged in Financial Accounts	11,400
Income tax debited in Financial Accounts	80,600
Bank interest and dividend credited to Financial Accounts	2,450
Loss in stock not charged in Cost Accounts	13,500

Prepare a reconciliation statement.

Solution:**Reconciliation Statement**

	₹	₹
Profit as per Cost Accounts		3,44,800
Add: Over-recovery of office overheads in Cost Accounts	3,400	
Depreciation overcharged in Cost Accounts	2,600	
Interest on investments not included in Cost Accounts	16,000	
Bank interest and dividend not entered in Cost Accounts	2,450	24,450
		3,69,250
Less: Under-recovery of work overheads	6,240	
Loss due to obsolescence not in Cost Accounts	11,400	
Income tax not entered in Cost Accounts	80,600	
Loss in stock not charged in Cost Accounts	13,500	
		1,11,740
Profit as per Financial Accounts		2,57,510

Illustration 12.5

A company's profit as per the Costing System was ₹ 46,126 whereas the audited financial accounts showed a profit of ₹ 33,248 for the year ended 31st December 2011. From the following additional information, you are required to prepare a Reconciliation Statement, showing clearly the reasons for the difference between the two figures:

Profit and Loss Account for the year ended 31st December 2011

	₹		₹
To Opening Stock	4,94,358	By Sales	6,93,000
To Purchase	<u>1,</u>	By Closing Stock	1,50,242
<u>64,308</u>	6,58,666		
	46,266		
To Direct Wages	41,652		
To Factory Overheads	96,658		
To Gross Profit c/d			
	8,43,242		8,43,242
	19,690	By Gross Profit	96,658
To Administration Expenses	44,352	By Sundry Income	632
To Selling Expenses	33,248		
To Net Profit	97,290		97,290

The cost records show:

- Closing stock balance of ₹ 1,56,394;
- Direct wages paid during the year ₹49,734;
- Factory overhead absorbed ₹ 39,428;
- Administration expenses charged @ 3% on sales;

(e) Selling expenses charged @ 5% of value of sales.

Solution:

Reconciliation Statement

	₹	₹
Profit as per Cost Accounts		46,126
Add: Direct wages over-absorbed in Cost Accounts: (₹ 49,734 – ₹ 46,266)	3,468	
Administration Expenses over- absorbed in Cost Accounts: (3% of ₹ 6,93,000 = ₹ 20,790 – ₹ 19, 690)	1,100	
Sundry income entered in Financial Accounts	632	(+ 5,200)
		51,326
Less: Over-valuation of closing stock in Cost Accounts : (₹1,56,394—₹1,50,242)	6,152	
Under absorption of factory overheads (₹41,652 – ₹ 39,428)	2,224	
Under absorption of selling overheads in Cost Accounts: (₹44,352 –5% of 6,93,000) = (₹44,352 – ₹ 34,650)	9,702	(-)18,078
Profit as per Financial Accounts		33,248

2. Problems which require the computation of profit under one accounts and reconciling it with the given profit as per another accounts.

Illustration 12.6

The following is the Trading and Profit and Loss accounts of a company for the year 31st March 2011.

Particulars	(₹)	Particulars	(₹)
To Material	1,096	By Sales (120 units)	2,500
To Wages	704	By Closing Stock (4 units)	64
To Work Expenses	332		
To Administration Exp.	150	By Work in Progress:	
To selling Exp.	180	Material	26.00
To Preliminary Exp.	20	Labour	14.00
To Net Profit	<u>130</u>	Factory Expenses	<u>48</u>
	<u>2,612</u>	<u>8.00</u>	<u>2,612</u>

The company manufactures a standard product. The books of the company estimate the following expenses:

- (i) Factory expenses @ 20% on prime cost
- (ii) Administrative Exp. @ ₹ 1.20 per unit
- (iii) Selling expenses @ ₹ 1.60 per unit.

Calculate profit or loss as per Cost Accounts and reconcile the results of two sets of accounts.

