



**T. Y. B. Com.**

**FINANCIAL ACCOUNTING AND AUDITING  
PAPER - IV**

**COST ACCOUNTING - INTRODUCTION AND  
BASIC CONCEPTS**

**Dr. Sanjay Deshmukh**  
Vice Chancellor,  
University of Mumbai

**Dr. Ambuja Salgaonkar**  
Director Incharge,  
Institute of Distance and  
Open Learning,  
University of Mumbai.

**Dr. Dhaneswar Harichandan**  
Incharge Study Material Section,  
Institute of Distance and  
Open Learning,  
University of Mumbai.

**Course Co-ordinator** : **Ms. Madhura Kulkarni**  
Asst. Prof-cum-Asst. Director, IDOL,  
University of Mumbai, Mumbai-400 098.

**Course Writer** : **Prof. S.D. Ovhal**  
Sidharth College of Commerce of Economics,  
Fort, Mumbai - 400001

: **Prof. Ashok Mahadik**  
Lala Lajpatrai College,  
Maharalaxmi, Mumbai - 400034

: **Prof. Shilpa Palande**  
R. J. Thakur College,  
Thane (W), 400606

: **Prof. Anthony D'Souza**  
R. J. Thakur College,  
Thane (W), 400606

**Editor** : **Prof. M. N. Wani**  
Tikambhai Mehta Commerce College,  
Mangaon, Dist. Raigad

**December 2015, T.Y.B.Com., Financial Accounting and Auditing Paper - IV,  
Cost Accounting - Introduction and Basic Concepts**

**Published by** : Director Incharge  
Institute of Distance and Open Learning ,  
University of Mumbai,  
Vidyanagari, Mumbai - 400 098.

DTP Composed : Ashwini Arts  
Gurukripa Chawl, M.C. Chagla Marg,  
Bamanwada, Vile Parle (E), Mumbai - 400 099.

Printed by :

# CONTENTS

<b>Unit No.</b>	<b>Title</b>	<b>Page No.</b>
1.	Introduction to Cost Accounting	01
2.	Inventory Control	18
3.	Inventory Accounting	51
4.	Labour Cost	76
5.	Overheads	108
6.	Computation of Overhead Rates	121
7.	Classificaion of Cost and cost Sheet	145
8.	Reconciliation of Cost and Financial Accounts	163
9.	Cost Control Accounts (Integral & Non Integral Accounting)	182
10.	Contract Costing	204
11.	Process Costing	240
12.	Standard Costing	276
13.	Marginal Costing	307
14.	Some Emerging Concepts of Cost Accounting	322



**Revised Syllabus of the Courses of B.Com.  
Programme at T.Y.B.Com.  
with Effect from the Academic Year 2015-2016  
for IDOL Students**

**Financial Accounting and Auditing Paper-IV:  
Cost Accounting- Introduction and Basic Concepts**

**SECTION I  
Modules at a Glance**

Sr. No.	Modules	No. of Lectures
1	Introduction of Cost Accounting	05
2	Material Cost	10
3	Labour Cost	10
4	Overheads	10
5	Classification of cost and Cost Sheets	15
6	Reconciliation of cost and Financial Accounts	10
	<b>Total</b>	<b>60</b>

Sr. No.	Modules / Units
1	Introduction of Cost Accounting a) Objectives and scope of Cost Accounting b) Cost centres and Cost units c) Cost classification for stock valuation, Profit measurement, Decision making and control d) Coding systems e) Elements of Cost f) Cost behaviour pattern, Separating the components of semi- variable costs
2	Material Cost (i) Procurement procedures—Store procedures and documentation in respect of receipts and issue of stock, Stock verification Inventory control —Techniques of fixing of minimum, maximum and reorder levels, Economic Order Quantity, ABC classification; Stocktaking and perpetual inventory (ii) Inventory accounting Simple practical problems based on Calculation of EOQ Raw Material Turnover ratio Preparation of stock ledger and pricing of material cost based on FIFO and Weighted average cost and valuation of inventory

## II

3	<p>Labour Cost</p> <p>(i) Attendance and payroll procedures, Overview of statutory requirements, Overtime, Idle time and Incentives</p> <p>(ii) Labour turnover</p> <p>(iii) Utilisation of labour, Direct and indirect labour, Charging of labour cost, Identifying labour hours with work orders or batches or capital jobs</p> <p>(iv) Efficiency rating procedures</p> <p>(v) Remuneration systems and incentive schemes.</p> <p>Simple practical problems based on</p> <p>Preparation of labour cost statement</p> <p>Remuneration and incentive systems based on Piece work plan, Haley Premium Plan, Rowan system, Gantt's Task</p>
4	<p>Overheads</p> <p>Functional analysis — Factory, Administration, Selling, Distribution, Behavioural analysis — Fixed, Variable, Semi variable cost</p> <p>Simple practical problems on</p> <p>Departmentalization and apportionment of primary overheads,</p> <p>Computation of overhead rates including Machine overhead rates</p> <p>Basic concepts of treatment of over/under absorption of overheads- Direct Labour method and Prime Cost method</p>
5	<p>CLASSIFICATION OF COSTS AND COST SHEET</p> <p>Classification of costs, Cost of Sales, Cost Centre, Cost Unit, Profit Centre and Investment Centre</p> <p>Cost Sheet, Total Costs and Unit Costs, Different Costs for different purpose</p> <p>Simple practical problems on preparation of cost sheet</p>
6	Reconciliation of cost and financial accounts
7	Practical problems based on reconciliation of cost and Financial accounts

### III

#### SECTION II Modules at a Glance

Sr. No.	Modules	No. of Lectures
1	Cost Control Accounts	05
2	Contract Costing	10
3	Process Costing	10
4	Introduction to Marginal Costing	10
5	Introduction to Standard Costing	15
6	Some Emerging concepts of cost Accounting	10
	<b>Total</b>	<b>60</b>

Sr. No.	Modules / Units
1	<p><b>COST CONTROL ACCOUNTS</b>                      Costing Books, Advantages and Disadvantages, Ledgers to be maintained                      Principal Accounts                      Note- Simple practical problems on preparation of cost control accounts</p>
2	<p><b>CONTRACT COSTING</b>                      Progress payments, Retention money, Contract accounts, Accounting for material, Accounting for Tax deducted at source by the contractee, Accounting for plant used in a contract, treatment of profit on incomplete contracts, Contract profit and Balance sheet entries.                      Excluding Escalation clause                      Note- Simple practical problems</p>
3	<p><b>PROCESS COSTING</b>                      Process loss, Abnormal gains and losses, Joint products and by products.                      Excluding Equivalent units, Inter-process profit                      Note- Simple Practical problems Process Costing and joint and by products</p>
4	<p><b>INTRODUCTION TO MARGINAL COSTING</b>                      Marginal costing meaning, applications, advantages, limitations, Contribution, Breakeven analysis and profit volume graph.                      Note:-Simple Practical problems based on Marginal Costing excluding decision making</p>
5	<p><b>INTRODUCTION TO STANDARD COSTING</b>                      Various types of standards, Setting of standards, Basic concepts of material and Labour variance analysis.                      Note:-Simple Practical problems based on Material and labour variances excluding sub variances and overhead variances</p>

6	<b>SOME EMERGING CONCEPTS OF COST ACCOUNTING</b> Target Costing Life cycle Costing Benchmarking ABC Costing Note- No practical problems
---	--



# INTRODUCTION TO COST ACCOUNTING

## Unit structure

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Meaning of Cost, Costing and Cost Accounting
- 1.3 Objectives of Cost Accounting
- 1.4 Cost Centre and Cost Units
- 1.5 Classification of Cost
- 1.6 Elements of Cost
- 1.7 Summary
- 1.8 Exercise

---

## 1.0 OBJECTIVES

---

After studying this unit students will be able to:

- Understand the need of Cost Accounting
- Know the meaning of Cost, Costing and Cost Accounting
- Explain the objectives of Cost Accounting
- Understand the classification of Cost
- Discuss about the Elements of Cost
- Know the methods of Costing

---

## 1.1 INTRODUCTION

---

Cost Accounting is the system of accounting which is concerned with determination of costs of doing something which can be manufacturing or rendering service or even conducting any activity or function. The objective of Cost Accounting is to render detailed and useful information for guidance to Management.

Financial accounting is developed over the time to record, summarise and present the financial transaction or events which can be expressed in terms of money. This function was primarily concerned with record keeping, leading to preparation of Profit and Loss Account and Balance Sheet. The information obtained through financial statements is useful to the Management or Owner in several respects. However, the information provided by financial



accounting is not sufficient for several purposes of decision making in many areas such as : determining output level, determining product selection – addition or dropping or changing product combination in the case of multi product company, determining or revising prices of products, whether Profit earned is optimum as compared with competitors and in comparison to earlier years. The need of data for such details lead to the development of Cost Accountancy.

---

## 1.2 MEANING OF COST, COSTING AND COST ACCOUNTING

---

### 1.2.1 Cost :

Institute of Cost and Works Accountants of India, defines cost as “measurement, in monetary terms, of the amount of resources used for the purpose of production of goods or rendering services”.

Thus the term cost means the amount of expenditure, actual or notional incurred or attributable to a given thing. It can be regarded as the price paid for attaining the objective. For e.g. Material cost is the price of materials acquired for manufacturing a product.

### 1.2.2 Costing :

The term costing has been defined as “the techniques and processes of ascertainment of costs. **Whelden** has defined costing as, “the classifying recording and appropriate allocation of expenditure for the determination of costs the relation of these costs to sale value and the ascertainment of profitability.”

Therefore costing involves the following steps.

1. Ascertaining and Collecting of Costs
2. Analysis or Classification of Costs
3. Allocating total costs to a particular thing i.e. product, a contract or a process.

Thus costing simply means cost finding by any process or technique.

### 1.2.3 Cost Accounting :

Cost Accounting is a formal system of accounting by means of which cost of products or service, are ascertained and controlled.

**Whelden** defines Cost Accounting as, “Classifying, recording and appropriate allocation of expenditure for determination of costs of products or services and for the presentation of suitably arranged data for the purpose of control and guidance of management.”

Therefore, Cost Accounting is the application of costing principles, methods and techniques in the ascertainment of costs and analysis of savings or / and excesses as compared with previous experience or with standards. It provides, detailed cost information to various levels of management for efficient performance of their functions. The information supplied by Cost Accounting as a tool of management for making optimum use of scarce resources and ultimately add to the profitability of business.

---

### **1.3 OBJECTIVES OF COST ACCOUNTING**

---

Objectives of Cost Accounting are as follows :

- 1) To Ascertain the Cost :** To ascertain the cost of product or a services reveled and enable measurement of profit by proper valuation of inventory.
- 2) To Analyse Costs :** To analysis costs or to classify the expenses under different heads of accounts viz. material, labour, expenses etc.
- 3) To Allocate and Apportion the Costs :** To allocate or charge the direct expenses or specific costs such as Raw Material, Labour to particular product, contract or process and to distribute common expenses to each product, contract or process on a suitable basis.
- 4) Cost Reporting :** Cost Reporting or presentation includes :
  - a) What to report i.e. what is the nature of information to be presented?
  - b) Whom to Report i.e. to whom the report is to be addressed.
  - c) When to Report i.e. when the report is to be presented i.e. Daily weekly monthly yearly etc.
  - d) How to Report i.e. in what format the report is to be presented.
- 5) To Assist the Management :** Cost Accounting assist the management in:
  - a) Indicating to the management any inefficiencies and extent of various forms of waste of Raw Material, Time, Expenses etc.
  - b) Fixing of selling price.
  - c) Providing information to enable management to take decision of various types.

- d) Controlling Inventory of Raw Material, goods in process, finished goods, spares and consumables etc.
- 6) Cost Control :** Cost Accounting assist the management in cost control. Cost control includes the following stages.
- a) Setting up of targets of cast and production for each period.
  - b) Measuring the actual figures of performance relating to cost, production etc. for the period concerned.
  - c) The figures of actual performance are to be compared with the targets to find out the variation.
  - d) Analysing the variance, whether favourable or adverse.
  - e) Immediate action has to be taken in case of adverse variation.
- 8) Optimum Product Mix :** Advise the management in deciding optimum product mix merits and demerits of alterative courses of action viz. make or buy decisions, introduction or Automation mechanization, rationalization, system of production etc.
- 9) Future Policies :** Advise management on future policies regarding Expansion, growth, capital investment, etc.

---

## **1.4 COST CENTRE AND COST UNITS**

---

### **1.4.1 Cost Centre :**

It is a location, person or item of equipment for which cost may be ascertained and used for the purpose of cost control. It is a convenient unit of the organisation for which cost may be ascertained. The main purpose of ascertainment of cost is to control the cost and fill up the responsibility of the person who is in charge of the cost centre.

- **Types of cost centers :**

- I. Personal Cost Centre :**

It consists of a person or group of persons.  
e.g. machine operator, salesmen, etc.

- II. Impersonal Cost Centre :**

It consists of a location or an item of equipment or group of these. E.g. Factory, Machine etc.

- III. Operational Cost Centre :**

This consists of machines or persons carrying on similar operations.

**IV. Process Cost Centre :**

This consists of a continuous sequence of operation or specific operations.

**V. Production Cost Centre :**

This is the centre where actual production takes place or these include, those departments that are directly engaged in manufacturing activity and contribute to the content and form of finished product.

e.g. Cutting, Assembly and Finishing Departments etc.

**VI. Service Cost Centre :**

This is the Centre which renders services to production centres. These contribute to the production process in an indirect manner.

e.g. Stores department, Repairs and Maintenance department, H.R. Department, Purchase Department etc.

**1.4.2 Cost unit :**

It is a unit of product, service or time in terms of which cost are ascertained or expressed. It is basically, a unit of quantity of product or service in relation to which costs may be ascertained or expressed.

Few examples of cost unit are given below.

<b>Name of Industry</b>	<b>Cost unit</b>
Textiles	Meter, yards
Transport	Passenger km
Power	Kilowatt – hour
Paints	Litre
Iron and Steel	Tonne
Canteen	Per meal
Chemical	Litre, kilogram
Readymade Garments	Number
Petrol	Litre

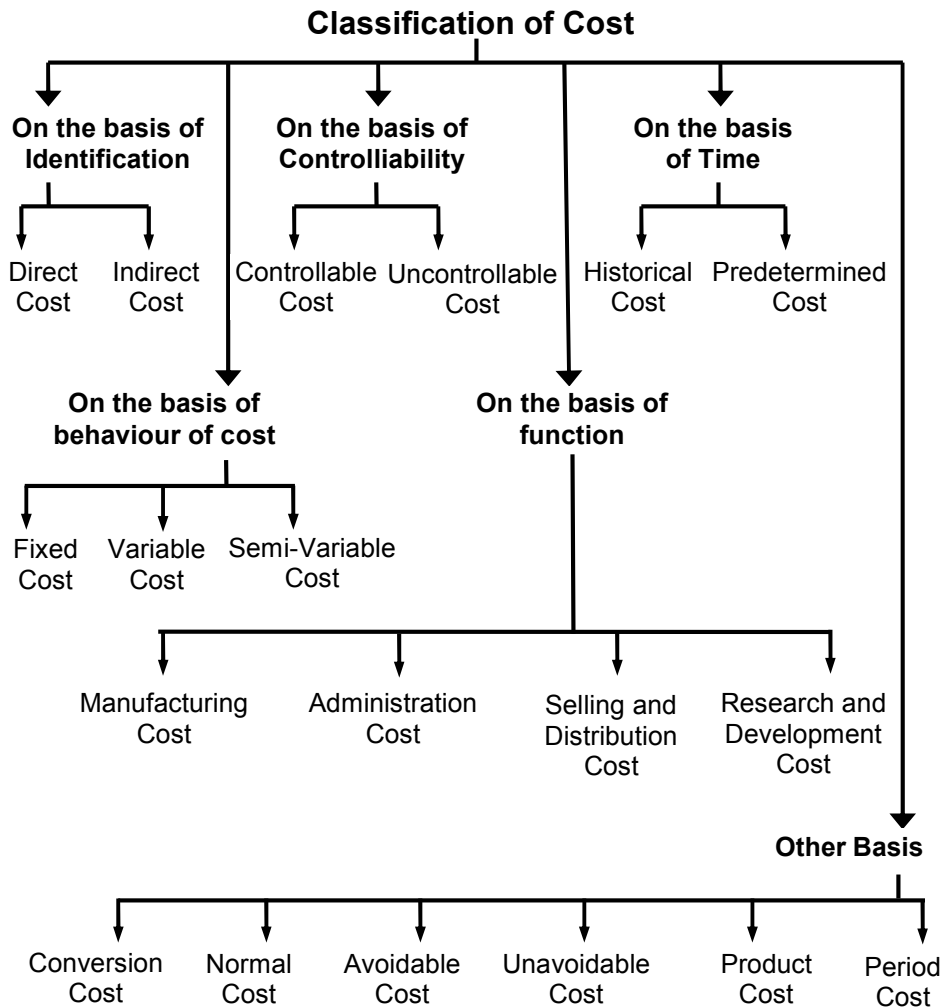
---

## **1.5 CLASSIFICATION OF COST**

---

Classification is the process of grouping costs according to their common characteristics. It is a systematic placement of like items together according to their common features. There are various ways of classifying costs, according to their common features as given below.

## Chart showing classification of cost :



### I On the basis of Identification :

On the basis of identification of cost with cost units or jobs or processes, costs are classified into –

1. **Direct Costs** : These are the costs which are incurred for and conveniently identified with a particular cost unit process or department. These are the expenditures which can be directly allocated to a particular job, product or an activity. E.g. Cost of Raw Material used, wages paid to labourers etc.
2. **Indirect Costs** : These are general costs and are incurred for the benefit of a number of cost units, processes or departments. These costs can not be conveniently identified with a particular cost unit or cost centre. Example : Depreciation of Machinery, Insurance, Lighting, Power, Rent of Building, Managerial Salaries, etc.

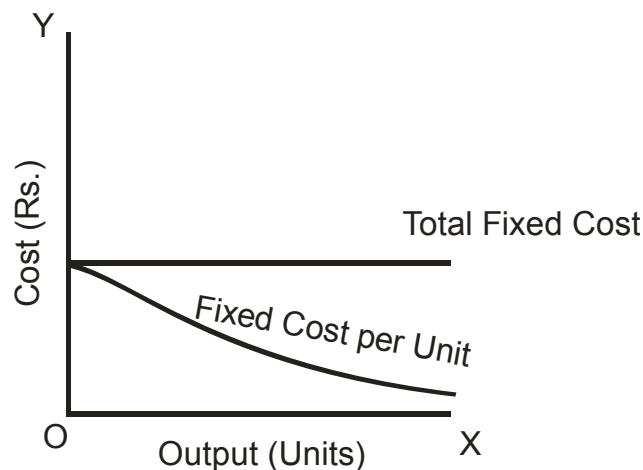
## II On the basis of behaviour of Cost

Behaviour means change in cost due to change in output. Costs behave differently when the level of production rises or falls. Certain costs change in direct proportion with production level while other costs remain unchanged. As such on the basis of behaviour of cost – costs are classified into

- 1) **Fixed Costs** : It is that portion of the total cost which remain constant irrespective of output upto the capacity limit. It is the cost which does not vary with the change in the volume of activity in the short run. These costs are not affected by temporary fluctuation in the activity of an enterprise. These are also known as period costs as it is concerned with period. Rent of premises, tax and insurance, staff salaries, are the examples of fixed cost.

Characteristics of Fixed Cost are :

- a. Large in value
- b. Fixed amount within an output range
- c. Fixed cost per unit decreases with increased output
- d. Indirect Cost
- e. Lesser degree of controllability
- f. Influence Variable Cost and Working Capital



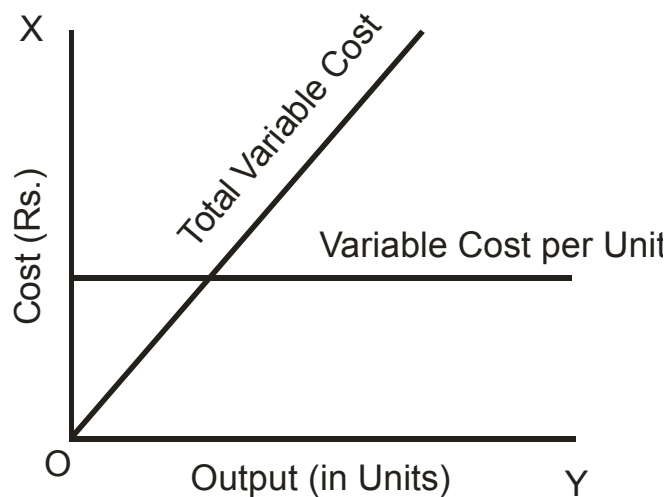
### Behaviour of Fixed Cost

- 2) **Variable Cost** : It is that cost which directly varies with the volume of activity. In other words, it is a cost which changes according to the changes in the volume of output. It tends to vary in direct proportion to output. It means when the volume of output increases, total variable cost also increases when the volume of output decreases, total variable cost also decreases.

But the variable cost per unit remains same. Direct material, Direct Labour, Direct Expenses are the examples of variable costs.

**Characteristics of Variable Cost are :**

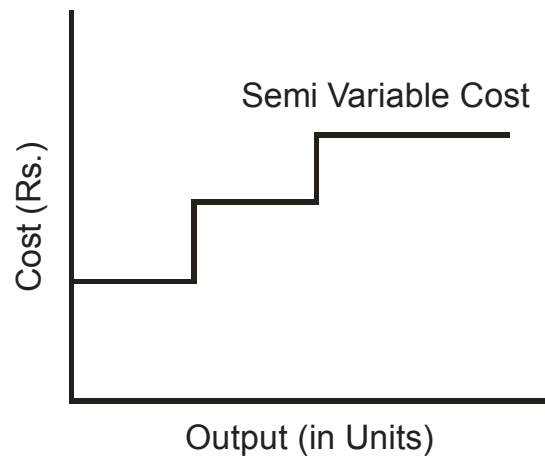
- a. Total cost changes in direct proportion to the change in total output.
- b. Cost per unit remains constant.
- c. It is quite divisible.
- d. It is identifiable with the individual cost unit.
- e. Such costs are controlled by functional manager.



**Behaviour of Variable Cost**

- 3) Semi-Variable Cost :** This is also referred as semi-fixed costs. These costs include both a fixed and a variable component. i.e. These are partly fixed and partly variable. They remain constant upto a certain level and registers change afterwards. These costs vary in some degree with volume but not in direct or same proportion. Such costs are fixed only in relation to specified constant condition.

**For example:** Repairs and maintenance of machinery, telephone charges, maintenance of building, supervision, professional tax, compensation for accidents, light and power etc.



**Behaviour of Semi-Variable Cost**

### III. On the basis of Controllability

On the basis of controllability, costs are classified into two types :

- 1) Controllable Cost
- 2) Uncontrollable Cost

**1) Controllable Cost :** These are the costs which can not be influenced or controlled by the concerned cost centre or responsibility centre. These costs may be directly regulated at a given level of management authority.

**2) Uncontrollable Cost :** These are the costs, which can not be influenced or controlled by the action of a specific member of an enterprise. For eg. it is very difficult to control costs like factory rent, managerial salaries etc.

The important points to be noted regarding this classification. First, controllable cost can not be distinguished from non-controllable costs, without specifying the level and scope of management authority. It means cost which is uncontrollable at one level of management may be controllable at another level of management. Eg. Rent and Factory Building may be beyond control for the production department but can be controlled by the administrative department by negotiations. Secondly all costs are controllable in the long run and at the some appropriate management level.

### IV On the basis of Functions

An organisation performs many functions. On the basis of functions costs can be classified as follows :



- 1) **Manufacturing Costs** : It is the cost of all items involved in the manufacturing of a product or service. It includes all direct costs and all indirect costs related to the production. It includes cost of direct materials, direct labour, direct expenses, and overhead expenses related to production. Overhead expenses, means all indirect costs involved in the production process. This is termed as factory overhead or manufacturing overheads. Eg. Salaries of staff for production department, technical supervision, Expenses of stores department, Depreciation of Plant and Machinery, Repairs and maintenance of Factory Building and Machineries etc.
- 2) **Administration Cost** : These are costs incurred for general management of an organisation. It is the cost which is incurred for formulating the policy, directing the organisation of controlling the operations. These are in the nature of indirect costs and are also termed as administrative overhead. Eg. Salaries of Administrative Staff, General Office expenses like rent, lighting, telephone, stationery, postage etc.
- 3) **Selling and Distribution Costs** : Selling costs are the indirect costs relating to selling of products or services. They include all indirect cost in sales management for the organisation. Selling costs include all expenses relating to regular sales and sales promotion activities. Examples of expenses which are included in selling costs are :
  - 1) Salaries, Commission and traveling expenses for sales personnel
  - 2) Advertisement cost
  - 3) Legal Expenses for debt realization
  - 4) Market research cost
  - 5) Show room expenses
  - 6) Discount allowed
  - 7) Sample and free gifts
  - 8) Rent on Sales room
  - 9) After sale services

Distribution costs are the costs incurred in handling a product from the time it is completed in the works until it reaches the ultimate consumer. Distribution expenses include all these expenses which are incurred in connection with making the goods available to customers. These expenses include the following.

- 1) Packing charges
- 2) Loading charges

- 3) Carriage on Sales
  - 4) Rent of warehouse
  - 5) Insurance and lighting of warehouse
  - 6) Transportation costs
  - 7) Salaries of godown keeper, driver, packing staff etc.
- 4) **Research and Development Cost** : Research and development costs are incurred to discover new ideas, processes, products by experiment. It includes the cost of the process which begins with the implementation of the decision to produce or improved product.

#### V On the basis of Time

On the basis of time of computation, costs are classified into historical costs and predetermined costs.

- 1) **Historical Costs** : These are the costs which are ascertained after these have been incurred. Historical costs are then nothing but actual costs. They represent the costs of actual operational performance. These costs are not available until after the completion of manufacturing operations.
- 2) **Pre determined Costs** : These are the future costs which are ascertained in advance of production on the basis of a specification of all the factors affecting cost and cost data. Predetermined costs are future costs determined in advance on the basis of standards or estimates. These costs are extensively used for the purpose of planning and control.

#### VI Other Basis

- 1) **Normal Cost** : Normal cost may be defined as a cost which is normally incurred on expected lines at a given level of output, in the condition in which that level of output is normally attained. This cost is a part of production.
- 2) **Abnormal Cost** : Abnormal cost is that cost which is not normally incurred at a given level of output, in the condition in which that level of output is normally attained. Such cost is over and above the normal cost and is not treated as a part of the cost of production.
- 3) **Avoidable Cost** : The cost which can be avoided under the present conditions is an avoidable cost. These are the costs which under given conditions of performance efficiency should not have been incurred. They are logically associated with some activity and situation and are ascertained by the

difference of actual cost with the happening of the situation and the normal cost. Eg. when spoilage occurs in manufacturing in excess of normal limit, the resulting cost of spoilage is avoidable cost.

- 4) Unavoidable Cost :** The cost which can not be avoidable under the present condition is an unavoidable cost. They are inescapable costs which are essentially to be incurred within the limits or norms provided for. It is the cost that must be incurred under a programme of business restriction.

### **CHECK YOUR PROGRESS**

- Draw the chart showing Classification of Cost.
- Define the following terms:
  1. Costing
  2. Cost Accounting
  3. Impersonal cost center
  4. Service Cost center
  5. Direct Cost
  6. Uncontrollable cost
  7. Predetermined cost
- Give Examples:
  1. Fixed cost
  2. Variable cost
  3. Semi variable cost
  4. Manufacturing cost
  5. Administration cost
  6. Selling cost
  7. Distribution Cost

---

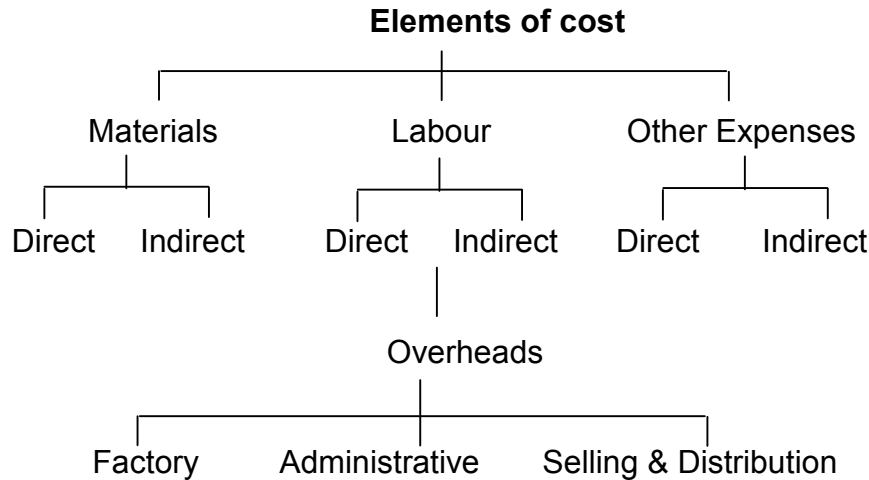
## **1.6 ELEMENTS OF COST**

---

A manufacturing organisation converts raw materials into finished products. For that it employs labour and provides other facilities. While compiling production cost, amount spent on all these are to be ascertained. For this purpose, cost are primarily classified into various elements. This classification is required for accounting and control.

The elements of cost are (i) Direct material (ii) Direct labour (iii) Direct expenses and (iv) Overhead expenses.

The following chart depicts the broad headings of costs and this acts as the basis for preparing a Cost sheet.



### 1.6.1 Material Cost

It is the cost of material of any nature used for the purpose of production of a product or a service. Materials may be Direct Material or Indirect Material.

- **Direct material** : It is the cost of basic raw material used for manufacturing a product. Direct materials generally become a part of the finished product. No finished product can be manufactured without basic raw material. This cost is easily identifiable and chargeable to the product. For e.g. Leather in leather products, Steel in steel furniture, Cotton in textile etc. Direct material includes the following.

#### Examples-

- i) Material specially purchased for a specific job or process.
- ii) Materials passing from one process to another.
- iii) Consumption of materials or components manufactured in the same factory.
- iv) Primary packing materials.
- v) Freight, insurance and other transport costs, import duty, octroi duty, carriage inward, cost of storage and handling are treated as direct costs of the materials consumed.

In certain cases direct materials are used in small quantities and it will not be feasible to ascertain their costs and allocate them directly. For instance, nails used in the manufacture of chairs and tables, glue used in the manufacture of toys, thread used in stitching garments etc. In such cases cost of the total quantity consumed for the period will be treated as Indirect costs.

- **Indirect material** : It is the cost of material other than direct material which cannot be charged to the product directly. It can not be treated as part of the product. These are minor in importance. It is also known as expenses materials. It is the

material which cannot be allocated to the product but can be apportioned to the cost units.

**Examples :** Lubricants, Cotton waste, Grease, Oil, Small tools, Minor items like thread in dress making, nails in furniture (nuts, bolts in furniture) etc.

Therefore, indirect materials can not be easily identified with specific job. They may not vary directly with the output. It is considered as a part of overheads.

### 1.6.2 Labour Cost

This is the cost of remuneration in the form of wages, Salaries, Commissions, Bonuses etc. paid to the workers and employees of an organisation.

- **Direct Labour Cost :** Direct Labour Cost is the amount of wages paid to those workers who are engaged on the manufacturing line. It consists of wages paid to workers engaged in converting of raw materials into finished products. The amount of wages can be conveniently identified with a particular line, product, job or process. These workers directly handle machines on the production line. Direct wages include payment made to the following group of workers.

- 1) Labour engaged on the actual production of the product
- 2) Labour engaged in aiding the operation viz. supervisor, foremen, shop Clerks and worker on internal transport.
- 3) Inspectors, Analysts, needed for such production.

**Example :** Carpenter in furniture making unit, tailor in readymade wear unit, Labour in construction work etc.

- **Indirect Labour Cost :** It is the amount of wages paid to those workers who are not engaged on the manufacturing line. It is of general character and can not be directly identified with a particular cost unit. This indirect labour is not directly engaged in the production operations but such labour assist or help in production operations. It can not be easily identified with specific job, contract of work order. It may not vary directly with the output. It is treated as part of overheads.

**Example :** Labour in Human Resource department, Labour in payroll department, Labour in stores, Labour in Securities Department, Labour in power house department etc.

### 1.6.3 Expenses

All costs other than material and labour are termed as expenses. It is defined as the cost of services provided to an undertaking and the notional cost of the use of owned assets.

- **Direct Expenses** : It is the amount of expenses which is directly chargeable to product manufactured or which may be allocated to product directly. It can be easily identified with the product. These are the expenses which are specifically incurred in connection with a particular job or cost unit. They are also called as chargeable expenses.

**Example** : Hire of special plant for a particular job, Travelling expenses in securing a particular contract, Carriage paid for materials purchased for specific job, Royalty paid in mining or production etc.

- **Indirect Expenses (Overheads)**: All indirect costs other than indirect materials and indirect labour costs, are termed as indirect expenses. It is the amount of expenses which can not be charged to the product directly. These can not be directly identified with particular job, process or work order and are common to cost units' or cost centers.
- Indirect expenses / Overheads can be sub-divided into following main groups.

**1. Factory or Works Overheads:** Also known as manufacturing or production overheads it consists of all costs of indirect materials, indirect labour and other indirect expenses which are incurred in the factory.

**Examples :**

Factory rent and insurance. Depreciation of Factory building and machinery.

**2. Office or Administration overheads:** All indirect costs incurred by the office for administration and management of an enterprise.

**Examples:**

Rent, rates, taxes and insurance of office buildings, audit fees, directors fees.

**3. Selling and Distribution overheads:** These are indirect costs in relation to marketing and sale.

**Examples :**

Advertising, Salary and Commission of sales agents, Travelling expenses of salesmen.

---

## 1.7 SUMMARY

---

Cost Accounting is the process of accounting for costs from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost center and cost units. Cost accounting profession got recognition in 1939 in India. It has been made compulsory for specified manufacturing companies. Cost Accounting has the objectives of determining Product costs, facilitate planning and control of regular business activities and supply information for taking short term and long-term decisions. Cost Accounting is useful in different areas such as materials, labour, overheads, stock valuation etc.

---

## 1.8 EXERCISE

---

1. What is cost Accounting? What are its objectives?
2. What are the various elements of costs?
3. What is meant by Cost Accounting? Explain in brief different ways of Cost Classification.
4. Write short notes on:
  - a. Cost centers
  - b. Cost units
  - c. Elements of costs
5. Choose the correct alternative
  1. Cost accounting is an important system developed for
 

i) shareholders	ii) government
iii) <b>management</b>	iv) financial institutions
  2. The costing which determines cost after it has been actually incurred is
 

i) <b>historical</b>	ii) standard
iii) estimated	iv) marginal
  3. A cost center is a
 

i) <b>location for which cost is incurred</b>	ii) an organisation
iii) a unit of cost	iv) profit center
  4. A cost center which is engaged in production activity is called
 

i) <b>production cost center</b>	ii) process cost center
iii) impersonal cost centre	iv) production unit

6. Variable cost per unit remains \_\_\_\_\_.  
i) **constant**  
ii) flexible  
iii) (i) & (ii)  
iv) none of the above
7. Cost which is related to capacity is called :  
i) Fixed cost  
ii) Capacity cost  
iii) Plant cost  
iv) **none of the above**
8. Cost which is unaffected by the change in output is called as :  
i) **Fixed cost**  
ii) Variable cost  
iii) Period cost  
iv) None of the above
9. Cost which is relevant for decision-making is  
i) Relevant cost  
ii) **Past cost**  
iii) Opportunity cost  
iv) Imputed cost
10. The cost which remains constant irrespective of output upto capacity limit is  
i) **Fixed cost**  
ii) Product cost  
iii) Variable cost  
iv) Sunk cost
11. Variable cost is also known as  
i) Product cost  
ii) Period cost  
iii) **Direct cost**  
iv) Semi fixed cost
12. The cost which is directly chargeable to the product is  
i) Indirect cost  
ii) **Direct cost**  
iii) Overheads  
iv) Period cost





## INVENTORY CONTROL

### Unit structure

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Definition of Inventory
- 2.3 Purchase of Materials
- 2.4 Methods of Stock Taking
- 2.5 Inventory / Material Control Systems or Techniques
- 2.6 Stock Levels
- 2.7 Economic Re-Order Quantity Solved Problems
- 2.8 Inventory Turnover Ratio
- 2.9 Questions

---

### 2.0 OBJECTIVES

---

After studying the unit the students will be able to

- Define the concept Inventory and explain the various costs related to Inventory.
- Explain the material purchase procedure.
- Discuss about the function in storing the material.
- Know the techniques of Material Control.
- Solve the practical problems related to Stock Levels, EOQ and Inventory Turnover Ratio.

---

### 2.1 INTRODUCTION

---

Inventory means stock of items kept in reserve for certain period of time. It includes raw materials, work-in-progress or semi-finished goods, finished goods and spare parts for the maintenance of equipment etc. Raw materials are those inputs that are converted into finished products. Work in progress represents semi-finished goods that requires some work before they are ready for sale. Finished products are those which are ready for sale

Inventory is the physical stock of items that a business or production organisation keeps in hand for efficient running of its production function.

---

## **2.2 DEFINITION OF INVENTORY**

---

### **2.2.1 Meaning and Definition**

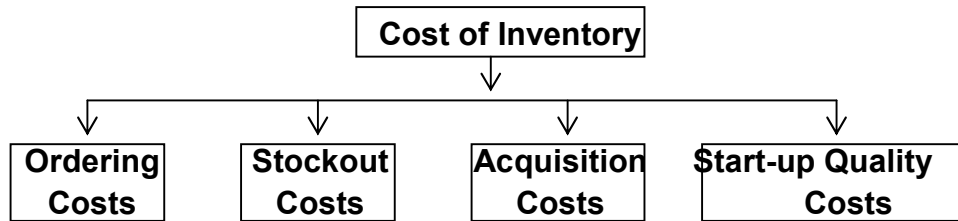
According to **Gordon B. Carson**, inventory includes raw materials and component parts. Inventories consist of raw material, component parts, supplies and finished assemblies which an organisation purchases from an outside source and parts, assemblies and finished products which the company manufactures itself. In simple words inventory means 'stock items' or items in stock.

It is very essential that material of the correct quantity and quality is made available as and when required, with due regard to economy in storage and ordering costs, purchase prices and working capital. Inventory control involves (i) Assessing the items to be held in stock. (ii) Deciding the extent of stock holding of items individually and collectively. (iii) Regulating the input of stock into the store houses and (iv) Regulating the issue of stock from the stores houses.

### **2.2.2 COST OF INVENTORY**

Inventory control is generally concerned with the procurement of raw-materials and purchased parts (i.e. components) and their supply to the production departments. Supplies and stores are the indirect materials. They do not form a part of the finished products. They are closely related to the maintenance services and so they should be controlled by the maintenance department. Work-in-progress is primarily concerned with the manufacturing department, because it is results from the various operations performed on the shop. It is proper to assign the control functions of work-in-progress to manufacturing department.

Every business organisation, however big or small, has to maintain inventory and it constitutes as integral part of the working capital. It has been estimated that inventory in Indian industries constitutes more than 60% of current assets. Inventories are significant elements in cost process. Inventories require a significant investment, not only in acquiring them but also in holding them. The various types of cost of inventory are as follows :



**1. Ordering Costs** : Each time we purchase a batch of raw material from a supplier, a cost is incurred for processing the purchase order, expediting, record keeping, and receiving the order into the warehouse. Each time we produce a production lot, a changeover cost is incurred for changing production over from a previous product to the next one. The larger the lot sizes, the more inventory we hold, but we order fewer times during the year and annual ordering costs are lower.

**2. Stockout Costs** : Each time we run out of raw materials or finished-goods inventory, costs may be incurred. In finished-goods inventory, stockout costs can include lost sales and dissatisfied customers. In raw-materials inventory, stockout costs can include the cost of disruptions to production and sometimes even lost sales and dissatisfied customers. Additional inventory, called **safety stock**, can be carried to provide insurance against excessive stockouts.

**3. Acquisition Costs** : For purchased materials, ordering larger batches may increase raw-materials inventories, but unit costs may be lower because of quantity discounts and lower freight and materials-handling costs. For produced materials, larger lot sizes increase in-process or finished-goods inventories, but average unit costs may be lower because changeover costs are amortized over larger lots.

**4. Start-up Quality Costs** : When we first begin a production lot, the risk of defectives is great. Workers may be learning, materials may not feed properly, machine settings may need adjustment, and a few products may need to be produced before conditions stabilize. Larger lot sizes mean fewer changeovers per year and less scrap.

---

## **2.3 PURCHASE OF MATERIALS**

---

There is a purchase department which carries out the function of purchases of materials. The purchase manager is responsible for ensuring the items ordered are of the standard quality, lower cost and received in time. The purchase procedure vary with different business firms. The purchase procedure is given below:

**a) Purchase Requisition:**

Purchase requisition is the formal request made by the storekeeper to the purchase department for giving order of raw materials or stores. It serves the dual purpose of authorizing the purchase department to make purchases and provides a record of the description and quantity of materials required. It also fixes the responsibility of the department or personnel making purchase requisition.

**b) Purchase order:-**

After receiving the duly approved requisition, the purchase department has to place an order with a supplier. It is an offer to buy certain materials at stated price and terms. For routine purchases, the order is placed through established supplies. In other cases, the purchase department may ask for bids or send out request for quotation before placing an order. The purchase order is a formal contract for the supply of materials. Copies of the purchase order are sent to the departments concerned.

**c) Receiving and Inspection of materials:**

The stores department is responsible for taking delivery of packages and to get a physical verification of the contents. When the materials are received, the stores official gets the packages, open them and make a detailed verification of the contents. After the contents of the packages are checked, the details are entered into a Goods Received Note. Copies of the G.R.Note are issued to the supplier, purchase and accounts department, where the factory has to test the materials received for quality and specifications. It has to ensure that the quality of materials is as per purchase order.

**d) Approval of Invoices and Payment**

Invoice received by the purchase department is forwarded to the Accounts department for payment with their recommendation. Accounts department has to check the authenticity, arithmetical

accuracy and G. R. Note in order to make sure that the goods are as per purchase order. When it is found that everything is in order, it is passed for payment by the Accountant. Then the cashier will draw the cheque as per terms and conditions of the purchase order and invoice and finally payment is made to the supplier.

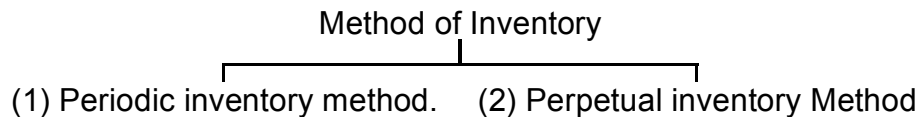
---

## 2.4 METHODS OF STOCK TAKING

---

### 2.4.1 Meaning

#### Methods of taking inventories / stock



#### 1. Periodic inventory method :

Under this method of taking inventories, value of stock is determined by physical counting of the stock on the accounting date of preparation of the final accounts. It is possible that stock taking may take a week or so in large enterprises and purchases and sales may have to be suspended for that period to get correct figure of closing inventory. This method of ascertaining the value of stock at the end of the year is also known as annual stock taking. Thus this method is based physical stock taking. It provides data once in a year is simple and economical method of stocktaking can be adopted in small concerns, but it does not provide basis for control.

#### 2. Perpetual Inventory Method :

Perpetual inventory defined as a system if records maintained by the controlling department, which reflects the physical movements of stock and their current balance. Under this method stock registers are maintained to make a record of the physical movements of stock and their current balance. Stores ledger is maintained to keep a record of the receipt and issue of the materials and also reflects the balance in store. Similarly, work-in-progress ledger is maintained to give the value of work-in-progress on hand and a finished goods ledger is maintained to know the value of finished goods on hand. Thus this system provides a running record of inventories on hand at any time. To ensure the accuracy of perpetual inventory records physical verification of the inventory is made by a program of continuous stock taking.