Solution:

Units Produced = Units sold + Closing Stock = 120 + 4 = 124 units

Cost Sheet

Particulars	(₹)
Material	1,096
Wages	<u>704</u>
	1,800
Prime Cost	<u>360</u>
Add: Factory Overheads (20% on Prime cost)	2,160
	<u>48</u>
Less: Closing Work in Progress	2,112
Work cost	
Add:	<u>148.80</u>
Administrative Overheads (@ ₹ 1.20 per unit on 124 units)	2,260.80
Production	72.93
Less: Closing stock of finished goods $\frac{₹ 2260.80}{124 \text{ units}} \times 4 \text{ units}$	<u>2,187.87</u>
	Cost of
goods sold	<u>192.00</u>
Add:	2,379.87
Selling expenses (@ ₹ 1.60 per unit on 120 units)	<u>120.13</u>
Selling Cost	<u>2,500.00</u>
Profit	
Sales	

Reconciliation Statement

Particulars		(₹)
Profit as per Cost Accounts		120.13
Add:		
1. Factory expenses overcharged (₹ 360 -- ₹ 332)		28.00
2. Selling expenses overcharged in cost (₹ 192 -- ₹ 180)		<u>12.00</u>
		160.13
Less:		
1. Administration expenses undercharged (150- 148.80)	1.20	
2. Overvaluation of closing stock (₹ 72.93 - ₹ 64)	8.93	
3. Preliminary expenses written off	<u>20.00</u>	
		<u>30.13</u>
Profit as per Financial Accounts		<u>130.00</u>

4. Problems requiring the computation of profit under both cost and financial accounts before they are reconciled.

Illustration 12.7

From the following particulars, prepare (a) a statement of cost of manufacture, (b) a statement of profit as per Cost Accounts, (c) Profit and Loss Account as per financial books and (4) Reconciliation statement reconciling profit as per Cost and Financial books.

	₹	
Opening stock of raw materials		60,000
Opening stock of finished goods		1,20,000
Purchase of raw materials		3,60,000
Stock of raw materials at the end		90,000
Stock of finished goods at the end		30,000
Wages		1,50,000

Calculate factory overheads at 25% on prime cost and office overhead at 75% on factory overhead.

Actual works expenses amounted to ₹1,16,250 and actual office expenses amounted to ₹91,500.

The selling price was fixed at a profit of 20% of the selling price.

Solution:

(a) Statement of Cost

	₹	₹
Opening stock of Raw Materials	60,000	
Add: Purchase of Raw Materials	3,60,000	
	4,20,000	
Less: Closing stock of Raw Materials	90,000	3,30,000
Wages		1,50,000
Prime Cost		4,80,000
Factory overheads (25% on ₹4,80,000)		1,20,000
Work Cost		6,00,000
Office Overheads (75% of ₹ 1,20,000)		90,000
Cost of Production		6,90,000

(b) Statement of Profit

Stock of finished goods	₹	₹
	1,20,000	
Add: Cost of finished goods	6,90,000	
	8,10,000	
Less: Closing stock of finished goods	30,000	
Cost of goods sold		7,80,000
Profit (20% of selling price or 25% on cost price)		1,95,000
Selling price		9,75,000

(c) Profit and Loss account for the year ended.....

To Opening stock:	₹	By Sales	₹
Raw materials	60,000		9,75,000
Finished goods	1,20,000	By Closing Stocks:	
To Purchase	3,60,000	Raw Materials	90,000
To Wages	1,50,000	Finished goods	30,000
To Works expenses (actual)	1,16,250		
To Office Expenses (actual)	91,500		
To Net Profit	1,97,250		
	10,95,000		10,95,000

(d) Reconciliation Statement

Profit as per Cost Accounts		₹
Add: Over-absorption of Factory overhead:		1,95,000
Cost Records	1,20,000	
(-) Financial records	1,16,250	3,750
		1,98,750
Less: Under-absorption of Office overhead:		
Cost Records	91,500	
(-) Financial records	90,000	1,500
Profit as per Financial Accounts		1,97,250

Illustration12.8

Ashutosh Ltd commenced business on 1st April 2016. Cost and financial records are maintained for the year ended 31st March 2017.