It is possible that the balance of stock by the perpetual inventory may differ from the actual balance of stock as ascertained by physical verification. Any difference noted between actual stocks as disclosed by the physical verification and the stocks shown by stock records should be investigated and rectification made then and there. If the physical verification reveals that actual balance of stock, is more than the balance shown by the stores ledger or work-in-progress ledger or finished goods ledger debit note is prepared and stock record are adjusted accordingly so that balance may reconcile with actual balance. A Stock Adjustment Accounts is prepared and debited with the shortage of stock and credited with surplus.

Continuous stock taking is an essential feature of the perpetual inventory system. But the two terms, perpetual inventory and continuous stock taking should not be taken as one; perpetual means the system of stock records and continuous stock taking whereas continuous stock taking means only the physical verification of stock records with actual stocks.

In continuous stock taking, physical verification is spread throughout the year. Every day 10 to 15 items are taken at rotation and checked so that surprise, element in short verification is maintained and each item is checked for a number of times during the year. On the other hand, surprise element is missing in case of periodical checking because checking is usually done at the end of the year. In short this method is based on records. It requires a lot of recording and is thus expensive. It can be adopted only in big concerns. It provides data on running basis and thus facilitates the preparation of financial statements at shorter intervals. It also provides basis for control by investigation the basis for control by investigation the discrepancies arising from the comparison of physical stock with their book values.

#### **2.4.2 Difference between Periodic inventory and Perpetual inventory.**

The following are the main differences between the two methods of taking inventory.

<b>Periodic Inventory</b>	<b>Perpetual Inventory</b>
1. It is based on physical stocktaking	1. It is based on records.
2. It provides data periodically i.e. once in year.	2. It provides the data on running basis and thus facilitates the preparation of financial statements at shorter intervals.
3. It does not provide basis control.	3. It provides basis for control by investigating the discrepancies arising from the comparison of physical stock with book values.
4. It is simple and economical method of taking inventory and can be adopted in small concern.	4. It is expensive as it requires a lot of recording due to an elaborate method of taking inventory. It can be adopted by big concerns only.

---

## **2.5 INVENTORY / MATERIAL CONTROL SYSTEMS OR TECHNIQUES**

---

### **2.5.1 Meaning**

**Material control** is the function of ensuring that the sufficient stocks are maintained to meet all requirement without any problem. It also includes to avoid carrying unnecessary stock. It is for safeguarding company's priority in the form of materials by keeping systematic records and maintaining them at optimum level considering requirements and financial resources of company's business. It needs proper planning organising and controlling the receipt and issues of material and its storage to achieve the objectives of the company efficiently.

### **2.5.2 Objectives of material control**

- a) To maintain continuous supply of material.
- b) To avoid over stocking of materials
- c) To obtain minimum quantity of materials from reliable sources.
- d) To minimize total cost.
- e) To avoid waste and loss of stock during storage period.
- f) To maintain up dated stock level.
- g) To supply required information to the management in decision making and its execution process.

### 2.5.3 Techniques of Material Control

Various techniques are used in controlling the inventories. Some popular and important techniques are as under :

- A. Re-order Point (ROP).
- B. Economic Ordering Quantity (EOQ).
- C. ABC Analysis.

#### A. RE-ORDER POINT (ROP) :

Receiving and issuing of inventories are the common and recurring phenomena in a manufacturing organisation. When the inventories fall below a particular point, they are replenished by the fresh purchases. Re-order point (ROP) is the point when the inventories have to be replenished by fresh order. It fundamentally deals with 'when to order' or to replenish the inventories.

Re-order point is a stock level at which fresh supplies of materials should be ordered. The level is fixed between somewhere between minimum level and maximum level. It is fixed in such a way that fresh supply of materials are received before the level reaches the minimum level. The re-order point also called re-order level depends upon two factors:

(a) Maximum consumption and (b) Lead time i.e. the anticipated time lag between the dates of issuing orders and receiving supplies. The formula for calculating re-order level is :

Re-order Level = Maximum usage × Minimum re-order period.

**Re-order Quantity :** Re-order quantity is the quantity for which an order is placed when stock reaches the re-order level. The term is used generally in synonymous with the Economic Order Quantity since order is placed only in such size which will be economical for the enterprise in all respect.

#### B. ECONOMIC ORDER QUANTITY :

The Economic Order Quantity (also known as re-order quantity) refers to the size of the order which gives the maximum economy in purchasing any material. It is an optimum or standard order size. When the stock reaches the recorder level, the company should give a fresh order of optimum size.

This quantity is also called "Economic Purchase Quantity, or Economic lot size, or optimum lot size or Minimum Cost Inventory."



In fixing the economic order quantity, the following costs are considered:

**1. Ordering Cost :** This is the cost of placing an order with the supplier and includes cost of stationery, salary of those who are engaged in placing a order and in receiving and inspecting the materials. It is a fixed cost and therefore cost of placing an order varies from time to time depending upon the number of order placed and the quantity of items ordered. The number of orders increase, the ordering cost goes up and vice-versa.

**2. Inventory Carrying Cost :** It is the cost of holding the stock in storage and includes interest on investment, obsolescence losses, store keeping cost, such as rent of warehouse, salary of store keeper, stationery used in maintaining records of stores, etc, insurance cost, deterioration and wastage of material. The larger the volume of inventory, the great will the inventory carrying cost and vice-versa.

The above two costs are of opposite nature. If for example, an attempt is made to reduce of inventory carrying cost by holding the stores as low as possible, the number of orders will increase and consequently the ordering cost will go up. On the other hand, if orders are placed for a larger quantity, the inventory carrying cost will increase and ordering cost, the economic order quantity (EOQ) is fixed to keep the aggregate cost to the minimum.

**Assumptions of Economic Order Quantity (EOQ) :** The EOQ model is based on the following assumptions:

(i) There is only one product involved; (ii) Annual usage (demand) requirements are known; (iii) Usage is spread evenly throughout the year so that the usage rate is reasonably constant; (iv) Lead time does not vary; (v) Each order is received in a single delivery and (vi) There are no quantity discounts.

**Precautions in Applying EOQ :** The following precautions are necessary in applying E.O.Q.

**1. Simplification of Routine :** If the E.O.Q. formula tells us that 13 orders have to be placed in a year, we may place 12 orders, i.e. once a month.

**2. Ordering in Package Sizes :** Many goods are packed in units of one gross. If figure shows a quantity of 11 dozens, it should be changed to 12 dozens.

**3. Economical Freight Rates** : If the mathematical figure gives 9/10th of a lorry or rail wagon load, it is better to increase the quantity to have one full lorry load or one full wagon load. This would be cheaper, because the full wagon load rates would be lower than transporting the material as smalls.

**4. Perishable Articles** : For perishable articles whose shelf-life is very low, E.O.Q. should be very much less than the theoretical figure and should be based on practical considerations.

**5. Seasonal Articles** : For articles of a seasonal nature, e.g., cotton or groundnuts or oilseeds, bulk purchases during the season will be cheaper than purchases based on E.O.Q.

**6. Bulk Purchases** : In certain cases, considerable discounts would be available for bulk purchases. This should be compared to the savings as a result of the application of E.O.Q. formula and a decision should be taken based on which is cheaper.

**7. Import of Materials** : E.O.Q. cannot be successfully applied in the case of imports of materials which is based on import licences.

**Importance of Economic Order Quantity (EOQ)** : If re-order quantity is determined in advance and adjusted it ensures the following advantages :

1. The cost of storage can be kept at a minimum.
2. Purchase orders can be easily prepared at intervals.
3. The advantages of placing large orders can be derived as far as possible.

**Limitations of Economic Order Quantity (EOQ)** : The following are the limitations of EOQ:

- (a) Where rate of consumption fluctuates very often ordering a fixed quantity may lead to over or under stocking.
- (b) Very often, consumption rate cannot be anticipated because of certain unavoidable reasons such as power failure, slackening of customers' demand etc.
- (c) Sometimes, estimating of carrying cost and ordering cost in advance is not easy.

### **C. A.B.C. ANALYSIS:**

A most useful guide to devising stock control system is often known as 'Pareto Analysis' (after the name of an Italian Philosopher). The term is also known as ABC analysis because it

analyses the range of stock items held into three sectors, known as A, B and C.

ABC analysis is a new technique of classifying and controlling production and store inventories both purchased and manufactured in accordance with value of the item. It is the starting point for material management. It is the basic analytical management tool which enables top management to place the effort where the results will be greatest. The technique is popularly known as Always Better Control or the Alphabetical approach. The technique tries to analyse the distribution of any characteristic by money value of importance in order to determine its priority. In materials management the technique has been applied in areas needing selective control such as inventory, criticality of items, obsolete stocks, purchasing orders, receipt of materials, inspection, store-keeping and verification of bills.

ABC analysis or classification is the principle of Selective Control of inventories and a technique of grouping thousands of stock items handled by an organisation. The principle involved is that the degree of control on stock items and amount of safety stock carried should vary directly with the consumption value of the item involved.

**Advantages of ABC Analysis :** The following are the advantages of ABC Analysis :

- 1. Selective Control :** This approach helps the materials manager to exercise selective control and focus his attention only on a few items when he is concerned with lakhs of store items.
- 2. Control Inventories :** By concentrating on 'A' class items, the materials manager is able to control inventories and show visible results in a short span of item.
- 3. Obsolete Stocks :** By controlling the 'A' items obsolete stocks are automatically pin pointed.
- 4. Clerical Cost :** The system also helps in reducing the clerical cost and better planning and improved inventory turnover.
- 5. Equal Attention :** ABC Analysis has to be resorted to because equal attention to A, B and C items will not be worthwhile and would be very expensive.

Material cost is defined as cost of material of any kind or nature used for the purpose of production of goods or services. Direct materials are the materials whose cost can be attributed to a

cost object in economical feasible way and indirect materials are those whose cost cannot be directly attributed to a particular cost object.

---

## 2.6 STOCK LEVELS

---

### 2.6.1 Meaning

Stock levels is the technique which fixes the stock control level in terms of quantity for ensuring the optimum quantity of materials purchased and stored. This raise the questions when to buy and where from to buy and helps the management while preparing budget and schedule of purchases.

#### A. Maximum Level :-

This level of stock indicates the maximum figure of inventory quantity held in stock at any time. The quantity of stock should not exceed the level.

Following factors should be considered while fixing the maximum level of various stock.

1. **Re-order level** :- The product of maximum consumption of inventory item and its maximum delivery period.
2. **Minimum Consumption** :- Minimum Consumption and minimum delivery period for each stock should be known.
3. **Adequacy of working capital** :- It should know to maintain maximum level of inventory.
4. **Storage space** :- It should be stored properly in stores.
5. **Additional storage cost** :- Cost required for additional storage should be considered.
6. Additional insurance cost should be considered.
7. **Regular supply** :- In case of importance materials due to their irregular supply, the maximum level should be high.

$$\text{Maximum Level} = (\text{Reorder level}) + (\text{Reorder quantity}) - (\text{Maximum consumption} \times \text{Minimum Reorder period})$$

#### B. Minimum Level :-

Minimum level shows the lowest figure of inventory balance, which must be maintained in hand at all times, so that there is no stoppage of production due to non-availability inventory. This level is possible to maintain fixed level after takking into consideration the rate of consumption and the time required to acquire sufficient material to avoid dislocation of production.

**Factors responsible to maintain minimum level of inventory.**

- a. Average rate of consumption for each inventory items.
- b. Maximum consumption and maximum delivery period in respect of each item to determine its re-order level.
- c. Average re-order level to each item. This period can be calculated by averaging minimum and maximum period.

$$\text{Minimum level} = (\text{Re order level}) -$$

$$(\text{Average consumption} \times \text{Average/Normal Reorder Period})$$

**C. Re-order level**

This level is between the minimum and maximum levels in such away at which purchase requisition should be made out for fresh supply. The object of maintaining this level is to place order so that stock is not reduced to a level less than the minimum level.

Following factors are considered while maintain this re-order level.

1. Maximum consumption
2. Maximum Re-order period
3. Minimum level

$$\text{Re-order level} = \text{Minimum level} +$$

$$(\text{Normal Consumption} \times \text{Normal Reorder Period})$$

**OR**

$$= (\text{Maximum Consumption} \times \text{Maximum Re-order Period})$$

**D. Average stock/ inventory level :-**

It is the level of average of minimum level and Maximum level. It means the average level is maintained in states.

$$\text{Average stock level} = \frac{\text{Maximum level} + \text{Minimum level}}{2}$$

**OR**

$$= \text{Minimum level} + \frac{1}{2} \text{ reorder quantity}$$

**E. Danger level :-**

This is the level below the minimum stock level. When stock reaches this level, immediate action is need to take for replacement of stock. If the stock is reached at this level, the normal lead time is not available and hence regular purchase procedure can not be adopted. This may results in high cost remedial action only. If this is fixed below the re-order level and above minimum level it will be possible to take preventive action.

**Danger level** = (Average rate of consumption) × urgent supply time

**OR**

= (Normal consumption) × (maximum re-order period for emergency purchases)

### 2.6.2 SOLVED PROBLEMS

1) In Aniket and Co, weekly minimum and maximum consumption of material 'A' are 50 and 120 units respectively. The reorder quantity as fixed by the company is 350 units. The material is received within 4 to 6 weeks from issue of supply order.

Calculate the following.

- Minimum level
- Maximum level
- Re-Order level

**Solution :-** Average consumption =  $(50 + 120)/2 = \frac{170}{2} = 85$

Average re-order period =  $(4 + 6) \div 2 = 5$  weeks

a) Re-order level = Maximum consumption × Maximum Re-order period

$$= 85 \times 6$$

$$= 510 \text{ units}$$

b) Minimum level = (reorder level) –

(Average consumption × Average re-order period)

$$= 510 - (85 \times 5)$$

$$= 510 - 425$$

$$= 85 \text{ units}$$

c) Maximum level = Re-order level + Re-order quantity –

(minimum consumption × minimum Re-order period)

$$= 510 + 350 - (50 \text{ units} \times 4 \text{ weeks})$$

$$= 860 - 200$$

$$= 660 \text{ units.}$$

2) The following information is available in respect of material in ABC Co. Ltd of Aurangabad,

- Re-order quantity = 2,500 units
- Re-order period = 6 to 8 weeks
- Maximum consumption = 600 units per week

- d) Normal consumption = 300 units per week  
 e) Minimum consumption = 200 units per week  
 calculate i) Re-order level  
 ii) Minimum level  
 iii) Maximum level  
 iv) Average stock level

**Solution**

$$\begin{aligned} \text{i) Re-order level} &= \text{Maximum consumption} \times \\ &\quad \text{Maximum Reorder period} \\ &= 600 \times 8 = 4800 \text{ units} \end{aligned}$$

$$\begin{aligned} \text{ii) Minimum level} &= (\text{Re-order level}) - (\text{Normal consumption} \times \\ &\quad \text{Average Reorder period}) \\ &= 4800 - \left(300 \times \frac{8+6}{2}\right) \\ &= 4800 - (300 \times 7) \\ &= 4800 - 2100 \\ &= 2700 \text{ units} \end{aligned}$$

$$\begin{aligned} \text{iii) Maximum level} &= \text{Re-order level} + \text{Reorder quantity} - \\ &\quad (\text{Minimum consumption} \times \text{Minimum Re-order period}) \\ &= 4800 + 2500 - (200 \times 6) \\ &= 7300 - (1200) \\ &= 7300 - 1200 \\ &= 6100 \text{ units} \end{aligned}$$

$$\begin{aligned} \text{iv) Average stock level} &= \frac{\text{Minimum level} + \text{Maximum level}}{2} \\ &= 2700 + 6100 / 2 \\ &= 8800 / 2 \\ &= 4400 \text{ units} \end{aligned}$$

---

## 2.7 ECONOMIC RE-ORDER QUANTITY SOLVED PROBLEMS

---

### 2.7.1 Formula to calculate EOQ

$$\text{Economic order Quantity} = \sqrt{\frac{2 \times A \times O}{C}}$$

Where A = Annual unit consumed / used

O = Ordering cost per order

C = Annual carrying cost of one unit i.e. Carrying cost percentage p.a  $\times$  cost per unit.

### 2.7.2 Solved Problems

#### Illustration 3

From the following particulars, calculate Economic Order Quantity and number of order to be placed in the year by using

- a) Tabulation method
- b) Formula method
  - i) Annual consumption of material - 6000 kg
  - ii) Cost of placing an order - ₹ 60
  - iii) Cost per kg - ₹ 5
  - iv) Storage and carrying cost – 10 % an average inventory.



Ans.

## a) Tabulation method

Particulars	Formula	1	2	3	4	5	6	7	8	9	10
Annual usage	A	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Order size	Q	6000	3000	2000	1500	1200	1000	857	750	667	600
Ordering cost p.u.	O	60	60	60	60	60	60	60	60	60	60
Carrying cost p.u.	C = 10% of ₹ 5	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
No. of orders	N = A/Q	1	2	3	4	5	6	7	8	9	10
Total carrying cost	TC = Q × C	1500	750	500	375	300	250	214	188	167	150
Total Ordering cost	TO = N × O	60	120	180	240	300	360	420	480	540	600
Total Annual cost	TAC = TC + TO	1560	570	680	615	600	610	634	668	707	750

Box indicates EOQ = 1200 unit. When 5 order of 1200 kg each are placed, the carrying cost 300 and the total cost 600 is the lowest.

Tabulation method is useful for computing EOQ when the order size / lot is shifted, ii) Supplier offers volume discount that higher discount for large quantities.

## b) Formula method

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

Where, A = Annual consumption – 6000 kg

O = costing of placing an order – ₹ 60

C = storage and carrying cost per unit =  $\frac{5 \times 10}{100} = ₹ 0.50$

$$\begin{aligned} \therefore EOQ &= \sqrt{\frac{2 \times 6000 \times 60}{0.50}} = \sqrt{\frac{2 \times 6000 \times 60 \times 100}{50}} = \sqrt{1440000} \\ &= 1200 \text{ unit} \end{aligned}$$

**Illustration 4**

From the following figures, calculate Economic order Quantity and order to be placed for number kg in each year.

Annual consumption of material : 4000 kg

Cost per unit = Rs. 20 Per kg

Cost of Buying per order = Rs 5 /-

Storage and carrying cost = 87.0 average inventory

$$\text{Ans. EOQ} = \sqrt{\frac{2AO}{C \times S}}$$

Where A = Annual usage – 4000 kg

O = cost of buying per order = 5 /-

C = cost per unit = 20 /-

S = storage and carrying cost

$$\begin{aligned} \therefore \text{EOQ} &= \sqrt{\frac{2 \times 4000 \times 5}{8\% \text{ of } 20}} \\ &= \sqrt{\frac{40000}{0.16}} \\ &= \sqrt{250000} \\ &= 500 \text{ kg} \end{aligned}$$

**Illustration 5**

From the following information, calculate EOQ

Semi - Annual consumption – 6000 units

Purchase price of input unit – ₹ 25 /-

Ordering cost per order – ₹ 45 /-

Quarterly carrying cost – 3 %

$$\text{EOQ} = \sqrt{\frac{2AO}{C}}$$

Where, A = Annual consumption = 6000 × 2 = 12000 units

O = Ordering cost per order = ₹ 45 /-

C = Annual carrying cost of one unit = 3 % of 25 × 4

$$= \frac{3 \times 25}{100} \times 4 = ₹ 3$$

$$\begin{aligned}\therefore \text{EOQ} &= \sqrt{\frac{2 \times 12000 \times 45}{3}} \\ &= \sqrt{3,60,000} \\ &= 600 \text{ units}\end{aligned}$$

**Illustration 6**

PQR Ltd produces a product which has monthly demand of 52,000 units. The product requires a component X which purchased at 15 /- per unit. For every finished product, 2 unit of component X are required. The ordering cost is 350 /- per order and carrying cost is 12 % p.a.

You are required

- Calculate Economic Order Quantity for component 'X'.
- If minimum lot size is supplied 52000 units what is the extra cost, the company has to incur?
- What is the minimum carrying cost, the company has to incur?

**Ans. Annual consumption of component "X"**

$$52000 \text{ units} \times 12 \text{ months} \times 2 = 12,48,000 \text{ units}$$

$$\text{a) Economic order Quantity} = \sqrt{\frac{2AO}{C}}$$

$$\text{Where } A = \text{Annual consumption} = 12,48,000 \text{ units}$$

$$O = \text{Ordering cost Due order} = ₹ 350 /-$$

$$C = \text{Annual carrying cost} = \frac{12^3}{100} \times 15^3$$

$$\begin{aligned}\therefore \text{EOQ} &= \sqrt{\frac{2 \times 1248000 \times ₹ 350}{₹ 15 \times 12 \div 100}} \\ &= \sqrt{\frac{87,36,00000}{180 \div 100}} \\ &= \sqrt{\frac{87,36,00000}{108}} \\ &= 22030 \text{ units}\end{aligned}$$

b) Calculation of Extra cost if minimum lot size is 52000 units

i) **If Lot size is 52000 units**

$$\text{Ordering cost} = \left( \frac{1248000}{52000} \times 350 \right) = 8400$$

$$\text{Carrying cost} = \left( 52000 \times \frac{1}{2} \times 15 \text{₹} \times 12 \div 100 \right) = 46800$$

$$\text{Total Cost} = 46800 + 8400 = 55200 \text{ (I)}$$

ii) **If cost size is 22030 units**

$$\text{Ordering cost} = \left( \frac{1248000}{22030} \times 350 \right) = 19828$$

$$\text{Carrying cost} = \left( 22030 \times \frac{1}{2} \times \text{₹}15 \times \frac{12}{100} \right) = 19827$$

$$\text{Total Cost} = 19828 + 19827 = 39655 \text{ (II)}$$

$$\text{Extra cost} = \text{I} - \text{II} = 55200 - 39655 = 15545$$

c) Minimum Carrying cost :

$$22030 \text{ units} \times \frac{1}{2} \times \text{₹} 15 \times \frac{12}{100} = 19,827$$

### Illustration 7

A manufacturer has to supply to his customer 600 units of his produce per year. Storage is not allowed and the inventory carrying cost amounts to ₹ 0.60 per unit per year. The set up cost per run is ₹ 80

Find the

- Economic order Quantity,
- Minimum average yearly cost,
- Optimum number of order per year and
- Optimum period of supply per optimum order.

**Ans :-** a) Economic order Quantity =  $\sqrt{\frac{2AS}{C}}$

Where A = Annual usage - 600 units

S = set – up cost per run - ₹ 80

C = carrying cost per unit - ₹ 0.60

$$\begin{aligned}\therefore \text{EOQ} &= \sqrt{\frac{2 \times 600 \times 80}{0.60}} \\ &= \sqrt{1,60,000} \\ &= 400 \text{ units}\end{aligned}$$

**b) Optimum number of orders p.a**

$$\begin{aligned}\text{Optimum number of order per year} &= \frac{\text{Annual usage}}{\text{EOQ}} \\ &= \frac{600}{400} \\ &= 1.5\end{aligned}$$

Since number of order can not be fractional we round it off to the next whole number. Thus, optimum number of order per year = 2

**c) Minimum Average yearly cost**

$$\begin{aligned}\text{Minimum Average yearly cost} &= \text{set up cost} + \text{carrying cost} \\ &= ₹ 160 + ₹ 120 \\ &= ₹ 280\end{aligned}$$

$$\therefore \text{set – up cost} = ₹ 80 \times 2 = ₹ 160$$

$$\begin{aligned}\text{Carrying cost} &= \text{Average inventory} \times \text{carrying cost per unit} \\ &= \frac{400}{2} \times 0.60 \\ &= ₹ 120\end{aligned}$$

**d) Optimum supply period per optimum order**

$$\begin{aligned}\text{Optimum supply period per optimum order} &= \frac{\text{EOQ}}{\text{Average monthly requirement}} \\ &= \frac{400}{\frac{600}{12}} \\ &= \frac{400}{50} \\ &= 8 \text{ months}\end{aligned}$$

**Illustration 8**

A firm's inventory planning period is one year. Its inventory requirement for this period is 1,600 units. Assume that its order costs are ₹ 50 /- order. The carrying cost expected to be

₹ 1 per unit per year for an item.

The firm can produce inventories in the various lots as follows :

- i) 1,600 units    ii) 800 units    iii) 900 units    iv) 200 units and  
v) 100 units

Which of these order quantities is the economic order quantity ?

Use    a) Equation method        b) Tabulation method.

**Ans : a) Equation method**

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

Where,    A = Annual usage – 1600 units

          O = Ordering cost per order - ₹ 50

          C = Carrying cost per unit per annum. ₹ 1

$$\begin{aligned} \therefore EOQ &= \sqrt{\frac{2 \times 1600 \times 50}{1}} \\ &= \sqrt{1,60,000} \\ &= 400 \text{ units} \end{aligned}$$

**b) Tabulation method**

Inventory cost for different order Quantities

Particulars	Formula	1	2	3	4	5
Annual usage	A	1600	1600	1600	1600	1600
Order size	Q	1600	800	400	200	100
Ordering cost per order	O	50	50	50	50	50
Carrying cost p.u.p.a.	C	1	1	1	1	1
No. of orders	$N = A/Q$	1	2	4	8	16
Total Ordering cost	$TO = N \times O$	50	100	200	400	800
Total carrying cost	$TC = Q \times C$	800	400	200	100	50
Total Annual cost	$TAC = TC + TO$	850	500	400	500	850

It can be seen from the table that the carrying and ordering cost taken together are the lowest for the order size 400 units. Therefore, Economic order Quantity is 400 units.

---

## 2.8 INVENTORY TURNOVER RATIO

---

### 2.8.1 Meaning

There are several items in the stores which are issued to the production after long gap from the date of purchases. There are several other items which are never issued to the production as they have become outdated which needs to be disposed off. These items need to be identified so that management can avoid the capital locked up in such items. It is necessary to compute the inventory turn over ration for finding these items. This ratio indicates not only replacement of stock during the year but the efficiency or inefficiency with inventories are maintained in the organisation. This ratio measures how quick sales of inventories is done. It is the test of efficient inventory management. A higher inventory turnover ratio indicates good inventory management. A low inventory turnover ratio may adversely affect the ability of an organisation to meet consumer's demand and not cope up with requirement.

### 2.8.2 Formula

This ratio measures relationship between cost of goods sold and the inventory level. Inventory turnover ratio is calculated as follows :

$$\begin{aligned} \text{Inventory turnover ratio} &= \text{Cost of goods sold or material} \\ &\quad \text{consumed / Average Inventory or Stock} \\ &= \dots\dots\dots \text{times} \end{aligned}$$

Where, cost of material consumed = opening stock + purchases – closing stock

$$\text{Average Inventory} = \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

This ratio can also be calculate in days as follows :

$$\begin{aligned} \text{Inventory turnover ratio} &= \frac{\text{Number of days in a year}}{\text{Inventory Turnover Ratio}} \\ &= \text{Number of days} \end{aligned}$$

However serious limitation of this approach is that detailed data may not be available in respect of inventory level and cost of goods. In order to overcome this difficulties another approach for computation of inventory turnover Ratio is used which is based on the relationship between sales and closing inventory. Alternatively,

$$\text{Inventory turnover Ratio} = \frac{\text{Sales}}{\text{Closing Inventory}}$$

In short, of the two approach of calculating inventory turnover ratio, the first which relates to the cost of goods sold to average

inventory and theoretically it is superior whereas advantages of second approach is that it is free from practical problems of computations.

### 2.8.3 Solved Problems

#### Illustration 9

The following data are available in respect of material 'Y' for the year ended 31<sup>st</sup> march 2015

Particulars	₹
Opening stock	1,10,000
Closing stock	1,50,000
Purchases during the year	320000

**Calculate** i) Inventory turnover Ratio

ii) Number of days for which average inventory is held.

**Ans :-**

$$\begin{aligned} \text{Cost of material consumed} &= \text{Opening stock} + \text{Purchases} - \text{closing stock} \\ &= 11,0000 + 32,0000 - 1,50,000 \\ &= 2,80,000 \end{aligned}$$

$$\begin{aligned} \text{Average Inventory} &= \frac{\text{Opening stock} + \text{Closing stock}}{2} \\ &= \frac{110000 + 150000}{2} \\ &= \frac{260000}{2} \\ &= 130000 \end{aligned}$$

$$\begin{aligned} \text{Inventory turnover Ratio} &= \frac{\text{Cost of material consumed}}{\text{Average Inventory}} \\ &= \frac{280000}{130000} \\ &= 2.15 \text{ times} \end{aligned}$$



ii) Number of days for which average inventory is held

$$= \frac{\text{Number days in a year}}{\text{Inventory turnover ratio}}$$

$$= \frac{280000}{130000}$$

$$= 169.76 \text{ days} \quad \text{OR} \quad 170 \text{ days}$$

### Illustration 10

Inventory records of Aishwarya Ltd. Shows as following information :

Particulars	Material A	Material B	Material C
Opening stock	1400 kg	400 liters	200 kg
Purchases	23,000 kg	2200 liters	3600 kg
Closing stock	400 kg	2400 liters	2400 kg

Inventory is valued of ₹ per kg and ₹ 2.5 per liter.

Calculate material turnover ratio for each of the materials.

**Ans :** Material consumed = opening stock + purchases – closing stock

$$\text{Material A} = 1400 + 2300 - 400 = 2400 \text{ kg}$$

$$\text{Material B} = 400 + 22000 - 2400 = 20,000 \text{ liter}$$

$$\text{Material C} = 200 + 3600 - 2400 = 1400 \text{ kg}$$

$$\text{Average Inventory} = \frac{\text{Opening stock} + \text{Closing stock}}{2}$$

$$\text{Material A} = (1400 + 400) / 2 = 900 \text{ kg}$$

$$\text{Material B} = (400 + 2400) / 2 = 1400 \text{ liter}$$

$$\text{Material C} = (200 + 2400) / 2 = 1300 \text{ kg}$$

$$\text{Material turnover ratio} = \frac{\text{Cost of material consumed}}{\text{Average Inventory or Stock}}$$

$$\text{Material A} = \frac{2400 \times 2 \text{ ₹}}{900 \times 2 \text{ ₹}} = \frac{4800}{1800} = 2.666 \text{ or } 2.6$$

Times

$$\text{Material B} = \frac{20000 \times 2.50 \text{ ₹}}{1400 \times 2.50 \text{ ₹}} = \frac{50000}{3500} = 14.285 \text{ or } 14.29 \text{ Times}$$

$$\text{Material C} = \frac{2400 \times 2 \text{ ₹}}{1300 \times 2 \text{ ₹}} = \frac{2800}{2600} = 1.076 \text{ or } 1.08 \text{ Times}$$

$$\text{Material Inventory} = \frac{\text{Number days in a year}}{\text{I.T. ratio}}$$

$$\text{Material A} = \frac{365}{2.67} = 136.704 \text{ or } 137 \text{ days}$$

$$\text{Material B} = \frac{365}{14.29} = 25.542 \text{ or } 26 \text{ days}$$

$$\text{Material C} = \frac{365}{1.08} = 337.962 \text{ or } 338 \text{ days}$$

### Illustration 11

From the following data for the year ended 31<sup>st</sup> March 2015, calculate the inventory turnover ratio of two items and put forward your comments on them.

Particulars	Material 'X' ₹	Material 'Y' ₹
Opening Stock (01.04.2014)	30,000	27,000
Purchases (01.04.2014 to 31.05.2014)	1,56,000	81,000
Closing Stock (31.03.2014)	18,000	33,000

**Ans :** Cost of Material consumed = Opening stock + Purchase – closing stock

$$\text{Material X} = 30,000 + 1,56,000 - 18,000 = ₹ 1,68,000$$

$$\text{Material Y} = 27,000 + 81,000 - 33,000 = ₹ 75,000$$

$$\text{Average Inventory} = (\text{opening stock} + \text{closing stock}) \div 2$$

$$\text{Material 'X'} = (30,000 + 18,000) \div 2 = ₹ 24,000$$

$$\text{Material 'Y'} = (27,000 + 33,000) \div 2 = ₹ 30,000$$

$$\text{Inventory turnover ratio} = \frac{\text{Cost of material consumed}}{\text{Average Inventory or Stock}}$$

$$\text{Material 'X'} = ₹ 1,68,000 \div ₹ 24,000$$

$$= 7 \text{ Times}$$

$$\text{Material 'Y'} = ₹ 75,000 \div ₹ 30,000$$

$$= 2.5 \text{ times}$$

**Comment :**

**Result :** Comparatively inventory turnover ratio of material 'X' is higher than that of material Y (4.5 times)

**Decision :-** The management of this organisation needs to concentrate on material y as its turnover is 2.5 times only. It has to analysis the causes and take remedial measures for remaining material idle for long time / period in warehouse.

### Illustration 12

From the following information supplied by Sanket Ltd, calculate

- Inventory turnover Ratio
- Number of days for which the inventory is held.

Particulars	Material 'P' (E)	Material 'Q' (i)
Opening stock	30,000	45000
Purchases	2,00,000	3,00,000
Closing stock	45,000	50,000
Sales	36,000	4,50,000

**Ans :-**

Cost of Material consumed = opening stock + Purchases – closing stock

Material P = 30,000 + 200000 – 45000 = ₹ 185000

Material Q = 45000 + 300000 – 50,000 = ₹ 29,5000

Average Inventory = (Opening stock + Closing stock) ÷ 2

Material P = (30,000 + 45000) ÷ 2 = ₹ 375000

Material Q = (45000 + 50000) ÷ 2 = ₹ 47,500

i) Inventory turnover ratio =  $\frac{\text{cost of material consumed}}{\text{Average Inventory}}$

Material 'P' = 1,85,000 ÷ 37500 = 4.93 = 5 times

Material 'Q' = 2,95,000 ÷ 47500 = 6.21 = 6 times

Alternatively, Inventory turnover ratio is as follows :

Inventory turnover ratio = sales / closing inventory

Material 'P' = 360000 / 45000 = 8 times

Material 'Q' = 450000 / 50,000 = 9 times

ii) Number of days for which the inventory is held

∴ Number of days =  $\frac{\text{Number of days in a year}}{\text{Inventory Turnover Ratio}}$

$$\text{Material 'P'} = \frac{365}{5} = 73 \text{ days}$$

$$\text{Material 'Q'} = \frac{365}{6} = 61 \text{ days}$$

## 2.9 QUESTIONS

1. Define Inventory and explain the various costs of inventory?
2. Why do we not want to hold inventories?
3. What do you understand by inventory control? Explain its objectives and importance.
4. What are the selecting techniques of inventory control?
5. What is the significance of Economic Order Quantity?
6. What are the objectives of Inventory Control?
7. Write short notes on the following :
  - a. Inventory,
  - b. Inventory control
  - c. Cost of inventory,
  - d. ABC analysis/Pareto analysis.
  - e. Inventory Turnover Ratio

### 8. Practical Problems

- 1) Following information is available from the books of manufacturing company for material 'X' for the year ending 2015.
 

Normal usage	<input type="checkbox"/>	900 units per week each
Maximum usage	<input type="checkbox"/>	1200 units per week each
Minimum usage	<input type="checkbox"/>	600 units per week each
Reorder quantity	<input type="checkbox"/>	850 units
Reorder period	<input type="checkbox"/>	4 to 6 week

Calculate Re-order level, Minimum level, Maximum level and Average stock level.

**(Ans. Reorder level - 7200 units, Minimum level-2700 units  
Maximum level - 5650 units, Average level - 4,175 units)**

- 2) From the following information calculate
  - a) Re-order stock level
  - b) Minimum stock level
  - c) Maximum stock level
  - d) Average stock level

Re-order quantity	-	36000 units
Time required for delivery	-	2 to 4 months
Maximum consumption	-	9000 units per month
Normal consumption	-	6000 units per month

Ans :

a)	Re-order	-	36000 units,
b)	Minimum level	-	18000 units,
c)	Maximum level	-	66000 units,
d)	Average level	-	42000 units

3) A manufacturing company produces a special product 'Sorbina' the monthly demand for which is 500 units. The following particulars are available in respect of the material used for manufacturing product.

Cost of placing an order	-	₹ 120
Annual carrying cost per unit	-	₹ 12
Normal usage per week	-	60 units
Minimum usage per week	-	30 units
Maximum usage per week	-	90 units
Delivery period	-	4 to 6 weeks

Compute :	a)	Economic Re-order quality
	b)	Re-order level
	c)	Minimum level
	d)	Maximum level and
	e)	Average level

(Ans. EOQ – 250 units, Re-orders level – 540 units. Minimum level – 240 units, maximum level – 670 units, Average level – 455 units.)

4) The following information is available from the books of a company where two types of materials are used, namely A and B.

Normal usage	–	300 units per week each
Maximum usage	–	450 units per week each
Minimum usage	–	150 units per week each
Re-order quantity	- A - 2400 units, B - 3600 units	
Re-order period-	A- 4 to 6 weeks, B - 2 to 4 weeks	
Compute	1) Re-order level 2) Minimum level	
	3) Maximum level and 4) Average stock level	

Ans. :

	Material A	Material B
a) Re order level	2700 units	1800 units
b) Minimum level	1200 units	900 units
c) Maximum level	4500 units	5100 units
d) Average stock level	2850 units	3000 units

5) From the following particulars, compute Economic order quantity

Annual consumption- 405000 units

Order placing and receiving cost -₹ 20 per order

Annual stock holding-20 % of consumption

(Ans. EOQ - ₹ 9,000)

6) X Ltd. Produces a product that has monthly demand of 4000 units. The product requires a component A, which is purchased at ₹ 10 for every finished product one unit at component, is required. The ordering cost is ₹ 60 and the holding cost is 10% of per annum consumption.

Calculate Economic order Quantity

(Ans. EOQ = ₹ 6,928)

7) From the following information, calculate Economic order Quantity by using formula and tabulation method.

Annual Requirement (unit)	6400
Ordering cost (per order ₹)	100
Carrying cost per unit (₹)	8
Per unit price (₹)	80

The firm can produce inventories in various lots such as

i) 6400 units	ii) 3200 units	iii) 1600 units
iv) 800 units	v) 400 units	vi) 200 units
and vii) 100 units		

(T.Y.B.Com. M. U. Nov. 14)

(Ans. EOQ = 400 units)

8) Find the Economic order Quantity from the following information by Tabulation and Formula method.

Annual Demand	-	20000 units
Cost per article	-	₹ 1
Inventory carrying cost	-	15%
Cost per order	-	₹ 15

(Ans. EOQ = 2000 units.)

9) The following information relating to a type of material is available.

Annual demand	-	2000 units
Ordering cost	-	₹ 20/- per order
Storage cost	-	₹ 2%
Unit Price	-	₹ 20 /-
Interest due	-	8%
Lead Time	-	½ month

Calculate Economic order Quantity and Inventory cost of raw material.

(Ans. EOQ = 200 units, Inventory cost = ₹ 40400)

10) From the following information, calculate Economic order Quantity and the number of orders to be placed in one quarter of the year.

- i) Quarterly consumption of materials-2000 kg
- ii) Cost of placing an order-₹ 50
- iii) Cost per unit -₹ 40
- iv) Storage and Carrying cost- 8% on average inventory

(Ans. EOQ = 500 units, No. of orders per quarter – 04 orders)

11) A manufacturer requires 9600 units of a certain commodity annually. This is currently purchased from a regular supplier at ₹ 50 per unit. The cost of placing an order is ₹ 60 per order and annual carrying cost is ₹ 5 per piece. What is EOQ for placing an order ?

(Ans. EOQ = 480 units)

12) The following information is available from the books of M/s Mahi Enterprises for the year 2015.

Particulars	Materials 'A' (₹)	Material 'B' (₹)
Opening stock	2000	3000
Purchases	26000	7000
Closing stock	3000	3500

Calculate the material Turnover Ratio and determine which material is moving fast.

(Ans. Material / Inventory Turnover Ratio – A – 10 times, B - 2 times)

13) From the following for the year ending 31st March 2015.

Compute

- Cost of material consumed
- Average inventory
- Inventory Turnover Ratio
- Number of days for which material is held.
- Which material is moving fast.

Particulars    Materials No. 1(₹)    Materials No. 2(₹)

Opening stock (01.04.14)    10000    15000

Closing stock (31.03.15)    25000    5000

Purchases during the year    100000    75000

(Ans.

	Materials No. 1(₹)	Materials No. 2(₹)	
a) Material Consumed	85000	85000	
b) Average Inventory	17500	10000	
c) Inventory Turnover ratio	4.85 times	8.5 times	
d) No. of days for material held	75.25days	42.94 days	
	75 days	43 days	
e) Material 1 is moving fast)			

14) Calculate stock holding period for material if, Opening stock ₹ 12000, Closing stock - ₹ 10,000 and Purchases during the year ₹ 53000

Assumption : No. of working days in a year – 364

(Ans. Material / Stock period – 73 days.)

15) From the following information, calculate

a) EOQ and b) Total annual carrying ordering cost at that quantity.

Semi annual consumption                    -            6000 units

Purchase price of input unit                -            ₹ 25

Quarterly carrying cost                      -            3%

Order cost per order                         -            ₹ 45

(Ans. EOQ – 600 units, Total Annual carrying and Ordering Cost - ₹ 1800)

16) From the following information, calculate EOQ and Total Annual carrying and ordering cost at that quantity and material holding period also.

Quarterly consumption                        -            750 units

Purchase price per unit                        -            ₹ 25/-

Semi – Annual carrying cost                 -            6%

Order cost per order                            -            ₹ 45/-

(Ans. EOQ – 300 units, carrying and ordering cost - ₹ 900)



- 17) Calculate the stock turnover ratio from the following

Opening stock	-	₹ 80000
Closing stock	-	₹ 160000
Sales	-	₹ 620000
Sales Return	-	₹ 20000
Gross Profit Ratio	-	20% on sales

**(Ans. Stock Turnover Ratio = 4 times)**

Net sales	620000	-	20000	₹600000
(-) G.P. 20% of sales				₹120000
Cost of Goods sold				480000

- 18) Calculate stock turnover Ratio and stock of material holding period in days

Opening stock	-	₹ 60000
Closing stock	-	₹ 140000
Net sales	-	₹ 300000
Gross profit @	-	20 % on sales
Working days of year	-	365

**(Ans. Stock turnover ratio – 4 times, Stock holding period – 91.25 or 91 days)**



## INVENTORY ACCOUNTING

### Unit Structure:

- 3.0 Objectives
- 3.1 Stores Records
- 3.2 Issue of Materials
- 3.3 Pricing of Materials Issued
- 3.4 First In First Out (Fifo)
- 3.5 Average Cost
- 3.6 Solved Problems
- 3.7 Exercise

---

### 3.0 OBJECTIVES

---

After studying the unit students will be able to:

- Know the important store records.
- Explain about issue of material.
- Explain the methods of stock valuation.
- Know the advantages and disadvantages of FIFO method and Average cost method.
- Solve the problems of stock valuation.