From the following information prepare statements:

- Showing the result as per Costing records.
- Showing the result as per Financial records, and
- Reconciling these results

Particulars	As per costing records	As per Financial Records
Material consumed (20,000 kgs)	₹28.50 per kg	₹26 per kg
Direct Wages (3,000 man day)	₹.80 per man day	₹85 per man day
Factory overheads	20% of the time cost	₹3,60,000
Administrative Overheads	₹30 per kg of output produced	₹4,00,000
Sales Overheads	₹50 per kg of output sold	₹9,60,000
Stock (of output produced) as on 31-3-2017 (2,000 kgs)	At cost of production	₹1,50,000
Work-in-progress as on 31-3-2017	₹1,62,000	₹1,62,000
Sales (16,000 kgs)	₹130 per kg	₹129.50 per kg
Rent Income	-	₹1,20,000
Preliminary Expenses written off	-	₹30,000

Solution:

Asutosh Ltd.
Cost Sheet for the year ended 31.03.2017

Particulars	Details	Amount(₹)
Material consumed	(20,000 kgs × ₹28.50)	5,70,000
Direct Wages	(3,000 man days × ₹80)	2,40,000
Prime Cost		8,10,000
Add: Factory overheads	(20% on prime cost)	1,62,000
Less: Closing work-in-progress		9,72,000
Factory Cost		1,62,000
Add: Administrative overhead	(18,000 kgs × ₹30)	8,10,000
Cost of production		5,40,000
Less: Closing Stock	(13,50,000 × 2000/18,000)	13,50,000
Cost of Goods sold		1,50,000
Add: Sales overhead	(16,000 kgs × Rs.50)	12,00,000
Cost of sales		8,00,000
Profit	(16,000 kgs × Rs.130)	20,00,000
Sales		80,000
		20,80,000

Asutosh Ltd.

P&L A/c for the year ended 31-03-2017

Particulars	₹	Particulars	₹
To Material	5,20,000	By Closing stock of WIP	1,62,000
To Wages	2,55,000	By Sales	20,72,000
To Factory Overheads	3,60,000	By Closing stock of Finished goods	1,50,000
To Admn. Overheads	4,00,000	By Rent	1,20,000
To Sales overheads	9,60,000	By Net Loss	21,000
To Preliminary expenses written off	30,000		-
	25,25,000		25,25,000

Reconciliation Statement of Cost and Financial Accounts for the year ended 31.03.2017

	₹	₹
Profit as per Cost Accounts		
Add:		80,000
1. Material consumed over charged in Cost Accounts	50,000	
2. Admn. Overheads recovered in Cost Accounts	1,40,000	
3. Rental income only recovered in Financial Accounts	1,20,000	3,10,000
		3,90,000
Less:		
1. Direct wages under charged in Cost Accounts	15,000	
2. Factory overheads under recovered in Cost Accounts	1,98,000	
3. Sales overhead under recovered in Cost accounts	1,60,000	
4. Preliminary expenses only charged in FinancialAccounts	30,000	
5. Sales over recovered in Cost accounts	8,000	4,11,000
Loss as recorded in Cost Accounts		21,000

Illustration 12.9

From the following information prepare-

- P&L Account
- Cost Sheet
- Reconciliation Statement:

	₹	Units
Sales	2,50,000	20,000
Material	1,00,000	
Wages	50,000	
Factory Overhead	45,000	
Office overheads	26,000	
Selling and distribution overheads	18,000	
Closing stock of finished goods	15,000	1,230
Work-in-progress:		
Material	3,000	

Wages	2,000	
Factory overheads	2,000	
Goodwill written off	20,000	
Interest on capital	2,000	

In costing books, factory overhead is charged at 100% on wages, administration overheads at 10% of factory cost and selling and distribution overheads at the rate of Re.1 per unit sold.

Solution:

Profit and Loss Account

Particulars	₹	Particulars	₹
To Materials	1,00,000	By Sales	2,50,000
To Wages	50,000	By Closing Stock	15,000
To Factory overheads	45,000	By Work-in-progress (3,000 + 2,000 + 2,000)	7,000
To Office overheads	26,000		
To Selling and distribution overheads	18,000		
To Goodwill	20,000		
To Interest	2,000		
To Profit	11,000		
	2,72,000		2,72,000

Cost Sheet

Materials	1,00,000
Wages	50,000
Prime Cost	1,50,000
Factory Overhead	50,000
	2,00,000
Less: Work-in-progress (closing) (3,000 + 2,000 + 2,000)	7,000
Factory Cost	1,93,000
Administration overhead	19,300
Cost of production	2,12,300
Less: Closing stock of finished goods	
2,12,300	
<u>21,230</u> × 1,230	12,300
Cost of goods sold	2,00,000
(Selling and Distribution overhead @Re.1 for 20,000 units)	20,000
Cost of sales	2,20,000
Profit	30,000
Sales	2,50,000