---

### 3.1 STORES RECORDS

---

The important function of the storekeeper is to maintain records of receipts, issues and balances of various items of materials. Bin Card and store ledger are two important stores records that are kept for making a record of the various items at stores,

#### I) BIN CARD :

A bin is a place where the materials are stored. It may be a shelf, an aluvarch, open space etc. depending upon the nature of the commodity. A bin card provides a quantitative record of the receipts, issues and balance of materials. The bin cards are usually attached to or placed near to the bin so that receipts and issues may be entered therein as soon as they take place. Separate bin

cards are prepared for each item of stores. Thus, bin card provides a continuous record of the stock in each bin and assist the storekeeper to control the stock. For each materials, the maximum stock to be held are noted on the card. An ordering level is also indicated therein so that fresh supplies may be ordered before the minimum is reached. A specimen of the bin card is given below:

BIN CARD						
Name .....			Maximum level .....			
Description .....			Minimum level .....			
Bin No. ....			Ordering level ,.....			
Location Code .....			Re-ordering quantity .....			
Stores Ledger Folio .....			Unit ....			
Date	Receipts	Issues	Balance	Audit		
	G.R. No.	Qty.	Date	Req. No.	Qty	Qty
Date	Initials					

**ii) Stores Ledger**

Stores ledger is a continuous record of stores received and issued and discloses the balance in hand at any time both in quantity and value. It includes an account of each class of materials and facilitates ascertainment of all details relating to the material in minimum time. It provides management with a perpetual inventory. A specimen of the stores ledger is given below:

STORES LEDGER						
Name .....			Maximum level .....			
Description .....			Minimum level .....			
Bin No. ....			Ordering level ,.....			
			Re-ordering quantity .....			
			Unit ....			
Date	RECEIPTS		ISSUES	BALANCE	Remarks	
	G.R. No.	Qty. Rate	Req. No.	Qty	Amt.	Qty.
	Rate Amt.					

## 3.2 ISSUE OF MATERIALS

All materials in the stores are meant for issue to various departments. The procedure for the issue is normally laid down by the management. The storekeeper issues materials to various department against material requisition note, the specimen of which is given below:-

### Specimen of Materials Requisition

MATERIAL REQUISITION					
Department .....			Serial No.....		
Job No. ....			Date .....		
Code No.	Description	Quantity	Weight	Bin Card No.	Stores
Ledger Folio	Rate	Amount			
Rs.					
Authorised by .....			Received by.....		
Storekeeper's Signature .....			Checked by .....		

On receipt of material requisition, the storekeeper issues the necessary materials after obtaining the signature of the person receiving the materials. Materials requisitioned from the storekeeper and not needed or found to be defective are returned to the storeroom and a returned materials report is prepared by the concerned person upon receipt of the materials. Sometimes, it is necessary to return any rejected, excess or damaged materials to the supplier after making correct entries in the stores ledger.

Materials are issued from stores on properly prepared and approved materials requisition. It is a written order to the storekeeper to deliver materials to the place and the department. The materials requisition note includes date, requisition number, department charged, name of the stores, ledger account to be credited, description of materials, quantity, unit price, total value, delivery point and the signature of the person requisitioning the material and signature of the departments executive approving the requisition or comparatively fixed list of materials generally use a special form of material requisition which is called as 'bill of materials'. Materials requisitioned from the stores and not required

or found to be defective are returned to the stores, where a returned material report is prepared by the concerned person. The amount and value of materials returned to the stores are deducted from total value of materials issued. Similarly, the amount shown by materials returned is deducted from the total amount charged to each department. It may be necessary to return any rejected, excess or damage materials to the supplier. This also requires some correction entries in the stores ledger.

---

### **3.3 PRICING OF MATERIALS ISSUED**

---

When materials are purchased they are recorded at price at which they are purchased after asking necessary adjustments for discounts, transportation charges, cost of containers etc. But, when it comes to the issue of materials, the problem arises with regard to the price at which each issue should be recorded because the different quantities of materials are purchased at different prices. For this purpose, a number of methods of pricing the issue of materials are used which are as follows:-

- a) FIFO Method :-** The first in first out method is used when the materials received but are to be issued first. The price of the earliest lot/ quantity is taken first and then for the next lot. The value of closing stock confirms more or less, to the current market price. This method is suitable for falling price.
  
- b) LIFO Method :** - The last in first out method, is used when materials received last are issued first. The storekeeper will charge the cost price of the latest lot purchased. This is suitable in the times of rising prices.
  
- c) Average Rate Method:-** Under this method the materials are issued at a price which is an average price of materials purchased. The simple average is an average of prices without having regard to the quantities involved. Weighted average price is used in order to avoid fluctuation in price and reduce the number of calculations. Weighted average of the total cost and total quantities of materials purchased. is calculated each time a purchase is made.

---

## **3.4 FIRST IN FIRST OUT (FIFO)**

---

### **3.4.1 MEANING**

Under the method the earliest lot of materials or goods purchased or goods manufactured are exhausted first and closing stock is out of the latest consignments received or goods manufactured and is valued at the cost of such goods. In other words: cost of goods sold is calculated keeping in view the earliest lots exhausted on the presumption that units are sold in which they were acquired. In short under this method it is assumed that goods or materials which are purchased first are issued first stock consist of latest purchase. Hence items lying in the stock should be valued at latest purchase price.

### **3.4.2 ADVANTAGES**

- (1) This method is simple to understand and easy to operate.
- (2) It is logical method because it takes a into consideration the normal procedure of utilizing first those items of inventory which are received or manufactured first.
- (3) This method is very useful when prices are falling because cost of goods so sold will be high on account of using earliest lots which are costly.
- (4) Closing stock is valued nearer the market price as it would consist of recent purchase of units.
- (5) This method is useful when transactions are not too many and prices are fairly steady.
- (6) This method is useful when inventory is subject to deterioration and obsolescence.

### **3.4.3 DISADVANTAGES**

- (1) This method increases the possible of clerical errors if the price fluctuates, considerably as every time as issue of material is sold, the store ledger clerk will have to go through his ascertain the price to be changed.
- (2) If the prices fluctuate, comparison between different jobs executed by the concern becomes difficult because one job started a few minutes later than another of the same nature may have consumed the supply of lower priced or higher priced stock.
- (3) Market prices as it is calculated keeping in view the earliest last which were purchased at lower rate.

---

### 3.5 AVERAGE COST

---

The principal on which the average cost method is based is that all items on the store are so mixed up that consumption of material or sale of finished goods cannot at the average cost of the various items on hand. Average may be of two types :

- (a) Simple Average Method (not in syllabus)
- (b) Weighted Average Method

Weighted average method is quite superior to other methods and it is better to follow this method. This method can be used with advantage in those cases where price and quantity vary widely. The average rate does not change with issue but would vary with a fresh supply of materials received when a new average will have to be calculated, in a period of fluctuating price this method will even out the fluctuations. This method is also goods as the weighted average rate lies in between the extreme rates as shown by FIFO and LIFO method. However the difficulty is that fresh calculations are needed at every purchase of materials or goods.

---

### 3.6 SOLVED PROBLEMS

---

#### Illustration No. 1

From the following particulars prepared Stores ledger for the month of Mar 08

(a) FIFO to "ABC", (b) Weighted average to "XYZ".

	ABC	XYZ
Stocks (kgs) on 1-3-2008	2000 @ Rs. 28	4,000 @ Rs. 13
Purchases (kgs)		
[i] On 11-3-2008	1,800 @ Rs. 27	2,500 @ Rs. 14
[ii] On 21-3-2008	1,700 @ Rs. 25	2,000 @ Rs. 18
Sales (kgs)		
[i] On 6-3-2008 1,300	2,500	
[ii] On 15-3-2008	1,400	2,000
[iii] On 18-3-2008	700	1,300
[iv] On 29-3-2008	1,100	1,70

**(IDE, Nov. 1999, adapted)**

**Solution :**

**(A) FIFO to "ABC"**

**STOCK LEDGER OF ABC**

Date	Receipts			Issues			Balance		
	Units	Price	Amt.	Units	Price	Amt.	Units	Price	value
01-3-2008	Opening	-	-	-	-	-	2,000	28.00	56,000
06-3-2008	-	-	-	1,300	28.00	36,400	700	28.00	19,600
11-3-2008	1,800	27.00	48,600	-	-	-	700 1,800	28.00 27.00	19,600 48,600
15-3-2008	-	-	-	700 700	28.00 7.00	19,600 18,900	1,100	27.00	29,700
18-3-2008	-	-	-	700	27.00	18,900	400	27.00	10,800

Date	Receipts			Issues			Balance		
	Units	Price	Amt.	Units	Price	Amt.	Units	Price	Amt.
21-3-2008	1,700	25.00	42,500	-	-	-	400 1,700	27.00 25.00	10,800 42,500
29-3-2008	-	-	-	400 700	27.00 25.00	10,800 17,500	1,000	25.00	25,000

Therefore, the value of stock of ABC as on 31-3-2004 : 1,000 units  
@ Rs. 25.00 = Rs. 25,000

**(B) Weighted Average (Under Perpetual System of Inventory)**

**STOCK LEDGER OF XYZ**

Date	Receipts			Issues			Balance	
	Units	Price	Amt.	Units	Wt. Avg. Rate	Amt.	Units	Value
01-3-2008	Opening	-	-	-	-	-	4,000	52,000
06-3-2008	-	-	-	2,500	13.00	32,500	1,500	19,500
11-3-2008	2,500	14	35,000	-	-	-	4,000	54,500



15-3-2008	-	-	-	2,000	13.63	27,250	2,000	27,250
18-3-2008	-	-	-	1,300	13.63	17,712	700	9,538
21-3-2008	2,000	18	36,000	-	-	-	2,700	45,538
29-3-2008	-	-	-	1,700	16.87	28,671	1,000	16,867

**Working Notes :**

1] Issued of XYZ on March 15 is valued at Rs. 13.63 which is the weighted average rate, arrived at as follows :

$$\frac{19,500 + 35,000}{1,500 + 2,500} = \frac{54,500}{4,000} = 13.625 \text{ r/o } 13.63$$

2] Issue of XYZ on March 29 is valued at Rs. 16.87 per kg. which is the weighted average rate arrived at as follows :

$$\frac{9,538 + 36,000}{700 + 2,000} = \frac{45,538}{2,700} = 16.865 \text{ r/o } 16.87$$

Therefore, the value of stock as on 31-3-2008 : 1,000 units @ Rs. 16.87 = Rs. 16,867

**Illustration : 2**

From the following information relating A to Z item, value closing stock on 31-12-2008 applying – (a) FIFO, (b) Weighted average

Stocks (kgs) on 1-12-2008                      5,000 units @ Rs. 14

Purchases (kgs)

[i] On 18-12-2008                                      4,200 units @ Rs. 13

[ii] On 23-12-2008                                    3,800 units @ Rs. 9

Sales (kgs)

[i] On 7-12-2008                                      1200 units

[ii] On 16-12-2008                                    2600 units

[iii] On 19-12-2008                                   1800 units

[iv] On 30-12-2008                                   3400 units

**(IDE, April 1999, adapted)**

**Solution :**

**(A) FIFO**

**STOCK LEDGER**

Date	Receipts			Issues			Balance		
	Units	Price	Amt.	Units	Price	Amt.	Units	Price	value
01-12-2008	Opening	-	-	-	-	-	5,000	14.00	70,000
07-12-2008	-	-	-	1,200	14.00	16,800	3,800		53,200
16-12-2008	-	-	-	2,600	14.00	36,400	1,200	14.00	16,800
18-12-2008	4,200	13.00	54,600	-	-	-	1,200 4,200	14.00 13.00	16,800 54,600
19-12-2008	-	-	-	1,200 600	14.00 13.00	16,800 7,800	3,600	13.00	46,800
23-12-2008	3,800	9.00	34,200	-	-	-	3,600 3,800	13.00 9.00	46,800 34,200
30-12-2008	-	-	-	3,400	13.00	44,200	200 3,800	13.00 9.00	2,600 34,200

Therefore, the value of stock as on 31-12-2008 : 4,000 units @ Rs. 36,800

**B] Weighted Average (Perpetual Inventory system)**

**STOCK LEDGER**

Date	Receipts			Issues			Balance	
	Units	Price	Amt.	Units	Wt. Avg. Rate	Amt.	Units	Value
01-12-2008	Opening	-	-	-	-	-	5,000	70,000
07-12-2008	-	-	-	1,200	14.00	16,800	3,800	53,200
16-12-2008	-	-	-	2,600	14.00	36,400	1,200	16,800
18-12-2008	4,200	13.00	54,600	-	-	-	5,400	71,400
19-12-2008	-	-	-	1,800	13.22	23,796	47,607	47,604
23-12-2008	3,800	9.00	34,200	-	-	-	7,400	81,804
30-12-2008	-	-	-	3,400	11.05	37,570	4,000	44,234

**Working Notes :**

[1] Issue on December 19 is valued at Rs. 13.22 which is the weighted average rate, arrived at as follows :

$$\frac{16,800 + 54,600}{1,200 + 4,200} = \frac{71,400}{5,400} = 13.2222 \text{ or } 13.22$$

[2] Issue on December 30 is valued at Rs. 11.05 per kg. which is the weighted average rate arrived at as follows :

$$\frac{47,604 + 34,200}{3,600 + 3,800} = \frac{81,804}{7,400} = 11.054 \text{ or } 11.05$$

Therefore, the value of stock as on 31-12-2003 : 4,000 units @ Rs. 11.05 = Rs. 44,234

### Illustration : 3

Sumit Ltd. has purchased and issued the materials in the following order :

Month	Date	Particulars	Units	Cost Per Unit Rs.
August, 2003	01	Purchases	300	3
	04	Purchases	600	4
	06	Issues	500	-
	10	Purchases	700	4
	15	Issues	800	-
	20	Purchases	300	5
	23	Issues	100	-

Ascertain the quantity of closing stock as on 31<sup>st</sup> August, 2003 and sales what will be the value under the following methods.

[i] First in first out method. [ii] Weighted Average method.

(IDE, Nov. 2000, adapted)

**Solution :**

**(A) FIFO**

### STOCK LEDGER

Date	Receipts			Issues			Balance		
	Units	Price	Amt.	Units	Price	Amt.	Units	Price	value
1-8-2003	Opening	-	-	-	-	-	Nil	Nil	Nil
1-8-2003	300	3.00	900	-	-	-	300	3.00	900
4-8-2003	600	4.00	2,400	-	-	-	300 600	3.00 4.00	900 2,400
6-8-2003	-	-	-	300 200	3.00 4.00	900 800	400	4.00	1,600

10-8-2003	700	4.00	2,800	-	-	-	400 700	4.00 4.00	1,600 2,800
15-8-2003	-	-	-	400 400	4.00 4.00	1,600 1,600	300	4.00	1,200
20-8-2003	300	5.00	1,500	-	-	-	300 300	4.00 5.00	1,200 1,500
23-8-2003	-	-	-	100	4.00	400	200 300	4.00 5.00	800 1,500

Therefore, the value of stock as on 31-8-2003 : Rs. 2,300

### [B] Weighted Average (Perpetual Inventory System)

#### STOCK LEDGER

Date	Receipts			Issues			Balance	
	Units	Price	Amt.	Units	Wt. Avg. Rate	Amt.	Units	Value
01-8-2003	Opening	-	-	-	-	-	Nil	Nil
01-8-2003	300	3.00	900	-	-	-	300	900
04-8-2003	600	4.00	2,400	-	-	-	900	3,300
06-8-2003	-	-	-	500	3.67	1,835	400	1,465
10-8-2003	700	4.00	2,800	-	-	-	1,100	4,265
15-8-2003	-	-	-	800	3.88	3,104	300	1,161
20-8-2003	300	5.00	1,500	-	-	-	600	2,661
23-8-2003	-	-	-	100	4.44	444	500	2,217

#### Working Notes :

[1] Issue on August 6 is valued at Rs. 3.67 which is the weighted average rate, arrived at as follows :

$$\frac{900+2,400}{300+600} = \frac{3,300}{900} = 3.666\text{r/o} \approx 3.67$$

[2] Issue on August 15 is valued at Rs. 3.88 per kg. which is the weighted average rate arrived at as follows :

$$\frac{1,465+2,800}{400+700} = \frac{4,265}{1,100} = 3.877\text{r/o} \approx 3.88$$

[3] Issue on August 23 is valued at Rs. 4.44 per kg. which is the weighted average rate arrived at as follows:

$$\frac{1,161+1,500}{300+300} = \frac{2,661}{600} = 4.435 \text{ or } 4.44$$

Therefore, the value of stock as on 31-8-2002 : 500 units @ Rs. 4.44 = Rs. 2,217

#### Illustration :4

Keep stock record on FIFO, and Weighted Average basis from the following transactions :

#### Purchases : March 2004.

Date	Units	Rate Per unit (Rs.)
01	500	18
04	700	20
09	900	18
15	300	25
25	200	20
31	500	25

#### Sales : March 2004

02	200	22
07	500	25
11	400	21
18	800	28
27	500	25

Find out the goods sold and the profit.

Solution :

## FIFO METHOD

## STOCK LEDGER

Date	Purchases		Sales	Stock	
	Units	Rate		Units	Units × Rate =
March, 2004					
01	500	18	-	500 × 18 =	9,000
02	-	-	200	300 × 18 =	5,400
04	700	20	-	300 × 18 =	5,400
				700 × 20 =	14,000
					19,400
07	-	-	500	500 × 20 =	10,000
09	900	18	-	500 × 20 =	10,000
				900 × 18 =	16,200
					26,200
11	-	-	400	100 × 20 =	2,000
				900 × 18 =	16,000
					18,200
15	300	25	-	100 × 20 =	2,000
				900 × 18 =	16,200
				300 × 25 =	7,500
					25,700
18	-	-	800	200 × 18 =	3,600
				300 × 25 =	7,500
					11,100
25	200	20	-	200 × 18 =	3,600
				300 × 25 =	7,500
				200 × 20 =	4,000
					15,100
27	-	-	500	200 × 20 =	4,000
31	500	25	-	200 × 20 =	4,000
				500 × 25 =	12,500
					16,500

Value of stock under FIFO is Rs. 16,500.

**Profit when stock is valued under FIFO basis.****Opening Stock****Nil Rs.****Add : Purchases**

500	×	18	=	9,000
700	×	20	=	14,000
900	×	18	=	16,200
300	×	25	=	7,500
200	×	20	=	4,000
500	×	25	=	<u>12,500</u>

63,200  
63,200

Less : Closing Stock (as valued under FIFO)      16,500  
Cost of Goods Sold (A)                              46,700

**Sales**

200	×	22	=	4,400
500	×	25	=	12,500
400	×	21	=	8,400
800	×	28	=	22,400
500	×	25	=	12,500

(B)              60,200  
(B-A)           13,500

**Profit****[B] Weighted Average (Perpetual Inventory System)****STOCK LEDGER**

Date	Receipts			Issues			Balance	
	Units	Price	Amt.	Units	Wt. Avg. Rate	Amt.	Units	Value
01-3-2004	500	18.00	9,000	-	-	-	500	9,000
02-3-2004	-	-	-	200	18.00	3,600	300	5,400
04-3-2004	700	20.00	14,000	-	-	-	1,000	19,400
07-3-2004	-	-	-	500	19.40	9,700	500	9,700
09-3-2004	900	18.00	16,200	-	-	-	1,400	25,900
11-3-2004	-	-	-	400	18.50	7,400	1,000	18,500
15-3-2004	300	25.00	7,500	-	-	-	1,300	26,000
18-3-2004	-	-	-	800	20.00	16,000	500	10,000
25-3-2004	200	20.00	4,000	-	-	-	700	14,000
27-3-2004	-	-	-	500	20.00	10,000	200	4,000
31-3-2004	500	25.00	12,500	-	-	-	700	16,500
Total			63,200			46,700		

**Working Notes :**

[1] Issue on March 7 is valued at Rs. 19.40 which is the weighted average rate, arrived at as follows :

$$\frac{5,400+14,000}{300+700} = \frac{19,400}{1,000} = 19.40$$

[2] Issue on March 11 is valued at Rs. 18.50 which is the weighted average arrived at as follows :

$$\frac{9,700+16,200}{500+900} = \frac{25,900}{1,400} = 18.50$$

[3] Issue on March 18 is valued at Rs. 20 which is the weighted average rate on arrived at as follows :

$$\frac{18,500+7,500}{1,000+300} = \frac{26,000}{1,300} = 20$$

[4] Issue on March 27 is valued at Rs. 20.00 which is the weighted average rate, arrived at as follows :

$$\frac{10,000+4,000}{500+200} = \frac{14,000}{700} = 20$$

Therefore, the value of stock as on 31-3-2000 : 700 units Rs. 16,500.

[5] Cost of Goods sold = Opening Stock + Purchases – Closing Stock = 63,200 – 16,500 = 46,700

[6] Profit = Sale – Cost of goods sold = 60,200 – 46,700 = 13,500

**Illustration : 5**

Following are the purchases and sales of wheat in the months of March, 2004. Prepare a statement showing valuation of stock on the basis of (i) FIFO and (ii) Weighted Average Cost method.

Date	Purchases	Rate	Sales
2004	(Kg.)	(Rs.)	(Kg.)
March 1	600	4	-
4	-	-	300
5	300	3.80	-
10	-	-	200
18	200	4.20	-
23	-	-	400
29	400	4.40	-
31	-	-	300



Out of purchases March 5, 50 Kgs. were returned to the supplier on March 8.

Out of Sales on March 23, a customer returned 20 Kgs. on March 26.

**Solution :**

**FIFO**

**STOCK LEDGER**

Date	Purchases / Returns		Sales / Returns	Stock	
	Units (Kg.)	Rate (Rs.)	Units (Kg)	Units × Rate =	Amt.
Mar. 1	600	4	-	$600 \times 4 =$	2,400
04	-	-	300	$300 \times 4 =$	1,200
05	300	3.80	-	$300 \times 4 =$	1,200
				$300 \times 3.8 =$	1,140
					2,340
08	-	-	50	$300 \times 4 =$	1,200
			(Returns)	$250 \times 3.8 =$	9,50
					2,150
					(Note – 1)
10	-	-	200	$100 \times 4 =$	400
				$250 \times 3.8 =$	9,50
					1,350
18	200	4.20	-	$100 \times 4 =$	400
				$250 \times 3.8 =$	9,50
				$200 \times 4.2 =$	840
					2,190
23	-	-	400	$150 \times 4.2 =$	630
26	20	4.20	-	$170 \times 4.2 =$	714
	(returns)				(Note – 2)
29	400	4.40	-	$170 \times 4.2 =$	714
				$400 \times 4.4 =$	1,760
					2,474
31	-	-	300	$270 \times 4.4 =$	1,188

Value of Stock under FIFO is Rs. 1,188.

**Note : 1**

50 Kgs. returned on March, 8 are out of March 5 Purchases, hence they are shown as issued at a rate of 3.8 per Kg. and accordingly stock is calculated.

**Note : 2**

Sales returns on March 26 are out of March 23 Sales. Under FIFO method Sales on March 23 are out of Kg. 100 @ Rs. 4 + Kg. 250 @ Rs. 3.8 + Kg. 50 @ Rs. 4.2. Hence 20 Kg. received are priced at Rs. 4.20 per Kg.

**B] Weighted Average (Perpetual Inventory System)****STOCK LEDGER**

Date	Receipts			Issues			Balance	
	Units	Price	Amt.	Units	Wt. Avg. Rate	Amt.	Units	Value
01-3-2004	600	4.00	2,400	-	-	-	600	2,400
04-3-2004	-	-	-	300	4.00	1,200	300	1,200
05-3-2004	300	3.80	1,140	-	-	-	600	2,340
05-3-2004	-	-	-	50	3.90	195	550	2,145
10-3-2004	-	-	-	200	3.90	780	350	1,365
18-3-2004	200	4.20	840	-	-	-	550	2,205
23-3-2004	-	-	-	400	4.01	1,604	150	601
26-3-2004	20	4.01	80	-	-	-	170	681
29-3-2004	400	4.40	1,760	-	-	-	570	2,441
31-3-2004	-	-	-	300	4.28	1,284	270	1,157

**Working Notes :**

[1] Issue on March 5 & March 10 is valued at Rs. 3.90 which is the weighted average rate, arrived at as follows :

$$\frac{1,200 + 1,140}{300 + 300} = \frac{2,340}{600} = 3.90$$

[2] Purchase returns of 50 kg. are out of the total stock of 600 kg. which was valued at Rs. 3.90 per kg.

[3] Issue on March 23 is valued at Rs. 4.01 per kg. which is the weighted average rate arrived at as follows :

$$\frac{1,365+840}{350+200} = \frac{2,205}{550} = 4.01$$

[4] Sales on March 23 are out of stock valued at Rs. 4.01 per kg. Hence returns of 20 kg. are also taken at a rate of Rs. 4.01 per kg.

[5] Weighted Average Rate on March 31 is arrived at as follows :

$$\frac{681+1,760}{170+400} = \frac{2,441}{570} = 4.28$$

Therefore, the value of stock as on 31-3-2008 : 270 units @ Rs. 4.28 = Rs. 1,157

### Illustration : 6

A company deals in 3 products viz. A, B and C. The details for purchases and sales for January 2004 are as under.

Product	A		B		C	
	Units	Rs.	Units	Rs.	Units	Rs.
Selling Price per Unit		100		200		250
Opening Stock	100	60	100	100	50	120
Purchases :						
Jan 9	300	65	200	110	50	135
Jan 20	100	64	50	120	100	140
Jan 29	50	68	50	125	20	130
Closing Stock	140		70		60	

You are required to prepare a trading and profit and loss account for the month assuming the selling and distribution expenses to be Rs. 63,000. Use FIFO method for stock valuation.

## Solution

## Stock Ledger (FIFO Method)

## Product – A

Date	Purchases		Sales	Closing Stock	
	Qty.	Rs.	Qty.	Qty. × Rs. =	Amount
01-1-2004	-		-	100 × 60 =	6,000
09-1-2004	4300 × 65		-	100 × 60 =	6,000
				300 × 65 =	19,500
					25,500
20-1-2004	100 × 64		-	100 × 60 =	6,000
				300 × 65 =	19,500
				100 × 64 =	6,400
					31,900
29-1-2004	50 × 68		-	100 × 60 =	6,000
				300 × 65 =	19,500
				100 × 64 =	6,400
				50 × 68 =	3,400
					35,300
Total Sales			100 × 60	90 × 64 =	5,760
During			300 × 65	50 × 68 =	3,400
January			10 × 64		9,160
			410		

## Product – B

Date	Purchases		Sales	Closing Stock	
	Qty.	Rs.	Qty.	Qty. × Rs. =	Amount
01-1-2004	-		-	100 × 100 =	10,000
09-1-2004	200 × 110		-	100 × 100 =	10,000
				200 × 110 =	22,000
					32,000
20-1-2004	50 × 120			100 × 100 =	10,000
				200 × 110 =	22,000
				50 × 120 =	6,000
					38,000
29-1-2004	50 × 125			100 × 100 =	10,000
				200 × 110 =	22,000
				50 × 120 =	6,000
				50 × 125 =	6,250
					44,250
Total Sales			100 × 100	20 × 120 =	2,400
During			200 × 110	50 × 125 =	6,250
January			30 × 120		8,650
			330		

## Product C

Date	Purchases		Sales	Closing Stock	
	Qty.	Rs.		Qty.	Qty. × Rs. =
01-1-2004	-		-	50 × 120 =	6,000
02-1-2004	50 × 135			50 × 120 =	6,000
				50 × 135 =	6,750
					12,750
20-1-2004	100 × 140		-	50 × 120 =	6,000
				50 × 135 =	6,750
				100 × 140 =	14,000
					26,750
29-1-2004	20 × 130		-	50 × 120 =	6,000
				50 × 135 =	6,750
				100 × 140 =	14,000
				20 × 130 =	2,600
					29,350
Total Sales			50 × 120	40 × 140 =	5,600
During			50 × 135	20 × 130 =	2,600
January			60 × 140		8,200
			160		

## Note : 1

## Number of units sold during January :

Product	A	B	C
Opening Stock	100	100	50
Add : Total Purchase	<u>450</u>	<u>300</u>	<u>170</u>
	550	400	220
Less : Closing Stock	<u>140</u>	<u>70</u>	<u>60</u>
Units Sold	<u>410</u>	<u>330</u>	<u>160</u>

Dr.		Trading Account		Cr.	
Particulars	Rs.	Particulars	Rs.		
To Opening Stock		By sales			
A $100 \times 60 = 6,000$		A $410 \times 100 = 41,000$			
B $100 \times 100 = 10,000$		B $330 \times 200 = 66,000$			
C $50 \times 120 = \underline{6,000}$	22,000	C $160 \times 250 = 40,000$		1,47,000	
To Purchases		By Closing Stock			
A 29,300		A 9,160			
B 34,250		B 8,650			
C 23,350	86,900	C <u>8,200</u>		26,010	
To Gross Profit c/d	64,110				
	<b>1,73,010</b>			<b>1,73,010</b>	

Dr.		Profit & Loss Account		Cr.	
Particulars	Rs.	Particulars	Rs.		
To Selling & Distribution Expenses	63,000	By Gross Profit b/d	64,110		
To Net Profit	1,110				
	64,110			64,110	

---

### 3.7 EXERCISE

---

1. Write short Notes
  - a. FIFO Method
  - b. Weighted average method
2. Practical problems

#### Problem 1

Prepare a Stores Ledger Account from the following transactions assuming that issue of stores have been made on the principle of and also on "First in First Out".

2000			
January 2	Purchased	2000 units	at Rs. 4.00 per unit
January 20	Purchased	250 units	at Rs. 5.00 per unit
February 5	Issued	1000 units	
February 10	Purchased	3000 units	at Rs. 6.00 per unit
February 12	Issued	2000 units	
March 2	Issued	500 units	
March 15	Purchased	2500 units	at Rs. 5.50 per unit
March 20	Issued	1500 units	(P.U.)

**Ans. FIFO Stock : 150 units at Rs. 5.50 = Rs. 8,250**

### Problem 2

Value the stock under Weighted Average method.

Receipt			
01-1-2000	Opening stock	200 units at	Rs. 3.50 per unit
03-1-2000	Purchased	300 units at	Rs. 4.00 per
13-1-2000	Purchased	900 units at	Rs. 4.30 per unit
23-1-2000	Purchased	600 units at	Rs. 3.80 per unit
Issues			
05-10-2000	Issued	400 units	
15-10-2000	Issued	600 units	
25-10-2000	Issued	600 units	

**Ans.**

Issue Price rate	5 <sup>th</sup>	15 <sup>th</sup>	25 <sup>th</sup>	Closing Stock
a) Weighted Average	3.80	4.25	3.98	400 units Rs. 1,592



**3. Select the correct alternative:**

1. In times of rising prices, the pricing of issues will be at a more recent current market prices in
  - i) FIFO
  - ii) Weighted Average
  - iii) **LIFO**
  - iv) SimpleAverage
  
2. When prices fluctuate widely, the method that will smooth out the effect of fluctuations is
  - i) Simple Average
  - ii) **Weighted Average**
  - iii) FIFO
  - iv) LIFO
  
3. The total cost of goods available for sale with a company during the current year is Rs.12, 00,000 and the total sales during the period are Rs.13, 00,000. If the gross profit margin of the company is 33 % on cost, the closing inventory during the current year is
  - i. Rs.4,00,000
  - ii. Rs.3,00,000
  - iii. Rs.2,25,000
  - iv. Rs.2, 60,000.
  
4. Consider the following for Alpha Co. for the year 2010-11:
  - Cost of goods available for sale Rs.1, 00,000
  - Total sales Rs. 80,000
  - Opening stock of goods Rs. 20,000
  - Gross profit margin 25%
  - Closing stock of goods for the year 2010-11 was
    - i. Rs.80,000
    - ii. Rs.60,000
    - iii. Rs.40,000
    - iv. Rs.36, 000.
  
5. Record of purchase of T.V. sets.

Date	Quantity	Price per unit
	Units	Rs.
March 4	900	5
March 10	400	5.50

## Record of issues

March 5      600  
 March 12     400

The value of T.V. sets on 15 March, as per FIFO will be

- i. Rs.1,500
- ii. Rs.1,650
- iii. Rs.1, 575.
- iv. None of the three.

6. A firm dealing in cloth has 15000 meters of cloth on April 1, 2005 valued at Rs.1, 50,000 according to FIFO. The firm purchased 20000 meters @ Rs.12 per meter during the year ending 31st March, 2006 and sold 30000 meters @ Rs.25 per meter during the same period. As per FIFO, the closing stock will be valued at:
- Rs.60,000
  - Rs.1,25,000
  - Rs.50,000
  - None of the above.
7. A minimum quantity of stock always held as precaution against out of stock situation is called \_\_\_\_\_
- Zero stock.
  - Risk stock.
  - Base stock.
  - None of the above.
8. Opening stock of the year is Rs.20, 000, Goods purchased during the year is Rs.1, 00,000, Carriage Rs.2, 000 and Selling expenses Rs.2, 000. Sales during the year is Rs.1, 50,000 and closing stock is Rs.25, 000. The gross profit will be
- Rs.53, 000.
  - Rs.55, 000.
  - Rs.80, 000.
  - Rs.51, 000.
9. The cost of stock as per physical verification of Bharat Ltd. on 10th April, 2011 was Rs.1, 20,000. The following transactions took place between 1st April, 2011 to 10th April, 2011:  
Cost of goods sold Rs.10, 000, Cost of goods purchased Rs.40,000, Purchase returns Rs.6, 000  
The value of inventory as per books on 31st March, 2011 will be
- Rs. 1, 56,000.
  - Rs. 1, 51,000.
  - Rs. 1, 50,000.
  - Rs. 1, 52,000.

**Answers: 1-i, 2- ii, 3-iii, 4-ii, 5-ii, 6-ii, 7-iii, 8-iv, 9-i.**



## LABOUR COST

### Unit Structure:

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Time Keeping
- 4.3 Time Booking
- 4.4 Reconciliation of Book Time with Attendance Sheet
- 4.5 Piece Workers, Casual Workers And Out Workers
- 4.6 Pay Roll Accounting
- 4.7 Labour Turnover
- 4.8 Remuneration System / Methods
- 4.9 Wage Payment
- 4.10 Individual Bonus Plans
- 4.11 Solved Problems
- 4.12 Exercise

---

### 4.0 OBJECTIVES

---

After studying the unit the students will be able to:

- Understand the Classification of Labour Cost.
- Know the meaning, importance and procedure of time keeping.
- Explain the objectives and methods of Time booking,
- Explain the methods of calculating labour turnover.
- Know the methods of paying remuneration.

---

### 4.1 INTRODUCTION

---

Labour represents the human contribution to production and it is the main second element of cost of Material Cost. The Labour in the process of production cannot be under - estimated even in the organization which goes though fully automatic technology in the process of production of goods and services. Therefore, it needs to properly account, organise and control the labour cost.

Labour Cost is divided into two following categories:

### 1. **Direct Labour Cost:**

The Direct Labour cost is the cost which is directly emerged in the production cost and can conveniently identified to a particular cost unit, job or process.

### 2. **Indirect Labour Cost:**

The Indirect Labour cost is the cost which is indirectly engaged in the process and covering we raw materials into finished goods. It does not conveniently identified with a particular job, produce a cost unit.

## **4.2 TIME KEEPING**

### **4.2.2 Meaning:**

Time Keeping means recording the attendance of the workers and time spent by them (idle time, overtime, etc.) on actual work.

### **4.2.2 Importance :**

The importance of time keeping is a following:

#### **a) Payment of Wages:**

The Timekeeping is importance while computing wages due to them which depends upon the time spent by the workers on work.

#### **b) Legal record of attendance / Service:**

The record of attendance of the workers are important at the time of computation and determination of legal benefits such as Provided Fund, Bonus, Workmen's Compensations, Maternity Leaves, Pension, etc.

#### **c) Discipline:**

Record of Time of workers acts as a check on the movement of the workers. It ensures punctuality and regularity among the workers and avoids idle time or waste of time.

#### **d) Calculation and Control of Labour Cost:**

Time Keeping helps the department in:

a) Calculating Labour Cost

b) Controlling Labour Cost.

It helps in finding the time spent by the worker on work / job. Hence the labour cost allocation to job is possible. Sometimes Labour overheads are also apportioned to each job on the basis of labour hour rate. It helps in fixing the labour hour rate.

### 4.2.3 Procedure:

Each and every organization has its own procedure of recording the attendance and time keeping produce covers the following aspects:

#### 1. Who Maintains the Time Keeping Records:

The time keeping department keeps the records of time keeping depends up on the number of workers size of organization ,method of payment of wages.

#### 2. Place of Time Keeping record:

The Time Keeping is recorded at the factory gate or at each department of factory.

#### 3. How Time Keeping records are kept:

The Time Keeping is recorded manually or mechanically by the following methods.

##### a. Manual Time Keeping Records:

This method covers the following method of maintain time keeping records:

##### i. Attendance Register:

Under this method the details of attendance of the workers are recorded in the attendance register or muster. It may be kept at the gate of the factory or at each department. The entries, in the register, of workers is made by an assistant or the employee themselves who signs the register whenever they enter and leaves the premises.

This method is simple to understand and to operate. It does not creates complications while operating the punching cards. It creates misuse and frauds in records of timekeeping.

##### ii. Token, Disk or Check Method:

In this method, each employee is given a Token or a Metal Disk on which identity number is printed or written. At the opening time of office ,all disks or tokens are hung on the board at the factory gate. As and when employee arrives at the gate, her/she pick up their taken and hangs on another board. This indicates that the employees has been arrived in time in the factory. Remaining all tokens or disks are collected from the box and assumed that all the employees are late or absent. They will be recorded as late or absent on the daily attendance register / sheet. Same procedure is followed at the lunch breaks or departure time. Sometimes workers takes the taken with them in the department, instead of putting the

taken box at factory gate. Then he/ she hangs the token on the board at the factory gate. It indicates that they are present at his department Further checking movement of the employees is done within the factory premises. This is called the check system of timekeeping.

This method is simple to understand. It leads mistake and fraud in record. It is not possible to mark overtime , Idle time under this method.

**b. Mechanical / Time clock Method:**

In this method, Time of arrival and department is recorded mechanically i.e. Time Clock. Each worker is given an identify number. All cards are kept on the board at the entrance of factory gate. Every time a worker arrives and leaves the factory gate, they take cards from the box and insert into the time clock. As soon the card inserts into the Time Clock, the clock mechanically prints or records the time on the card. Some cards may print late arrivals in red ink. The cards still having on the board after scheduled time are treated as absent.

It is very accurate system of recording time. It avoids recurring expenses on remuneration payable to the assistants. It doesn't open fraud or misuse. This provides Printed evidence of record of attendance. This method is useful in obtaining legal benefit of P.F., Maternity benefit, leave enhancement, etc without any problem.

---

## **4.3 TIME BOOKING**

---

Time Booking means record of time spent by the worker on jobs during his/her attendance at factory / factory department. Recording the working time is commonly known as time booking. It is important to know the actually time spent on job, or for job or operation or process. It is the process of recording of time actually spent by the workers for job or operation. This is useful for calculation of wages or remuneration payable to the workers.

### **4.3.1 Objectives of Time Booking:-**

The objectives of time books are stated below:

**i) Full Utilization of Work Time:**

It ensures that each worker is physically present in the factory and he has spent fulltime for job. It leads efficiency of workers.

**ii) Ascertainment of Labour Cost:**

If facilitates the ascertainment of labour cost of each job of cost centre or each unit. Sometimes overheads are absorbed on

the basis of labour hour rate. It helps in fixing the labour rate for absorption of overheads.

**iii) Computation of Incentives:**

Many times incentives are paid to the workers with good productivity, efficiency, and time spent on job, etc. It help in the process of calculation of such incentives.

**iv) Determination of Wage or Bonus:**

It helps in the process to calculating the wage and bonus payable to workers on the basis of actual time required for completion of job.

**4.3.2 Methods of Time Booking**

The method of Time booking are as follows:

**1. Daily Time Sheet:**

In this method Daily Time Sheet or Daily Record Card is provided to each worker for recording details of time spent by him on work a during day. It must be agree with clock card. It is suitable for small works. It is easy to understand and operate. The foremen can know the worker's performance from this sheet. It needs less paper work as compared to other method. It is suitable for the workers who have to work in different departments.

It requires lot of paper work when workers are required to work on same or different jobs on several days. The time is recorded by the workers in the daily time sheet. It is not reliable method.

**2. Weekly Time Sheet:**

In this method, the weekly time sheet is supplied to each worker and they have to write the details of work and time spent on Job for a week period. This card is suitable where very limited work or jobs are to be completed by the workers in a week. It enables the foreman to know the weekly performance of the worker. It is convenient method where small or limited job to be completed which requires very less paper work.

It is inaccurate method because sheet cards can be prepared from memory. It is reliable method.

**3. Job Cards:**

A job or a job ticket is a card which shows details of time spent by a worker or a group of workers for each operation. It is given to a worker which gives the details of job performed. He has to record manually time (hours) worked by him / her on the job card. In big

organization the provided job cards are made available which are punched for recording required details.

Normally job card is printed giving detail of job, order number and other details. This method enables co- ordination between the production control and cost department.

Preparation of job card becomes burdensome because separate job cards needs to prepare for separate job. Wrong information record is possible in this type. It is not suitable where last minute alterations involves.

---

#### **4.4 RECONCILIATION OF BOOK TIME WITH ATTENDANCE SHEET**

---

Organization adopts deferent method of time booking and recording in attendance sheet time to time which will be convenient as per their nature, size, etc. However, irrespective of adapted method, it is necessary to exercise the control on labour. The Labour control could be possible from the reconciliation of time booked with attendance sheet. It means the care has to be taken while recording time spent on job and idle time should confirm to the total time for which payment has mode.

---

#### **4.5 PIECE WORKERS, CASUAL WORKERS AND OUT WORKERS**

---

##### **1. Piece Workers:**

Piece workers are paid wages on the basis of piece rate. When this method is adopted, it is advised to prepare job report separately to each job. They are paid wages on the basis of actual output. The time record is important for payment if actual amount of wages and avoiding late arrival and early leaving the job premises by the workers.

##### **2. Casual Workers:**

The workers who work in the organization in place of absent workers are called as casual workers. Commonly these workers are known as substitute or bodies. It needs to take special care while recording the attendance time and making payment to such casual workers.

The casual works should be given job cards signed by the foreman. At the end of the day these cards are supplied to the pay roll department for making payment of wages of such workers.



The casual workers are hired on the circumstance like execution of the order, increase of purchase, etc.

### **3. Out Workers:**

Out worker are those who perform their works at site or customer's premises or at their residence. It is necessary to exercise close control on outworkers since they are normally paid at higher rate of wages and for this purpose attendance record of outworkers should be kept carefully.

---

## **4.6 PAY ROLL ACCOUNTING:**

---

### **4.6.1 MEANING**

Pay roll accounting is the part of accounting which relates to computation of gross wages and deduction from gross wages for the purpose of wages payment to each employee.

Periodic Statement of Pay Roll and Pay slip shows gross wages earned by the worker, deductions from gross wages and net wages payable to each worker or employee.

### **4.6.2 Deductions**

Following deductions are allowed as per the Payment of Wages Act 1963:

- a) Penalty for absence from duty
- b) Absence from duty
- c) Deduction for damage
- d) House Rent
- e) Cost of amenities and Services
- f) Recovery of advance
- g) Income Tax
- h) P.F. amount
- i) Insurance Premiums
- k) ESI, etc.

### **4.6.3 Pay Slip:**

It is a statement which prepared for each worker individually. It shows gross deductions form gross wages and net wages payable.

---

## 4.7 LABOUR TURNOVER

---

### 4.7.1 Meaning

Labour turnover in an organization is the rate of exchange in the composition of labour force during a specified period measured against a suitable index. It has a perpetual existence. The working force in an organization does not remain constant. Some of the existing staff may leave, new people join the organization. This phenomenon is known as Labour Turnover.

### 4.7.2 Cost of Labour Turnover:

There are two types of Labour cost which leads to high cost and lower productivity:

#### a. Preventive Cost:

The preventive cost which includes the cost incurred to keep labour turnover at a low level. For example cost of medical services, welfare schemes and pension schemes, etc.

##### i. Personal administrative cost:

The firms have personal administrative department which is entrusted with recruitment, trading and maintaining good relationship with the labour force i.e. between firms and employees.

##### ii. Medical Services:

The firms provided preventive and medical services to the employees and their family. In fact the employees prefer a firm providing free medical and other services to the employees and their families. It means healthy employees are the assets of the firms who enhance the productivity of the firms.

##### iii. Welfare Services:

The firm provides welfare services to the employees and includes expenditure on the labour welfare activities. e.g. sport canteens, house, transport, education facilities, etc.

##### iv. Miscellaneous Schemes:

The firms normally think for the employee's future. Therefore firms provides pension scheme, good scales, bonus, provident fund schemes etc.

#### b. Replacement Cost:

Replacement Costs are the costs which arise due to high labour turnover. It refers to those cost which are associated with replacement. These costs are incurred for recruitment, training and absorption of new workers. If the work is new, it results into losses, wastages and lower productivity due to inefficiency and lack of experience to new workers. It means a company will incur very high replacement costs if labour turnover is high.

### 4.7.3 Measurement of Labour Turnover / Method of Measurement of Labour Turnover.

There are different methods for the measurement of Labour turnover. The method of measuring the Labour Turnover adopted by the firm depends upon the conception of Management and the definition of Labour turnover. Once the organization has adopted particular method, then it should be consistently followed which enable comparisons of data from the year to year.

Following are the methods of Labour Turnover adopted.

#### 1. Separation Method:-

In this method, Labour turnover is considered as a relationship between total number of separation for given period and the average number of workers on the pay roll during the period.

Therefore, **Labour Turnover Rate=**

$$\frac{\text{Number of separation in a period}}{\text{Average Number of workers during the period}} \times 100$$

#### 2. Replacement Method:

This method is also known as Net Turnover Method. Under this method, labour turnover is measured / considered as relationship between the actual replacement of labour during the period and average number of workers during the period.

$$\text{Labour Turnover Rate} = \frac{\text{Number of Workers Replace in a Period}}{\text{Average Number of workers in a Period}} \times 100$$

#### 3. Basis of Accession Method:

Under this method the experts view is considered logically to measure the labour turnover. It is a relationship between accessions and the average number of workers during the period. It is calculated as follows:

**Labour Turnover Rate=**Assessions /Average number of workers during the period x 100

#### 4. Avoidable Separation Method:

There is an argument made that in any organization certain amount of Labour turnover is inevitable. The percentage of separation can be high due to some unavoidable circumstance or reasons. Eg. Sickness, old age, death, family conditions, seasonal and cyclical conditions or fluctuations in the business.

Therefore, separation should be avoidable and unavoidable. The Labour turnover is calculated by considering the relation of

avoidable separation and average working force (workers) during the period.

$$\text{Labour Turnover Rate} = \frac{\text{Avoidable Separation in the period}}{\text{Average working force workers during the period}} \times 100$$

#### 5. Fluxy Method:

Under this method, the separations and replacements for the period are considered for calculation of Labour turnover. It is the relationship between the sum of separations and replacement during the period and Average Number of Workers during the period.

$$\therefore \text{Labour Turnover Rate} = \frac{\text{Separation + Replacement during the period}}{\text{Average Number of Works during the period}} \times 100$$

### 4.7.4 PRACTICAL QUESTIONS

#### Illustration: 1

From the following information, Calculate Labour turnover rate and Labour Fluxy rate:

No of Workers as on 01-01-2014 - 3,800

No of Workers as on 31-12-2014 - 4,200

During the year 60 workers were left while 180 workers were discharged, 1000 workers were recruited during the year of these 200 were recruited because of existing and the rest were recruited in accordance with expansion plans.

#### Solution :

$$\text{Average No of workers} = \frac{3800 + 4200}{2} = \frac{8000}{2} = 4000$$

#### a) Replacement Method:

$$\begin{aligned} \text{Labour Turnover Rate} &= \frac{\text{No. of workers Replaced}}{\text{Average No. of Workers}} \times 100 \\ &= \frac{200}{4000} \times 100 \\ &= \frac{20000}{4000} \\ &= 5\% \end{aligned}$$

b) **Separation Method:**

$$\begin{aligned} \text{Labour Turnover Rate} &= \frac{(\text{Nb.of Workers left} + \text{Nb. of Workers}) \text{Discharged}}{\text{Average Nb. of Workers}} \times 100 \\ &= \frac{40 + 180}{4000} \times 100 \\ &= 4.5\% \end{aligned}$$

c) **Fluxy Method:**

$$\begin{aligned} \text{Labour Turnover Rate} &= \frac{(\text{Nb. of Seperation} + \text{Nb. of addition})}{\text{Average Nb of Workers}} \times 100 \\ &= \frac{(220 + 1000)}{4000} \times 100 \\ &= 122 \\ &= 30.5\% \end{aligned}$$

---

## 4.8 REMUNERATION SYSTEM / METHODS :

---

Labour is rewarded by making payment of wages. Wages may be paid either on the basis of Time spent on work or on the basis of output from work. Following are the methods / System of payment of remuneration to the Labour.

**a. Time Rate System:**

This method is related to the number of working hours spent by a worker on work. As per Time Rate System, wages means the product of Labour and Labour Work. The payment of wages calculation is depends upon the time spent on work irrespective of the quantity of output. Normally over time if any is paid at higher rate 1.5 time of the rate. The wages rate may be determined as per hour, week, fortnightly per month.

Wages = Actual time devoted X Time Rate  
This case is suitable in case of the following:

- 1) Where attendance and quality of work are more important than output.
- 2) Where it is difficult to measure quality.
- 3) Where highly skilled and unskilled workers including apprentices and learners.

- 4) Where the work requires close supervision which ensure “fair day’s work”.

- **Advantages:**

- 1) This System is easy to understand and operate.
- 2) This system assures steady and regular income.

- **Disadvantages**

- 1) This System does not motivate the workers to produce more output. More Efficiency is ignored.
- 2) This System Leads high labour cost because idle time remuneration is also paid.
- 3) It needs to have strict supervision to ensure that the workers spend their time in productive activities through the day.

**b. Piece Rate System:**

Under this system, each unit, job, operation or process is known as a piece. A piece rate is fixed for each unit or job or operation or process. The workers are paid on the basis of the number of pieces completed irrespective of the time spent by the worker on the job. Payment of overtime or idle time are not arisen in this case. Record of work time and attendance is recorded on time card, piece work ticket records the output by the workers.

Wages = Pieces Completed X Piece Rate .

- **Advantages:**

- 1) It is Simple to calculate wages because Piece Rate is fixed first.
- 2) The wages is calculated on the basis of Pieces of output. Management has not to loose on account of inefficiency or workers.
- 3) The wages is directly linked with output. The workers are motivated to make good and greater effort of assuring higher income.
- 4) The Labour cost are lower due to higher labour productivity and efficiency and minimization of idle time or overtime.

- **Disadvantages**

- 1) It is very difficult to fix the piece rate. Many times it is difficult to establish standard output and hence to fix piece rate.
- 2) The worker is neither assured of regular income nor can enjoy social benefits like leave, allowances, etc.
- 3) This method is not suitable in cases of jobs like research, repairs, quality control, inspection, etc.
- 4) This method is expensive as it requires additional expenditures for installation and operation.
- 5) If the wages are not guaranteed, the worker may lose earnings, especially when a continuous flow of work cannot be maintained.

**c. Incentive Plans**

An incentive can be defined as the offer of a bonus. Non-monetary incentives may improve living and working conditions of the worker or employees. The incentives may be provided to the worker individually or collectively to the group.

- **Good Incentive Schemes**

Following are the features of good incentive schemes:

- 1) It should be simple to operate and understand.
- 2) It should be economical.
- 3) It should facilitate fixed wages.
- 4) It should be given to efficient workers.
- 5) The scheme should be approved by the workers.
- 6) It should reduce absenteeism and labour turnover.
- 7) It should be flexible in nature.
- 8) It should be supported by the management.

---

## **4.9 WAGE PAYMENT**

---

### **1. High Wage Plan:-**

The Ford Motor Company, USA has introduced this plan in order to induce the workers to put extra efforts in their work. Under this plan the worker is paid at a higher rate prevailing in the industry and they are expected to perform well but high qualitatively and quantitatively.

## 2. Measured Day Work:

Under this method the hourly rate of line is made up of two parts viz, fixed and variable rate. The fixed rate is based on the requirement of job and the variable rate for each worker depending upon the merit rating and cost of living index. The total of Fixed and variable part of a day is called as measured day's work rate of workers.

## 3. Differential Time Rate:

Under this method different rates are fixed for different level of efficiency. The rate is depends upon the efficiency and performance of the worker. Up to certain limit of efficiency, normal rate for day is paid and gradually hourly rate increases on the basis of efficiency level of worker. The differential rates are as follows.

Upto 75% efficiency Normal	(Rs100 per hour)
From 76% to 80% efficiency	(Rs110 per hour)
From 81% to 90% efficiency	(Rs120 per hour)
From 91% to 100% efficiency	(Rs130 per hour)
From 101% to 120% efficiency	(Rs140 per hour)

## 4. Taylor's Differential Piecework System:

This system aims of rewarding efficient worker by providing piece rate more than certain level of limit of output. This method is introduced by F.W. Taylor in USA. Day wages is not guaranteed in this method. There are Two rates of wages. i.e. low piece rate for output to below average and high piece rate for standard / more output, more reward at high rateis given to the workers who shows standard performance and below average performing workers are ignored for reward.

The lower rate is 80% Normal Piece rate and the higher rate is 120% of the normal rate.

## 5. Merick differential Rate System:

Under this method, there is some modification have been taken place of taylor's differential piece rate system. Merick has three rate of remuneration. First rate is for the beginners, the second for developing workers and third for highly skilled workers.



These piece rate as follows.

83% of efficiency - Normal rate from 83% to 100% efficiency - 10% above the Normal rate. from 100% & above efficiency - 20% above the normal rate.

#### **6. Gantt Task Bonus Plan:**

Under this method, the combination of time rate bonus and piece rate is considered. This plan aims at providing an incentives for efficient workers to attain the high level of output and at the same time ported and encourage the less or unsalted workers who can not complete their work at standard time given. These are as follows.

Production below Standard	Guaranteed Time Rate
Production Equal to Standard	120% of Normal rate or 20% Bonus of time or Piece Rate
Production above Standard	High Piece Rate or 120% of Piece rate

#### **7. Emerson's Efficiency System:**

This system guarantees minimum wages payable to the workers. But he cross certain limit of efficiency, bonus in addition to minimum wages is paid. A worker who attain efficiency equal to 2/3 of the standard efficiency, or above, is declared as efficient worker and deserves incentives. The efficient worker is paid bonus at raising rate at various level of efficiency, raising from 66.67% to 150%. If worker shows performance below 66.67% then only time rate wage is paid. But if performance is above 66.67% to 100%, efficiency bonus increases from 0.01% to 20% and above 100% efficiency, bonus of 20% of wages (basic) plus 01% for each 01% increase in efficiency paid.

#### **8. Hayne's System:**

In this system standard is set in minutes. The standard time for job is expressed in terms of the standard man minutes called "MANIT". In this case saved time is shared between the workers and foreman in the ratio of 5:1. If non- reparative work is there, then saved time is shared among the worker, employees and foreman in 5:4:1 ratio.

## 9. Accelerated Premium System:

Under this system, earnings increases with output, infact the earning increases in greater proportion than the increase in production. This system acts as a strong incentive for skilled workers to earn high wages by increasing output and production beyond standard.

---

### 4.10 INDIVIDUAL BONUS PLANS

---

In case of individual bonus plan, the bonus to be paid to each individual worker is calculated on the basis of saved hours difference between time allowed and time taken. It is the Standard time fixed by conducting time and motion study by the work study engineers.

The actual time taken is compared with the standard time and bonus is payable to the workers if time taken is less than the standard time.

#### Methods of Individual Bonus Plan:

##### 1. Halsey Premium Plan:

This plan has been introduced by F.A. Halsey, an American Engineer. Under this method, bonus is paid on the basis of time saved. Bonus is paid at 50% of the line saved. A worker is assured of time wages if he takes longer time than actual time allowed. Total wages is calculate by using the following formula.

$$\begin{aligned} \text{Total Earnings} &= \text{Time Wages} + [50\% \text{ of Time Saved} \times \text{time Rate}] \\ &= (H \times R) + [50\% (S - H) \times R] \end{aligned}$$

where, H = hours worked, R= rate per hour, S=standard time.

##### 2. Halsey Weir Premium Plans:

Under this method, there is only one difference as compared to Halsey Plan and that is inboards of 50% bonus for the time saved, it is  $33\frac{1}{3}\%$  of the time saved. Total earnings as per this plan is calculated by using the following formula.

$$\text{Total Equal} = (H \times R) + 33\frac{1}{3}[S - H] R$$

Where, H = Hours Worked, R = Rate Per Hour, S = Standard Time.

##### 3. Rowan Premium Plan:

This premium bonus plan was introduced by Mr. James Rowan. It is similar to that of Halsey plan in respective of time saved, but bonus hours are ascertained as the proportionof time

taken which the time saved bears to time allowed and they are paid for at the rate.

Total earning is calculated as follows, Total =  $(H \times R) + [(S - H) / S \times H \times R]$

where, H = Hours Worked, R = Rate Per Hour, S = Standard Time.

#### 4. **Barth Variable Sharing Plan:**

Under this system, the total earning is calculated by following the formula given below:

$$\text{Total Earnings} = R \times \sqrt{S \times H}$$

where R= Rate Per hour, S = Standard Time, H = Hours worked.

---

### 4.11 SOLVED PROBLEMS

---

#### Illustration 2

Calculate the earnings of worker A and B under straight Piece Rate System and Taylor's Differential Piece Rate System from the followings particulars:

Normal Rate per hour –Rs 1.80

Standard Time per unit = 20 seconds

Differentials to be applied are:

80 % of Piece rate below the standard,

120% of the Piece rate above standard.

A produced 1400 unit per day of 8 hours and B 1800 units per day of 8 hours.

#### **Solution:**

##### **Basic Calculations:**

Pieces per minute =  $60/20 = 3$  minutes

Unit per hour =  $60 \times 3 = 180$  units

Normal Piece Rate =  $\text{Rs } 1.80/180 \text{ units} = \text{Rs } 0.01$

Standard Production in actual time =  $8 \text{ hrs} \times 180 \text{ units} = 1440$  Units.

##### **Earnings under Straight Piece Rate:**

Earnings of A =  $1400 \text{ units} \times \text{Rs } 0.01 = \text{Rs } 14$

Earnings of B =  $1800 \text{ units} \times \text{Rs } 0.01 = \text{Rs } 18$

**Earnings under Taylor's Differential Piece Rate**

$$A's \text{ efficiency} = \frac{1400 \times 100}{1440} = 97.22\% = < 100\%$$

$$B's \text{ Efficiency} = \frac{1800 \times 100}{1440} = 125\% = > 100\%$$

$$\therefore A's \text{ Earning} = 1400 \text{ units} \times \text{Rs } 0.01 \times 80\% = \text{Rs}11.20$$

$$\therefore B's \text{ Earning} = 1800 \text{ units} \times \text{Rs } 0.01 \times 120\% = \text{Rs}21.60$$

**Illustration : 3**

A worker's basic wages is ₹2/- per day of 8 hours and is paid under the Rowan Premium Bonus Scheme. He also get D.A. of ₹12/- per week of 45 hours. His time sheet of a week is summarized below:

<u>Job No.</u>	<u>Time allowed</u>	<u>Time Taken</u>
248	25 hours	20 hours
448	30 hours	20 hours
Idle Time (Waiting)	-	8 hours
		48 hours

Calculate the gross wages he has earned for the week and indicate accounts to which the wages amount will be paid.

**Solution:**

$$\text{Rate} = R = 2/8 \text{ Hrs.} = 0.25 \text{ Paise}$$

**Statement Showing Earnings of A Worker.**

<b>Particulars</b>	<b>Rs</b>	<b>Rs</b>
1) Amount to be paid to Job No. 248.		
Wages = $T \times R + \frac{S - T}{S} \times T \times R$		
= $20 \times 0.25 + \frac{25 - 20}{25} \times 20 \times 0.25$		
= $5 + 0.2 \times 5$	6.00	
= $5 + 1$		
DA = $12 \times \frac{25}{55}$	5.45	11.45

2) Amount to be paid to Job No.248		
Wages = $T \times R + \frac{S - T}{S} \times T \times R$		
= $20 \times 0.25 + \frac{30 - 20}{30} \times 20 \times 0.25$		
= $5 + 0.333 \times 5$	6.67	
= $5 + 1.655$		
DA = $12 \times 25 / 55$	6.55	13.22
3) Idle Time to be paid to overheads.		
Wages 8 hours x 0.25 paise		2.00
Gross Wages of a workers for the week		26.67

**Illustration : 4**

A workman's wage for a guarantee 44 hours week is Rs0.19 per hour. The estimated time to produce one article is 30 minutes and under incentive scheme the time allowed is increased by 20%. During one week the workman manufactured two articles.

Calculate his gross wages under each of the following method of remuneration.

- Time rate.
- Piece - work, with a guaranteed weekly work workly.
- Rowan Premium Bonus.
- Halsey Premium Bonus 50% to workman.

**Solution:****a) Wages Under Time Rate Method**

44 hours x Rs0.19

Rs8.36

**b) Wages Under Piece Rate Method**

Estimated Time for on Article - 30 Minute

Time allowed increased by 20%

$\therefore 30 + \frac{20}{100} \times 30$  - 36 Minute

Time allowed for 100 articles at 36 minutes -60 minutes

$\therefore$  Wages = 60 hours x Rs 0.19

Rs11.40

<b>c) Wages Under Rowan Premium Bonus</b>	
Wages for 44 hrs @ Rs0.19	Rs 8.36
(20)	
(+) Bonus = $\frac{S-T}{S} \times T \times R = \frac{60-44}{60} \times 44 \times 0.19$	Rs 2.23
Where S = Standard Time,	
T = Time Taken	
R = Rate Per hours	
Wages Paable	Rs 10.59
<b>d) Wages Under Halsey Premium</b>	
Wages for 44 hrs x ₹0.19	Rs8.36
(+) Bonus = $\frac{S-T}{2} \times R$	
= $\frac{60-44}{2} \times 0.19$	Rs1.52
Wages Payable	Rs 9.88

**Illustration : 5**

The following are the particulars applicable a process.

Time rate - Rs 8 per hour

High Task - 200 units per week

In a 40 hours week, the production of the worker was:

A - 180 units, B - 200 units, C - 205 units

Calculate the total earnings of each worker under Gandhi Task Bonus System.

**Solution:****a) Actual Output < High Task ie. below Standard**

$$\therefore \text{A's earnings} = 40 \text{ hours} \times \text{Rs } 8 = \underline{\text{Rs } 320/-}$$

**b) Actual Output = High Task ie. at Standard**

$$\begin{aligned} \therefore \text{B's Earning} &= 40 \text{ hrs} \times \text{Rs } 8 + 20\% \text{ of } (40 \times 8) \\ &= 320 + 20\% \text{ of } 320 \\ &= 320 + 64 = \underline{\text{Rs } 384/-} \end{aligned}$$

c) **Actual Output > High Task ie above & Standard**

$$\therefore \text{C's earning} = 205 \times \text{Rs}2.00 = \underline{\underline{\text{Rs}4.10}}$$

**Illustration : 6**

In a manufacturing company the daily wages rate is Rs 3.00. The standard output in a 6 days week is 200 units representing 100% efficiency. The daily wages rate is paid without bonus to those workers who show up to  $66\frac{2}{3}\%$  efficiency Standard. Beyond this there is a bonus payable on a graded scale as below:

82% efficiency - 5% bonus

90% efficiency - 9% bonus

100% efficiency - 20% bonus

Future increases of 1% for every 1% future every in efficiency. In a 6 days week produced the following: Mr.A 180 units, Mr. B 164 units Mr. C - 200 units, Mr. D. 210 units. Calculate the earnings of each workers.

**Solution: Earning of workers is as follows:**

$$\text{Mr. A's efficiency} = \frac{180}{200} \times 100 = 90\%$$

$$\begin{aligned} \text{Mr. A's earning} &= (6 \times 3) + 90\% \text{ of } (6 \times 3) \\ &= 18 + 90\% \text{ of } 18 = 18 + 1.62 = \underline{\underline{\text{Rs}19.62}} \end{aligned}$$

$$\text{Mr. B's efficiency} = \frac{164}{200} \times 100 = 82\%$$

$$\begin{aligned} \text{Mr. B's earning} &= 6 \times 3 + 5\% \text{ of } (6 \times 3) \\ &= 18 + 0.9 = \underline{\underline{\text{Rs}18.90}} \end{aligned}$$

$$\text{Mr. C's efficiency} = \frac{200}{200} \times 100 = 100\%$$

$$\begin{aligned} \text{Mr. C's earning} &= 6 \times 3 + 20\% \text{ of } 18 = \\ &= 18 + 3.6 = \underline{\underline{\text{Rs}21.60}} \end{aligned}$$

$$\text{Mr. D's efficiency} = \frac{210}{200} \times 100 = 105\%$$

$$\begin{aligned} \text{Mr. D's earning} &= 6 \times 3 + 25\% \text{ of } 18 = \\ &= 18 + 4.5 = \underline{\underline{\text{Rs} 22.5}} \end{aligned}$$

**Illustration : 7**

From the following information available you are required to calculate the Net Wages Bill as well as total wages cost.

- a) As per the time card the gross earnings of the workmen Rs 4,50,000/-.
- b) Various deductions from the goods earnings are as follows:

<b>Particulars</b>	<b>Rs</b>
Employees Contribution to P.F.	37,500
ESI Employees Contribution	6,000
Aeolians against wages	12,000
Co-operative Society's dues	9,000
Canteen charges	2,000
Income Tax	8,000

- c) Company's contribution to P.F. and ESI Rs 30,000 and Rs 38,000 respectively.

**Solution:**

## Calculation of Earnings and Lost to Company

<b>Particulars</b>	<b>Rs</b>	<b>Rs</b>
a) Gross earnings of Employees		4,50,000
Less : Deductions		
Employees contributing to P.F.	37,500	
Employees Contribution & ESI	6,000	
Advance Against Wages	12,000	
Dues of Coop Society	9,000	
Canteen Charges	2,000	
Income Tax	8,000	74,500
Net Earnings to Employees		3,75,500
b) Total Cost to Company		
Workman's Gross earning		4,50,000
Add: Employers Contribution to Provided Fund	30,000	
ESI	8,000	38,000
Cost to Company		4,88,000



**Illustration : 8**

Ajay an employee of Amardeep & Co. gets the following employments and benefits:

- |    |  |              |
|----|--|--------------|
| a) | Salary   | ₹3,000 P.M.  |
| b) | Dearness Allowance   | ₹5,250 P.M.  |
| c) | Employees Contribution to<br>P.F. 9 % Salary & DA<br>ESI 4% of Salary & DA |              |
| d) | Bonus 20% of Salary & DA   |              |
| e) | Other Allowances   | ₹28,250 P.M. |
| f) | Medial Allowance   | ₹5,000 P.M.  |

Ajay works for 25,00 hours p.m., out of which 400 hours are non-productive but treated as normal idle time.

Your are requested to find out the effective hourly cost of Ajay.

**Solution:**

Company of Labour Cost per hour Earnings of Ajay.

Particulars	Rs	Rs
a) Salary	30,000	
b) D.A.	5,250	
	8,250 x 12 =	99,000
c) Employees Contribution to PF 9% of 99,000		8,910
ESI 4% of 99,000		3,960
d) Bonus 20% of 99,000		19,800
e) Other Allowance		28,250
f) Medical Allowance		5,000
Total Cost to Company Per Month		1,64,920
Total Working Hours	2,500	
(-) Idle Hours (Normal)	400	
Effective Working Hours		2,100

$$\text{Effective Hourly Cost of Ajay} = \frac{1,64,920}{2,100} = ₹ 78.53 \text{ Per Hours}$$

**Illustration : 9**

Calculate the earnings of worker Amar, Akbar and Anthony under Matrik's Multiple Piece Rate System from the following:

Normal rate Rs 6.60  
 Standard Time Per Unit - 1 minute  
 Output per day by  
 Amar - 390 units  
 Akbar - 450 units  
 Anthony - 550 units  
 Working hour per day 8 hours.

**Solution:**

Normal Rate Per Hour = Rs 6.60  
 Standard Output Per Hour  
 (1 minute = 1 units) = 60 units  
 Normal Wage Rate Per Unit =

Rs 6.60/60 units = Rs 1.10 per unit  
 Standard Out Put = 60 unit is per hour x 8 hrs  
 = 480 units

## a) Efficiency Level

Worker	Actual Output (Unit)	Standard Output (Unit)	Efficiency % age
Amar	390	480	81.25%
Akbar	450	480	93.75%
Anthony	550	480	114.50% Or 115.00%

## b) Straight Piece Rate System

Wages of	-	Output	x	N.R / Piece Rate(Rs)	=	Rs
Amar	-	390	x	1.60	=	429.00
Akbar	-	450	x	1.10	=	495.00
Anthony	-	550	x	1.10	=	605.00

**c) Multiple Piece Rate:**

- Upto  $83\frac{1}{3}\%$  efficiency - Normal Piece Rate
- Above  $83\frac{1}{3}\%$  to 100% efficiency - 110% of Normal Piece Rate
- Above 100% efficiency - 120% of Normal Piece Rate

**d) Wages Payable to****Rs**

Amar	-	390 x Rs1.10	=	429.00
Akbar	-	$450 \times \left(1.10 \times \frac{110}{100}\right) = 450 \times 1.21$	=	544.50
Anthoney	-	$550 \times \left(1.10 \times \frac{120}{100}\right) = 550 \times 1.32$	=	726.00

---

**4.12 EXERCISE**

---

1. A factory works for 9 hours per day and has a 5 days week. A worker requires 9 hours for completion of a job on daily wages. However, under incentive schemes, he completes the job in 6 hours. A worker is entitled day rate of Rs 7/- per hour.

You are asked to calculate his earnings to be charged under the following plans :

- a) Piece Work Plan.
- b) Halsey Premium Plan.
- c) Rowan Plan.

(Ans : a) Rs 63/-, b) Rs 52.50 c) Rs 56/-)

2. Calculate the earnings of a worker a) Halsey Plan and b) Rowan Plan from the following particulars :

- i) hourly rate of wages guaranteed 0.50 paise per hour.
- ii) standard time for producing one dozen articles- 3 hours.
- iii) Actual time taken by the worker to produce 20 dozens articles -48 hours.

( Ans. Halsey Plan- Rs 27/-, Rowan plan- Rs 28.80)

3. The following particulars applicable to a particular job –B

Standard production per hour – 8 units

Standard working hours-7

Normal rate per hour-Rs 1.50

Maqdhavi produced 35 units, Ram produced 45 units and

Prasad produced 60 units.

Calculate wages payable to these workers under Merrick's Differential Piece Rate System.

( Ans : Madhavi- Rs 6.5625,Ram- Rs 9.28 and Prasad-Rs 13.50)

4. Calculate earnings of workers of Nilesh and suresh under Taylor's Differential Piece Rate System:  
Standard Time – one hour 125 units.  
Normal Rate- Rs 10 per hour.  
Differedntial Piece Rate:  
i) 80 % piece rate below standard.  
ii) 120% of piece rate at or above standard.  
In a day of 6 hours Nilesh produced 800 units and Suresh produced 990 units.  
(Ans.: Nilesh- Rs 51.20 and Suresh-Rs 95.04)

5. Ashok an employee of R & T company gets the following emoluments:

Particulars	Rs
i) Basic pay	2,500 p.m.
ii) D.A.	4,500 p.m.
iii) Employer's contribution to P. F.	12% of D. A. and salary
iv) Employer's contribution to ESI	4.75 % of Salary and D.A.
v) Bonus	20 % of Salary and D.A.
vi) Other allowance	27,750 p.a.
i. Ashok works 2,500 hours out of which 400 hours are normal idle time.	
vii) Find out the effective hourly cost of Ashok.	

( Ans. Rs. 67.91)

- a. From the following information, find out net wages payable in cash and also find out cost of wages for March 2015.
- |  |               |
|--|---------------|
| a) Basic salary p.m.   | Rs 60,000     |
| b) D.A.  | 100% of basic |
| c) Total amount deposited to P.F.  | Rs 12,000     |
| d) Amenities   | Rs 4,500      |
| e) Employer's contribution to P.F. is equal employee's contribution.             |               |
| f) The ratio of employer's and employee's share in to the contribution to ESI is |               |
| g) Recovery of staff quarter Rent  | Rs 6,000.     |
| i) Recovery of provisions supplied   | Rs 5,000.     |
- ( Ans : Rs 1,01,500 ; Rs 1,33,000)

6. From the following information prepare statement showing employee cost.
- i) Basic pay Rs 7,00,000.
  - ii) Lease rent paid for accommodation provided to an employee Rs. 2,00,000, amount recovered from the employees Rs 40,000.
  - iii) Employer's contribution to P F Rs 75,000.

- iv) Employee's contribution to P F Rs 75,000.
- v) Reimbursement of medical expenses Rs 67,000.
- vi) Hospitalization expenses of employee's family member borne by the Employer Rs 18,000.
- vii) Festival bonus Rs 20,000.
- viii) Festival advance Rs 30,000.

## 7. OBJECTIVE QUESTION :

### A) Multiple Question:

1. Cost of idle time arising due to non-availability of raw material is -----.  
 a) Charged to costing profit & loss A/c  
 b) Charged to factory overheads  
 c) Covered by inflating the wage rate  
 d) Ignored
2. Wages sheet is prepared by -----.  
 a) Time keeping department      b) Personnel department  
 c) Pay roll department              d) Cost accounting department
3. Time and Motion study is conducted by-----.  
 a) Time keeping department      b) The personnel department  
 c) Engineering department      d) Pay roll department
4. Productivity of labour is measured by comparing -----.  
 a) Actual time with standard time  
 b) Total output with total man hours  
 c) Added value for the product with total wages cost  
 d) All of the above.
5. Labour turnover is -----.  
 a) Productivity of labour              b) Change in labour force  
 c) Efficiency of labour                  d) Total cost of labour
6. Idle time is time spent by workers-----.  
 a) in factory                              b) Off their work  
 c) on their job                              d) in office
7. Time wages are paid -----.  
 a) on the basis of actual time  
 b) on the basis of standard time  
 c) on the basis of time saved  
 d) on the of overtime
8. Time keeping refers to time spent by the workers -----.  
 a) on their job                              b) in factory  
 c) off their job                              d) without job

9. Difference between attendance time and job time is-----.
- a) overtime
  - b) idle time
  - c) standard time
  - d) Actual time
10. Differential piece wages means-----.
- a) Different wages for different level of performance
  - b) Different wages for different level time consumed
  - c) Different wages for different of workers
  - d) Different wages for different types of industries
11. Normal idle time is -----.
- a) can be avoided
  - b) can not be avoided
  - c) can be minimized
  - d) can be controlled
12. Labour turn over measured by,
- a) Replacement Method
  - b) Seperation method
  - c) Flux method
  - d) All of the above
13. Salary of foremen should classified as,
- a) Fixed overhead
  - b) Variable method
  - c) Semi-fixed or semi-variable method
  - d) None of the above
14. How many rate are used to calculate wages under Taylor's differential piece? Piece rate system/
- a) Two
  - b) Three
  - c) Four
  - d) Five
15. The card which records idle time is
- a) Idle time Card
  - b) Job Card
  - c) Job Sheet
  - d) I Card
16. Pay roll accounting is concerning with
- a) Computation of wages
  - b) Appointment of workers
  - c) Termination of workers
  - d) All of the above
17. Labour turnover can be reduced by
- a) Exit interview
  - b) Better facilities
  - c) Better pay
  - d) All of the above
18. The method oif time booking include
- a) Daily time sheet
  - b) Attendance Register
  - c) Time clock
  - d) None of the above
19. Casual workers work in place of
- a) Absentees
  - b) Retrenched workers
  - c) Sincere workers
  - d) None of the above

20. Deductions allowed as per payment of wages Act include  
 a) House Rent                                    b) Income Tax  
 c) P.F. Deductions                                d) All of the above
21. Replacement cost is associated with  
 a) Replacement of labour                    b) Appoint of labour  
 c) Termination of labour                    d) All of the above
22. The method acceptable to labour union is  
 a) Time rate                                      b) Piece rate  
 c) Rowan rate                                    d) None of the above
23. Over time is paid to the worker who for extra time than ---- working hours Specified.  
 a) Extra   b) Additional   c) Normal   d) Idle
24. Travelling time from one job to another job is  
 a) Normal idle time                            b) Abnormal idle time  
 c) Over time                                      d) None of the above
25. Over time paid due to negligence of a worker is charged to the concerned Worker  
 a) Worker                                        b) Department  
 c) Overheads                                    d) All of the above  
 ( Ans : 1-a, 2-d,3-c, 4-d, 5-b,6-b, 7-a,8-b, 9-b,10-a,11-b,12-d,13-c, 14-b, 15-a,16-a,17-d,18-a, 19-a, 20-d, 21-a, 22-a, 23-b, 24a, 25-b)

**8. Fill in the blanks :**

- 1) \_\_\_\_\_ means keeping a record of the attendance of the workers and time spent by them in actual work, idle time, over time, etc. ( Time Keeping)
- 2) \_\_\_\_\_ is the time spent beyond the normal working hours which is usually paid at higher rate than the normal time rate. ( Over Time)
- 3) If the over time is abnormal, it is debited to\_\_\_\_\_. ( Costing P & L Account)
- 4) Under \_\_\_\_\_ rate system , worker assured of a steady and regular income. ( Time rate)
- 5) Labour in percentage  $= (\text{Time allowed as per standard} / \text{_____}) \times 100$ . ( Time taken)
- 6) Cost of welfare service \_\_\_\_\_ cost. ( Preventive)
- 7) Muster roll is kept at the \_\_\_\_\_ of the factory. ( Gate)
- 8) Workers who work outside factory premises is called as\_\_\_\_\_.( Out work)
- 9) Piece workers are paid on the basis of \_\_\_\_\_. ( Piece rate)

- 10) Under \_\_\_\_\_ plan thirce piece are paid. ( Merrick Differential Piece Rate)
- 11) Under \_\_\_\_ plan bonus is to the workers on the basis of time saved. ( Halsey Plan)
- 12) Under piece rate system wages are paid at a \_\_\_\_\_per unit. ( Fixed Rate)
- 13) Over premium increases \_\_\_\_\_ of plant and machinery. ( Depreciation)
- 14) Normal idle time are charged to \_\_\_\_\_overheads. ( Factory)
- 15) Time booking means recording of \_\_\_\_\_ time.( attendance)
- 16) Cost of normal idle time is charged to \_\_\_\_\_. ( Costing P and L Account)
- 17) In Halsey Plan , a worker gets bonus equal to \_\_\_\_of the time saved. ( 50%)
- 18) Idle time arises only when workers are paid on \_\_\_\_basis. ( Time Rate)
- 19) Under Gantt Task and Bonus Plan, no bonus is payable to worker , if his efficiency is less than \_\_\_\_\_. ( Standard output)
- 20) The formula for computing wages under time rate is \_\_\_\_\_. ( Hours worked x Time taken)
- 21) \_\_\_\_\_ time is the difference between the time for which the employees are paid and the employees' time booked against the cost object. ( Idle)
- 22) \_\_\_\_\_helps in the preparation of labour requirement budget. ( Efficiency Rate)
- 23) According to \_\_\_\_\_plan time rate wages are guaranteed.(Rowan Bonus)
- 24) \_\_\_\_\_ is the combination of the wages by time rate and wages by piece rate method. ( Time and Piece Rate)
- 25) Under \_\_\_\_\_method (system),the minimum wages are not guaranteed .(Piece work )

### 9. True or False

- 1) Overtime wages are to be paid at double the normal wage rate.
- 2) Cost of idle time due to labour strike should be treated as factory overhead.
- 3) In Taylor's Piece Rate Plan, time wages are guaranteed to each worker.
- 4) Earning under Halsey and Rowan plan is the same.



- 5) The cost of labour turnover is recovered through departmental overhead recovery rate.
- 6) Time booking means recording of attendance time.
- 7) Productivity of workers can be improved on if they are supervised closely.
- 8) The wages paid to a worker (joiner) who construct wooden mould for concrete laying on building contract should be as direct labour cost of the contract.
- 9) Labour productivity is automatically improves( increases) when production increases.
- 10) Cost of normal idle time may be treated as production overheads.
- 11) Idle time arises when workers are paid on time basis or pieces basis.
- 12) Increase in production may or may not be accompanied by increase in labour productivity.
- 13) Job evaluation is a comparative appraisal of jobs ant of workers.
- 14) Time-cum-job card shows the attendeence records as well as effective time work of each.
- 15) Bonus is payable at efficiency of  $66\frac{2}{3}\%$ .
- 16) Cost of abnormal idle time is transferred to costing profit and loss account.
- 17) Labour turnover may be caused due to low wages.
- 18) Pay roll accounting is concerned with calculation of wages.
- 19) The objective of time booking is ascertainment of labour cost.
- 20) Overtime premium is always treated as factory overheads.
- 21) Tea and lunch break is normal idle time.
- 22) Overtime increases depreciation of Plant and Machinery.
- 23) Strike and lock out time is abnormal idle time.
- 24) Abnormal idle time wages is included in in cost of production.
- 25) Machine setting time is abnormal idle time.

( Answer : True – 1,5,6,7,8,10,14,17,18,19,21,22,23:  
False-2,3,4,9,11,12,13,15,16,20,24,25)

## 10. Match the following:

Column 'A'	Column 'B'
1) Clock card	a) Reconciliation of time
2) Out workers	b) Workers who works out side
3) Net wages	c) Individual worker
4) Daily time sheet	d) Gross wages less deductions
5) Pay slip	e) Paid at piece rate
6) Casual worker	f) At the entrance of factory
7) Piece workers	g) In place of absentees
8) Job card	h) Method of time book
	i) 160 holes
	j) Time rate

( Answers : 1-f,2-b,3-d,4-h,5-c,6-g,7-e,8-a)

b)

Column 'A'	Column 'B'
1) Labour Turnover	a) Provides incentives to efficiency
2) Medical service	b) Taylor's Piece Rate Plan
3) Low wages	c) Turnover of worker
4) Halsey plan	d) Three rates fixed
5) Rowan plan	e) Preventive cost
6) Time rate plan	f) Cause labour turnover
7) Merrick Differential Plan	g) Equal treatment
8) 83% of Normal Piece rate	h) Bonus for time saved
9) Piece rate plan	i) No incentives to efficiency
	j) Proportion of actual time to standard time
	k) Merick's piece rate

( Answer : 1-c, 2-e, 3-f, 4-h, 5-j, 6-l, 7-d, 8-b, 9-a)

Column 'A'	Column 'B'
1) Normal idle time	a) Difference between Total time and actual time spent by worker
2) Power failure	b) Normal idle time
3) The Factories Act	c) Controllable
4) Abnormal idle time cost	d) Causes excess labour cost
5) Tea and Lunch break	e) Costing profit & loss A/c
6) Idle Time	f) Abnormal idle time
7) Salary leave as direct labour	g) Annual with full pay
	h) Direct cost method
	i) Overhead method

( Answer : 1-d, 2-f, 3-g, 4-e, 5-b, 6-a, 7-h)



## OVERHEADS

### Unit structure

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Overheads - The concept
- 5.3 Basis of Apportionment or Distribution of Overheads
- 5.4 Solved Problems
- 5.5 Exercises
- 5.6

---

### 5.0 OBJECTIVES

---

After studying the unit the students will be able to:

- Understand the meaning and composition of overheads.
- Explain the procedure of Overhead Accounting.
- Discuss about the basics of apportionment and absorption of overheads.
- Solve the practical problems.

---

### 5.1 INTRODUCTION

---

Total cost of product involves direct and indirect cost. Direct Cost can be directly identified with manufacturing of product. It includes Direct Material, Labour and expenses. Indirect Cost is identified with non-production / manufacturing of goods. The indirect cost is referred to as overheads or loading or supplementary cost.

---

### 5.2 OVERHEADS- THE CONCEPT

---

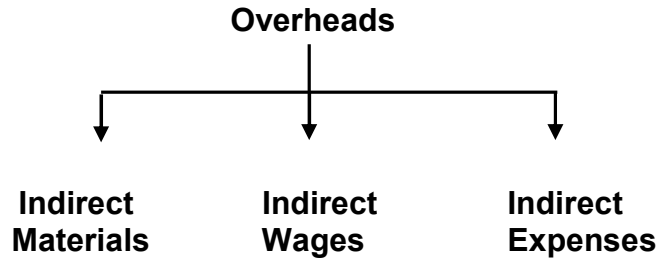
#### 5.2.1 MEANING

Overhead Costs are operating cost of business enterprise which cannot be traced directly to a particular unit of output. The term overhead is used interchangeably with such terms as 'burden', 'supplementary costs', 'manufacturing expenses' and 'indirect expenses'. **Blocker and Wellmer.**

'In Cost accounting all indirect, costs are termed as 'Overhead'. **W W. Bigg.**

“The Aggregate of Indirect Material Costs, indirect wages (labourcost )and indirect expenses”. **The Institute of Cost and Management Accountants, London.**

### 5.2.2 Composition of Overheads :



### 5.2.3 Overheads Accounting:

Overheads comprises of indirect materials, indirect wages and indirect expenses which are not directly identified or allocated to cost object in an economically feasible way.

Overheads accounting aims at absorbing the overload in product unit produced by the firm or company. It involves the following:

- i) Collection, Classification and Codification of Overheads.
- ii) Allocation, Apportionment and Reapportionment of Overheads.
- iii) Absorption of Overheads.

**1. Collection of overheads:** It means the collection of items of expenses from the Books of account and other records regarding to their nature and purposes. E.g. Store Issue Note, Purchase Voucher, Pay Roll Sheet, Time Sheet, Cash Book, Journals other reports.

**2. Codification of Overheads:-**It means giving a code number to each item of overheads for easy identification from different heads of overhead. It may be done numerically alphabetically.

For Example -

Turning Department.A1 or A

Grinding Department. A2 or B

Component of Manufacturing - 101

Maintenance - 102

**3. Classification of Overheads:-**It means the process of grouping overheads according their common features or characteristics or nature.

It can be classified in the following ways.

- a) On the Basis of Behaviour -

- Fixed and Variable Overheads

b) On The Basis of Function -

- Production Overheads, Selling and Distribution Overheads and Administration Overheads.

**4. Allocation of Overheads :-**It means Charging the whole items of cost to suitable and identifiable cost centers or cost units. It is transfer of the cost of goods or services from primary account to one or more secondary accounts.

**5. Apportionment of Overheads:-** It means distribution of cost over several periods of time in proportion to anticipated benefits. It consists of dividing a joint or common cost between two or more cost objectives. It means distribution of overheads to more than one cost centers on some equitable basis. This also known as 'departmentalisation of overheads'.

**6. Absorption of Overheads:**It means charging of overheads from cost centers to product or service by means of absorption rate for each cost centre.

$$\text{Overhead Absorption Rate} = \frac{\text{Total Overhead of the Cost Centre}}{\text{Total Quantum of Unit or Base}}$$

It means the expensing the cost of Job, products, process or unit, i.e. recovery by the product. The cost absorption process involves the recognition of expenses under the conditions of physical movement, benefit yielded and period of charges, etc.

---

### **5.3 BASIS OF APPORTIONMENT OR DISTRIBUTION OF OVERHEADS**

---

There are some items of expenses which cannot be allocated easily to a specific department and it needs equitable apportionments on the basis of benefit received. It is done on the basis of floor area occupied, labour hours, machine hours, kilowatt hours, capital value or value of assets, technical estimate, etc.

The Table Shows the Apportionment of Overheads.