Reconciliation Statement

₹

Profit as per Cost Accounts		30,000
Add: Over charged factory overhead in Cost Accounts		5,000
Over charged selling and distribution overhead in Cost Accounts		2,000
Closing stock under valued in Cost Accounts		2,700
		39,700
Less: Goodwill written off in financial Accounts	20,000	
Interest on capital not included in cost accounts	2,000	
Under charged office overhead in cost accounts	6,700	28,700
Profit as per Financial Accounts		11,000

Illustration 12.10

The following is the Trading and profit and Loss account of M/s. Shakti Limited for the year ending 31-12-2017

Particulars	₹	Particulars		₹
To Materials consumed	7,08,000	By Sales (30,000 units)		15,00,000
To Direct Wages	3,71,000	By Finished stock (1000 units)		40,000
To Work overheads	2,13,000	By work in-progress:		
To Administration overheads	95,500	Material	17,000	
To Selling and Distribution overheads	1,13,500	Wages	8,000	
To Net Profit for the year	69,000	Work overhead	5,000	30,000
	15,70,000			15,70,000

In manufacturing a standard unit, the company's cost records show that:

- (i) Works overheads have been charged to work-in-progress at 20% of the prime cost.
- (ii) Administration overheads have been recovered at ₹3 per finished unit.
- (iii) Selling and distribution overheads have been recovered at ₹4 per unit sold.
- (iv) The under-absorbed or over absorbed overheads have not been adjusted in the Costing P&L a/c

Prepare:

- (i) A costing P&L A/c including net profit.
- (ii) A statement reconciling the profit as disclosed by the Cost Accounts and that shown in the Financial Accounts.

Solution:

Costing Profit and Loss Account for the year ending 31st December 2017

Particulars	₹	Particulars	₹
To Materials consumed	7,08,000	By Cost of production	13,57,800
To Direct Wages	3,71,000		
Prime Cost	10,79,000		
To Works overhead @ 20% on	2,15,000		
To Gross works cost	12,94,800		
Less: Closing stock of work-in-progress	30,000		
Works cost	12,64,800		
To Administration overhead @ ₹.3 per unit	93,000		
	13,57,800		13,57,800
To Cost of production	13,57,800	By Finished stock @ ₹43.8 p.u.	43,800
	13,57,800	By Cost of goods sold c/d	13,14,000
To Cost of goods sold b/d	13,14,000	By Sales	15,00,000
To Selling and distribution overhead @ ₹4 per unit	1,20,000		
To profit	66,000		
	15,00,000		15,00,000

Reconciliation Statement

particulars		Amount(₹)
Profit as per Cost Accounts		66,000
Add: Over absorption of works overhead in Cost accounts	2,800	
Over absorption of selling and distribution overheads	6,500	9,300
		75,300
Less: Under absorption of Admn. overheads	2,500	
Over valuation of closing stock in Cost Books	3,800	6,300
Profit as per Financial Accounts		69,000

KNOW YOUR PROGRESS

6. Loss on sale of fixed assets is an item of both financial accounts and cost accounts.
7. Interest received on bank deposits is purely a financial item.
8. Transfer to general reserve is an item of cost account.
9. Under absorption of overheads cause more profits in cost accounts.
10. Selling overhead under absorbed results in higher profit in financial accounts.
11. Reconciliation of cost and financial accounts ensures the accuracy of two sets of accounts.
12. Memorandum Reconciliation Account forms a part of double entry system.

(B) Memorandum Reconciliation Account

Illustration 12.11

The Profit and Loss Account of M/S Prakash for the year ended 31-12-2008 is as follows.

Profit and Loss Account for the year ended 31-12-2008

To Office salaries	₹ 11,282	By Gross profit	₹ 54,648
To Office expenses	6,514	By Dividend	400
To Salesman's salaries	4,922	By Interest on deposit	150
To Sales expenses	9,304		
To Distribution expenses	2,990		
To Loss on sale of machinery	1,950		
To Fines	200		
To Discount on debentures	100		
To Net profit	17,936		
	55,198		55,198
To Income tax	8,000	By Net Profit	17,936
To Reserve	1,000		
To Dividend	4,000		
To Balance c/d	4,936		
	17,936		17,936

The cost accountant of the company has ascertained a profit of ₹19,636 as per his books.