<b>Overheads / Expenses</b>	<b>Basis of Apportionment</b>
1) Rent, Rates, Taxes, Air Conditioning	Floor Area Occupied
2) LabourWelfare Expenses, Perquisites, Time Keeping, Personnel Office, Supervision	No. of Workers
3) Compensation to Workers, Holiday Pay, ESI and PF Contribution	Direct Wages
4) Depreciation on P & M, Repair & Maintenance of P & M	Capital Value or Value of Assets
5) Insurance of Stock	Stock Value
6) Lighting expenses, electric power	No. of light points or area occupied or material unit or house power of machine or No. of machine hours or value of machine or consumption of unit.
7) Material landing and store overheads	Weight of materials or volume of material or value of materials or unit of materials
8) Delivery expenses	Weight, volume or tone mile
9) Telephone expenses.	No. of Calls or No. of telephone machine
10) Audit fees	Sales or total cost
11) Advertising	Actual expenses or % of sales
12) Store keeping	Weight or value of materials
13) Recreation	No. of employees or total wages

b) Cost of Service Department	Basis of Apportionment
1) Purchases	No. of purchases or value of purchases
2) Account	No. of employees or value of purchases
3) Maintained, repairs of shop, planning & progress, tool room	Direct Labour Hour, Machine Hours, Direct Labour Wages
4) Canteen & welfare, hospital (medical), dispensary, personal department, time keeping	No. of workers, No. of employees
5) Computer Section	No. of Card punched, computer hour, specific allocation to departments
6) Power House (electric lighting cost)	Floor area, cubic content, No. of electric points, wattage
7) Power House (electric power cost)	Horse power, KWH, Horse Power x Machine Hours KWH x Machine Hours
8) Store Department	value or weight of material issued
9) Transport Department	Crane hours, truck hours, truck mileage, truck tonnage, truck non-hours, tonnage handled, No. of packages of standard size.
10) Fire Protection	Capital value of assets
11) Inspection / Quality	Inspection labours
12) Purchase Departments	No. of purchase order, value of purchases

---

## 5.4 SOLVED PROBLEMS

---

### Illustration : 1

A Limited Company has Three Manufacturing Departments 'A', 'B' and 'C' and one service Department 'S'. The following Figures are available of 25 working days of 8 hours each day. All These Departments Work for all the days and with full attendance.

Expenditure	Departments				Total
	A Rs	B Rs	C Rs	S Rs	Rs
Power and Lighting	200	300	360	240	1,100
Supervisor's Salary	-	-	-	-	2,000
Rent	-	-	-	-	1,000
Welfare	-	-	-	-	900
Other Expenses	200	400	400	200	1,200
<b>Total</b>	-	-	-	-	<b>5,400</b>
Supervisor's Salary	30%	30%	20%	20%	100%
No. of Workers	30	40	20	10	100
Floor area (Sq Ft)	600	800	600	500	2500
Service rendered by Service Dept	50%	30%	20%	-	100%

Calculate Labour hour rate for each department A, B & C.

**Solution:**

**Statement Showing Distribution of Overheads**

Expenditures	Base	Departments				Total
		A (Rs₹)	B (₹Rs)	C (Rs₹)	S (Rs₹)	Rs
Power & Lighting	Given	200	300	360	240	1,100
Supervisor's Salary	% age	600	600	400	400	2,000
Rent	Floor Area	240	320	240	200	1,000
Welfare	No. of Workers	270	360	180	90	900
Other Expenses.	Given	200	400	400	200	1,200
<b>Total</b>		<b>1,510</b>	<b>1,980</b>	<b>1,580</b>	<b>1,130</b>	<b>6,200</b>
Allocation of Expenses of Service Dept to Manu. Dept	% age	565	339	226	(1,130)	
		<b>2,075</b>	<b>2,319</b>	<b>1,806</b>	<b>--</b>	<b>6,200</b>

1) No. of Hours in a Month = 25 x 8 = 200 hours

2) Total Labour hours in each Dept

Dept A = 200 x 30 Hrs = 6000Hrs

B = 200 x 40 Hrs = 8000Hrs

C = 200 x 20 Hrs = 4000Hrs



## 3) Labour Hour Rate For Department

$$A - \frac{2075}{6000} = 0.3458 \quad = \text{Rs}0.35 \text{ Paise}$$

$$B - \frac{2319}{8000} = 0.289 \quad = \text{Rs}0.29 \text{ Paise}$$

$$C - \frac{1806}{4000} = 0.451 \quad = \text{Rs}0.45 \text{ Paise}$$

**Illustration : 2**

You are Supplied with the following information and required to work out the production hour rate of recovery of overhead in Departments, A, B and C.

Particulars	Production Dept				Service Dept	
	Total (Rs)	A (Rs)	B (Rs)	C (Rs)	D (Rs)	E (Rs)
Rent	12,000	2,400	4,800	2,000	2,000	800
Electricity	4,000	800	2,000	500	400	300
Indirect Labour	6,000	1,200	2,000	1,000	800	1,000
Depreciation on Machinery	5,000	2,500	1,600	200	500	200
Sundries	4,500	910	2,143	847	300	300
Estimated Working Hours		1,000	2,500	1,400	--	--

Expense of Service Departments D and E are apportioned as follows:

	A	B	C	D	E
D	30%	40%	20%	--	10%
E	10%	20%	50%	20%	--

Solution:

## Statement of Overhead Distribution

Particulars	Total	Production Department			Service Department	
	₹	A ₹	B ₹	C ₹	D ₹	E ₹
Rent	12,000	2,400	4,800	2,000	2,000	800
Electricity	4,000	800	2,000	500	400	300
Indirect Labour	6,000	1,200	2,000	1,000	800	1,000
Depreciation on Machinery	5,000	2,500	1,600	200	500	200
Sundries	4,500	910	2,143	847	300	300
Total	31,500	7,810	12,543	4,547	4,000	2,600
Dept. D		1,200	1,600	800	(4000)	400
		9,010	14,143	5,347	00	3,000
E		300	600	1,500	600	(3,000)
		9,310	14,743	6,847	600	00
D		180	240	120	(600)	60
		9,490	14,983	6,967	00	60
E		6	12	30	12	(60)
		9,496	14,995	6,997	12	00
D		4	5	3	(12)	--
Total	31,500	9,500	15,000	7,000	00	--
Estimated Working Hrs		1,000	2,500	1,400	--	--
Rate Per Hour		$\frac{9,500}{1,000}$	$\frac{15,000}{2,500}$	$\frac{7,000}{1,400}$	-	-
Rate per hour		9.50	6.00	5.00	-	-

**Illustration : 3**

In a Light Engineering Factory, Mumbai Andheri (West), a Machine shop consists of three cost centers (A, B and C) each having three distinct set of Machines. Following are the details of estimates for year 2016.

Particulars	Departments			Total
	A	B	C	
No. of Workers	200	200	400	800
No. of Machine Hours	30,000	30,000	40,000	1,00,000
% age of Horse Power	40	25	35	100
Value of Assets (Rs)	10,00,000	16,00,000	14,00,000	40,00,000
Direct Wages (Rs)	8,00,000	10,00,000	12,00,000	30,00,000
Depreciation (Rs)				4,00,000
Indirect Labour (Rs)				9,00,000
Insurance Charges (Rs)				2,00,000
Electricity (Rs)				3,00,000
Supervisory Salary (Rs)				1,60,000
Staff Welfare Expenses (Rs)				3,00,000
Other Expenses (Rs)				6,00,000

Work out a composite machine hour rate for each of the three cost centre indicate clearly the basis of apportionment of expenses between three cost centers.

**Solution:****Computation of Composite Machine Hour Rate**

Particulars	Base	Cost Centers			Total (Rs)
		A (Rs)	B (Rs)	C (Rs)	
Direct Wages	Given	8,00,000	10,00,000	12,00,000	30,00,000
Depreciation	Value of Assets	1,00,000	1,60,000	1,40,000	4,00,000
Indirect Labour	Direct Wages	2,40,000	3,00,000	3,60,000	9,00,000
Insurance Charges	Value of Assets	50,000	80,000	70,000	2,00,000
Electricity	Horse Power % age	1,20,000	75,000	1,05,000	3,00,000
Supervisory Salary	No. of Workers	40,000	40,000	80,000	1,60,000
Staff Welfare	No. of Workers	75,000	75,000	1,50,000	3,00,000
Other Expenses	No. of Machine Hours	1,80,000	1,80,000	2,40,000	6,00,000
Total	a)	16,05,000	19,10,000	23,45,000	58,60,000
No. of Machine Hours	b)	30,000	30,000	40,000	1,00,000
Machine Hour Rate	a ÷ b	53.50	63.666 or 63.67	58.625 or 58.63	-

**Illustration : 4**

In a factory there are three production departments and two service departments i.e. A, B, C, R and S respectively. In a March 2015, the departmental expenses were as follows:

Production Department	Service Department				
	A	B	C	R	S
(Rs)	46,000	12,000	13,000	9,000	4,000

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

particulars	Production Dept.			Service Dept.	
	A	B	C	R	S
Service Dept R	40%	30%	20%	--	10%
Service Dept S	30%	30%	20%	20%	--

You are required to apportion the cost of service department to production department under Repeated Distribution Method.

**Solution:**

Particulars	Base of allocation	Prod. Dept. A Rs	Prod. Dept. B Rs	Prod. Dept. C Rs	Service Dept. R Rs	Service Dept. S Rs
Primary Distribution of Overheads		46,000	12,000	13,000	9,000	4,000
Dept. 'R' Overhead	4:3:2:1	3,600	2,700	1,800	-9,000	900
Dept. 'S' Overheads	3:3:2:2	1,470	1,470	980	980	-4900
Dept. 'R' Overheads	4;3;2;1	396	294	196	-980	98
Dept. 'S' overheads	3:3:2:2	30	30	20	18	-98
Dept.' R' Overheads	4:3:2:1	8	6	4	-18	-
Total		51,500	16,500	16,000	-	-

**5.5 EXERCISES:-**

01. The overhead expenses of a company are recovered by the cost accountant according to the production departments 'X' and 'Y' and service department 'S'. From the following information prepare a primary distribution schedule.

Expenses	Rs.
Indirect Wages	8,000
Rent and Rates	15,000
Power	4,500
Light	3,200
Depreciation on Machinery	24,000
Sundries	20,000

Following information is also available for department

:

Particulars	'X'	'Y'	'S'
Working Hours	4,000	3,500	3,600
H.P. of Machine	15	25	05
Direct Wages (Rs)	12,000	4,000	4,000
Value of Machinery (Rs)	100,000	80,000	60,000
Floorspace area (Sq. ft.)	600	500	400
Light Points	10	05	05

(Ans :Dept. X-Rs.35,900; dept. Y- Rs 21,900 and Dept. S- Rs 20,900)

02. A Ltd. furnish you the following half yearly budgeted data for for the half year ended 31<sup>st</sup> March 2015. Distribute the overheads by most equitable method.

Particulars	Production Dept.			Service Dept.	
	A	B	C	D	E
Direct Wages (Rs)	40,000	60,000	80,000	20,000	40,000
Direct Materials (Rs in lacs)	1	2	4	2	1
No. of employees	10	15	15	05	05
Electricity ( MWH)	8,000	6,000	4,000	2,000	2,000
Light Point	5	8	2	3	2

Asset Value (Rs in lacs)	12	8	6	2	2
Area occupied, (Sq. meters.)	150	250	100	50	50

The overheads for the above period were :

Particulars	Rs	Particulars	Rs
Motive Power	17,500	Lighting	1,600
Store Expenses	20,000	Staff Welfare Expenses	4,000
Depreciation	30,000	Repairs	15,000
Rent, Rates and Taxes	12,000	General Expenses	12,000

03. A company is having two production departments namely A and B and two service departments S-1 and S-2. The expenses incurred during the of March,2014 are as following :

Expenses	Rs
Electricity	3,600
Insurance on Assets	9,000
Power	15,000
Rent and Taxes	28,000
Depreciation	18,000
Canteen expenses	5,400

The following information is also available for the above departments.

Particulars	A	B	S-1	S-2
Floor Space (sq. ft.)	6,000	4,000	2,000	2,000
No. of Workers	100	50	50	25
H. P. of Machine	120	30	30	15
Direct wages	10,000	10,000	5,000	3,000
Value of Assets( Rs. in thousands )	10	4	3	1
Direct Materials	15,000	10,000	5,000	-
No. of Light Points	30	15	15	5

Prepare statement showing primary distribution of overheads.

04. The following data were obtained from the books of Four Square Engineering for the following half year ended 30<sup>th</sup> June , 2014. Prepare overhead distribution summary.

Items	Production	Dept.	Service	Dept.	
A	B	C	X	Y	
Direct Wages (Rs)	7,000	6,000	5,000	1,000	1,000
Direct Materials (Rs)	3,000	2,500	2,000	1,500	1,000
Employees (Nos.)	200	150	150	50	50
Electricity(kwh)	8,000	6,000	6,000	2,000	3,000
Light Points (Nos)	101	51	5	5	5
Assets Value (Rs)	50,000	30,000	20,000	10,000	10,000
Area Occupied (Sq. Mtrs.)	800	600	600	200	200

Expenses for the 6 months were as follows:

Expenses	Rs	Expenses	Rs
Stores overheads	400	Depreciation	6,000
Motive power	1,500	Repairs and Maintenance	1,200
Electric Power	200	General Expenses	10,000
Labour Welfare	3,000	Rent and Taxes	600

Apportion the expenses of Department X in the ratio of 4:3:3 and that of Department Y in proportion to direct wages, to department A, B and c respectively.

( Answer : Dept. A – Rs 11,396; Dept. B- Rs 8,663 ; Dept. C- Rs 7,341)



## COMPUTATION OF OVERHEAD RATES

### Unit Structure :

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Overheads Absorption Rates
- 6.3 Methods of Adsorption of Overhead
- 6.4 Solved Problems
- 6.5 Under and Over Absorption of Overheads
- 6.6 Exercises

---

### 6.0 OBJECTIVES

---

After studying the unit the students will be able to:

- Calculate the overhead absorption rate.
- Understand the methods of absorption of overheads.
- Solve the related practical probles.

---

### 6.1 INTRODUCTION

---

We have seen the methods of apportionment of overheads in the earlier chapter. The next step is to see how overheads are absorbed in the cost of production. Absorption of overheads means recovery of overhead in the cost of production.

It means charging of overheads to cost centers in such a manner that are the cost of production of such unit includes an appropriate or equal share of overheads of cost centers.

---

### 6.2 OVERHEADS ABSORPTION RATES

---

The overhead absorption rate is determined for the purpose of absorption of overheads in cost of job, products, etc. There are several methods of determination of overheads absorption rate.

Overhead absorption rate is the relation between amount of overheads and total numbers of units of the base selected.

$$\text{Overhead Absorption Rate} = \frac{\text{Amount of Overheads}}{\text{Quantile or Value Base}}$$



**Actual Rate:**

Actual Rate is determined by dividing actual overheads incurred during the period by actual quantity or value of base selected.

$$\therefore \text{Actual Rate} = \frac{\text{Actual Overhead Expenses Incurred During the Period}}{\text{Actual Quantity or Value of The Base Related to Production during the period}}$$

**Pre - Determined Rate:**

This is rate is decided on the basis of budgeted overheads and the budgeted base for the certain period.

$$\text{Pre - Determined Rate} = \frac{\text{Budgeted Overhead for The Period}}{\text{Budgeted Base for The Period}}$$

This ratio facilitates calculation of cost in advance and helps while preparing bills promptly. No extra clerical staff is required.

**Blanket Rate:**

This is the single or general overheads rates applicable to the whole factory. This rate is suitable in those fortifies where several products passes through many departments.

$$\text{Blanket Rate} = \frac{\text{Overhead Cost for Entire Factory}}{\text{Total Quantum of Base Selected}}$$

**Multiple Rate:-**

A concern may use multiple overhead rates separately for each producing department, for each service department for each cost centers and for each product line. It is determined where the product lines are varied or machinery is used for varying degrees in different department. It means the incidents of overhead cost each department is different.

This calculated as follows.

$$\text{Multiple Overhead Rate} = \frac{\text{Each Depatment Cost Centres or Product}}{\text{Corresponding Base}}$$

---

## **6.3 METHODS OF ADSORPTION OF OVERHEAD**

---

Following are the various method adapted for absorption of overhead.

## 1. Machine Hour Rate:

It is the cost of running a machine for one hour. Under this method, machines are used as the basis of overhead absorption rate.

$$\text{Machine Hour Rate} = \frac{\text{Production Overhead}}{\text{Machine Hours}}$$

This method is suitable where major portion of production of goods is performed with the help of machine. Machine Hour Rate facilitates the calculation of correct and reliable cost. Relative efficiencies of Machines can be compared. It helps management to understand the difference between usefulness of machine and Manual Work.

It is not suitable where major work is done by manual labour. It requires detailed record of machines for each job. It is difficult to understand and operate and also difficult to calculate machine hour in advance.

### Computation of Machine Hour Rate:

Computation of Machine Hour Rate involves the following:

- i) Consider each machine or a group as a separate cost centre.
- ii) Compute fixed or Standing Charges which vary with line and not with Machine.

Fixed / Standing Charges	Base of Apportionment
a) Rent	Area Occupied
b) Heating & Lighting	No. of Light Point or Floor Area Occupied
c) Supervision Charges	Time devoted by Supervisor
d) Insurance	Insured Value of each Machine
e) Cleaning Materials	No. of Machines
f) Miscellaneous Expenses	Based on the facts

- iii) Computation of Machine Hours

a) No. of Effective Working Days	xxx
b) No. of Working Hours Per Day	xxx
c) Total Working Hours (a x b)	xxx

d) Less: No Hours required for machine and repairs	xxx
e) Effective Machine Hours (c - d)	xxx
f) Unproductive setup time	xxx
g) Effective Machine Hours (e - f)	xxx

iv) Standing Charges per hour II / III xxx

v) Running Charges for Each Machine

Running Charges	Base of Apportionment
a) Depreciation	Value / Useful Life
b) Repairs and Maintenance	Machine Hours
c) Power	Meter Reading / HD / Machine Hours
d) Miscellaneous expenses	Equitable basis based on factor.

vi) Hourly Running Charges for each Machine.

$$\text{Hourly Running Charges Per Machine} = \frac{\text{Total Running Charges}}{\text{Machine Hours}}$$

vii) Machine Hour Rate (IV + VI) xxx

Format for Computation of Machine Hour Rate

	₹	₹
<b>A) Standing Charges:</b>		
i) Rent & Rates	xxx	
ii) Heating & Lighting	xxx	
iii) Supervision Charges	xxx	
iv) Insurance	xxx	
v) Miscellaneous Expenses / Overheads	xxx	
	xxx	
Standing Charges Per Hour = $\frac{\text{Standing Charges}}{\text{Effective Machine Hours}}$		xxx
<b>B) Running Charges / Expenses Per Hour</b>		
i) Depreciation		xxx
ii) Power		xxx

iii) Repair & Maintenance		xxx
iv) Consumers & Lubricants		xxx
v) Miscellaneous Expenses		xxx
<b>C) Machine Hour Rate</b>		xxx

## 2. Labour Hour Rate:

This method is referred to production hour rate method and adopted in those factors where labour prominent. This rate express the relation between the expenses incurred other than wages paid to workers and number of machine hours put by the workers during the period.

$$\text{Labour Rate} = \frac{\text{Budgeted or Actual Overheads ( Expenses)}}{\text{Budgeted or Actual Labour Hours}}$$

$$\text{Budgeted Labour Hour} = \left( \begin{array}{l} \text{No - 4 workers} \\ \text{employed during} \\ \text{the period} \end{array} \right) \times \left( \begin{array}{l} \text{No. Hours for} \\ \text{which factor} \\ \text{workes each day} \end{array} \right)$$

## 3. Percentage of Prime Cost Method:

This method shows relationship between budgeted actual overheads and prime cost. This method is used where standard product requires constant quality of materials and number of labour hour produced.

$$\text{Percentage on Prime Cost} = \frac{\text{Budgeted Actual Overheads}}{\text{Budgeted Prime Cost}} \times 100$$

## 4. Percentage of Direct Material Cost Method:-

Under this method, the cost of Material consumed in production is considered as base of overhead absorption. This method gives relationship between actual budgeted overheads and budgeted or actual direct materials cost in percentage.

$$\text{Direct Materi Cost Rate} = \frac{\text{Budgeted or Actual Overhead}}{\text{Actual Direct Materials}} \times 100$$

## 5. Percentage of Direct Labour Method:-

Under this method, Labour Overheads are recovered on the basis of actual rate. This method is useful where production is in uniform nature and all workers are more or less the same hourly rate and Labour is predominant.

$$\text{Direct Labour Rate} = \frac{\text{Factory Overheads}}{\text{Direct Labour}} \times 100$$

### 6. Combined Machine Hour and Labour Hour Rate:

This method is useful where company having various department in which work is completed by Machine work and Labour work (Manual). This method is used where separate allocation of running charges in not possible and are allocated on the basis of machine labour rate and other expenses, which are not directly related to machines, are allocated on the basis of labour rate.

---

## 6.4 SOLVED PROBLEMS

---

### Illustration : 1

Calculate the Machine Hour Rate from the following:

Particulars	Rs
Cost of Machine	12,000
Cost of Installation	3,000
Scrap Value	3,000
Rent, Rates for a quarter for the shop	300
General Lighting	20 P.M.
Supervisor's Salary for Shop	600 per quarter
Insurance Premium for Machine	60 p.a.
Estimate Repairs	400 p.a.

Power 2 units per hour @ Rs 5 per 100 units. Estimate working hours p.a. 2,000. The machine occupies  $\frac{1}{4}$ th of the total area of the shop. The supervisor is expected to denote  $\frac{1}{6}$ th of his time for supervising the machine. General lighting expenses are to be apportioned on the basis of the floor area.

Solution:

## Statement Showing Machine Hour Rate

Particulars	Working	P.A. ₹	Per Hour ₹
Standing Charges			
Rent & Rates	$\left(\frac{1}{4} \times 300 \times 4\right)$	300	
General Lighting	$\left(20 \times \frac{1}{4} \times 12\right)$	60	
Shop Supervisor's Salary	$6000 \times \frac{1}{6} \times 4$	400	
Insurance Premium		60	
		820	
Standing Charges	$= \left(\frac{820}{2000 \text{ Hrs}}\right)$		0.41
Running Changes Depreciation	$\frac{12000 + 3000 - 3000}{20000 \text{ Hrs}}$		0.60
Repairs	$\left(\frac{400}{2000}\right)$		0.20
Power	$\left(\frac{2 \text{ units} \times 05}{100}\right)$		0.10
Machine Hour Rate			1.31

## Illustration : 2

From the following information, Calculate Machine Hour Rate.

Cost of Machine	Rs 45,000
Scrap Value	Rs 5,000
Rent for workshop	Rs 30,000
General Lighting	Rs 200 PM.
Power Consumption 20 Units Per Hour	@ Rs 20 per every 100 units

Administrative Expenses	Rs 4,000 p.a.
Repairs and Maintenance	75% of Depreciation
Workshop Supervisor's Salary	Rs 4,000 P.M.
Estimated Working Time per year	50 weeks of 40 hours each
Selling up time for production	200 hours per year
Effective Life of Machine	10 Years

The Machine Occupies 1/4<sup>th</sup> area of workshop. The supervisor is expected to 1/4<sup>th</sup> of time in supervising the machine.

**Solution:**

### Calculation of Machine Hour Rate

Particulars	Working	P.A. Rs	Per Hour Rs
Standing Charges			
Rent	$(30,000 \div 4)$	7,500	
General Lighting	$(200 \times 12 \div 4)$	600	
Administrative Expenses	$(4000 \text{ for years})$	4,000	
Workshop Supervisor's Salary	$(4,000 \times 12 \div 4)$	12,000	
		24,100	
Standing Charges Per Hours	$(24,100 \div 2,000)$		12.05
Running Charges			
Depreciation	$\left( \frac{45,000 - 5,000}{10} = \frac{40,000}{10} = \frac{4,000}{2,000} \right)$		2.00
Repairs & Maintenance	$\left( 4,000 \times \frac{75}{100} \times \frac{1}{2,000} \right)$		1.50
Power	$\left( \frac{20 \times 20 \times 1,800}{100 \times 200} \right)$		3.60
Machine Hour Rate			<u>19.15</u>

**Note:**

Machine Hours =  $50^w \times 40^H = 2000$  Hrs. It is presumed that no current is used by the machine devising setting up time.

**Illustration : 3**

Computer the Machine Hour Rate from the following data.

Particulars	Rs
- Cost of Machine	- 1,10,000
- Installations Charges	- 10,000
- Estimated Scrap value after expire of 15 years life	- 5,000
- Rate and Rates for the shop per month in	- 200
- Governal Lighting for the shop per month	- 800
- Insurance Premium for Machine per annum	- 1,000
- Repairs and Maintenance Expenses per annum	- 1,000
- Consumption of Power to units per hours	- 10
- Rate of Power per 100 units	- 30
- Estimated Working Hours Per Annum	- 2,200
- This includes non-productive setting up time of 200 hours.	
- Shop Supervisor Salary P.M.	- 600

The Machine occupies  $\frac{1}{4}$ <sup>th</sup> of the total area of the shop: Supervisor is expected to devote  $\frac{1}{5}$ <sup>th</sup> of his time for supervising the machine.

**Solution:**

Computation of Machine Hour Rate

	Particulars	Working	P.A. ₹	Per Hour ₹
<b>a)</b>	<b>Standing Charges</b>			
	Rent and Rates	$(200 \times 12 \div 4)$	600	
	General Lighting	$(800 \times 12 \div 4)$	2,400	
	Insurance Premium	-	1,000	
	Shop Supervisor's Salary	$\left(600 \times 12 \times \frac{1}{5}\right)$	1,440	



			5,440	
	Standing Charges Per Hour	$(5,440 \div 2,000)$		2.72
<b>b)</b>	<b>Running Charges</b>			
	Power	$(30 \times 10 \div 100)$		3.00
	Repairs & Machine	$(1,000 \div 2,000)$		0.50
	Depreciation	$\left( \frac{1,10,000 + 10,000 - 5,000}{2,000 \times 15} \right)$		3.83
	Machine Hour Rate			10.05

**Note:**

Machine Hour = 2,200 Hrs. - 200 Non - Productive Selling Time  
= 2,000 Hrs.

**Illustration : 4**

From the following figures, compute the machine Hour Rates for Machines A, B and C for a 4-week prior repeatedly. Each machine is expected to be working 200 hours.

Particulars	Per Annum Rs
Rent and Taxes	3,000
Lighting and halting	400
Depreciation	1,000
Indirect Wages	1,500
Power	600
Sundries	1,750
Canteen Expenses	1,200
Repairs and Maintenance	500

Four the above three machine in the factory, the necessary particulars are as follows:

Particulars	Machine	Machine	Machine
	A	B	C
Area Space Occupied (Sq. ft.)	100	200	300
No. of Light Points	1	3	--
Cost of Machine (Rs)	25,000	15,000	10,000
No of Workers	1	2	3
Power (Rs)	250	150	200
Direct Wages (Rs)	2,000	3,000	5,000

**Solution:**

**Machine Hour Rate**

Particulars	Base of Apportionment	Machines		
		A Rs	B Rs	C Rs
<b>a) Standing Charges</b>				
Rent and Taxes	(1:2:3)	500	1,000	1,500
Lighting and Heating	(1:3:0)	100	300	-
Indirect Wages	(2:3:5)	300	450	750
Sundries	(2:3:5)	350	525	875
Canteen Expenses	(1:2:3)	200	400	600
Total		1,450	2,675	3,725
<b>b) Running Charges</b>				
Depreciation	(5:3:2)	500	300	200
Power	(Actual)	250	150	200
Repairs & Maintenance	(5:3:2)	250	150	100
Total		1,000	600	500
<b>c) Total Charges (a + b)</b>		2,450	3,275	4,225
Machine Hour Rate = C ÷ Machine Working Hour		12.25	16.25	21.13

**Illustration : 5**

The following expenses have been incurred in respect of a shop having four indelicate machine.

Rent and Rates	Rs	6,000 p.a.
Power Consumed by the shop at 10 paise per unit	Rs	4,800 p.a.
Repairs for 4 Machine	Rs	2,500 p.a.
Lighting for shop per machine	Rs	150 p.a.
Lubricants etc.	Rs	150 p.a.
Depreciation per machine	Rs	600 p.a.

**Supervisor's Salary:**

Working after 4 Machines and Paid Rs 650 p.m.

Attendants : 2 attendants looking after five machines paid

Rs 60 p.m.each

Each Machine consumes 10 units of power per hour.

Calculate Machine hour rate.

**Solution:****W. Note:-**

$$\text{i) No. of Units Consumed} = \frac{\text{Rs.}4800 \times 100}{100} = 48,000 \text{ units}$$

$$\text{No. of units per machine} = 48000/4 = 12,000 \text{ units}$$

$$\text{Hours in a year} = 12000/10 = 1,200 \text{ hours}$$

$$\begin{aligned} \text{ii) Wages to attendant 5 Machine} &= 2 \text{ attendant} \times \text{Rs } 60 \text{ each} \\ &= (60 \times 2) \times 12 \\ &= 1440 \end{aligned}$$

$$\therefore \text{Wages for 4 Machines} = 1440 \times \frac{4}{5} = \text{Rs.}1152$$

Particulars		P.A. Rs
<b>a) Standing Charges</b>	Rent & Rates	6,000
	Wages to attendant (Note. II)	1,152
	Supervisor's Salary (650 x 12)	7,800
		14,952
<b>b) Running Charges</b>	Power	4,800

	Repairs	2,500
	Lighting (150 x 04)	600
	Lubricants	150
	Depreciation (600x4)	2,400
		10,450
<b>c) Total Expenses (a + b)</b>		25,402
<b>d) Machine Hour Rate =</b>	$\frac{C}{\text{Working Hours}} = \frac{25,402}{1,200}$	21.17

**Illustrations : 6**

The following information is extracted from the budget of Amar Co. Ltd for the 2016.

Factory Overheads	Rs 93,000
Direct Labour Cost	Rs1,50,000
Directed Labour Hours	2,32,500
Machines Hours	75,000
Direct Material Cost	Rs3,00,000

The following details are available for job 205:

Direct Material Cost	Rs 45
Direct Labour Cost	Rs 50
Direct Labour Hours	40
Machine Hours	30

You are required to workout overhead application rates and ascertain the cost of Job 205 by using the following methods of overhead application.

- i) Direct Labour Hour Rate.
- ii) Direct Labour Cost.
- iii) Machine Hour Rate.
- iv) Prime Cost.
- v) Direct Material Cost

**Solution:**

- i) Direct Labour Hour Rate =  $\frac{\text{Overhead of the Dept}}{\text{Laour Hours}}$   
 $= \frac{93,000}{2,32,500}$   
 $= \text{Rs}0.40 \text{ per hour}$
- ii) Direct Labour Cost =  $\frac{\text{Overhead of the Dept}}{\text{Direct Labour Cost}} \times 100$   
 $= \frac{93,000}{1,50,000} \times 100$   
 $= 62\%$
- iii) Machine Hour Rate =  $\frac{\text{Overhead of the Dept}}{\text{Machine hours}}$   
 $= \frac{93,000}{75,000}$   
 $= \text{Rs } 1.24 \text{ Per Hour.}$
- iv) Prime Cost =  $\frac{\text{Overhead of the Dept}}{\text{Prime Cost}} \times 100$   
 $= \frac{93,000}{1,50,000 + 3,00,000} \times 100$   
 $= \frac{93,000}{4,50,000} \times 100$   
 $= 20.67\%$
- v) Direct Material cost =  $\frac{\text{Overheads of the dept}}{\text{Direct Material Cost}} \times 100$   
 $= \frac{93,000}{3,00,000} \times 100$   
 $= 31\%$

**Statement Showing Job Cost of Job No.205**

Particulars	1	2	3	4	5
Material Cost	45.00	45.00	45.00	45.00	45.00
Labour Cost	50.00	50.00	50.00	50.00	50.00
Overheads Cost	16.00	31.00	37.20	19.63	13.95
	111.00	126.00	132.20	114.63	108.95

**Working Notes Overheads:**

- 1)  $DLH \times DLR = 40 \times 0.40 = \text{Rs } 16$
- 2)  $62\% \text{ of Labour Cost} = \frac{50 \times 62}{100} = \text{Rs } 31$
- 3)  $\text{Machine Hours} \times \text{MHR} = 30 \times 1.24 = \text{Rs } 37.20$
- 4)  $\text{Prime Cost} \times \frac{20.67}{100} = \frac{95 \times 20.67}{100} = \text{Rs } 19.63$
- 5)  $\text{Material Cost} \times \frac{31}{100} = \frac{45 \times 31}{100} = \text{Rs } 13.95$

---

## **6.5 UNDER AND OVER ABSORPTION OF OVERHEADS**

---

**6.5.1 MEANING**

Under absorption of Overhead means the amount of overheads absorbed in production is less than the actual overheads incurred and over absorption of overheads means the overheads absorbed in the production is more than the actual overheads incurred. This is made understand by the following example.

<b>Overheads</b>	<b>Recovered in Costing ₹</b>	<b>Actual Incurred ₹</b>	<b>Over/Under Absorption ₹</b>
Factory Overheads	50,000	75,000	25,000 under
Office Overheads	80,000	60,000	20,000 Over

Over or under absorption may arises due to the following reasons.

- a) Errors in estimation of overhead expenses.
- b) Errors in estimation of production level.
- c) Errors in estimation of machine hours.
- d) Sudden Changes in method of productive.
- e) Seasonable changes in overhead expenses.

**6.5.2 ACCOUNTING TREATMENT:**

Under or over absorption of overheads may be disposed by following any one of the methods stated:

**a) Use of Supplementary Rate:**

This method is used when the amount of over or under absorption of overheads is quite large and is due to normal circumstances i.e. increase in material price and labour rate. This can be calculated by the following formula.

$$\text{Supplementary Rate} = \frac{\text{Amount of Under or Over Absorption of Overheads}}{\text{Actual Base}}$$

**b) Writing Off to Costing Profit and Loss A/c:**

This method is used where the amount of under or over absorption of overhead is not large or arises due to abnormal circumstances i.e. defective planning, idle capacity. Under absorbed overhead amount is debited to costing P & L A/c and over absorbed amount of overhead is credited to costing P & L A/c.

**c) Carry Forwarded to Next Accounting Period:**

Logically this method is not recommended as it is inconsistent with accounting standard. Amount of under absorption of overhead is transferred to debit side of Reserve A/c or Suspense A/c and amount of over absorption of overhead is credited to suspense A/c or Reserve A/c.

**6.5.3 Illustration**

Factory Overhead Cost of Four Production Department of ABC Ltd as are as follows .

Depts.	Overheads
	Rs
P	18,300
Q	4,300
R	4,000
S	1,900

**Overheads has been applied as under:**

- P - 15000 Machine hour @ Rs 1.50 per hour.
- Q - 3000 Labour Hours @ Rs1.30 per hour
- R - 80% of Direct Labour Cost of Rs6,000
- S - 950 Pieces @ Rs 2 per piece

Calculate department wise under or over absorbed overheads.

**Solution:**

Calculation of Overhead absorbed

P	- 14000 Hrs @ Rs1.50 per hour	= Rs21,000
Q	- 3000 Labour hours @ Rs1.30 per L. H.	= Rs 3,900
R	- 80% of Rs 6,000 = 6,000 x 80/100	= Rs 4,800
S	- 950 Pieces @ Rs 2 per Piece = 950 x 2	= Rs 1,900

Statement showing under over absorption of overheads.

Departments	Overheads Insured (Actual)	Absorbed Overhead	Absorption	
	Rs	Rs	Under Rs	Over Rs
P	18,300	21,000	-	2,700
Q	4,300	3,900	400	-
R	4,000	4,800	-	800
S	1,900	1,900	-	-

**6.6 EXERCISE**

- Calculate the machine hour rate, from the following particulars.
 

Cost of machine	- Rs 42,000
Estimated scrap value	- Rs 2,000
Estimated working life	-10 years Of 2,000 hours each
Running time for a 4 week period	-150 hours
Estimated repairs for life	- Rs 10,000
Standing charges allocated to this machine for a period-Rs 300	
Power consumed per hour	-5 units @ 10 paise per unit

**(Ans. :Rs 11.00)**
- Compute the machine hour rate from the following data .
 

Cost of machine	: Rs 1,00,000
Installation charges	: Rs 10,000
Estimated scrap value after the expiry of its life (15 years)	: Rs 5,000
Rent and rates for the shop per month:	Rs 200
General lighting for the shop per month	: Rs 300
Insurance premium for thr machine per annum	: Rs 960
Repairs and maintenance expenses per annum	: Rs 1,000
Power consumption – 10 units per hour	: -
Rate of power per 100 units	: 20
Estimated working hours per annum	: 2,200
(This includes non- setting up time of 200 hrs)	
Shop supervisor's salary per month	: Rs 600



The machine occupies  $\frac{1}{4}$ <sup>th</sup> of the total area of the shop. The supervisor is expected to devote  $\frac{1}{6}$ <sup>th</sup> of time for supervising the machine.

(Ans. :Rs 7.83 )

3. From the following data of a factory machine room, compute an hourly machine rate, assuming that machine room will work on 90% capacity throughout the year and that a breakdown of 10% is reasonable. There are three days holiday at Deepavali, 2 days at Holi and 2 days Christmas exclusive of holidays. The factory works 8 hours a day and 4 hours on Saturday. Number of Machines (each of the same type) – 40.

Expenses per annum	Rs
Power	3,12,000
Light	64,000
Salaries to foreman	1,20,000
Lubrication oil ( Assumed fixed)	6,600
Repairs to machine	1,44,600
Depreciation	78,560

( Delhi University 2006)

(Ans : 9.00)

**Working Notes:**

	Hrs
• Total hours ( 365 X 80 )	2,920
Less : Saturday only 4 weeks (52X 4 )	208
Sundays holiday (52x8)	416
Holidays on Deepavali, Holi and Christmas ( 3+2+2)	
56	
Total	680

Machine hours worked	
2,240	
Less : 10% breakdown ( Normal)	224

Effective Machine Hours per Machine  
2,016

- Total machine hours = Effective machine hours per machine X Number Of machines
- = 2,016 x 40 = 80,640 Hrs.

4. Compute the machine hour rate from the following details.

Particulars	Rs
Cost of machine	1,00,000
Installation charges	10,000
Scrap value of machine (10 yrs life )	5,000
Rent and taxes p.m.	2,000

General lighting for the shop p.m. 3,000  
 Insurance premium for shop per quarter 2,400  
 Repairs and maintenance p.m. 1,000  
 Power – 10 units per hour – rate per 100 units 20  
 Estimated working hours p.a. 2,000  
 Supervisor's salary p.m. 600  
 Machine occupies  $\frac{1}{4}$ <sup>th</sup> of the shop area and supervisor gives  $\frac{1}{5}$ <sup>th</sup> of his time for the looking after the machine.  
**(Ans Rs 29.15)**

5. The following information relates to the activities of a production of a factory for a period.

Direct material used Rs 3,000  
 Direct wages Rs 7,000  
 Direct labour worked 12,000 hours ( including 2,000 hours on machine)  
 Overcharged to the department Rs 5,000  
 For a particular order No. 1.2 carried out in the production department, the relevant data were ;  
 Direct material used Rs 1,000  
 Direct wages Rs 1,500  
 Direct labour worked 240 hours  
 Calculate the overhead chargeable to Order No. 102 by different cost rates.

**(Ans. Prime cost method- 50%, Direct labour rate Rs - 0.417 per hour, Direct labour cost method – 71.43%, Machine hour rate-Rs. 2.50 per hour )**

6. The factory overhead cost of four production department of a company engaged in executing job orders, for an accounting year, are as follows :-

Department	Rs
A.	19,800
B.	4,500
C.	4,000
D.	2,000

Overhead has been applied as under :-

- Dept. A Rs 3.00 per Machine Hour for 7,000 hours.
- Dept. B Rs 1.30 per Direct labour rate for 3,000 hours.
- Dept. C 70 % of Direct labour cost of Rs 7,000.
- Dept. D Rs 2/- per piece , for 950 pieces.

Find out the amount of department wise Under or Over absorbed factory overheads.

( Dept. A- Over- absorption Rs 1,200 ;

- “ B- Under- absorption Rs 600;
- “ C- Over- absorption Rs 900;
- “ D- Under absorption Rs 100)

## 7. Objective Questions:

### A) Multiple Choice Question:

1. Selling and distribution overheads are absorbed on the basis of
  - a) Rate per unit
  - b) Percentage on works cost
  - c) Percentage on selling cost
  - d) **Any of these**
2. Charging overheads to individual unit is known as
  - a) **Allocation**
  - b) Apportionment
  - c) Absorption
  - d) Collection
3. Assigning code numbers to a group of overheads is called as
  - a) Classification
  - b) **Codification**
  - c) Analysis
  - d) None of the above
4. Store keeping expenses are allocated on the basis of
  - a) No. of material requisitions
  - b) Area
  - c) Direct labour hours
  - d) **None of the above**
5. The process by which cost items are charged directly to a cost is called
  - a) Absorption
  - b) Apportionment
  - c) Allocation
  - d) Allotment
6. Insurance is apportioned on machine on the basis of
  - a) **Insured value of each machine**
  - b) Invoice price of each machine
  - c) Area
  - d) Cost of machine
7. Office overheads are recovered as a % of
  - a) Direct materials
  - b) Direct wages
  - c) Factory cost
  - d) None of the above
8. Labour rate is followed when most of the work is done by
  - a) **Labour**
  - b) Machine
  - c) Different group of machine
  - d) None of the machine
9. Which of the following is service department
  - a) Refining department
  - b) Machining department
  - c) Receiving department
  - d) Finishing department

10. When the amount of under or over absorption is significant, it should be disposed off by
  - a) **Transferring to costing profit and loss account**
  - b) The use of supplementary rates
  - c) Carrying over as a deferred charge to the next accounting year
  - d) Either of the three
11. Factory overheads should absorbed on the basis of
  - a) Relationship to cost incurred
  - b) Direct labour hour
  - c) Direct labour cost
  - d) Machine hours
12. When the amount of overhead absorbed is less than the amount of overhead incurred, it is called
  - a) **Under absorption of overhead**
  - b) Over absorption of overhead
  - c) Proper absorption of overhead
  - d) None of the above
13. What is the basis for distribution of indirect material cost to various department ?
  - a) Direct allocation
  - b) Cost of direct materials consumed
  - c) Machine hour worked
  - d) Either of the above

**B. Fill in the blanks :**

1. \_\_\_\_\_ rate is calculated by dividing the overhead by the aggregate of the productive hours of direct workers. (The labour hour rate)
2. \_\_\_\_\_ is the loss in value of asset due to its supervision at a date earlier than that foreseen. (Obsolescence)
3. When amount of Over/Under absorbed overheads is negligible, it is disposed of by Transferring it to \_\_\_\_\_ ( Costing Profit and Loss Account)
4. The process of grouping costs according to their common characteristics is called \_\_\_\_\_ ( Cost classification)
5. \_\_\_\_\_ means allotment of whole items of cost to cost centers or cost units.(Allocation)
6. Under /over absorption of overheads takes place when rate \_\_\_\_\_ rate of absorption is Used. ( predetermined )
7. The difference between actual and recovered overhead is termed as \_\_\_\_\_. ( under/over Absorbed overheads)
8. Cost which can be controlled is \_\_\_\_\_ cost. (controllable)

9. Repairs and maintenance is \_\_\_\_\_ expenses. ( Machine )
10. Machine hour rate is suitable when machine is a \_\_\_\_\_ factor of production. ( dominant)
11. Office overhead rate are recovered as a %age of \_\_\_\_\_ cost. ( factory cost)
12. Percentage of direct is suitable when direct \_\_\_\_\_ is major factor of production. ( Labour)
13. Production is suitable when output is \_\_\_\_\_.( uniform)
14. \_\_\_\_\_ cost is the aggregate of all kind of consideration paid payable fo9r the service rendered by an employee of an enterprise. (Employee cost)
15. \_\_\_\_\_ deals with principle and method of determining employee cost . ( Cost Accounting Standard-7)

**C) True or False :**

1. Cost of packing is production overheads.
2. Power cost is allocated over the department on the basis of H.P. of machine.
3. Employee welfare expenses are allocated on the basis of light points.
4. Supervisors salary is allocated on the basis of time spent.
5. Overheads includes indirect materials , labour and expenses.
6. Depreciation should be excluded from cost accounts.
7. Factory overhead includes all production costs other than direct materials and salaries.
8. Carriage inwards is not really an overheads at all, but is a direct cost.
9. The application o0f predetermined overheads rates is a reason for the difference in costing and financial profit .
10. Cash discount is completely excluded from the the cost.
11. Overhead absorption is the allotment of overhead to cost unit.
12. The use of actual overhead absorption rates results in delay in determining cost of products.
13. Direct labour cost method of absorption of factory overhead is suitable only in those departments where work is done by manual labour.
14. The principle base used for applying factory overhead are ; units of production , material cost, direct wages, direct labour hours and machine hours.