Prepare a Memorandum Reconciliation Account, showing the profit as per Financial Accounts.

Memorandum Reconciliation Account

	₹		₹
To Expenses not debited in Cost Accounts:		By Profit as per cost Accounts	19,636
Fines	200	By Income not credited in Cost Accounts:	
Discounts on Debentures	100	Dividend Received	400
Loss on sale of Machinery	1,950	Interest on Deposit	150
Income Tax	8,000		
Reserve	1,000		
Dividend	4,000		
To Net Profit as per Financial Accounts	4,936		
	20,186		20,186

Illustration 12.12

The following is the summary of the Trading and Profit and Loss Account of Zinc and Oxide Ltd. for the year ended 31st December 2011:

Profit and Loss Account (For the half year ending 30th June, 2011)

Particulars	₹	Particulars	₹
To Materials consumed	68,500	By Sales (60,000 units)	1,50,000
To Wages	37,750	By Finished Stock (2,000 units)	4,000
To Factory expenses	20,750	By Work in Progress:	
To Administrative expenses	9,560	Material	1,600
To selling and distribution expenses	11,250	Wages	900
To Preliminary expenses written off	1,000	Factory Expenses	500
To Goodwill written off	500	By Dividend	450
To Net Profit	8,140		
	1,57,450		1,57,450

The company manufactures standard product. In the cost accounts, factory expenses have been allocated to production at 20% of Prime Cost. Administrative expenses at 15 paise per unit and selling and distribution expenses at 20 paise per unit. The Net Profit shown by the cost accounts was ₹ 8,200.

You are required to prepare Memorandum Reconciliation Account

Solution:

Analysis of Difference

Particulars	Cost Books (₹)	Financial Books (₹)	Difference (₹)	Dr. or Cr. Memorandum (₹)
Prime Cost (Material + Wages)	1,06,250	1,06,250	--	--
(i) Factory Overhead	21,250	20,750	500	Cr.
(ii) Administration overheads	9,300	9,560	260	Dr.
(iii) Selling & Distribution overheads	12,000	11,250	750	Cr.
(iv) Work-in-progress (closing)	3,000	3,000	--	
	1,51,800	1,50,810	900	

Working Notes: (Figures shown in Cost Books)

- (i) Factory Overhead: 20% of ₹ 1,06,250 = ₹ 21,250
- (ii) Administration Overhead: ₹ 62,000 units X 15 paise = ₹ 9,300
- (iii) Selling and Dist. Overhead: 60,000 units X 20 paise = ₹ 12,000
- (iv) Work- in- Progress: [Prime Cost (1600 + 900 = 2500) + 20% of 2,500
= 2500 + 500 = ₹ 3,000

Memorandum Reconciliation Account

Particulars	Amount (₹)	Particulars	Amount (₹)
To Preliminary Expenses	1,000	By Profit as per Cost A/c	8,200
To Goodwill	500	By Factory Overhead	500
To Administrative	260	By Selling & Distribution Overhead	750
To Profit as per Financial A/c	<u>8,140</u>	By Dividends	<u>450</u>
	<u>9,900</u>		<u>9,900</u>

12.9 CIRCUMSTANCES IN WHICH RECONCILIATION CAN BE AVOIDED

The reconciliation of cost accounts and financial accounts can be avoided when both sets of books are integrated, i.e., when only one set of books is maintained in recording both cost and financial transactions.

Thus, under integral system of accounting, there is no need of preparing reconciliation statement to reconcile the results of cost and financial accounts.