15. Administration overheads are usually absorbed as a %age of prime cost.
16. Time factor is ignored when the cost of material is used as the basic for absorption of overhead.
17. Predetermined rate of absorption of overhead helps in quick preparation of cost of estimates and quoting prices.
18. Machine hour rate is not suitable for absorption of overheads if the work is done mainly by the machine.
19. Departmentalization of overheads facilitates the control objective of cost accounting.
20. A blanket overhead rate is a single overhead rate computed for the entire factory.

( Ans. - True- 2,5,8,9,10,11,12,14,16,17,19,20  
False- 1,3,4,6,7,13,15,18)

D) a) Match the following

Column 'A'	Column 'B'
i) Rent	a) Percentage of sales
ii) Power	b) Capital value
iii) Depreciation	c) H.P. of machine
iv) Advertising	d) Employee expenses
v) CSA-7	e) Indirect labour
vi) Office salary	f) No. of light points
vii) Lighting and heating	g) Floor space area occupied by each machine
viii) Indirect material	h) Cost of catalogue
	i) Insurance

( Ans. i)-g, ii)- c, iii)-b, iv)-a, v) –d. vi)-e, vii)-f, viii)-h)

b) Match the following

Column 'A'	Column 'B'
1) Telephone charges	a) Semi-variable overheads
2) Compensation of workers	b) Cost of each machine insured
3) Stationery	c) Time spent on machine by workers
4) Repeated distribution method	d) On the basis of wages
5) Insurance	e) Indirect material
6) Supervision	f) Method of reapportionment of same dept. cost
7) Rent and rates	g) Floor area occupied
8) Repairs and maintenance	h) Machines hour
9) power	i) Meter reading
10) Depreciation	j) Sales of goods
	k) Useful life of assets
	l) Factory cost

(Ans. : 1)-a, 2)-c, 3)-e, 4)-f,5)-b, 6)-d, 7)-g, 8)- h, 9)-i, 10)- k

c) Match the following

Column 'A'	Column 'B'
1. Absorption	a. Cost Accounting Standard-3
2. Depreciation of machine	b. Cost Accounting Standard-13
3. Under absorption of overhead	c. No. of employee
4. Machine hour rate	d. Direct wages
5. Labour hour rate	e. Weight of material issued
6. Apportionment	f. Charging overheads to cost unit
7. Service cost centre	g. Machine expenses process
8. Personnel Department	h. Recovery of less overhead
9. ESI and P F contribution	i. Recovery of more overhead
10. Store Department	j. Machine intensive industry
	k. Labour intensive industry
	l. Light points

( Ans. :1-f, 2-g, 3-h, 4-i,5- k, 6-a,7-b, 8-c,9-d,10-e )



## CLASSIFICATION OF COSTS AND COST SHEET

### Unit Structure :

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Cost Classifications
- 7.3 Cost Sheet
- 7.4 Solved Problems
- 7.5 Summary
- 7.6 Exercises

---

### 7.0 OBJECTIVES

---

After studying the unit the students will be able to:

- Understand the concept of cost
- Classify the costs
- Understand the cost sheet
- Explain the elements of cost.
- Prepare the cost sheets.

---

### 7.1 INTRODUCTION

---

A manufacturing organisation converts raw materials into finished products. For the purpose, it employs labour and provides other facilities. While compiling production cost, amounts spent on all these facilities are required to be ascertained. Thus, cost ascertainment involves (a) collection and classification of costs according to cost elements (b) its allocation or apportionment to cost centres or units (c) choice of an appropriate method of costing and (d) selection of an appropriate costing technique. Costs are primarily classified into various elements for accounting and control.

---

### 7.2 COST CLASSIFICATIONS

---

Cost items are analysed or grouped according to their common characteristics which is some independent factor. There are many objectives of cost classifications depending on the



requirements of management. The different cost classifications are as follows:-

### **7.2.1 Cost Classification by Elements :**

The constituent elements of costs are broadly classified into three distinct elements i.e. materials, labour and expenses. These three elements of cost can be further grouped into direct and indirect categories. Direct materials refer to the cost of materials which are conveniently and economically traceable to specific units of output for example. Raw cotton in textiles, crude oil in making diesel. The indirect materials refer to materials that are needed for the completion of the product but whose consumption with regard to the product is either so small or so complex that it would not be appropriate to treat it as a direct material. For example, stationery lubricants, cotton waste etc.

### **7.2.2 Cost Classification by Function.**

A business organisation has to perform several functions such as Manufacturing, Administration, Selling and Distributing and Research and Development. Functional classification of cost implies that the business performs many functions for which costs are incurred. Expenses or Costs are usually classified by function and grouped under the headings of Manufacturing, Selling and Administrative costs in measuring net income.

Manufacturing costs are all check costs incurred to manufacture the products and to bring them to a saleable condition. This includes direct material, direct labour and indirect manufacturing costs or overheads. Administration costs are incurred for formulation of policy, directing the organisation and controlling the activities excluding the cost of research, development, production, selling and distribution. These costs include salary of executives, office, staff, office rent, stationery, postage etc. Selling costs, include the cost of creating and stimulating demand and getting customers. For example, advertisement, salary and commission to salesmen, packing. Distribution costs include the cost of warehouse, freight, cartage etc.

Research and Development costs are incurred in the process of finding out new ideas, new processes by experiments or other means of putting the results of such experiments on a commercial basis. Functional classification of cost is important because it provides an opportunity to the management to evaluate the efficiency of departments performing different functions in an organisation.

### 7.2.3 Cost Classification by variability:

Cost can be classified as (i) fixed (ii) variable and (iii) semi - fixed or semi variable in terms of their variability or changes in cost behaviour in relation to changes in output or activity or volume of production. Activity may be indicated in any form such as units of output, hours worked, sales, etc. The separation of costs into variable and fixed categories is the most difficult part of the costing operation. Certain costs are easily identifiable as variable or fixed while other costs can be segregated only after careful consideration of their nature and an examination of their behaviour.

**i) Fixed costs:**

Fixed cost is a cost which does not change in total for a given time period despite wide fluctuations in output or volume of activity. These costs must be met by the organisation irrespective of the volume level. These costs are also known as capacity costs, period costs or stand - by costs; for example, rent, property taxes, supervisor's salary, advertising, insurance etc.

**ii) Variable costs:**

Variable costs are those costs which vary directly and proportionately with the output. There is a constant ratio between the change in the cost and the change in the level of output. Direct materials and labour are the examples of variable costs. Thus, all these costs which tend to vary directly with variations in volume of output are variable costs. However, it must be remembered that variable costs remain the same or approximately the same in amount per unit of production regardless of increase or decrease in volume.

**iii) Semi variable or semi fixed costs:**

There is another group of costs in between the fixed and variable costs. It is semi variable or semi fixed costs. These costs vary in some degree with volume but not in direct proportion. Such costs are fixed only in relation to specified constant conditions. Semi fixed costs are those costs which remain constant upto a certain level of output after which they become variable. For example: maintenance of building, depreciation of plant, supervisor's salary, telephone expenses etc.

---

## 7.3 COST SHEET

---

Cost sheet is a statement prepared to present the detailed costs of total output during a period. It provides information relating to cost per unit at different stages of total cost of production. The preparation of cost sheet is one of the important and primary function of cost accounting. Cost sheet is not an account. There is

a prescribed form for preparation of cost sheet. A cost sheet is a statement of cost prepared for a given period of time in such a manner that it indicates various elements of cost as clearly as possible. The cost sheet is useful in ascertaining the total cost of production per unit, formulation of production plan, fixing up the selling price and to minimize the production cost. Sometimes standard cost data are provided to facilitate comparison with the actual cost increased. The preparation of the cost sheet requires understanding of the treatment of the following items:-

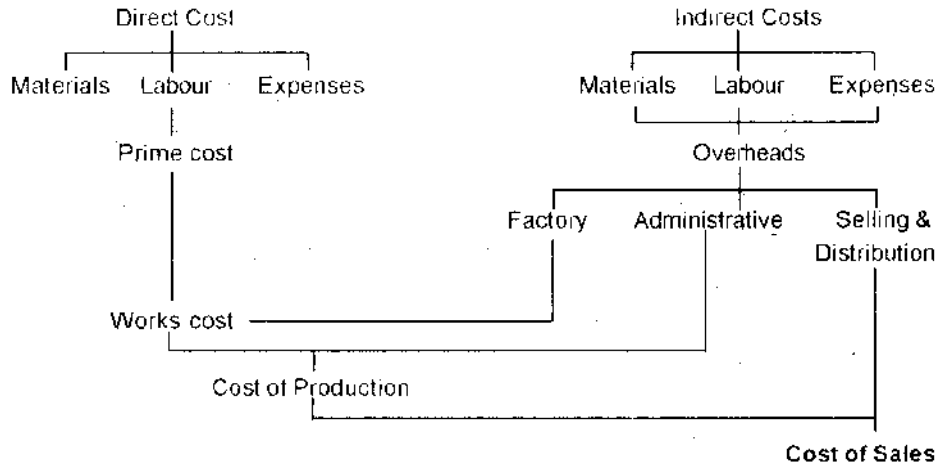
- a) **Stock of raw materials:** The opening and closing stock of raw materials are to be adjusted with purchase of Raw materials in order to determine the value of raw materials consumed for the output produced. Carriage/ Freight inward and Octroi on purchase etc. also to be added to purchases. This is a part of Prime Cost.
- b) **Stock of Work in Process –** The value of stock of work in process is a part of Factory cost and therefore, it should be adjusted with factory overheads. Sale of scrap should be deducted from the factory overheads in order to determine the total factory cost.
- c) **Stock of Finished goods :-** Finished goods covers the products on which factory work has been completed. It is the cost of completed production. The opening and closing values of finished goods are to be adjusted with the total cost of production in order to arrive at cost of sales.

### 7.3.3 Expenses excluded from cost sheet:

There are certain expenses /costs which do not form a part of cost sheet. Some of these expenses are an apportionment of profit. Examples of these expenses are -

- i) Dividend to shareholders
- ii) Income Tax
- iii) Interest on loan
- iv) Donations paid
- v) Capital expenditure
- vi) Capital loss on sale of assets.
- vii) Commission to Partners / Managing Director
- viii) Discount on issue of shares/ debentures
- ix) Underwriting commission.
- x) Writing of goodwill/ bad debts
- xi) Provision for Taxation, Bad Debts or any kind of Fund or reserves.

**Break up of cost sheet**



**7.3.4 Specimen of cost sheet.**

The specimen form of a cost sheet is given below:

Cost sheet for the period .....  
(Production ... Units )

Particulars	Total Cost Rs.	Cost Per Unit Rs.
<b>Direct Materials</b>		
Raw Materials		
Opening stock Materials :		
Add : Purchases .....		
Add : Carriage / Freight Inward _____		
Less : Closing stock _____		
Cost of materials consumed		
Direct Labour		
Direct Expenses		
<b>Prime cost</b>	_____	_____
Factory overheads		
Add: Work in Progress (Opening )		
Less : Work in Progress (Closing )		
<b>Works /Factory cost</b>		
Office and administrative expenses		
Cost of Production (of goods produced)		
Add: Op. Stock of finished goods		
Less closing of finished goods		
cost of production (of goods sold)		

Selling & Distribution expenses		
<b>Cost of Sales</b>		
Add. Profit (Loss)		
Sales		

### 7.3.5 Elements of Total Cost

Costs are classified under different heads which represent the successive stages through which the cost flow.

#### i) **Prime Cost**

Prime cost is the basic cost of any product. It comprises of those expenses which could be traced directly to it. The prime **cost** consists of cost of direct materials, direct labour and direct expenses. Direct expenses include special expenses which can be identified with product or job and are charged directly to the product as part of the prime cost. For example cost of hiring special plant or machinery, cost of special moulds, design or patterns, Architect's fees, Royalties, License fees etc.

#### ii) **Work cost:**

Works cost of a Product consists of prime cost plus the portion of works or factory expenses chargeable against the Production. Works or factory expenses include, indirect materials indirect labour and indirect expenses. Indirect materials refer to those materials that are needed for the completion of the product but the consumption of these materials is either so small or complex that it would not be appropriate to treat it as direct materials. These are supplies that cannot be conveniently and economically charged to a specific unit of output. For example, lubricants, cotton waste, works stationery etc.

Indirect labour is that labour which does not affect the construction or the composition of the finished product. This is the labour cost of production related activities that cannot be associated with or conveniently traced to specific product through physical observation. For example, Foremen's salary and salary of employees engaged in maintenance or service work. Indirect expenses covers all expenditure incurred by the manufacturer from the time of production to its completion as delivery to customer by way of rate of product. Any cannot be allocate but which can be apportioned to or absorbed by the cost cehtres cost units are known as indirect expenses. These expenses are incurred for the benefit of more than one product, job or activity and, therefore, must be apportioned by appropriate bases to the various functions or products. For example, lighting and heating, maintenance factory manager's salary, watch and ward department's salary etc.

**(ii) Cost of Production :**

Cost of Production consists of works cost plus an additional amount of office and administrative expenses. It includes all expenses connected with the managerial functions such as planning, organizing, directing, coordinating and controlling the operations of the manufacturing business. For example, office rent, salary, lighting, stationery, repairs and maintenance and depreciation of office building, audit fees, legal expenses.

**iv) Cost of Sales:**

Cost of sales consists of cost of production plus proportionate selling and distribution expenses of the product. Selling expenses include the expenses incurred for creating demand for the product such as advertisement, salaries of salesmen, selling expenses and show room expenses. Distribution expenses are those expenses incurred in connection with the delivery of goods to the customers such as packing, carriage outwards, warehouse expenses.

---

## **7.4 SOLVED PROBLEMS**

---

**Illustration -1**

Bombay Manufacturing company submits the following information on 31-3-2010

<b>Particulars</b>	<b>Rupees</b>
Sales for the year	2,75,000
Inventories at the beginning of the year-	
- Raw Materials	3,000
- Work in Progress	4,000
- Finished Goods	1,10,000
Purchase of materials	65,000
Direct Labour	6,000
Inventories at the end of the year -	
- Raw	Materials
4,000	
- Work in Progress	6,000
- Finished Goods	8,000
Other expenses for the year –	
Selling expenses	27,500
Administrative expenses	13,000
Factory overheads	40,000
Prepare Statement of cost	

**Solution :**

**Bombay Manufacturing Company**  
**Statement of cost for the year ended 31-3-2010**

	Rs.	Rs.
Materials consumed		
Opening stock:	3,000	
+ Purchases	110000	
	113000	
- Closing stock	4000	
		109000
Direct Labour		65000
Direct Expenses		6000
		180000
<b>Prime cost</b>		
Factory overheads	40000	
+ Work in Progress (beginning )	4000	
	44000	
- Work in Progress (Closing )	6000	
		38000
Works cost		2,18,000
Administrative expenses		13,000
Cost of Production		2,31,000
+ Opening Stock of finished goods		7,000
		2,30,000
- Closing Stock of finished goods		8,000
		2,30,000
Selling & Distribution expenses		27,500
cost a sales		2,57,500
Profit (Bal. Fig)		17,500
Sales		2,75,000

**Illustration -2**

From the following information prepare a statement showing (i) Prime cost (ii) Works cost (iii) Cost of Production (iv) Cost of Sales (v) Net profit of X Ltd. which produced and sold 1000 units in June 2009.

	Rs.
<b>Opening Stock:</b>	
Raw Materials	24,000
Finished goods	16,000
<b>Closing stock:</b>	
Raw Materials	20,000
Finished goods	15,000
Purchase of Raw Materials	80,000
Sales	2,00,000
Direct Wages	35,000
Factory Wages	2,000

Carriage Inward	2,000
Carriage Outward	1,000
Factory Expenses	4,000
Office Salaries	15,000
Office Expenses	12,000
Factory Rent & Rates	2,500
Depreciation - Machinery	2,500
Bad Debts	1,500

**Solution**

**Ltd.**  
**Cost Statement for June, 2009**

Particulars	Rs.	Total Cost Rs.	Cost per Unit Rs.
Opening stock of materials	24,000		
Add: Purchase of materials	<u>80,000</u>		
Add: Carriage Inward	<u>2,000</u>		
	1,06,000		
Less: Closing stock of materials	<u>20,000</u>		
Cost of Materials consumed		86,000	86.00
Direct Wages		35,000	35.00
(i) PRIME COST		<u>121,000</u>	<u>121.00</u>
<b>Factory overheads :</b>			
Factory Wages	2,000		
Factory expenses	4,000		
Factory Rent & Rates	2,500		
Depreciation	<u>2,500</u>		
		<u>11,000</u>	<u>11.00</u>
(II) WORKS COST		<u>1,32,000</u>	<u>132.00</u>
<b>Administrative Overheads :</b>			
Office Salaries	15,000		
Office Expenses	12,000	27,000	27.00
(iii) COST OF PRODUCTION		<u>1,59,000</u>	<u>159.00</u>
<b>Selling &amp; Distribution Overheads :</b>			
Carriage Outward	1,000		
Bad Debts	<u>1,500</u>		
		<u>2,500</u>	<u>2.50</u>
<b>TOTAL COST</b>		<u>1,61,500</u>	<u>161.50</u>
Add: Opening Stock of finished goods		<u>16,000</u>	
		1,77,500	
Less: Closing Stock of finished goods		<u>15,000</u>	
(iv) Cost of Sales		<u>1,62,500</u>	<u>162.50</u>



(v) Net Profit (Bal.Fig)	37,500	37.50
Sales	2,00,000	200.00

**Illustration – 3**

NRC Ltd., manufactured and sold 1000 Radio sets during the year 2009. The summarized accounts are given below :

<b>Mfg. / Trading &amp; Profit &amp; Loss A/c</b>			
	Rs.		Rs.
To Cost of Materials	40,000	By Sales	2,00,000
To Direct Wages	60,000		
To Manufacturing Exp.	25,000		
To Gross Profit	75,000		
	2,00,000		2,00,000
To Salaries	30,000	By Gross Profit	75,000
To Rent, Rates & Taxes	5,000		
To General Expenses	10,000		
To Selling & Distribution Exp.	15,000		
To Net Profit	15,000		
	75,000		75,000

It is estimated that output and sales will be 1200 Radio Sets in the year 2010. Prices of Materials will rise by 20% on the previous year's level. Wages per unit will rise by 5% Manufacturing expenses will rise in proportion to the combined cost of materials and wages. Selling and distribution expenses per unit will remain unchanged. Other expenses will remain unaffected by the rise in output. Prepare cost sheet showing the price at which the Radio Sets should be sold so as to earn a profit of 20% on the selling price.

**Solution****COST SHEET**

	2009 1000 Radios		2010 1200 Radios	
	Total Rs.	Per Unit Rs.	Total Rs.	Per Unit Rs.
Direct Materials	40,000	40.00	57,600	48.00
Direct Wages	60,000	60.00	75,600	63.00
<b>PRIME COST</b>	<b>1,00,000</b>	<b>100.00</b>	<b>1,33,200</b>	<b>111.00</b>
Manufacturing Expenses	25,000	25.00	33,300	28.00
<b>WORKS COST</b>	<b>1,25,000</b>	<b>125.00</b>	<b>1,66,500</b>	<b>139.00</b>
Salaries	30,000	30.00	30,000	25.00
Rent, Rates Insurance	5,000	5.00	5,000	4.00
General Expenses	10,000	10.00	10,000	8.00
<b>COST OF PRODUCTION</b>	<b>1,70,000</b>	<b>170.00</b>	<b>2,11,500</b>	<b>176.00</b>
Selling & Distribution Expenses	15,000	15.00	18,000	15.00
Cost of Sales	1,85,000	185.00	2,29,500	191.00
Net Profit	15,000	15.00	57,275	48.00
<b>SALES</b>	<b>2,00,000</b>	<b>200.00</b>	<b>2,86,775</b>	<b>239.00</b>

**Illustration – 4.:**

A factory can produce 60,000 units per year at its 100% capacity. The estimated cost of production are as under:-

Direct Material - Rs. 3 per unit  
Direct Labour - Rs. 2 per unit

Indirect Expenses :

Fixed - Rs. 1,50,000 per year  
Variable - Rs. 5 per unit  
Semi-variable - Rs.50,000 per year upto 50% capacity and an extra expenses of Rs.10,000 for every 25% Increase in capacity or part thereof.

The factory produces only against order and not for stock. If the Production programme of the factory is as indicated below and the management desires to ensure a Profit of Rs. 1,00,000 for the

year, work out the average selling price at which per unit should be quoted:

First 3 months of the year 50% of capacity remaining 9 months 80% of the capacity. Ignore selling, distribution and administration overheads.

**Solution :**

Particular	First 3 months (7500 Units) Rs.	9 Months (3600 Units) Rs.	Total Rs.
Direct Material	22500	108000	130500
Direct Labour	15000	72000	87000
	37500	1,80,000	2,17,500
<b>Add : Indirect Expenses:</b>			
Fixed 1: 3)	37500	112500	150000
Variable @Rs.5 b.u.	37500	180000	217500
<b>Semi -variable</b>			
For 3 months	12500	—	—
@Rs.50,000 p.a.			
For 9 months			
@Rs.70,000 p.a.	—	525000	65000
	125000	525000	650000
Total Cost			
Profit	—	-	100000
			750000
Sales			

**Illustration -5**

The following figures have been taken from the books of M Ltd. as on 31.12.2009

Stock of Raw Materials on 1.1.2009	Rs.	35,000
Stock of Raw Materials on 31.12.2009	Rs.	5,000
Purchase of Materials	Rs.	50,000
Factory Wages	Rs.	45,000
Factory Expenses	Rs.	17,500
Establishment Expenses	Rs.	10,000
Finished Stock on 1.1.2009	Rs.	15,000
Finished stock on 31.12.2009	Rs.	7,500
Sales	Rs.	2,00,000

The Company manufactured 4000 units during the year 2009. The company is required to quote for the price for supply of 1000 units during the year 2010. The cost of material will increase

by 15% and factory labour will cost more by 10% in the year 2010 Prepare a statement showing the price to be quoted to give the same percentage of net profit on sales and was realized during 2009.

a) **Cost Sheet for the year 2009**

		Rs.	Rs.
Opening Stock of Materials :	35,000		
+ Purchases . . . .	50,000		
	85,000		
- Closing stock of Materials	5,000		
<b>Materials Consumed</b>		80,000	20.00
Factory Wages		45,000	11.25
<b>Prime Cost</b>		1,25,000	31.25
Factory Expenses		17,500	4.37
<b>Works Cost</b>		1,42,500	35.62
Establishment Expenses		10,000	2.50
<b>Cost of Production</b>		1,52,500	38.12
Add : Opening Stock of finished goods	15,000		
		1,67,500	
Less : Closing stock of finished goods	7,500		
<b>Cost of Sales</b>		1,60,000	
Profit		40,000	
Sales		2,00,000	

b) **Statement showing quotation Price for 1000 units**

		Rs.
Materials (20 x 1000) =	20,000	
+ 15% increase	3,000	23,000
Factory wages (11.25 x 1000)=	11,250	
10% increase	1,125	12,375
<b>Prime Cost</b>		35,375
Factory Expenses (4.375 x 1000)		4,375
<b>Works Cost</b>		39,750
Establishment Expenses (2.50 x 1000)		2,500
<b>Total Cost</b>		42,250
Profit (20% on Sale i.e., 25% of Cost)		10,563
Sales		52,813

**Note :** Percentage of Profit on sales earned during the year 2002 is 20%

$$= \frac{4000}{2000} \times 100 = 20\%$$

**Illustration – 6.**

In a factory two types of T.V sets are manufactured i.e black & white + colour. From the following particulars prepare a statement showing cost and profit per T.V Set sold. There is no opening or closing stock.

	B Colour Rs.	& W	Rs.
Materials	273000	10,80,000	
Labour	156000	6,20,000	

Works overhead is charged at 60% of Prime cost and Office overhead is taken at 20% at Works cost. The selling price of B & W is Rs.60,00 and that of colour is 10000. During the period 200 B & W and 400 colour T.V. sets were sold. The selling expenses are Rs. 50 per T.V.Set.

**Solution****B) Statement of Cost and Profit**

Particulars	B & W	Colour	
	Rs.	Rs.	Per Unit
Materials	273000	10,80,000	2700
Labour	156000	6,20,000	1550
Prime Cost	429000	17,00,000	4250
Add : Work Overheads (60% of Prime Cost )	257400	10,20,000	2550
Works Cost	686400	27,20,000	6800
Add : Office overheads (20% of Works cost)	137280	5,44,000	1360
Cost of Production	823680	32,64,000	8160
Add : Selling Expenses	10000	20,000	50
Cost of Sales	833680	32,84,000	8210
Profit (Bal. Fig)	366320	7,16,000	1790
Sales	1,20,000	40,00,000	10,000

---

## 7.5 SUMMARY

---

Cost is a resource sacrificed or forgone to achieve a specific objective. It is a monetary amount that is paid to acquire goods or services. Costing is the process of determining the cost of doing something. Cost is composed of three elements - materials, labour and expenses or overheads. Each of these costs can be further classified as (a) Direct (b) Indirect. Cost can also be classified on the basis of function, variability and elements. Cost sheet is a statement prepared to present the detailed cost of total output during a period. It provides information relating to cost per unit at different stages of the total cost of production. There are certain expenses which are not considered while preparing the cost sheet, such as Dividend, Income tax, Interest on loan, Donation paid, Capital expenditure, Writing off goodwill and Provisions. Prime Cost, Work Cost, Cost of Production and Cost of sales are the different elements of costs.

---

## 7.6 EXERCISES:

---

1. What is cost? What are the different elements of costs?
2. Explain the significance of each of the following cost classifications:
  - a) Direct and indirect costs
  - b) Variable and fixed costs
  - c) Controllable and uncontrollable costs
3. What are the items of expenses which are excluded from cost sheet? Why?
4. Fill in the blanks:
  - a) -----comprises of those expenses which could be traced directly to the particular product. (Prime Cost)
  - b) Cost of hiring special plant or machinery is a ----- expenses. (Direct)
  - c) Architect's fees, Royalties, License fees etc. are the part of -----cost. (Prime)
  - d) The opening and closing stock of raw materials are to be adjusted with ----- . (purchase of Raw materials)
  - e) Carriage/ Freight inward and Octroi on purchase etc. are to be added to (purchases of raw materials).
  - f) The value of stock of work in process is a part of ----- . (Factory cost)
  - g) Sale of scrap should be deducted from the total ----- (factory overheads)

- h) The opening and closing values of finished goods are to be adjusted with the ----- . (total cost of production).
- i) Prime cost plus the portion of works or factory expenses chargeable against the Production is equal to ----- . (Works Cost)
- j) Indirect materials indirect labour and indirect expenses are called as ----- . (Works or factory expenses include)
- k) Lubricants, cotton waste, works stationery etc. are the examples of ----- . ( Indirect materials)
- l) -----labour does not affect the construction or the composition of the finished product. (Indirect).
- m) Foremen's salary and salary of employees engaged in maintenance or service work etc. are examples of ----- labour. (indirect).
- n) The expenses incurred for the benefit of more than one product, job or activity are called as -----expenses. (Indirect overheads).
- o) Factory manager's salary, watch and ward department's salary etc. are the examples of ----- . (Indirect expenses)
- p) Cost of Production consists of works cost plus an additional amount of ----- . (office and administrative expenses)
- q) Cost of production plus proportionate selling and distribution expenses of the product is equal to ----- . (Cost of sales)
- r) Salesmen's salary, show room expenses etc. are the ----- expenses.(Selling)
- s) Packing, carriage outwards, warehouse expenses etc. are -- ---expenses. (Distribution)
5. The following information is supplied relating to an output for the year ended 31.12.2009.

<b>Particulars</b>	<b>Rupees</b>
Purchase of Raw materials	148000
Direct wages	132000
Rent & Rates	14000
Carriages inward	6000
<b>Stock on 1-1-2009</b>	
Raw materials	22000
Work in progress	18000
Finished goods	30000

**Stock on 31.12.2009**

Raw materials	24000
Work in progress	35000
Finished goods	25000
Factory expenses	18000
Sales	420000

Selling and distribution costs amounted to 75 paise per unit sold. 25000 units were produced during the year. You are required to prepare cost sheet showing break –up of costs, total net profit and net profit per unit sold.

5. A factory produces a standard product. The following information is given to you from which you are required to prepare a cost sheet for January, 2009.

Direct materials consumed	Rs. 90,000
Direct Wages	Rs. 30,000
Other direct expenses	Rs. 10,000
Factory overheads – 80% of direct wages	
Office overheads – 10% of work cost	
Selling and distribution expenses	Rs. 2 per unit sold.

Units produced and sold during the month 10000. Find out the selling price per unit on the basis that Profit mark up is uniformly made to yield a profit of 20% of the selling price. There was no stock of work in progress at the beginning or at the end of the period.

6. A toy manufacturer earns an average net profit of Rs.3 per piece on a selling price of Rs.15 by producing and selling 60,000 pieces at 60 percent of the potential capacity. The composition of the cost of sales is :

Direct Materials	Rs. 4
Direct wages	Rs. 1
Work overhead	Rs. 6 (50 per cent fixed)
Sales Overhead	Rs. 1 (25 percent variable)

During the current year, he intends to produce the same number of pieces, but anticipates that-

- Fixed expenses will go up by 10 per cent.
- Direct labour will increase by 20 percent.
- Direct material cost will increase by 5 percent.
- Selling price will remain the same.



He obtains an order for a further 20 per cent of his capacity. What minimum price will you recommend for accepting an order to ensure the manufacturer an overall profit of Rs.183500?

7. The following particulars are extracted from the works and other relevant source in respect of a Ltd. Company?
- a) Estimated material cost of the job is Rs.25000 and the direct labour cost is likely to be Rs.5000
  - b) It will require machining by a German machine for 20 hours and a Japanese machine for 6 hours.
  - c) The machine hour rates for the German and Japanese machines are Rs.100 and Rs.150 respectively.
  - d) The direct wages in all other shops during the last year amounted to Rs.800000 as against Rs. 180000 of factory overhead.
  - e) The factory cost of all other jobs amounted to Rs.375000 as against Rs.375000 of office expenses.

You are required to make a quotation with 20 per cent profit on selling price.



## RECONCILIATION OF COST AND FINANCIAL ACCOUNTS

### Unit Structure :

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Need for Reconciliation
- 8.3 Procedure for Reconciliation
- 8.4 Solved Problems
- 8.5 Exercises

---

### 8.0 OBJECTIVES:

---

After studying the unit the students will be able to:

- Ascertain the difference between Profit as shown by Financial Profit and Loss Account and Profit appearing in Costing Profit & Loss Account.
- Identify and quantify the cost components, which contribute to the difference in profit figures.
- Prepare a statement reconciling the two profit figures reported by financial and cost records.

---

### 8.1 INTRODUCTION

---

It is normally assumed that the profit of a business for a given period is given by the Profit & Loss account made out for that period.

Imagine your surprise, when Profit and Loss Account prepared by the financial accountant of X Ltd. shows a profit of Rs.4,56,000 for the year ended 31.03.2009. While the cost accountant has prepared a cost sheet for the same period and arrived at a profit of Rs.5, 12,000. You feel that one of the figures reported should be wrong, otherwise how could there be a difference.

However, there is a logical explanation for the difference in the profit figures and both may be right.

This is because the fundamental assumptions made by the two accountants for preparing the profit and loss account vary. For example, Interest on loan will be debited in financial Profit & Loss Account but the cost accountant will ignore this item as he does not consider this interest expense as an item of cost. Naturally, in this case, the cost accountant will report a higher profit than the financial account.

---

## **8.2 NEED FOR RECONCILIATION**

---

### **8.2.1 Need for Reconciliation**

The need for reconciliation arises due to the following reasons:

- a) To ensure that no income or expenditure item has been omitted and that there is no under or over recovery of overheads.
- b) To check the arithmetical accuracy, as well as for the determination of reason for disagreement between the two results.
- c) To know the reason for variation of profit or loss as internal control.
- d) To take administrative decisions such as depreciation, stock valuation and direct expenses.
- e) To test the reliability of cost accounts.

### **8.2.2 REASONS FOR DISAGREEMENT BETWEEN COST AND FINANCIAL RESULT:-**

It is very essential to know the causes, which generally give rise to disagreement between Cost and Financial Accounts. These are briefly summarised below:-

#### **1. Expenses that are not taken into account in cost accounting:**

The under mentioned expenses are usually not included in overheads or, for that matter in cost.

- a) Expenses or income of purely financial nature like dividends received, rent received, cash discount allowed, etc.
- b) Expenses or profits of capital nature like profit or loss on sale of investments, plant and equipment, etc.

- c) Items not representing actual costs but dependent on arbitrary decisions of management e.g. an unreasonably high salary to the managing director, providing for depreciation at a rate exceeding the economic rate.
- d) Appropriation of profits for dividends, payment of income tax and transfer to reserves.

**2. Items recorded in financial books only and not in cost books:**

- a) Interest received/ paid on Debentures,
- b) Interest received and paid on Investment and Bank loan or overdraft respectively.
- c) Interest charged/ paid to debtors /creditors
- d) Discount allowed/ received.
- e) Provision for discount on debtors/ creditors
- f) Bad Debts written off/ bad debts recovered.
- g) Discount on issue of shares and debentures.
- h) Income tax paid /refund
- i) Penalty and fines paid / received
- j) Rent received/ paid
- k) Loss by fire, natural calamities or theft /damage recovered.
- l) Loss/ profit on sale of fixed assets, investment
- m) Cost of share transfer /share transfer fees received.
- n) Donation given/received
- o) Deferred revenue expenses written off.  
Such as writing off of:
  - i. Preliminary Expenses
  - ii. Discount on Shares/ Debentures

**3. Items recorded in cost book only and not in financial books:**

- a) Notional rent charges of owned premises
- b) Salary of proprietor
- c) Interest on proprietors fund

**4. Items recorded in both books with different amounts:**

In Cost book and Financial book some item of expenses and incomes which are treated differently such as -

**a) Method of charging depreciation:**

In Financial Books depreciation may have been provided, on Straight Line Method or Written down Value Method whereas in Costing Book depreciation may have been charged on the basis of Machine Hour Rate Method. Amounts of depreciation charge in both books are bound to be different.

**b) Under and Over recovered expenses:**

The expenses in costing books are recorded on the basis of pre-determined rates but in financial books they are recorded on actual basis hence the amount recorded in these two set of books differ.

**c) Method of Valuing Stocks:-**

It is well known that in Cost Book Stocks are only valued at cost. But in Financial Books stock are valued either at cost or market price, whichever is lower.

---

**8.3 PROCEDURE FOR RECONCILIATION**

---

**8.3.1 Procedure**

When there is a difference between the profit/loss shown by cost accounts and financial accounts the procedure for reconciliation is similar to that of Bank Reconciliation Statement. For reconciliation following steps should be considered.

1. Prepare a cost sheet for a particular period and find out costing profit or loss if it is not given.
2. If financial profit or loss is not given then find out the same by preparing Trading and Profit and loss account for a period which corresponds to the cost sheet.
3. Ascertain items which are shown in financial account and not in cost account.
4. Ascertain items which are shown in cost account only.
5. Calculate difference between expenses recorded in financial books and the amount of expenses recorded in cost accounts.
6. Reconciliation Statement is to be prepared as on a particular date. Hence one can start with the figure of profit / loss as per cost account and arrive at the figure of profit/ loss as per financial accounts or vice –versa.

[Entries which are at variance with each other will appear in Reconciliation Statement and also entries appearing in only one set of book (non - common items)]

### 8.3.2 PROFORMA STATEMENT OF RECONCILIATION

1. Starting with financial profit:

Statement of Reconciliation

Between Financial Profit and Cost Profit for the Year ended.....

Particulars	Rs	Rs
<b>Financial Profit (as per the financial books)</b>		xxx
<b>Add</b>		
1. Expenses, losses and appropriation debited in financial books only	xxx	
2. Closing stock under valued in Financial Books	xxx xxx	
3. Opening Stock over valued in Financial books	xxx xxx	
4. Excess depreciation charged in Financial Books	xxx	xxx
5. Expenses under recovered in Cost Books		
6. Income credited only in Cost Books	xxx xxx xxx	
<b>Less</b>		
1. Income credited only in Financial Books	xxx	
2. Closing stock over valued in Financial Books	xxx	xxx
3. Opening Stock under valued in Financial books		xxx
4. Short depreciation charged in Financial Books		xxx
5. Expenses over recovered in Cost Books		
<b>Costing Profit (as per Costing books)</b>		

2. Starting with Costing Profit:

Statement of Reconciliation

Between Financial Profit and Cost Profit For the Year ended.....

Particulars	Rs	Rs
<b>Costing Profit (as per the Costing books)</b>		xxx
<b>Add</b>		
1. Income credited only in Financial Books	xxx	
2. Closing stock over valued in Financial Books	xxx xxx	
3. Opening Stock under valued in Financial Books	xxx xxx	
4. Short depreciation charged in Financial Books	xxx	xxx
5. Expenses over recovered in Cost Books		xxx
6. Expenses debited only in Cost Books	xxx	

<b>Less</b>	xxx	
1. Expenses, losses and appropriation debited in financial books only	xxx	
2. Closing stock under valued in Financial Books	xxx	xxx
3. Opening Stock over valued in Financial Books	xxx	xxx
4. Excess depreciation charged in Financial Books		
5. Expenses under recovered in Cost Books		
6. Income credited only in Cost Books		
<b>Financial Profit (as per the financial books )</b>		

## 8.4 SOLVED PROBLEMS

**Illustration 1:** From the following particulars prepare a reconciliation statement:-

	<b>Rs.</b>
Net Profit as per financial records	154506
Net Profit as per costing records	206880
Works overheads under recovered in costing	3744
Administrative Overheads recovered in excess in costing	2040
Depreciation charged in financial accounts	13440
Depreciation recovered in Cost Accounts	15000
Interest received but not included in Cost Accounting	9600
Obsolescence loss charged in financial records	6840
Income tax provided in financial books	48360
Bank interest credited in financial books	900
Stores adjustment credited in financial books	570
Depreciation of stock charged in financial books	8100

**Solution**

<b>RECONCILIATION STATEMENT</b>		<b>Rs.</b>	<b>Rs.</b>
Net Profit as per costing records			206880
Add:			
1. Administrative Overheads over absorbed		2040	
2. Depreciation excess charged		1560	
3. Income not credited in costing -			
Interest received	15000		
Bank interest	900		
Stores adjustment	570	16470	
			20070
Total			226950
Less		3744	
1. Works overheads under recovered			
2. Expenses not charged in costing books	9600		
3. Income tax provided in Financial Book	48360		
4. Depreciation of Stock charged in Financial Book	8100	66060	69804
Net Profit as per financial books			157146

**Illustration 2** : Following is the Trading and Profit and loss account of a factory producing a particular unit of a product of which the actual output is 100000 units.

**Trading & Profit and Loss A/c for the year ended 31/12/09**

	<b>Rs</b>		<b>Rs.</b>
To Material	200000	By Sales	400000
To Wages	100000		
To Works Exp.	60000		
To Office rent	18000		
To Selling & Dist. Exit	12000		
To Net Profit	10000		
	400000		400000

The normal output of the factory is 1,50,000 units. Works expenses are fixed to the extent of Rs.36,000. Office expenses for all practical purposes are constant, Selling and distribution expenses are variable to the extent of Rs.6000/- Prepare a cost sheet and reconciliation statement.



**Solution :****(a) COST SHEET**

Actual output 1,00,000 units    Normal output 1,50,000 units

	Per Unit (Rs.)	Total (Rs.)
Material	2.00	2,00,000
Wages	1.00	1,00,000
	-----	-----
PRIME COST	3.00	3,00,000
Works expenses		
Fixed (2/3 of 36000) = 24000		
Variable = 24000	0.48	48,000
	-----	-----
WORKS COST	3.48	348000
*Actual output/ Normal output = 2/3 Proportionate fixed cost are considered Office Expenses (2/3 * 36000)	0.12	12,000
	-----	-----
COST OF PRODUCTION	3.60	3,60,000
Selling and Distribution Expenses		
Fixed (2/3) = 4000		
Variable = 6000	0.1	10,000
	-----	-----
COST OF SALES	3.7	3,70,000
Profit	0.3	30,000
	-----	-----
Sales	4.00	4,00,000
	-----	-----

**b) Reconciliation Statement**

Profit shown by Cost Accounts		30,000
Less :		
1. Under recovery of Work Expenses	12000	
2. Under recovery of Office Expenses	6000	
3. Under recovery of Selling Expenses	2000	20000
	-----	-----
Profits shown by Financial Accounts		10,000
	-----	-----

**Illustration 3 :** The Trading & Profit & Loss account of 'A' Ltd. is as follows:-

**Trading & Profit & Loss Account**

To Purchases	25120	By Sales (50000 units @ of Rs Rs.1.50 each)	75000
Less : Closing Stock	4050		
To Gross Profit	53870		
	-----		-----
To Net Profit	75000		75000
To Direct Wages	10500		
To Works Expenses	12130	By Gross Profit	43870
To Selling Expenses	7100	By Discount received	260
To Administrative Expenses	5340	By Profit on sale of land	2340
To Depreciation	1100		
To Net Profit	20300		
	-----		-----
	56470		56470

The profit as per cost accounts was only Rs.19,770. Reconcile the financial and costing profits using the following information :

- Cost accounts valued closing stock at Rs. 4280
- The work expenses in the cost accounts were taken at 100% of direct wages.
- Selling & administration expenses were charged in the cost accounts at 10% of sales and 0.10 per unit respectively.
- Depreciation in the cost accounts was Rs.800

**Solution :**

RECONCILIATION STATEMENT	Rs.	Rs.
Profit as per Cost Accounts		19770
Add: 1. Over absorption of selling expenses	400	
2. Discount received	260	
3. Profit on sale of land	2340	3000
	-----	-----
Less 1. Difference in valuation of closing		22770
2. Under absorption of Administrative Exp.	200	
3. Under absorption of Works Exps.	340	
4. Depreciation under changed	1630	
Profit as per Financial Accounts	300	2470
	-----	-----
		20300

**Illustration 4 :** From the following Profit & loss account draw up a Memorandum Reconciliation account showing the Profit as per Cost Accounts:-

To Office Salaries	11282	By Gross Profit	54648
To Office Expenses	6514	By Dividend received	400
To Salary to Salesmen	4922	By Interest on Bank FD	150
To Sales Expenses	9304		
To Distribution Exp.	2990		
To Loss on Sale of Machinery	1950		
To Fines	200		
To Discount	100		
To Net Profit c/d	17936		
To Income Tax	55198		55198
To Transfer to Reserves	8000	By Net Profit b/d	17936
To Dividend	1000		
To Balance c/d	4800		
	4136		
	17936		17936

The cost accountant has ascertained a Profit of Rs.19636 as per his books.

**Solution :**

Memorandum Reconciliation Account :

Dr	Rs	Cr.	Rs.
To Expenses not debited to Cost accounts:		By Profit as per cost account	19636
Fines	200		
Discount	100	By Income not credited in Cost accounts:	400
Loss on sale of Care	1950	Dividend Received	150
Income Tax	8000	Interest on Bank FD	
Tr. to Reserves	1000		
Dividend	4800		
To Net Profit c/d	4136		
	20186		20186

**Illustration : 5**

M/s ESVEE Ltd. has furnished you the following information from the financial books for the year ended 31<sup>st</sup> December, 2009.

<b>Particulars</b>	<b>Rs.</b>
Materials consumed	260000
Wages	150000
Factory overheads	94750
Administration Overheads	106000
Selling and Distribution overheads	55000
Bad Debts	4000
Preliminary expenses	5000
Opening Stock (500 units at Rs.35/- each)	17500
Closing stock (250 units at Rs.50/- each)	12500
Sales (10250 units)	717500
Interest Received	250
Rent Received	10000

The cost sheet shows the following:

Cost of materials	Rs. 26 per unit.
Labour cost	Rs. 15 per unit
Factory overheads	60% of Labour cost
Administration overheads	20% of Factory cost
Selling expenses	Rs, 6 per unit
Opening Stock	Rs. 45 per unit

You are required to prepare:

1. Financial Profit & Loss Account
2. Costing Profit & Loss Account
3. Statement of Reconciliation

**Solution****A) Financial Books****Profit and Loss Account for the year ended 31-12-2009**

	Rs		Rs.
To Opening Stock (500 Units at Rs.35 each)	17,500	By Sales (10250 units )	7,17,500
To Materials consumed (10000 units)	2,60,000	By Closing stock (250 units at Rs.50 each)	12,500
To Wages	1,50,000		
To Gross Profit c/d	3,02,500		
	<u>7,30,000</u>		<u>7,30,000</u>
To Factory overheads	94,750	By Gross Profit b/d	3,02,500
To Administration c/d	1,06,000	By Interest received	250
To Selling Expenses	55,000	By Rent Provided	10,000
To Bad Debts	4,000		
To Preliminary Expenses	5,000		
To Net Profit	48,000		
	<u>3,12,750</u>		<u>3,12,750</u>

**B) COST SHEET FOR THE YEAR ENDED 31.12.2009****Prod. 10000 units**

Particulars	Total Cost Rs.	Cost per Unit Rs.
Material Consumed	260000	26
Labour	150000	15
	<u>410000</u>	<u>41</u>
PRIME COST		
Factory Overheads (60% of Labour cost)	90000	9
	<u>500000</u>	<u>50</u>
WORKS COST		
Administration overheads (20% of work cost)	100000	10
COST OF PRODUCTION	600000	60.
Add : Opening Stock of finished goods (500 units at (Rs.45/- each)	22500	
	<u>622500</u>	

Less : Closing stock of finished goods (250 units)	15000	-----
	-----	
	607500	6
Selling Expenses	61500	-----
	-----	66
	669000	4
COST OF SALES	48500	-----
PROFIT	-----	70
SALES	717500	

**C) STATEMENT OF RECONCILIATION AS ON 31.12.2002**

Starting Point (Cost Accountant )	Rs.	Rs.
Profit as per Cost Accounts		48500
Add: 1. Over recovery of overheads :		
Selling expenses	6500	
2. Over valuation of stock :		
Opening stock	5000	
3. Purely financial income:		
Interest	250	
Rent	10000	31750
	-----	-----
		70250
Less : Under recovery of overheads-		
4. Factory overheads	4750	
5. Administrative overheads	6000	
6. Over valuation of stock :	2500	
Closing Stock		
7. Purely financial expenses:	4000	
Bad Debts		
Preliminary expenses	5000	22250
	-----	-----
Project as be Financial Accounts		48000

---

**8.5 EXERCISES**

---

1. What is the need for reconciliation of cost and financial accounts?
2. Discuss the main sources of difference between Profit shown by cost accounts and that as per financial accounts.
3. Objective type questions;

## A. Multiple choice questions:

1. Dividend received is shown in \_\_\_\_\_
  - i) costing profit and loss A/c
  - ii) financial profit and loss A/c
  - iii) Ignored
  - iv) None of the above
2. Over valuation of closing stock in Cost Accounts-----
  - i) Increases costing profit
  - ii) Increases financial profit
  - iii) Decreases costing profit
  - iv) Decreases financial profit
3. Over absorption of overheads in financial accounting
  - i) Decreases financial profit
  - ii) Increases financial profit
  - iii) Increases costing profit
  - iv) Both (i) & (ii)
4. Under valuation of opening stock in costing
  - i) Increases costing profit
  - ii) Decreases financial profit
  - iii) Decreases costing profit
  - iv) Both (i) & (ii)
5. Donations paid is
  - i) Debited to costing P & L A/c
  - ii) Debited to financial P & L A/c
  - iii) Ignored in costing
  - iv) (ii) & (iii)

**Answers:** ii, i, i, iii, ii.

## B. True or false

1. Under absorption of overheads in cost accounting decreases costing profit.
2. Interest received on Bank Deposit is ignored in cost accounting.
3. Interest on investment increases Costing profit.
4. Dividend paid on share capital is debited to financial P & L A/c.
5. Over absorption of overheads in financial accounting decreases the costing profit.
6. Cost accounting considers the Loss or profit on sale of capital assets.
7. Abnormal loss has considered in costing.
8. Fines and penalties reduce the financial profit.
9. Interest or Dividend received increases financial profit.
10. Overvaluation of opening stock in Financial Accounting reduces financial profit.
11. Under valuation of closing stock in costing increases costing profit.
12. Difference in Depreciation in costing and financial accounting distinguishes costing profit from financing profit.

**Answers:**

**False, True, False, True, False, False, true, true, true, true, false, true.**

Fill in the blanks

1. Premium on issue of shares is shown in -----accounts only.
2. Transfer to General Reserve is purely ----- item.
3. Interest on Bank Deposits is Credited in -----.
4. Overheads recovered more than actual in costing is called as \_\_\_\_\_.
5. Overheads recovered less than actual in financial accounting is called as \_\_\_\_\_.
6. Interest on capital reduces \_\_\_\_\_ profit.
7. Under absorption of overheads in costing increases \_\_\_\_\_ profit.
8. Over valuation of closing stock in financial accounting increases \_\_\_\_\_ profit.
9. Under valuation of closing stock in costing decreases \_\_\_\_\_ profit.
10. Over absorption of overheads in financial accounting decreases \_\_\_\_\_ profit.
11. Under absorption of overheads in costing increases \_\_\_\_\_ profit.
12. Dividend paid on shares is debited to \_\_\_\_\_ P & L A/c.

**Answers:**

**financial accounts, financial, financial P&L A/c., over absorption of overheads in costing, under absorption of overheads in financial accounting, financial profits, costing profit, financial profits, costing profits, financial profits, costing profits, financial.**

4. Practical Problems:

1. The following transactions have been extracted from the financial books of a company.

	Rs.	Units
-----		
Sales	250000.00	20000.00
Materials	100000.00	
Wages	50000.00	
Factory overheads	45000.00	
Office & Administrative overheads	26000.00	
Selling & Distribution overheads	18000.00	



Closing stock:		
Finished goods	15000.00	
Work in progress	1230.00	
Materials	3000.00	
Wages	2000.00	
Factory overheads	2000.00	
		7000.00
Goodwill written off		20000.00
Interest on capital		2000.00

-----

In costing books factory overheads were charged at 100% of wages, administration overheads were charged at 10% of factory cost and selling and distribution overheads at the rate of Re.1 per unit sold. Prepare a statement reconciling the Profit as per cost and financial accounts.

2. The financial Profit and loss Account of a manufacturing company for the year ended 31<sup>st</sup> March, 2009 is as follows:-

	Rs		Rs.
To Materials consumed	50000.00	By Sales	124000.00
To Carriage inwards	1000.00		
To Direct wages	34000.00		
To Works Expenses	12000.00		
To Administration Expenses.	4500.00		
To Selling and Distribution Expenses	6500.00		
To Debenture Interest	1000.00		
To Net Profit d	15000.00		
	124000.00		124000.00

The net profit shown by the cost accounts for the year is Rs.16,270. Upon a detailed comparison of the two sets of accounts it is found that (a) The amounts charged in the cost account in respect of overheads charges are as follows:- Works overhead charges Rs.11,500; Office overhead charges Rs.4,590, Selling and Distribution Expenses Rs.6,640 (b) No charge has been made in the cost account in respect of debenture interest. You are requested to reconcile the profits shown by the two sets of accounts.

3. During the year a company's profit have been estimated from the costing system to be Rs.23,063 whereas the financial accounts prepared by the auditors disclose a profit of Rs.16,624. Given the following information you are required to prepare a Reconciliation statement showing clearly the reason for the difference.

**Profit and Loss Account for the year ended March 3, 2009**

	Rs.	Rs.		Rs.
Opening Stock	2,47,179		Sales	3,46,500
Purchases	82,154			
	-----			
	3,29,333			
Closing stock	75,121	2,54,212		
	-----			
Direct wages		23,133		
Factory overheads		20,826		
		48,329		
Gross Profit		-----		-----
		3,46,500		3,46,500
		9,845	Gross profit b/d	48,329
Administration expenses			Sundry Income	316
		22,176		
Selling expenses		16,624		
Net Profit		-----		-----
		48,645		48,645

**The costing record shows:**

- a stock ledger closing balance of Rs.78,197
- a direct wages absorption account of Rs.24,867
- a factory overhead absorption account of Rs.19,714
- administration expenses calculated at 3% of the selling price
- selling expenses are five percent on selling price
- no mention of sundry income.

4. A company's Trading and Profit and Loss Account was as follows:-

	Rs.	Rs.		Rs.
Opening Stock	100000.00		Sales	175000.00
Purchases	80000.00			
	<u>180000.00</u>			
Less: Closing stock	80000.00			
		100000.00		
To Direct wages		20000.00		
To Factory Wages		15000.00		
To Gross Profit Cf.		40000.00		
		<u>175000.00</u>		
Total Rs.		175000.00	Total Rs.	175000.00
To Administration expenses		10000.00	By Gross profit	40000.00
To Selling expenses		15000.00		
To Net Profit		15000.00		
		<u>40000.00</u>		<u>40000.00</u>

Costing records show the following:-

- Stock Ledger closing balance Rs.89, 000
- Direct labour Rs.23, 000
- Factory overheads Rs.13, 000
- Administrative overheads and selling expenses each are calculated at 8 per cent of the selling price.

Prepare costing profit and loss account and the statement of reconciliation between the profit or loss as per the two accounts.

5. From the following information you are required to prepare a statement reconciling the result of Cost Book with Financial Books

	Rs.
Net profit as per Financial Books	51,052
Works overhead under recovered in Cost Book	1,001
Depreciation charged in Financial Book	13,000
Depreciation charged in Cost Book	14,326
Obsolescence loss charged in Financial Books only	2,021
Income tax provided in Financial Books only	2,626
Interest received but not recorded in Cost Book	3,031
Bank interest debited in Financial Book only	292

6. The following is the Financial Profit and Loss Account of a company for the year ending 31<sup>st</sup> March, 2009.

**Profit and Loss Account**

	Rs		Rs.
To Purchases	2,53,000	By Sales (50000 units at Rs. 16 each)	8,00,000
“ Wages	1,03,000	By Closing stock	43,000
“ Works Expenses	1,16,000	By Interest on Investments	3,000
“ Administration Expenses	55,000	By Profit on Sale of building	24,000
“ Selling Expenses	68,000		
“ Depreciation	12,000		
“ Net Profit	2,63,000		
	-----		-----
	8,70,000		8,70,000

The cost accounts disclosed the following information :-

1. Value of closing stock was Rs.45,000/-
2. Works expenses in cost accounts have been taken at 100% of wages
3. Selling Expenses in cost accounts have been charged at 10% on sales.
4. Administration Expenses in cost accounts have been taken at Rs.1 per unit sold.
5. Depreciation shown in cost accounts was Rs.10,000

Prepare a reconciliation statement to reconcile the profit shown as per cost accounts with the profit shown as per financial accounts.



## **COST CONTROL ACCOUNTS**

### **(INTEGRAL & NON - INTEGRAL ACCOUNTING)**

#### **Unit structure :**

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Non-Integral Accounting/ Interlocking Accounting System / Cost Ledger Accounting System:
- 9.3 Integral Accounting System
- 9.4 Cost Control Accounts
- 9.5 Solved Problems
- 9.6 Exercises

---

#### **9.0 OBJECTIVES**

---

After studying the unit the students will be able to:

- Understand the Non-integral Accounting system and solve the problems
- Know the Integral Accounting System and solve the problems.

---

#### **9.1 INTRODUCTION**

---

Under integral accounting system, only one set of books of accounts is prepared and the accounts are written in such a manner that due justice is done to all the Cost Accounting and financial Accounting principles. The accounts to be opened would depend on ultimate outcome expected and ultimate outcome of integral accounting system is the cost sheet for cost accountant and profit and loss A/c and balance sheet for financial accountant.

---

#### **9.2 NON-INTEGRAL ACCOUNTING/ INTERLOCKING ACCOUNTING SYSTEM / COST LEDGER ACCOUNTING SYSTEM:**

---

Under non-integral accounting system, two different sets of books are maintained. One for financial and other for cost accounting purposes. Since we are concerned only with cost accounting under this system, in the problem on non-integral accounting, we only need to know how the accounts are to be

written for cost accounting purposes. In non-integral system of accounting, we need to make reconciliation statement for knowing the reasons of difference in the profit which have been calculated in cost accounting system and financial accounting system.

### **9.2.1 Necessary Accounts to be opened:**

#### **1. General Ledger Adjustment A/c or Cost Ledger Control A/c:**

This is practically a dummy account and is to be used where one of the two parts of the journal is recorded. One is a cost sheet item and the other is a Balance Sheet item. Since Balance Sheet items have no place in our system, the Balance Sheet part of the Journal, whether debit or credit, is to be replaced by this account. If both the parts of the journal are balance sheet items or both the parts are cost sheet items, then naturally this account has no use.

#### **2. Stores Ledger Control A/C.**

This is in respect of raw material when raw material is purchased, this account is debited and when raw material is issued to the production department, it is credited to this a/c and debited to Work in-progress a/c. The material issued for repairs and maintenance is also credited to this account and debited to factory overheads account. Likewise, abnormal loss of material is credited to this account and debited to costing profit and loss A/c.

#### **3. Work - In - Progress Ledger Control A/C :**

On the debit side of this A/c, we write opening balance and factory cost incurred. On the credit side, factory cost of production completed is transferred to finished goods ledger control a/c and balance is closing stock. Also, if there is some abnormal loss, the factory cost of abnormal loss (Prime Cost and Factory Overheads) is credited to this A/c and debited to abnormal loss A/c and similarly, abnormal gain is debited to this a/c and credited to abnormal gain a/c.

#### **4. Finished Goods Ledger Control A/C :**

On the debit side of this A/c, we write opening stock of finished goods, factory cost of production completed and transferred to warehouse and administration overheads. On the credit side, the production cost of goods sold is transferred to cost of sales a/c and the balance is closing stock of finished goods.

**5. Wage Control A/C :**

On the debit side of this a/c, we write the wages incurred, whether direct or indirect. On the credit side, the indirect wages could be factory, administration or Selling & Distribution overheads and depending on that, we transfer them to Factory overheads Control A/c, administration Overheads Control A/c or S & D overheads Control A/c. direct wages are transferred to Work-in-progress account. It is also possible (in fact, better) to transfer to this account, only direct wages and to transfer indirect wages directly from GLA A/c to respective overheads accounts.

**6. Factory overheads Control A/c, Administrative Overheads Control A/c, Selling and Distribution overheads Control A/c.**

On the Debit side of each of these accounts, we write the amount actually spent.

The factory overheads, to the extent recovered, are transferred to Work-in-progress Ledger Control A/c. The administrative overheads are similarly transferred to Finished Goods Ledger Control A/c and Selling & Distribution Overheads are transferred to Cost of Sales a/c.

As regards the difference between the amount spent and recovered, if there is some instruction, direct or indirect, it should be followed. In the absence thereof, there are two alternatives. One is to transfer the difference to Costing Profit & Loss A/c and the other is to carry it forward by showing the difference as closing balance. It is also possible to follow supplementary rate system.

If opening trial balance is given and such items do appear in it then that means the company follows the policy of carrying forward the difference to the next period. If they do not appear in the opening trial balance then, in the absence of information to the contrary, these A/c's should be closed by transferring the difference to Costing Profit & Loss A/c. If the supplementary system is to be followed, then, the difference should be transferred to the same account to which absorption is transferred.

**7. COST OF SALES A/C :**

On the debit side of this A/c we write production cost of goods sold (which is transferred from finished goods ledger control a/c) and Selling and Distribution Overheads. The total being cost of sales, we transfer it to Costing Profit and Loss A/c.

**8. SALES A/C :**

On the credit side of this a/c, we write the amount of sales by debiting General ledger Adjustment A/c and we close this A/c by transferring sales to costing Profit and Loss A/c.

**9. ABNORMAL LOSS / GAIN A/C :**

These are the a/c's for recording the transactions of abnormal nature and we close these a/c's by transferring the balance to profit and Loss A/c.

**10. COSTING PROFIT AND LOSS A/C :**

On the debit side of this A/c, we write the cost of sales and abnormal losses and on the credit side sales and abnormal gain. Based on the policy as regards overheads, the under / over absorption may also be written on the debit side or as the case may be on credit side. We close this a/c by transferring the profit (loss) to General Ledger adjustment A/c.

**11. TRIAL BALANCE :**

Whether asked for or not, it is always advisable to prepare the trial balance. Obviously, the closing balances would be inventory accounts, General Ledger Adjustment accounts and Overhead A/c's (If the policy is to carry forwards the difference).

---

**9.3 INTEGRAL ACCOUNTING SYSTEM:**


---

Here, the balance sheet is also required and therefore General Ledger Adjustment Account (dummy A/c) obviously has no place. If there are some items of financial nature (Income Tax, Fine Penalty etc.), then only it is essential to prepare Costing Profit & Loss A/c, we prepare Profit & Loss A/c and we write all the items of Financial nature in the profit and loss A/c. In that case, the net profit that we get in Costing Profit & Loss A/c is transferred to this Profit and Loss A/c. Final Net profit is then to be transferred to Reserve and Surplus A/c.

As regards overheads, the under or over-recovery of overheads is to be transferred to be adjusted in current year only. Then, there are as many more accounts as the number of balance sheet items in the problem. We given very normal two effects to every transaction and then close all the accounts. Finally, we prepare trial balance or, as the case may be, the balance sheet.



---

## 9.4 COST CONTROL ACCOUNTS

---

### 9.4.1 Meaning :-

Cost Accounting means the process of accounting for cost from the point at which the expenditure is incurred to the establishment of its ultimate relationship with cost center and cost units.

### 9.4.2 Control and Profitability :-

The scope of cost accounting extends to preparation of statistical data or cost control accounts. There are two types of cost accounting integrated and Non-integrated.

### 9.4.3 Integrated System :-

It is a system in which the Financial and Cost Account are integrated to insure that all relevant expenditure is absorb into the cost account.

### 9.4.4 Non - Integrated System :-

It is a system in which the cost account are different from the Financial account, the two sets of accounts being kept continuously in agreement by the use of cost control. Under this system the separate account are prepared called as Cost Journal and Cost Ledger.

### 9.4.5 Journal Entries

	<b>Financial Account</b>	<b>Cost Account</b>
1)	Credit Purchase of Material for Stock	
	Purchases A/c - Dr	Store ledger control A/c - Dr
	To Sundry Creditors	To Cost ledger control A/c
2)	Cash Purchase of Material for Stock	
	Purchase A/c - Dr	Stock ledger control A/c - Dr
	To cash A/c	To Cost ledger Control A/c
3)	Purchase of Special Material for Direct Use in a Process or Job	
	Purchase A/c - Dr	WIP Control A/c - Dr
	To Sundry Creditors / Cash A/c	To Cost Ledger Control A/c
4)	Purchase of Material for Immediate Repair Work	
		Factory O.H. Control A/c - Dr
		To Cost Ledger Control A/c



- Selling & Dis O.H. Control  
(Sale Staff Salary) - Dr  
To Wages Control A/c
- 15) Payment for Expenses  
Expenses A/c - Dr  
To Cash/Bank A/c
- Factory O.H. Control A/c - Dr  
Admin O. H. Control A/c - Dr  
Selling & Distribution O. H.  
Control A/c  
To Cost Ledger Control
- 16) Recording Depreciation on Fixed Asst  
Depreciation A/c - Dr  
To Fixed Asset A/c
- Factory / Admin / Selling  
Control A/c  
To Cost Ledger Control A/c
- 17) Recording of Manufacturing O.H. applying at departmental Rate  
WIP Control A/c - Dr  
To Factory O.H. Control A/c
- 18) Abnormal Loss Due to Wastage  
Costing P & L A/c - Dr  
To WIP Control A/c
- 19) Scrap Taken on Stock Charge  
Store Control A/c - Dr  
To WIP Control A/c
- 20) Recording Cost of Goods Transfer to Finished Goods  
Finished Goods Control A/c -  
Dr  
To WIP Control A/c
- 21) Recording Sales  
Debtors / Cash A/c - Dr  
To Sales A/c
- Cost Ledger Control A/c - Dr  
To Sales (S. P.) A/c  
To Casting P & L A/c (Profit)
- 22) Absorption of Admin O.H.  
Finished Goods Control A/c -  
Dr  
To Admin O.H. Control A/c
- 23) Absorption of Selling & Distribution O.H.  
Cost of Sales A/c - Dr  
To Sell & Dist O.H. Control  
A/c

24) Under absorb Factory, Admin & Selling O.H.

Costing P & L A/c - Dr  
 Finished Goods / WIP / Cost of  
 Sales - Dr

OR

Overheads Suspense A/c - Dr  
 To Factory / Admin / Sell &  
 Dis Control A/c

25) Over absorb Factory, Admin & Selling O.H.

Factory / Admin / Sell & dis.  
 O.H. Control - Dr

To Costing P & L A/c

OR

To WIP / Finished Goods /  
 Cost of Sales

OR

Overhead Suspense A/c

26) Recording Cost of Goods Sold

1) Cost of Sales A/c - Dr  
 To Finished goods A/c

2) Costing P & L A/c - Dr  
 To Cost of Sale Cost

#### 9.4.6 Closing of the Ledger accounts:

After Completing the Journal Entries then Ledger A/c are closed in the following manner.

**1) Factory O.H. Controls A/c:**

Difference in A/c Transfer to WIP or If the problem said transfer to next month (Closing Bal) by bal. c/d.

**2) Admin O.H. Control A/c:**

Difference in A/c Transfer to Costing P & L or O.H. Adjustment A/c.

**3) Selling & Distribution O.H. :**

Difference in A/c Transfer to Costing P & L A/c or O.H. Adjustment A/c.

**4) O.H. Adjustment A/c:**

Difference in O.H. Adjustment A/c either transfer to costing P&L A/c or if the problem said transfer in trial balance.

- 5) **Cost of Sales:**  
Transfer the difference in this A/c to Costing P & L A/c.
- 6) **Costing P & L A/c:**  
Difference in this A/c Transfer to Cost Ledger Control A/c.
- 7) **Cost Ledger Control A/c / WIP Control A/c / Store Ledger Control A/c / FCI Control A/c:**  
Difference in resection Account Transfer to The Trial Balance (Closing Balance)

---

## 9.5 SOLVED PROBLEMS

---

### Illustration 1

C Ltd. Maintain a Separate Set of books for financial accounts and cost accounts.

The following information is provided for the year 2014.

Particulars	Amount
Material Control A/c	60,000
WIP Control A/c	90,000
Finished Goods Control A/c	1,40,000
Cost Ledger Control A/c	2,90,000
Transaction for the year	
Material Purchase	6,60,000
Material Issue as Direct Material	4,50,000
Indirect Material	1,20,000
Wages Paid Allocated as	
Direct Cost	2,70,000
Indirect Cost	90,000
Production Expenses	2,40,000
Value of Finished Goods Produce	10,80,000
Closing Stock of F.G.	1,20,000
Administration expenses	2,40,000
Selling expenses	1,80,000
Sales	18,00,000

Prepare the Necessary Control A/c in the books of Costing Records.

### Journal Entries

Date	Particulars	L/F	Debit ₹	Credit ₹
1.	Material Control A/c - Dr To Cost Ledger Control A/c		6,60,000	6,60,000
2.	WIP Control A/c - Dr To material Control A/c		4,50,000	4,50,000
3.	Factory O.H. Control A/c - Dr To Material Control A/c		1,20,000	1,20,000
4.	WIP Control A/c - Dr To Wages Control A/c		2,70,000	2,70,000
5.	Factory O.H. Control A/c - Dr To Wages Control A/c		90,000	90,000
6.	Factory O.H. Control A/c - Dr To Cost Ledger Control A/c		2,40,000	2,40,000
7.	Finished Goods Control A/c - Dr To WIP Control A/c		1,08,000	1,08,000
8.	Office & admin O.H. Control A/c - Dr To Cost Ledge Control A/c		2,40,000	2,40,000
9.	Sellings distribution O.H. Control A/c - Dr To Cost Ledger Control A/c		1,80,000	1,80,000
10.	Cost Ledger Control A/c - Dr to Costing P & L A/c (sales)		18,00,000	18,00,000

### Cost Ledger Control A/c

Particulars	₹	Particulars	₹
To Costing P & L A/c	18,00,000	By Bal. b/d	2,90,000
		By Material Control A/c	6,60,000
		By Factory O.H. Control A/c	2,40,000
		By Office & Admin O.H. Control A/c	2,40,000
To Bal. C/d	4,50,000	By Selling & Distribution O.H. Control A/c	1,80,000
		By Salary Swages Control A/c	3,60,000
		By Costing P & L A/c	2,80,000
	22,50,000		22,50,000

### Material Control A/c

Particulars	₹	Particulars	₹
To Bal. b/d	60,000	By WIP Control A/c	4,50,000
To Cost Ledger Control a/c	6,60,000	By Factory O.H. Control a/c	1,20,000
		By Bal. c/d	1,50,000
	7,20,000		7,20,000

### WIP Control A/c

Particulars	₹	Particulars	₹
To Bal. b/d	90,000	By Finished Goods	10,80,000
To Wages Control A/c	2,70,000	By Bal c/d	1,80,000
To Material Control a/c	4,50,000		
To Factory O.H. Control A/c	4,56,000		

### Finished Goods Control A/c

Particulars	₹	Particulars	₹
To Bal. b/d	1,40,000	By Costing A/c (Cost of Sales)	11,00,000
To WIP Control A/c	10,80,000	By Bal c/d	1,20,000
	12,20,000		12,20,000

**Factory O.H. Control A/c**

Particulars	₹	Particulars	₹
To Material Control A/c	1,20,000	By WIP Control A/c	4,50,000
To Wages Control A/c	90,000		
To Cost ledger Control A/c	2,40,000		
	4,50,000		4,50,000

**Office & Admin Control A/c**

Particulars	₹	Particulars	₹
To Cost Ledger A/c	2,40,000	By Costing P & L A/c	2,40,000
	2,40,000		2,40,000

**Selling & Distribution A/c**

Particulars	₹	Particulars	₹
To Cost Ledger A/c	1,80,000	By Costing P & L A/c	1,80,000
	1,80,000		1,80,000

**Salary & Wages A/c**

Particulars	₹	Particulars	₹
To Cost Ledger A/c	3,60,000	By WIP Control A/c	2,70,000
		By Factory O.H.	90,000
	3,60,000		3,60,000

**Costing P & L A/c**

Particulars	₹	Particulars	₹
To Finished Goods Control a/c	4,00,000	By Cost Ledger A/c	18,00,000
To Admin O.H. Control A/c	2,40,000		
To Selling A/c	1,80,000		
To Cost Ledger Control a/c	2,80,000		
	18,00,000		18,00,000



**Trial Balance**

<b>Particulars</b>	<b>Debit ₹</b>	<b>Credit ₹</b>
Cost Ledger Control A/c		4,50,000
Material Control A/c	1,50,000	
WIP Control A/c	1,80,000	
Finished Goods	1,20,000	
	4,50,000	4,50,000

From 31<sup>st</sup> March 2013 the following balances extracted from the book of the co.

**Trial Balance**

<b>Particulars</b>	<b>₹</b>	<b>₹</b>
Store Ledger Control a/c	3,50,000	
WIP	3,80,000	
FCT	2,50,000	
Cost Ledger Control A/c		9,80,000
	9,80,000	9,80,000

**Illustration 2:****Following Transaction took place in March 2013**

<b>Particulars</b>	<b>₹</b>
Raw Material Purchases	9,50,000
Return to Supplier	30,000
Issue to Production	9,80,000
Return to Store	30,000
Production Wages	4,00,000
Indirect Labour	2,50,000
Factory O.H.	5,00,000
Selling Distribution O.H.	7,00,000
Cost of Finished Goods Transfer To Warehouse	21,30,000
Cost of Goods Sold	21,00,000
Sales	30,00,000

Factory O.H. are apply to production at 150% of on, any under or our absorbed overheads being carry forward for adjustments in the subsequent month. All selling & distribution O.H. are created as a period cost and charge to the Profit & Loan A/c of the month in which they are incurred.

Show the necessary control A/cs, Costing P & L A/c and trial balance.

### Journal Entries

Date	Particulars	L/F	Debit ₹	Credit ₹
1.	Store Ledger Control A/c - Dr To Cost Ledger Control A/c		9,50,000	9,50,000
2.	Cost Ledger Control A/c - Dr To Store Ledger Control A/c		30,000	30,000
3.	WIP Control A/c - Dr To Store Ledger Control A/c		9,80,000	9,80,000
4.	Store Ledger Control A/c - Dr To WIP Control A/c		30,000	30,000
5.	WIP Control A/c - Dr To Wages Control A/c		4,00,000	4,00,000
6.	Factory O.H. Control A/c - Dr To Wages Control A/c		2,50,000	2,50,000
7.	Factory O.H. Control A/c - Dr To Cost Ledger Control A/c		5,00,000	5,00,000
8.	Selling & Distribution O.H. Control A/c - Dr To Cost Ledger Control A/c		4,00,000	4,00,000
9.	F. G. Control A/c - Dr To WIP Control A/c		21,30,000	21,30,000
10.	Cost of Sales A/c - Dr To Finished Goods Control A/c		21,00,000	21,00,000

11.	Cost Ledger Control A/c - Dr To Costing P & L A/c		30,00,000	30,00,000
12.	WIP Control A/c - Dr (4,00,000 x 150%) To Factory O.H. Control A/c		6,00,000	6,00,000

**Cost Ledger Control A/c**

Particulars	₹	Particulars	₹
To Store Ledger Control A/c	30,000	By Bal. b/d	9,80,000
To Costing P & L A/c	30,00,000	By Store Ledger Control A/c	9,50,000
		By Factory O.H. Control A/c	5,00,000
		By Selling Distribution A/c	4,00,000
		By Wages Control A/c	6,50,000
		By Costing P & L A/c	5,00,000
	39,80,000		39,80,000

**Store Ledger Control A/c**

Particulars	₹	Particulars	₹
To Bal. b/d	3,50,000	By Cost Ledger Control A/c	30,000
To Cost Ledger Control A/c	9,50,000	By WIP A/c	9,80,000
To WIP A/c	30,000	By Bal c/d	3,20,000
	13,30,000		13,30,000

**WIP**

Particulars	₹	Particulars	₹
To Bal. b/d	3,80,000	By Store Ledger Control A/c	30,000
To Store Ledger Control A/c	9,80,000	By Finished Goods Control a/c	21,30,000
To Wages Control A/c	4,00,000	By Bal. c/d	2,00,000
To Factory O.H. A/c	6,00,000		
	23,60,000		23,60,000

### Finished Goods

Particulars	₹	Particulars	₹
To Bal. b/d	2,50,000	By Cost of Sales	21,00,000
To WIP Control A/c	21,30,000	By Bal. c/d	2,80,000
	23,80,000		23,80,000

### Wages Control A/c

Particulars	₹	Particulars	₹
Cost Ledger Control A/c	6,50,000	By WIP	4,00,000
		By Factory O.H. Control A/c	2,50,000
	6,50,000		6,50,000

### Factory O.H. Control A/c

Particulars	₹	Particulars	₹
To Wages Control A/c	2,50,000	By WIP	6,00,000
To Cost Ledger A/c	5,00,000	By Bal. c/d	
	7,50,000		7,50,000

### Selling & Distribution Control A/c

Particulars	₹	Particulars	₹
To Cost Ledger A/c	4,00,000	By Costing (Bal) P & L A/c	4,00,000
	4,00,000		4,00,000

### Costing P & L A/c

Particulars	₹	Particulars	₹
To Selling & Distribution	4,00,000	By Cost Ledger A/c	30,00,000
To Cost of sales	21,00,000		
To Cost Ledger A/c (Profit) (Bal.)	5,00,000		
	30,00,000		30,00,000

### Cost of Sales A/c

Particulars	₹	Particulars	₹
To F. G. A/c	21,00,000	By Costing P & L (Bal.)	21,00,000
	21,00,000		21,00,000

### Trial Balance

Particulars	Dr. ₹	Cr. ₹
Cost Ledger Control A/c		9,50,000
Store Ledger Control A/c	3,20,000	
WIP	2,00,000	
F. G	2,80,000	
Factory O.H. Control A/c	1,50,000	
	9,50,000	9,50,000

---

## 9.6 EXERCISE

---

### A. Fill in the blanks:

1. Under ----- accounting system, only one set of books of accounts is prepared (integral)
2. Under ----- accounting system, two sets of books of accounts are prepared (non-integral)
3. In integral accounting system the transaction having both the parts of the journal are balance sheet items then this transaction is not recorded in-----adjustment a/c. (General ledger or Cost Ledger )
4. If both the parts of the journal entry are cost sheet items, then there is no entry in-----.(General ledger or Cost Ledger )
5. Cost and financial accounts are required to be reconciled under-----accounting system (non-integral)

### B. Practical problems

- Q.1 The financial and cost accounts of XYZ Manufacturing Company for the year ended 31 March, 2007 have been reconciled as below:

Financial Profit and Loss A/c. for The Year Ended 31<sup>st</sup> March, 2007.

Particulars		Rs.	Particulars	Rs.
Raw Materials:				
Opening Stock	56,450		Cost of Goods Manufactured (Trf. To Trading A/c)	8,10,000
Purchase	3,24,560			
	<u>3,81,010</u>			
Less: Closing Stock	58,060	3,22,950		
Production Overheads		2,39,370		
Direct Wages		2,47,320		
Work in Progress:				
- Opening Stock	18,620			
- Closing Stock	18,260	360		
		<u>8,10,000</u>		<u>8,10,000</u>
Finished Goods:				
Opening Stock	1,42,350		Sales	11,03,500
Cost of Goods Manufactured	8,10,000			
	<u>9,52,350</u>			
Closing Stock	1,46,850	8,05,500		
Gross Profit		2,98,000		
		<u>11,03,500</u>		<u>11,03,500</u>
Administration Expenses		1,24,620	Gross Profit	2,98,000
Selling Expenses		87,380	Discount Received	1,600
Discount Allowed		1,240		
Debenture Interest		6,360		
Net Profit		80,000		
		<u>2,99,600</u>		<u>2,99,600</u>

Reconciliation that means they are foil non interned A/c system of financial and cost accounts for the year ending on 31<sup>st</sup> March, 2007.

	₹		₹
Profit as per Financial A/c	80,000	Profit as per Cost A/c	84,550
Discount Allowed	1,240	Discount Received	1,600
Debenture Interest	6,360	Difference in Stock valuation:	
Difference in Stock Valuation:		Raw Material:	700
Work in progress : Closing	480	Raw Materials : Closing	750
Finished Goods : Opening	720	Work in Progress: Opening	620
		Finished Goods: Closing	580
	88,800		88,800

Data in The Cost Accounts Include:	₹
Direct Material Price Variance	3,120 Adverse
Direct Material Usage Variance	1,280 Adverse
Direct Labour Rate Variance	4,160 Favourable
Direct Labour Efficiency Variance	4,470 Favourable
Production Overhead Expenditure Variance	4,880 Favourable
Production Overhead Volume Variance	1,680 Adverse
Administration Overheads Cost Variance	620 Adverse
Selling and Distribution Cost Variance	620 Adverse
Selling Price Variance	5,000 Favourable
Sales Volume Variance	1,500 Adverse

You are required from the above data to show the necessary accounts as they should appear in the cost ledger under :

- a) Partial Plan      b) Single Plan

Q.2 Upto Date Ltd. which keeps cost control accounts in addition to the normal financial books of accounts is in the habit of preparing half - yearly accounts for ascertaining its performance.

From the information supplied hereunder, you are required to write up the cost ledger and prepare a costing profit and loss account showing the appropriate variances for the first half of the current year. Also ascertain the profit of the same period as given by the financial accounts, reconciling this with the profit shown in the cost accounts. In the cost accounts, the balance at the end of the previous year were:

	At Standard Cost ₹.(000)	
General Ledger Control A/c.		3,450
Raw Materials	1,025	
Work in Progress	1,840	
Finished Goods	585	
	3,450	3,450

The Summary of Transactions During the first half of the current year is :

	₹.(000)
Purchase of raw material on credit	4,045
Material Price Variance	95 Adverse
Material usage Variance	75 Adverse
Direct Wages Actual (6,50,000 hrs.)	3,390
Standard Wages at ₹2.50 per hour	3,275
Indirect Wages	1,155
Indirect Materials and Expenses	965
Depreciation	525
Administration, Selling and Distribution Expenses	2,925
Material Issued to Production at Standard Price	4,000
Factory Overheads absorbed to production at ₹2.00 per standard direct labour hour	2,620
Sales on Credit	15,735
Items of Purely Financial Nature:	
Debenture Interest Paid	180
Interest Received on Investments	35
Donations and Charities	135



	Costing Books at Standard	Financial Books at Actual
	₹	₹
<b>Opening Stock:</b>		
Raw Materials	1,025	1,050
Work in Progress	1,840	1,825
Finished Goods	585	625
<b>Closing Stock:</b>		
Raw Materials	?	895
Work in Progress	1,725	1,755
Finished Goods	595	600

Please take note that the administration, selling and distribution expenses will be charged to Costing Profit and Loss Account.

Q.3 Chem-Tech is a firm belonging to chemical industry. It has a system of budgetary control and standard costing in operation. For accounting purposes, it follows integral system. As far as accounting for standard cost goes, it follows single plan.

The following trial balance was developed as on 30<sup>th</sup> April, 2007.

L. F. No.	Account Head	₹.(000)	
		Debit	Credit
101	Raw Material	12	
102	Fixed Assets	85	
103	Share Capital		200
104	Work in Progress	80	
105	Finished Goods	40	
106	Creditors Control		23
107	Debtors Control	59	
108	Cash and Bank	19	
109	Depreciation Provision		12
110	Reserves		40
111	Material Price Variance	4	
112	Labour Cost Variance	8	
113	Factory Overhead Variance		2
114	Sales		500
115	Standard Factory Cost of Sales	470	
		777	777

Following Transactions Took Place in May, 2007	₹.(000)
Purchases on Credit	50
Payment to Sundry Creditors	80
Labour Cost Incurred	22
Indirect factory Expenses	13
Standard Cost of Material Purchased	47
Collection from Customers	65
Stock of Raw Material as on 31-5-2007	14
Work in Progress as on 31-5-2007	
Direct Wages	13
Factory Overheads	8
Factory cost of Production:	
Material	60
Labour	22
Overheads	12

Sales in May ₹40,000. Opening Balance in WIP A/c. was developed with the help of a statement of equivalent production. This balance included labour cost of ₹15,000 and overheads cost of ₹10,000. Factory cost of sales 33,000. You are required to give effect to the above transactions and prepare the resultant trial balance as on 31<sup>st</sup> May, 2007.

Ignore Taxation.



## CONTRACT COSTING

### Unit Structure :

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Important Concepts
- 10.3 Different Cost of The Contract
- 10.4 Profit on Contract
- 10.5 Format of Contract Account
- 10.6 Solved Problems
- 10.7 Exercises

---

### 10.0 OBJECTIVES

---

After studying the unit the students will be able to:

- Understand the features of Contract Costing
- Explain the important concepts used in Contract costing.
- Know the format of Contract Account.
- Solve the problems on Contract Costing

---

### 10.1 INTRODUCTION

---

A contract is nothing but a big job having the following main features:

- 1) It May be completed within a months or years.
- 2) It usually for a higher price like lakhs or thousands.
- 3) The actual work may be take place, or at a site which is away from the main office of the contractor.

Contract costing is the method of costing which is used to find out the cost or particular contract. It may be generally calculated from the point of view or the contractor.

---

### 10.2 IMPORTANT CONCEPTS

---

Some of the important terms used in contract costing:-

1) **Contract:-**

A contract is an agreement between the contractor and contractee it include the time period taken to complete the contract, price of the contract and so on.

- 2) **Contractor:-**  
A person who undertakes the contract.
- 3) **Contractee**  
A person for whom the job is being undertaken.
- 4) **Contract Price:-**  
The amount which is to be paid by the contractee to the contractor, for completing the contract work.
- 5) **Work Certified:-**  
It is an amount of work done by the contractor and certificated by the architect as per the terms of contract.
- 6) **Work Uncertified:-**  
It is an amount of work completed by the contractor but not certified by the architect at the end of the particular accounting year.
- 7) **Retention Money:-**  
It is an part of value of work certified by the architect which is a retained by the contractee as a security. It means, the cash paid by the contractee to the contractor in between the contract period is depend on the value of work certified by the architect. From this work certified amount some of percentage being paid by the contractee and the balance of this is called as retention money.

For e.g. → If the work certified is ₹8,00,000 then the contractee is being paid the amount is being 90% of ₹8,00,000 as per the agreement and the balance or 10% of work certified is called as Retention Money.

---

### **10.3 DIFFERENT COST OF THE CONTRACT:**

---

#### **1. Material:-**

Material which is required for contract is either purchased or issued from store because contract site is away from the head office of the contractor. Material May be taken from different way -

##### **a. Material Issue / Purchased:-**

It is debited to contract A/c.

##### **b. Material Transferred:-**

If the Materials transferred from one contract to another contract, then those who received the material are debited and who gives the material are credited to the respective contract A/c.

c. If the material is supplied by the contractee then it is not debited to contract A/c.

**d. Material Returned to Store / Supplier:-**

If the material is return to store or supplier it may be credited to the contract A/c.

**e. Material Lost or Destroyed:-**

If the Material Lost or destroy then the cost of material is credited to costing Profit & Loss A/c.

**f. Sale of Material:-**

If the material or scrap is sold, then the actual cost of material is credited to the contract A/c and the difference of any profit or loss may be transferred to costing Profit & Loss A/c.

**g. Material at Site:-**

After completion of the contract or at the end of the accounting year if any material is lying at site is shown as material at site to the credit side of the contract A/c.

**2. Labour:-**

Any labour charges related to the particular contract is either paid or outstanding are debited to the contract Account.

**3. Direct Expenses:-**

Any direct expenses which are related to the particular contract is either paid or outstanding are debited to the contract A/c. It includes architect fees, sanitary fitting, etc.

**4. Indirect Expenses:-**

Any indirect expenses which are related to the particular contract is either paid or outstanding are debited to the contract A/c. It induces head office expenses, general administrative expenses etc.

**5. Special Plant:-**

Plant which is specialty purchases for a particular contract and it is also used for that particular contract only, is called as special plant. Plant is also charged to the contract A/c but only upto the extent of depreciation amount, which is called as 'direct Method.' or otherwise we can use also capital method. Under capital Method, we debit the opening balance of plant value to the contract A/c and at the end of the year or contract credit the W.D.V. of the plant. It means, we give the debit effect of the depreciation of the particular plant.

For eg. During a contract plant is purchase for ₹2,00,000 and at the end of the contract the valuation of the plant is ₹1,80,000.

The effect given under Direct Method.