KNOW YOUR PROGRESS

13. The need of reconciliation arises in _____ accounting system.
14. Notional charges are _____ back to costing profit to reconcile it with profit as per financial accounts.
15. The reasons for difference in profit or loss in cost or financial accounts is analysed and highlighted through _____

- a. Statement of profit and loss account
 - b. Memorandum profit and loss account
 - c. Reconciliation statement
 - d. None of these
16. In _____accounts actual overheads incurred will be recorded.
- a. Cost
 - b. Financial
 - c. Integrated
 - d. Non integrated
17. Notional salary is shown in :
- a. Financial accounts
 - b. Cost accounts
 - c. Management accounts
 - d. None of the above
18. Capital losses shown in financial accounts are _____while reconciling costing profits with financial profits. (added/deducted)
19. _____charge of depreciation in cost accounts is deducted from costing profits while reconciling with financial profits (Under/Over)
20. Depreciation charged in costing books is ₹12,500 and in financial books ₹11,200. What will be the financial profit when costing profit is ₹5,000?
- a. ₹5,500
 - b. ₹6,000
 - c. ₹3,700
 - d. ₹6,300

12.10 SUMMARY

In case the organization is adopting non-integral system of accounting then separate sets of books are to be maintained for cost and financial transactions. The principles and practices of ascertaining profit and loss are different in these two sets of accounts. Therefore, the profit and loss revealed by the two sets of accounts are bound to be different. The possible reasons of disagreement are (a) items included only in financial accounts (financial charges, financial incomes and appropriation of profits) (b) items included only in cost accounts (notional items) (c) difference due to the use of different methods of stock valuation (d) difference due to the use of different rates and methods of depreciation (e) disagreement due to under/over absorption of overheads (f) abnormal losses and gains etc. The reasons of this difference are disclosed by preparing a reconciliation statement or memorandum reconciliation account. There is no need of reconciliation under integral system of accounting where both cost and financial transactions are recorded under one set of account.

12.11 KEY WORDS

- 1. Cost Accounts:** It is the application of cost accounting principles and techniques in the collection, classification and ascertainment of costs for managerial uses.
- 2. Financial accounts:** It deals with the ascertainment of profit or loss of the concern as a whole and financial position at the end of the accounting year by following the Generally Accepted Accounting Principles (GAAPs).
- 3. Reconciliation Statement:** It is statement which reconciles the profit/ Loss as per cost accounts with profit/loss as per financial accounts by highlighting all the reasons of differences between these two sets of accounts.
- 4. Memorandum Reconciliation Account**
This is another method of reconciliation between the profit and loss as reported by cost accounts and financial accounts. It is made in the form of an account. It is not a part of double entry system because all items posted in this account do not have their corresponding debits/ credits in the books of accounts.

12.12 ANSWER TO CHECK UP YOUR PROGRESS

1. True
2. False
3. True
4. False
5. False
6. False
7. True
8. False
9. True
10. False
11. False
12. False
13. Non-integrated
14. Added
15. Reconciliation statement
16. Financial
17. Cost Accounts
18. Deducted
19. Under
20. ₹6,300

12.14 TERMINAL QUESTIONS

SHORT QUESTIONS

1. Explain the need for reconciliation of cost and financial accounts.
2. How would you deal with under or over valuation of stocks in cost accounts while preparing reconciliation statement?
3. State briefly the treatment of under or over absorption of overheads while reconciling costing profits with financial profits.
4. Give examples of expenses which are included in the cost accounts but not in financial accounts.
5. Under what circumstances can a reconciliation statement be avoided?

LONG QUESTIONS

6. What do you mean by reconciliation of cost and financial accounts? Why should cost and financial accounts be reconciled?
7. State the reasons for the differences between the profits shown in the cost accounts and those shown in the financial accounts of an industrial organization.
8. ‘There is generally a divergence between financial profits and costing profits.’ Explain the statement and give the reasons for such divergence.
9. What is memorandum reconciliation account? Why and how is it prepared?

NUMERICAL QUESTIONS

10. From the following figures prepare a Reconciliation Statement:

	₹
Net Loss as per financial records	2,08,045
Works overheads under-recovered in costing	3,120
Administrative overheads recovered in excess	1,700
Depreciation charged in financial records	11,200
Depreciation charged in costing records	12,500
Interest received, not included in costing	8,000
Obsolescence loss charged in financial records	5,700
Income tax provided in financial books	40,300
Bank interest credited in financial books	750
Store adjustment (credit in financial books)	475
Value of opening stock in cost accounts	52,600
Value of opening stock in financial accounts	54,000
Value of closing stock in cost accounts	52,000
Value of closing stock in financial accounts	49,600
Interest charged in cost account but not in financial accounts	6,000
Preliminary expenses written off in financial books	800
Provision for doubtful in financial books	150

(Answer: Net Loss as per costing records ₹ 1,72,400)

11. From the following figures, prepare a Reconciliation Statement.

	₹
--	---

Net Profit as per financial records	1,28,755
Net profit as per cost records	1,72,400
Works overheads under-recovered in cost accounts	3,120
Administrative overheads recovered in excess	1,700
Depreciation charged in financial records	11,200
Depreciation charged in cost books	12,500
Interest received, not in cost books	8,000
Obsolescence loss charged in financial books	5,700
Income tax provided in financial books	40,300
Bank interest credited in financial books	750
Depreciation of stock charged in financial books	6,750
Store adjustment credited in financial books	475

12. In a factory, works overheads are absorbed @ 60% of labour and office expenses @ 20% of works cost. The total expenditure is as follows:

	₹
Materials	2,00,000
Labour	1,50,000
Factory expenses	98,000
Office expenses	85,000

10% of the output is in the stock and sales amounting to ₹5,10,000. Prepare a cost sheet and reconciliation statement.

[Ans: profit (cost) ₹34,800; (financial) ₹21,800]

13. From the following particulars prepare (a) Profit and Loss Account, (b) Cost Sheet taking factory overhead at 25% on prime cost, office overhead at 50% on factory cost and selling overhead at 10% of the office cost and (c) Reconciliation Statement. The selling price is fixed at cost plus 25%.

	₹
Opening Stock: Raw Materials	8,000
Finished goods	16,000
Costing Stock: Raw Materials	12,000
Finished goods	4,000
Purchase of raw materials	48,000
Wages	20,000
Sales	1,80,000
Office Expenses	10,000

Work expenses	14,000
Selling expenses	10,000
Interest on Investment	4,000
Income tax paid	2,000

[Ans: (Profit as Profit and Loss Account ₹72,000, Profit as per cost sheet ₹36,000)]

14. From the following details of Small tools Ltd., compute profit in financial accounts as well as in cost accounts and reconcile profit between cost and financial accounts showing clearly the reasons for the variation of the two profit figures.

₹			
Sales	20,000	Bad Debts	100
Purchase of Materials	3,000	Interest on Overdraft	50
Closing stock of materials	500	Profit on Sales of assets	1,000
Direct wages	1,000	Selling Expenses	2,000
Indirect wages	500	Distribution expenses	1,000
Indirect expenses	2,000		

In cost accounts:

Manufacturing overhead recovered @ 300% on direct wages

Selling overhead recovered ₹1,500

Distribution overhead recovered ₹700

[Ans: (Profit as per Cost Accounts: ₹11,300, Profit as per financial Accounts: ₹11,850)]

15. Following is the trading and profit and loss account of firm

Particulars	(₹)	Particulars	(₹)
To Purchase	25,210	By Sales	
To Direct Wages	10,500	(5,000 units)	75,000
To Work Expenses	12,130	By Closing Stock	4,080
To Administration Expenses	5,340	By Discount Received	260
To Depreciation	1,100		
To Selling Expenses	7,100	By Profit on Sale of Land	2,340
To Net Profit	<u>20,300</u>		
	<u>81,680</u>		<u>81,680</u>

The profit as per Cost Account was ₹ 19,770. Reconcile the two by taking the following points.

- Closing stock in Cost Accounts ₹ 4,280
- Works expenses at 100% of direct wages in Cost Accounts
- Selling Expenses in Cost at 10% of Sale
- Administrative expenses ₹ 1 per unit
- Depreciation charged in Cost Accounts ₹ 800.

16. The Following figures have been extracted from the Financial Accounts of manufacturing company for the first year of its operation.

	₹
Material Consumed	50,00,000
Direct Wages	30,00,000
Factory Overheads	16,00,000
Administrative Overheads	7,00,000
Selling and Distribution Overheads	9,60,000
Bad Debts	80,000
Preliminary Expenses Written off	40,000
Legal Charges	10,000
Dividend Received on Deposits	1,00,000
Interest Received	20,000
Sales (1,20,000 Units)	1,20,00,000
Closing Stock of Finished Goods (4000 units)	3,20,000
Work in Progress	2,40,000

The Cost Accounts for the same period reveals that direct materials consumed was ₹ 56,00,000. Overheads are recovered at 20% of the Prime Cost. Administrative overheads are recovered at ₹ 6 per unit. Selling and distribution expenses are at ₹ 8 per unit.

Prepare (i) Profit and Loss accounts, (ii) Cost Sheet, (iii) Reconciliation Statement.

[Ans: Profit as per Cost Accounts ₹ 5,65,160, profit as per Financial Accounts ₹ 12,90,000]

17. During the year 31st March, 2011 a company's profit as per Financial Accounts was ₹ 16,624.

Profit & Loss Account

Particulars	(₹)	Particulars	(₹)
To Opening Stock	2,47,179	By Sales	3,46,500
To Purchase	82,154	By Closing Stock	75,121
To Direct Wages	23,133		
To Factory Overheads	20,826		
To Adm. Expenses	9,845	By Sundry Income	316
To Selling Expenses	22,176		
To Net Profit	16,624		
	<u>4,21,937</u>		<u>4,21,937</u>

The cost records show the following. Prepare Reconciliation statement and arrive at the profit as per Cost Accounts.

- (i) Closing Stock ₹ 78,197
- (ii) Direct Wages ₹ 24,867
- (iii) Factory overheads absorbed ₹ 19,714
- (iv) Administrative expenses are calculated at 3% of sales
- (v) Selling expenses are absorbed at the rate of 5% of sales.

[Ans: Profit as per Cost Accounts ₹

23,063]

18. Following is the trading and profit and loss account of firm

Particulars	(₹)	Particulars	(₹)
To Purchase	25,210	By Sales	
To Direct Wages	10,500	(5,000 units)	75,000
To Work Expenses	12,130	By Closing Stock	4,080
To Administration Expenses	5,340	By Discount Received	260
To Depreciation	1,100		
To Selling Expenses	7,100	By Profit on Sale of Land	2,340
To Net Profit	<u>20,300</u>		
	<u>81,680</u>		<u>81,680</u>

The profit as per cost account was ₹ 19,770. Reconcile the two by taking the following points:

- (vi) Closing stock in Cost accounts ₹ 4,280
- (vii) Works expenses at 100% in Cost at 10% of Sale
- (viii) Selling Expenses in Cost at 10% of Sale
- (ix) Administrative expenses ₹ 1 per unit
- (x) Depreciation charged in cost accounts ₹ 800

19. The Following figures have been extracted from the financial accounts of manufacturing company for the first year of its operation.

	₹
Material Consumed	50,00,000
Direct Wages	30,00,000
Factory Overheads	16,00,000
Administrative Overheads	7,00,000
Selling and Distribution Overheads	9,60,000
Bad Debts	80,000
Preliminary Expenses Written off	40,000
Legal Charges	10,000
Dividend Received	1,00,000
Interest Received	20,000
Sales (1,20,000 Units)	1,20,00,000
Closing Stock of Finished Goods (4000 units)	3,20,000
Work in Progress	2,40,000

The cost accounts for the same period reveals that direct materials consumed was ₹ 56,00,000.

Overheads are recovered at 20% of the Prime Cost. Administrative overheads are recovered at ₹ 6 per unit.

Selling and distribution expenses are at ₹ 8 per unit.

Prepare (i) Profit and Loss accounts, (ii) Cost Sheet, (iii) Reconciliation Statement.

[Ans: Profit as per Cost Accounts ₹ 5,65,160, profit as per Financial Accounts ₹ 12,90,000]

20. During the year 31st March, 2001 a company's profit as per financial accounts was ₹ 16,624. Prepare Reconciliation statement and arrive at the profit as per cost accounts using the additional information given below.

Profit & Loss Account

Particulars	(₹)	Particulars	(₹)
To Opening Stock	2,47,179	By Sales	3,46,500
To Purchase	82,154	By Closing Stock	75,121
To Direct Wages	23,133		
To Factory Overheads	20,826		
To Adm. Expenses	9,845	By Sundry Income	316
To Selling Expenses	22,176		
To Net Profit	16,624		
	<u>4,21,937</u>		<u>4,21,937</u>

The cost records show the following:

- (vi) Closing Stock ₹ 78,197
- (vii) Direct Wages ₹ 24,867
- (viii) Factory overheads absorbed ₹ 19,714
- (ix) Administrative expenses are calculated at 3% of sales
- (x) Selling expenses are absorbed at the rate of 5% of sales.

[Ans: Profit as per Cost Accounts ₹ 23,063]