Dr. Contract A/c Cr.

Particular	₹	Particulars	₹
To Dept on Sp. Plant	20,000		

Effects of plant as for capital Method

Dr. Contract A/c Cr.

Particular	₹	Particulars	₹
To Special Plant	2,00,000	By WDV of Special Plant	1,80,000

Under both method the net effect of appreciation is ₹20,000.

#### 6. Common Plant:-

A common Plant, it means a plant which is used for any contract whenever needed. The treatment of the common plant is given in the same way of special point. It means either we can use 'Direct Method' of charging depreciation or plant on the debit side of the contract A/c of 'Capital Method or Debiting the opening value of the plant to the contract A/c and creating the WDV of the plant at the end of the contract of accounting year.

#### 7. Work in Progress in Balance Sheet:-

At the end of the accounting year under incomplete contract work in progress may be appear under Asset side of the Balance Sheet.

Extract of Balance Sheet

Assets Side	Amt
Cost of Work Certified	xx
(+) Work Uncertified	xx
( - ) Profit & Loss A/c (Reserve)	xx
	xx
( - ) Cash Received from Contracted	xx
Work in progress	xx

---

### 10.4 PROFIT ON CONTRACT

---

#### 1) Complete Contract :-

If the contract is completed then the profit or loss on contract, it may be debited or credited to the contract A/c. There is no need to transfer the profit to the reserve, it is entirely transferred to profit and loss a/c.

## 2) Incomplete Contract:-

If there is an incomplete contract then whatever difference is found out between the value of work in progress certified (Cr. Side of the contract A/c) and the cost of work in progress certified (Dr. Side of the contract A/c) is transferred to notional profit.

Then the notional profit is distributed between the Profit & Loss A/c and work in progress (Reserve profit) Firstly we have to find out the transfer of Profit and Loss A/c. is as under:-

- If the contract is complete upto 25% - then profit & loss a/c is nil. It means there is no need to transfer any profit from notional profit to profit & loss a/c. The entire amount of notional profit is transferred to work in progress (profit reserve).
- If the contract is completed between 25% to 50% - Then the profit & loss is calculated as -

$$\text{Profit \& Loss A / c} = \frac{1}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

- If the contract is completed between 50% to 90% - then the profit & loss a/c is calculated as,

$$\text{Profit \& Loss A / c} = \frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

- Nearing Completion - If the contract is completed between 90% to 99% then profit & loss a/c is calculated as,

$$\text{Profit \& Loss} = \text{Estimated Profit} \times \frac{\text{Cash Received}}{\text{Contract Price}}$$

**OR**

Sometimes it is given in the problem.

Contract completed is calculated by comparing with the contract price to the work certified.

For eg - If the contract price is ₹10,00,000 and work certified is ₹6,00,000 then the percentage of contract completed is calculated as,

$$\text{Contract Price} = 10,00,000 = 100\%$$

$$\text{Work Certified} \quad 6,00,000 = ?$$

$$\therefore 6,00,000 \times \frac{100}{10,00,000} = 60\%$$

$\therefore$  Contract completed is 60% the 2.3 formula can be used to transfer profit to the profit & loss a/c.

## 10.5 FORMAT OF CONTRACT ACCOUNT

### Format of Contract A/c (If Contract is 100% completed)

Particulars	₹	Particulars	₹
To Material	xx	By Material	
To Labour	xx	Returned / Sales / Destroyed	xx
To Direct Expenses	xx	By WDV of Common Plant (Capital Method)	xx
To Indirect Exp.	xx	By WDV of Special Plant (Capital Method)	xx
To Common Plant		By Contractee's A/c (Full Contract Price)	xxx
Depreciation (Direct Method) Cost (Capital Method)	xx	By Profit & Loss A/c (Loss)	xx
To Special Plant Depreciation (Direct Method) OR Cost (Capital Method)	xx		
To Profit & Loss A/c (Profit)	xx		
	xxx		xxx

Material Returned / Sold / Destroyed is credited to the contract A/c only at original cost whatever profit or Loss is transferred to costing profit and Loss A/c.

### Format of Contract A/c (If Contract is Incomplete)

Particulars	₹	Particulars	₹
To Material	xx x	By Material Returned / Sold / Destroyed	xx
To Labour	xx	By WDV of Common Plant (Capital Method)	xx
To Direct Exp.	xx	By WDV of Special Plant (Capital Method)	xx
To Indirect Exp.	xx	By Contractee's A/c (Full Contract Price)	xx
To Common Plant Depreciation	xx	By Profit & Loss A/c (If Loss)	xx



(Direct Method) OR Cost of Plant (Capital Method)	xx		
To Special Plant Depreciation	xx		
(Direct Method) OR Cost of Special Plant (Capital Method)	xx		
To Notional Profit c/d (If Profit)	xx		
	xx		xx
To Profit & Loss A/c	xx	By National Profit b/d	
To working Progress c/d to Balance Sheet (Reserve Profit)	xx		
	xx		xx

Under Incomplete contract, if there is profit, it must be transfer to Notional Profit.

## 10.6 SOLVED PROBLEMS

### Illustration : 1

(Contract Complete Less than 20%).

On 1<sup>st</sup> October 2013 Arvind Undertook a contract for ₹5,00,000. The following information is available in respect of a contract for the year ended 31/12/2013.

Particulars	₹
Work Certified	80,000
Wages Paid	30,000
Material Supplied	45,000
Other Expenses	5,000
Work Uncertified	1,800
Material Lying at Site	1,500
Wages Outstanding	1,000
Plant	20,000

Provide 10% depreciation on plant p.a. prepare contract A/c in the books of Arvind.

**Solution:-**

**Dr. Contract A/c (3 Months) Cr.**

Particulars	₹	Particular	₹
To Material	45,000	By work in Progress c/d	
To Wages	30,000	Material at Site	1,500
( + ) O/s	1,000		
	<u>31,000</u>	Work Certified	1,800
To Other Expenses	5,000	Work Uncertified	80,000
To Depreciation on Plant	500		
To Notional Profit c/d	1,800		
	<u>83,300</u>		<u>83,300</u>
To Profit & Loss A/c	Nil	By Notional Profit b/d	1,800
To Work in Progress (Reserve)	1,800		
	<u>1,800</u>		<u>1,800</u>

$$\text{Dep. on Plant} = 20000 \times 10\% \times \frac{3}{12} = 500 \text{ (For 3 Month)}$$

Out of Notional Profit some amount transfer to Profit & Loss A/c is calculated by comparing work certified with the contract price firstly to find out now much percentage (%) the contract is completed.

$$\text{Contract Price} - 5,00,000 = 100\%$$

$$\text{Work Certified} \quad 80,000 = ?$$

$$\text{Contract Completed} = 80,000 \times \frac{100}{5,00,000} = 16\%$$

$$\text{Contract Completed} = 16\%$$

∴ Profit Transfer to Profit & Loss A/c is Nil. Total notional Profit is transfer to work in progress (Reserve).

**Illustration : 2**

In Complete Contract.

M/s. ABC builder undertook a contract for a contract price of ₹60,00,000 and commenced the work on 1<sup>st</sup> July 2013. The following particulars are available for 9 months ended 31-03-2014

Particulars	₹
Material Issued from Stores	4,00,000
Material Bought Directly	20,50,000
Wages Paid	19,00,000
Direct Expenses	3,00,000
Establishment Charges	1,50,000
Plant	6,50,000
Sub - Contract Charges	1,00,000
Scrap Sold	30,000
Work Certified	50,00,000

The following further information was available:-

- Outstanding wages and direct expenses were ₹10,000 and ₹20,000 respectively on 31-03-2014.
- Material at site at the end of the year is Valued at ₹1,20,000.
- Value of work uncertified ₹2,00,000 on 31.03.2014.
- Included in wages is the salary paid to supervisor @ ₹30,000 p.m. who had devoted half of the time on this contract.
- Working life of the plant is estimated to be 5 years at the end or which it is estimated to be realized ₹50,000 as scrap value. The plant was purchased exclusively for this contract only.

Prepare contract A/c for the year ended 31-03-2014

Solution:-

Dr.

M/s ABC Builders

Cr.

Particulars	₹	Particulars	₹
To Material Issued From Stores	4,00,000	By Scrap Sold	30,000
To Material bought directly	20,50,000	By Work in Progress Work Certified	50,00,000
To Wages (WN)	17,75,000	Work Uncertified	2,00,000
To Direct Expenses (WN)	3,20,000	Material at Site	1,20,000
To Establishment Charges	1,50,000		
To Depreciation on Plant (WN)	90,000		
To Sub - Contract Charges	1,00,000		
To Notional Profit & Loss A/c	4,65,000		
	53,50,000		53,50,000
To Profit & Loss A/c (WN)	3,10,000	By National Profit b/d	4,65,000
To Work in Progress (Reserve)	1,55,000		
	4,65,000		4,65,000

**Working Note:-**

## i) Wages:-

Wages Paid	19,00,000
(+ ) Outstanding	10,000
	19,10,000
( - ) Supervisions Salary	1,35,000
half of the time devoted to other	
∴ half salary recovered	
(30,000 p.m. x 50% x 9 month)	
Total Wages	17,75,000

ii) Direct Expenses	3,00,000
( + ) Outstanding	20,000
Total Direct Expenses	3,20,000

## iii) Depreciation on Plant

Contract A/c to be prepared for 9 month (i.e. from 1<sup>st</sup> July 2013 to 31-03-2014)

$$\begin{aligned} \therefore \text{Depreciation} &= \frac{\text{Original Cost} - \text{Scrap Value}}{\text{Estimated Life of Plant}} \\ &= \frac{6,00,000 - 50,000}{5} = 1,20,000 \text{ p.a.} \end{aligned}$$

$$\therefore 1,20,000 \text{ p.a.} \times \frac{9}{12} = 90,000 \text{ for 9 months}$$

## iv) Notional Profit = 4,65,000

Out of this transfer to Profit & Loss A/c is calculated by how much % the contract is completed.

$$\text{Contract Price} = 60,00,000 = 100\%$$

$$\text{Work Certified} = 50,00,000$$

$$\begin{aligned} \text{Contract Completed} &= 50,00,000 \times \frac{100}{60,00,000} \\ &= 83.33\% \end{aligned}$$

Profit & Loss A/c is calculated as 8.33% contract completed then used the formula.

$$(50 - 90\%)$$

$$\begin{aligned} \text{P \& L A/c} &= \frac{2}{3} \times \text{Notional Profit} \\ &= \frac{2}{3} \times 4,65,000 \end{aligned}$$

$$\text{Profit \& Loss A/c} = 3,10,000$$

- iv) Work in progress (Reserve) is calculated as  
 = Notional Profit - Profit & Loss A/c (Profit)  
 = 4,65,000 - 3,10,000  
 1,55,000

### Illustration : 3

The Maharashtra construction company undertook the construction of a building at a contract price of ₹12,00,000. The date of commencement of contract was 1<sup>st</sup> April 2013.

The following cost information is given for the year ended 31-03-2014

Particulars	₹
Material Sent to the site	3,00,000
Wages	4,40,000
Archited Fees	55,500
Office & Administrative Overheads	1,51,000
Work Uncertified	55,000
Material at site at the end of the year	10,000
Cash Received from the Contractee (Being 90% of the work certified)	9,45,000
Material Destroyed by Fire	5,000
Supervisors Salary	60,000
Plant and Machinery at Cost	2,00,000

(Date of Purchase - 1<sup>st</sup> July 2013. The estimated working life of the plant - 10 years and its estimated scrap value at the end ₹ 20,000)

You are required to prepare a contract account for the year ended 31<sup>st</sup> March 2014.

**Solution:**

**Maharashtra construction company  
contract A/c  
for the year ended 31-03-2014 (12 months)**

**Dr.**

**Cr.**

Particulars	₹	Particulars	₹
To Material Sent to Site	3,00,000	By Material destroy by Fire (Profit & Loss A/c)	5,000
To Wages	4,40,000	By Work in progress Work Certified	10,50,000
To Architectures Fees	55,500	Work Uncertified	55,000
To Office and Administrative Overhead	1,51,000	Material at Site	10,000
To Depreciation on Plant (WN)	13,500		
To Supervisors Salary	60,000		
To Notional Profit c/d	1,00,000		
	11,20,000		11,20,000
To Profit & Loss A/c (wn)	60,000	By Notional Profit b/d	1,00,000
To working Progress (Reserve)	40,000		
	1,00,000		1,00,000

**Working Note:-**

**i) Depreciation on Plant:-**

(For 9 Months)

(Plant Purchase on 1/7/13 upto 31/03/2014)

$$\text{Depreciation} = \frac{\text{Original Cost} - \text{Scrap value}}{\text{Estimated Life of Plant}}$$

$$= \frac{2,00,000 - 20,000}{10} = \frac{1,80,000}{10}$$

Depreciation 18,000 p.a.

∴ Depreciation for 9 months

$$= 18,000 \times \frac{9}{12} = 13,500$$

- ii) Notional Profit = 1,00,000 it is distributed between profit & Loss A/c and work in progress (Reserve). Profit & Loss A/c should be calculated by how much % contract is completed compare with contract price & work certified.

$$\text{Contract Price} = 12,00,000 = 100\%$$

$$\text{Work Certified} = 10,50,000 = ?$$

$$= 10,50,000 \times \frac{100}{12,00,000} = 87.5\%$$

$$\text{Contract Completed} = 87.5\%$$

Formula used 50 - 90%)

$$\therefore \text{Profit \& Loss} = \frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

$$= \frac{2}{3} \times 1,00,000 \times \frac{90}{100}$$

$$\text{Profit \& Loss A/c} = 60,000$$

- iii) Work in progress (Reserve) =  
 = Notional Profit - Profit & Loss A/c  
 = 1,00,000 - 60,000  
 = 40,000

**Note:-**

Cash Received ₹9,45,000 (being 90% or the work certified)

$$\therefore \text{Cash received} = 9,45,000 = 90\%$$

$$\text{Work Certified} = ? \quad 100\%$$

$\therefore$  Work Certified can be calculated as

$$= 9,45,000 \times \frac{100}{90}$$

$$= 10,50,000$$

$$\therefore \text{Work Certified} = 10,50,000$$

**Estimated Contract:-**

Under Estimated contract we have to find out the total estimated profit after completion of contract, nothing but if the contract period is more than one year then the total contract cost deducted from the total contract price and find out the profit. It is not the actual profit it is our estimation in short after completion of contract we will earn the profit.



Estimated profit is calculated for the purpose of transferring profit to the profit & Loss A/c.

**Illustration : 4**

Uddan Constructors Pvt. Ltd. provide you the following information:

- The project commenced on 1<sup>st</sup> September 2013 and it was estimated to be completed by 31<sup>st</sup> March 2015.
- The contract price was negotiated at ₹680 lacs.
- The actual expenditure upto 31<sup>st</sup> March, 2014 and subsequent additional estimated expenditure upto 31<sup>st</sup> March, 2015 is furnished as under:

Particulars	Actual Exp. During 1-9-13 to 31-3-2014	Estimated Exp. during 1-4-14 to 31-3-2015
	₹	₹
Direct Material	195,60,000	127,40,000
Indirect Material	14,23,000	11,77,000
Direct Wages	42,46,500	41,33,500
Supervision Charges	4,14,400	5,55,600
Archited Fees	8,17,500	12,82,500
Construction Overheads	31,52,600	21,47,400
Administrative Overheads	14,16,000	24,34,000
Closing Material at Site	7,50,000	--
Work Uncertified at the end of the year	13,80,000	--
Work Certified during the year	350,00,000	330,00,000

The Value of plant and machinery sent to site was ₹60 Lacs, whereas the scrap value of the plant and machinery at the end at the project was estimated to be ₹3,00,000.

It was decided that the profit to be taken credit for should be that proportion of the estimated net profit to be realized on completion of the project which the certified value of work as on 31-03-2014, bears to the total contract price. You are required to prepare contract account for the period ended 31<sup>st</sup> March 2014 alongwith the working of profit to be taken credit for.

Solution:-

Uddan Constructors Pvt. Ltd.

**Contract A/c  
for the Period from 1-9-2013 to 31-3-2014**

Dr.

Cr.

Particulars	₹	Particulars	₹
To Direct Material	195,60,000	By Work in Progress	
To Indirect Material	14,23,000	Work Certified	350,00,000
To Direct Wages	42,46,500	Work Uncertified	13,80,000
To Supervision Charges	4,14,400	Material at Site	7,50,000
To Architect Fees	8,17,500		
To Construction Overheads	31,52,600		
To Administrative Overheads	14,16,000		
To Depreciation on Plant & Machinery	21,00,000		
To Notional Profit c/d	40,00,000		
	371,30,000		371,30,000
To Profit & Loss A/c	35,00,000	By Notional Profit b/d	40,00,000
To Work in Progress (Reserve)	5,00,000		
	40,00,000		40,00,000

## Dr. Memorandum Contract A/c (1-9-2013 to 31-3-2015) Cr.

Particulars	Actual Exp. (1-9-2013 to 31-3-2014) 7 Month	Estimated Exp. (1-4-14 to 31-3-15) 12 Month	Total 7 + 12 = 19 Months	Particulars	₹
To Direct Material	1,95,60,000	1,27,40,000	3,23,00,000	By Contraction's A/c (Full Contract Price)	6,80,00,000
To Indirect Material	14,23,000	11,77,000	26,00,000		
To Wages	42,46,500	41,33,500	83,80,000		
To Super Vision Charges	4,14,400	5,55,600	9,70,000		
To Archited Fees	8,17,500	12,82,500	21,00,000		
To Administrat ive on	14,16,000	24,34,000	38,50,000		
To Dept on Plant	21,00,000	36,00,000	57,00,000		
To Con Struction Overheads	31,52,600	21,47,400	53,00,000		
Total Exp.	3,31,30,000	2,80,70,000	6,12,00,000		
Estimated Profit			68,00,000		
			6,80,00,000		6,80,00,000

**Working Note:-**

1) Depreciation on Plant &amp; Machinery:-

$$\begin{aligned} \text{Depreciation} &= \frac{\text{Original Cost} - \text{Scrap Value}}{\text{Estimated Life of Plant}} \\ &= \frac{60,00,000 - 3,00,000}{19 \text{ Months}} = \frac{57,00,000}{19} \end{aligned}$$

Depreciation = ₹3,00,000 p.m.

Depreciation is also calculated for actual and estimated period.

- i) Actual Period (from 1-9-2013 to 31-3-2014) for 7 Months.  
 $\therefore \text{Dep. } 3,00,000 \text{ p.m.} \times 7 \text{ months}$   
 $= 21,00,000$
  - ii) Depreciation for estimated period (from 1-4-2014 to 31-3-2015) = 12 months  
 $\therefore \text{Dep. } 3,00,000 \text{ pm.} \times 12 \text{ months.}$   
 $= 36,00,000$
- 2) Notional Profit is ₹40,00,000 distributed between profit & Less A/c & Work in progress (Reserve).  
 Notional Profit is ₹40,00,000  
 Estimated Profit is ₹68,00,000  
 For Profit & Loss A/c Formula is given in the problem as.

$$\begin{aligned} \text{Profit \& Loss A/c} &= \text{Estimated Profit} \times \frac{\text{Work Certified as on 31-3-2014}}{\text{Total Contract Price}} \\ &= 68,00,000 \times \frac{3,50,00,000}{6,80,00,000} \end{aligned}$$

$$\text{Profit \& Loss A/c} = 35,00,000$$

### Illustration : 5

Ratnagiri Construction Pvt. Ltd. provides you the following information:

- a) The project commenced on 1<sup>st</sup> May 2013 and it was estimated to be completed by 31<sup>st</sup> January 2015.
- b) The contract price was fixed at ₹2,70,00,000.
- c) The actual expenditure upto 31<sup>st</sup> March 2014 and subsequent additional estimated expenditure upto 31<sup>st</sup> January 2015 is furnished as under:

Particulars	Actual Exp. 1-5-13 to 31-3-14	Estimated Exp. 1-4-14 to 31-1-15
Work Certified (cumulative)	1,62,00,000	2,70,00,000
Cash Received	1,29,60,000	1,40,40,000
Work Uncertified	3,85,000	--
Direct Material	87,14,500	37,92,500
Direct Wages	17,47,500	18,58,500
Direct Expenses	8,44,400	4,32,600
Indirect Material	3,25,600	2,85,500
Supervision Charges	1,98,500	1,65,600
Administrative Overheads	9,47,600	8,54,600
Sub Contract Charges	1,87,900	1,80,200
Material Return to Stores	75,500	--
Architect Fees	3% of W. C.	3% of W.C.
RCC Consultant Fees	4% of W.C.	4% of W.C.
Plant Issued at Commencement	40,00,000	--
Material at site as on 31-03-2014	1,39,500	--

**Other Information:-**

- 1) The estimated value of the issued plant at the end of the project is to be ₹5,35,000.
- 2) It was decided that the profit to be taken credit for should be that proportion of the estimated net profit to be realized on completion of the contract which the certified value of work as on 31<sup>st</sup> March 2014, bears to the total contract price.

Prepare contract A/c for the period ended 31<sup>st</sup> March 2014 and show your calculation profit to be credited to Profit and Loss A/ for the period ended 31<sup>st</sup> March 2014.

Solution:-

**Ratnagiri Construction Pvt. Ltd.****Contract Account****Dr (From 1-5-13 to 31-3-15) 11 Months Cr.**

Particulars	₹	Particulars	₹
To Direct Material	87,14,500	By Material Return to Store	75,500
To Direct Wages	17,47,500	<u>By Work in Progress</u>	
To Direct Expenses	8,44,400	Work Certified	1,62,00,000
To Indirect Material	3,25,600	Work Uncertified	3,85,000
To Supervision Charges	1,98,500	Material at Site	1,39,500
To Administrative Overheads	9,47,600		
To Sub Contract charges	1,87,900		
To Architect Fees (3% of 1,62,00,000)	4,86,000		
To RCC Consultant Fees (4% of 1,62,00,000)	6,48,000		
To Depreciation on Plant (1,65,000 p.m. x 11)	18,15,000		
To Notional Profit c/d	8,85,000		
	1,68,00,000		1,68,00,000
To Profit & Loss A/c	6,65,700	By Notional Profit b/d	8,85,000
To Work in Progress (Reserve)	2,19,300		
	8,85,000		8,85,000

## Memorandum Contract A/c

Particulars	Actual Exp. (1-5-13 to 31-3-14) 11 Months	Estimated Exp. (1-4-14 to 31-1-15) 10 Months	Total Exp. 21 Months	Particulars	₹
To Direct Material	87,14,500	37,92,500	1,25,07,000	By Contractee's A/c (Full Contract Price)	2,70,00,000
To Direct Wages	17,47,500	18,58,500	36,06,000		
To Direct Exp.	8,44,400	4,32,600	12,77,000		
To Indirect Material	3,25,600	2,85,500	6,11,100		
To Supervision Charges	1,98,500	1,65,600	3,64,100		
To Administrative Overheads	9,47,600	8,54,600	18,02,200		
To Sub Contract Charges	1,87,900	1,80,200	3,68,100		
To Architect Fees	4,86,000	3,24,000	8,10,000		
To RCC Cons. Fees	6,48,000	4,32,000	10,80,000		
To Depreciation on Plant	18,15,000	16,50,000	34,65,000		
Total Exp.	1,59,15,000	99,75,500	2,58,90,500		
Estimated Profit			11,09,500		
			2,70,00,000		2,70,00,000

## Working Note:-

i) Depreciation on Plant

$$\text{Depreciation} = \frac{\text{Original Cost} - \text{Scrap Value}}{\text{Estimated Life or Plant}}$$

Estimated Life of Plant =

1) Actual Period 1-5-13 to 31-3-14 = 11 Months

2) Estimated Period 1-4-14 to 31-1-15 = 10 Months  
21 Months

$$\text{Dep.} = \frac{40,00,000 - 5,35,000}{21}$$

∴ Depreciation 1,65,000 p.m.

∴ Depreciation for Actual Period

= 1,65,000 x 11 Months = 18,15,000

∴ Depreciation for Estimated Period

= 1,65,000 x 10 Months = 16,50,000

ii) Transfer to Profit & Loss A/c Out of Notional Profit = 8,85,000

$$\therefore \text{Profit \& Loss A / c} = \text{Estimated Profit} \times \frac{\text{Work Certified as on 31-03-14}}{\text{Total Contract Price}}$$

$$= 11,09,500 \times \frac{1,62,00,000}{2,70,00,000}$$

Profit & Loss A/c = 6,65,700

iii) Work in Progress (Reserve)

= Notional Profit - Profit & Loss A/c (Reserve)

= 8,85,000 - 6,65,700

= 2,19,300

Many Contracts - (More than 1 Contract aa a time)

### Illustration : 6

Mr. Bean Contractor has undertaken two contracts one at Mumbai and another at Thane. The details of the contracts are given below. For the year ended 31<sup>st</sup> March 2014.

Particulars	Contract at Mumbai	Contract at Thane
	01/07/2013	01/10/2013
	₹	₹
Contract Price	10,00,000	15,00,000
Direct Labour	2,55,000	1,82,000
Material Issued from Stores	2,20,000	2,00,000
Material Returned to Stores	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
Material Sold (Cost ₹8,000)	10,000	-
Material 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
Architect Fees	7,000	3,000

i) Provide depreciation on plant at 20% p.a.

ii) During the year material costing ₹10,000 were transferred from Thane contract to Mumbai Contract.



You are required to prepare contract A/c of Mumbai and Thane Contract.

**Solution:-**

<b>Mr. Bean Contractor</b>			
<b>Mumbai Contract A/c (1-7-13 to 31-3-14 - 9 Months)</b>			
<b>Dr.</b>			<b>Cr.</b>
<b>Particulars</b>	<b>₹</b>	<b>Particulars</b>	<b>₹</b>
To Material Issued	2,20,000	By Material Returned	10,000
To Direct Labour	2,55,000	By Material Sold	8,000
To Direct Expenses	40,000	By Work in Progress c/d	
To Office Overhead	15,000	Work Certified (W.N)	6,00,000
To Architect Fees	7,000	Work Uncertified	13,000
To Depreciation on Plant	30,000	Material at Site	18,000
To Material from Thane Contract	10,000		
To Notional Profit Ltd	72,000		
	6,49,000		6,49,000
To Profit & Loss A/c	38,400	By Notional Profit b/d	72,000
To Work in progress (Reserve)	33,600		
	72,000		72,000

**Working Note:-**

i) Work Certified -

Cash Received being 80% of Work Certified - ₹4,80,000

$$\therefore \text{Cash Received} = 4,80,000 = 80\%$$

$$\therefore \text{Work Certified} = ? = 100$$

$$\therefore \text{Work Certified} = 4,80,000 \times \frac{100}{80}$$

$$\therefore \text{Work Certified} = 6,00,000$$

ii) Depreciation on Plant.

Total Contract Period is 9 Months (from 1-7-13 to 31-3-14)

$$\text{Depreciation} = 2,00,000 \times 20\% \times \frac{9}{12}$$

$$\text{Depreciation} = 30,000$$

iii) Out of Notional Profit ₹72,000 transfer to Profit & Loss A/c is calculated by finding out how much contract is completed between work certified with the contract price.

$$\text{Contract Price} = 10,00,000 = 100\%$$

$$\text{Work Certified} = 6,00,000 = ?$$

$$\therefore \text{Contract Completed} = 6,00,000 \times \frac{100}{10,00,000}$$

$$\therefore \text{Contract Completed} = 60\%.$$

$\therefore$  Profit & Loss A/c transferred is calculated by following formula contract completed between 50-90%

$$\begin{aligned} \text{Profit \& Loss A / c} &= \frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Work Certified}} \\ &= \frac{2}{3} \times 72,000 \times \frac{4,80,000}{6,00,000} \end{aligned}$$

$$\text{Profit \& Loss A/c} = 38,400$$

iv) Work in Progress (Reserve) =  
Notional Profit - Profit & Loss A/c  
72,000 - 38,400 = 33,600

**Thane Contract A/c**  
**(From 1-10-2013 to 31-3-2014 - 6 Months)**

Dr.

Cr.

Particulars	₹	Particulars	₹
To Material Issued	2,00,000	By Material Return	15,000
To Direct Labour	1,82,000	By Material Transferred to Mumbai Contract	10,000
To Direct Expenses	30,000	By Work in Progress c/d	
To Office Overheads	10,000	Work Certified	3,00,000
To Architect Fees	3,000	Work Uncertified	9,000
To Depreciation on Plant	35,000	Material at Site	16,000
		By Profit & Loss A/c (Loss)	1,10,000
	4,60,000		4,60,000

**Working Note:-**

i) Calculation of Depreciation on plant.

Contract Period is 6 months.

(From 01-10-2013 to 31-03-2014)

Depreciation = 3,50,000 x 20%

= 70,000 p.a.

∴ Dep. For 6 months =  $70,000 \times \frac{6}{12}$

∴ Depreciation = 35,000

ii) Calculation of work certified :-

Cash Received ₹2,40,000 being 80% of work certified.

∴ Cash Received = 2,40,000 = 80%

Work Certified = ? = 100

∴ Work certified =  $2,40,000 \times \frac{100}{80}$

∴ Work Certified = 3,00,000

Many Years → contract Completed in more than 1 year.

**Illustration : 7**

Ram contractor undertook a contract for ₹15,00,000 on 1<sup>st</sup> July 2012. The contract was completed on 31<sup>st</sup> March 2014. The contractor prepares his accounts as on 31<sup>st</sup> March. The details of the contract are:

Particulars	Period	
	1-7-12 to 31-3-13	1-4-13 to 31-3-14
Material Issued	1,52,000	3,30,000
Direct Wages	1,25,000	4,65,000
Direct Expenses	30,000	45,000
Material Returned to Stores	22,000	15,000
Material at Site	20,000	8,000
Uncertified Work	48,000	--
Office Overheads	23,000	66,000
Material Lost by Fire	--	5,000
Work Certified	3,00,000	15,00,000
Plant Issued	3,00,000	1,50,000

Provide depreciation @ 20% on plant. Prepare contract A/c for the year ended 31-03-2013 and 31-03-2014.

Solution:

## Ram Contractors

**Contract Account**  
(From 1-7-12 to 31-3-13 - 9 Months)

Dr.			Cr.
Particulars	₹	Particulars	₹
To Material Issued	1,52,000	By Material Returned to Store	22,000
To Direct Wages	1,25,000	<u>By Work in Progress</u>	
To Direct Expenses	30,000	Work Certified	3,00,000
To Office Overheads	23,000	Work Uncertified	48,000
To Depreciation on Plant	45,000	Material Site	20,000
To Notional Profit c/d	15,000		
	3,90,000		3,90,000
To Profit & Loss A/c	NIL	By Notional Profit b/d	15,000
To Work in Progress (Reserve)	15,000		
	15,000		15,000

**Working Note:-**

- i) Depreciation on Plant :  
(Period or Contract 01-07-2012 to 31-03-13 - 9 Months)

$$\begin{aligned} \text{Depreciation} &= 3,00,000 \times 20\% \text{ p.a.} \\ &= 60,000 \text{ p.a.} \end{aligned}$$

$$\text{Depreciation for 9 Months} = 60,000 \times \frac{9}{12}$$

$$\text{Depreciation for 9 Months} = 45,000$$

- ii) Notional Profit - ₹15,000 out of transfer to Profit & Loss A/c is NIL.

Because contract completed is less than 25%. To find out contract completed compare with work certified to the contract price.

$$\therefore \text{Contract Price} = 15,00,000 = 100\%$$

$$\text{Work Certified } 3,00,000 = ?$$

$$\therefore \% \text{ of Contract Completed} = 3,00,000 \times \frac{100}{15,00,000} = 20\%$$

**Dr. Contract Account Cr.**  
**(From 1-4-13 to 31-3-14 - 12 Months)**

Particulars	₹	Particulars	₹
To <u>Work in Progress</u> <u>b/d</u>		By Work in Progress b/d (Reserve)	15,000
Work Certified	3,00,000	By Material Returned	15,000
Work Uncertified	48,000	By Material at Site	8,000
Material at Site	20,000	By Material Lost by Fire	5,000
To Material Issued	3,30,000	By Contractee's A/c (Full Contract Price)	15,00,000
To Direct Wages	4,65,000		
To Direct Expenses	45,000		
To Office Overheads	66,000		
To Depreciation on Plant (WN)	81,000		
To Profit & Loss A/c (Profit)	1,88,000		
	15,43,000		15,43,000

**Working Note:-**

i) Depreciation on Plant:

Depreciation is calculated on WDV basic.

Plant which was used for 1 year its Opening Balance is	3,00,000
( - ) Depreciation for 1 <sup>st</sup> Year	<u>45,000</u>
WDV of Plant	<u>2,55,000</u>

∴ Depreciation on 1<sup>st</sup> Plant

$$2,55,000 \times 20\% = \underline{51,000}$$

Depreciation on 2<sup>nd</sup> Plant

$$1,50,000 \times 20\% = \underline{30,000}$$

∴ Total Depreciation for 2 year is = 51,000 + 30,000 = 81,000

**Many Contract (Opening W/P given)****Illustration : 8**

Navin Ltd has under taken three Contracts. It furnishes the following information for the year ended 31<sup>st</sup> March 2014:

Particulars	Goa Contract	Roha Contract	Surat Contract
1) Balances on 1/4/2013			
Material at Site	100	2,000	--
Uncertified Work	25,000	4,000	--
Plant at Site	22,000	3,100	--
Work Certified	19,500	1,400	--
Provision for Contingencies	10,000	600	--
2) Transactions During the Year:			
Material Issued	--	6,200	8,000
Subcontract Charges	600	11,800	9,000
3) Balances on 31-03-14			
Material at Site	--	1,000	800
Uncertified Work	--	1,000	3,850
Plant at Site	--	2,000	950
Work Certified	25,000	30,000	12,000
4) Contract Price	25,000	40,000	50,000
5) Amount Received	25,000	27,000	10,800

- 6) Value of Plant Transferred from Goa Contract to Surat Contract ₹1,550.
- 7) The Company consistently adopt the policy of taking credit for the contract profit considering the proportion of amounts received to the contract price.

You are required to:

- a) Prepare the respective contract accounts for the year ended 31<sup>st</sup> March 2014.
- b) Find the net profit as per profit & Loss A/c.

**Solution:**

<b>Navin Ltd</b>			
<b>Dr.</b>	<b>Goa Contract A/c</b>		<b>Cr.</b>
<b>Particulars</b>	<b>₹</b>	<b>Particulars</b>	<b>₹</b>
To Opening Balance		By Provision for Contingencies b/d	1,000
<u>Work in Progress</u>		By Contractee's A/c (Full Contract Price)	25,000
Work Certified	19,500		
Work Uncertified	2,500		
Material at Site	100		
To Sub Contract Charges	600		
To Depreciation on Plant (WN)	650		
To Profit & Loss A/c (Profit)	2,650		
	26,000		26,000

**Working Note:-**

- i) Depreciation on Plant.

Op. Balance of Plant in Goa A/c	2,200
( - ) Transferred to Surat Contract	1,550
Plant Depreciation of Goa Contract	650

Dr. **Roha Contract A/c** Cr.

Particulars	₹	Particulars	₹
To Opening Balance		By Provision for Contingencies b/d	600
<u>Work in Progress</u>		By <u>Work in Progress b/d</u>	
Work Certified	1,400	Work Certified	30,000
Work Uncertified	4,000	Work Uncertified	1,000
Material at Site	2,000	Material at Site	1,000
To Material Issued	6,200		
To Sub Contract Charges	11,800		
To Depreciation on Plant	1,100		
To National Profit b/d	6,100		
	32600		32,600
To Profit & Loss A/c	4,118	By Notional Profit b/d	6,100
To Work in Progress (Reserve)	1,982		
	6,100		6,100

**Working Note:-**

i) Depreciation on Plant at Roha Contract

Opening Balance of Plant	3,100
( - ) Closing Balance of Plant	<u>2,000</u>
Depreciation on Plant	<u>1,100</u>

ii) Notional Profit ₹6,100, out of that Transfer to Profit & Loss A/c, specific instruction given in the problem

$$\text{Profit \& Loss A / c} = \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Contract Price}}$$

$$= 6,100 \times \frac{27,000}{40,000} = 4,118$$

$$\text{Profit \& Loss A/c} = 4,118$$

iii) Work in Progress (Reserve) = Notional Profit - Profit & Loss A/c 1982  
= 6,100 - 4,118



Dr. **Surat Contract** Cr.

Particulars	₹	Particulars	₹
To Material Issued	8,000	By <u>Work in Progress c/d</u>	
To Sub Contract Charges	9,000	Work Certified	12,000
To Depreciation on Plant (1550 - 950)	600	Work Uncertified	3,850
		Material at Site	800
		By Profit & Loss A/c (Loss)	950
	17,600		17,600

**Working Note:-**

i) Depreciation on Plant for Surat Contract -

Plant Transform from Goa	1,550
Closing Plant at Surat	- 950
Depreciation on Plant	<u>600</u>

Dr. **Profit & Loss A/c** Cr.

Particulars	₹	Particulars	₹
To Surat Contract (Loss)	950	By Goa Contract (Profit)	2,650
To Net Profit c/d	5,818	By Roha Contract (Profit)	4,118
	6,768		6,768

---

**10.6 EXERCISE**

---

**A. Objectives type Questions**

Q.1 Multiple Choice Questions.

- Retention money is
  - Payment received – Work certified
  - Work certified – Cash received
  - Work certified – work uncertified
  - Contract price – Work certified

2. Work in progress is valued at cost plus profit which has been taken to the
  - A. Contract A'C
  - B. Profit and loss A'C
  - C. Contractees A/C
  - D. None of the above
3. If the contract completed 80% then transfer to profit and loss A'C out of
  - A. NIL
  - B.  $1/3 * \text{Notional profit}$
  - C.  $2/3 * \text{Notional profit}$
  - D. Entire profit
4. Cost of normal wastage of materials is
  - A. Debited to contract A'C
  - B. Credited to contract A/C
  - C. Debited to P & L A/C
  - D. Credited to P & L A/C
5. Cost of abnormal wastage of materials in a contract is transferred to the
  - A. Contract A/C
  - B. Costing profit and loss A/C
  - C. Profit and Loss A/C
  - D. None of the above
6. Cash received on contract is credited to
  - A. Contract A/C
  - B. Contractees A/C
  - C. Profit and Loss A/C
  - D. None of the above
7. If the contract price is RS. 10,00,000 work certified is 60 % ,the amount of the profit is 72,000 ,then the reserve will be RS .
  - A . RS. 33,600
  - B. RS.30,600
  - C.RS.32,200
  - D.RS. 40,000
8. If the contract completed is less than 20% then the amount of profit is transfer to P & L A/C
  - A. Full amount
  - B. 50%
  - C. NIL
  - D. 20%
9. Cash received is calculated by
  - A. Work certified - Retention money
  - B. Work certified x cash received as % of W.C.
  - C. Contract price x % of W.C. x % of cash received
  - D. All of the above
- 10 Notional profit is calculated by
  - A. Work certified – Cost of Work certified
  - B. Work certified –Work uncertified
  - C. Work certified – Cash received
  - D. Any of the above

**(Answers : 1. A 2. B 3. C 4. A 5. B 6. B 7. A 8.C  
9. D 10. A)**

## Q .2 True and False

1. Cash received = Value of work certified – Retention money
2. Cost of material transferred from one contract to another contract , the contract A/C which receives the material is credited to the particular contract A/C.
3. Contractor is the person who undertakes the contract.
4. Contertee is the person who undertakes the contract.
5. Sale of plant , the sale price is debited to the contract A/C.
6. Under capital method, the amount of depreciaton is debited to contract A/C.
7. Cash received is credited to the contract A/c.
8. If the contract is 100 % completed ,then the entire profit is transferred to P & L A/C.
9. The cost of material issued by stores is debited to the contract A/c.
10. Work certified is that portion of the work completed which has been certified by the contractee's architect .

**(Answers: True : 1,3,8,9,10 False : 2,4,5,6,7.)**

**B. Practical Problem:-**

Q.1 Jai Hind Construction Company under took the construction of a building at a contract price of ₹2,00,00,000.

The Date of Commencement of contract was 1<sup>st</sup> May 2013.  
The following cost information is given for the period ended 31<sup>st</sup> March 2014:

- 1) Direct Material Sent to the Site - 5,000 tons @ ₹1.50 per kg.
- 2) Indirect Material ₹6,50,000.
- 3) Direct Labour - 12,000 Mandays @ ₹180 per Monday.
- 4) Indirect labour charged at 7.5% of Direct Labour.
- 5) sub Contract Charges Charged at 15% of Indirect Materials.
- 6) Direct Materials returned to stores 20 tons.
- 7) Direct Material lost in an accident 5 tons.
- 8) Supervision charges paid ₹8,000 per month.
- 9) Administrative Overheads incurred ₹12,000 per month.
- 10) Architect Fees Charged at 2% of Work Certified.
- 11) Plant & Machinery installed at site on the date of commencement of contract at a cost of ₹15,00,000. Which is to be depreciated @ 12% p.a. under original cost method.

- 12) Cash received from contractee ₹1,26,00,000 which is equal to 90% of work certified.
- 13) Direct Material at site as on 31<sup>st</sup> March 2014 - 15.
- 14) Cost of work done but not certified was ₹2,04,500 on 31<sup>st</sup> March 2014.

You are required to prepare a contract Account for the period ended 31<sup>st</sup> March 2014, in the books of Jai Hind Construction Company and show what profit or loss should be taken into account for the period ended 31<sup>st</sup> March 2014.

Q.2 R. Limited commenced a contract on 01-07-2013. The Total contract price was ₹5,00,000 but R Limited accepted the same for ₹4,50,000. It was decided to estimate the total profit and to take to the credit of profit & Loss A/c that proportion of estimated profit on cash basis which the work completed and certified borne to the total contract. Actual expenditure till 31-12-2013 and estimated expenditure in 2014 are given below.

Particulars	Accruals ₹	Estimate for 2014 ₹
Material	75,000	1,30,000
Labour	55,000	60,000
Plant Purchased (Original Cost)	40,000	--
Miscellaneous Expenses	20,000	35,500
Plant Returned to Stores (at Original Cost)	10,000	25,000
Material at Site	5,000	--
Work Certified	2,00,000	Full
Work Uncertified	7,500	--
Cash Received	1,80,000	Full

The plant is subjected to annual depreciation @ 20% of original cost. The contract is likely to be completed on 30-09-2014.

You are required to prepare the contract A/c for the year ended 31-12-2013. Working showed be clearly given.

It is the policy of the company to charge depreciation on time basis.

Q.3 Raj and Company has undertaken two contract viz. A and B. The following particulars are available for the year ended 31<sup>st</sup> March 2014.

Particulars	Contract A	Contract B
Date of Commencement	01-07-2013	01-12-2013
Contract Price	6,00,000	5,00,000
Material Sent to Site	1,60,000	60,000
Material Returned	4,000	2,000
Closing Stock of Material at Site	22,000	8,000
Direct Labour	1,50,000	42,000
Direct Expenses	66,000	35,000
Establishment Expenses	25,000	7,000
Plant Installed at Site	80,00	72,000
Work Uncertified	23,000	10,000
Work Certified	4,20,000	1,35,000
Architect Fees	2,000	1,000

During the year Material Costing ₹9,000 have been transferred from contract A to contract B. The contractor charges depreciation @ 25% p.a. on plant.

You are required to prepare contract A/c, working for profits, if any, and show how the relevant items would appear in the Balance Sheet Assuming that contractee had paid 90% of the work certified.

Q.4 M/s Jadhav constructions under took contract For ₹5,00,00,000 on 1<sup>st</sup> August 2012. The contract was completed on 31<sup>st</sup> March 2014. The contractor closes his accounts on 31<sup>st</sup> March. The details of the contract are as follows:

Particulars	For the Period ended 31-03-13	For the Period ended 31-03-14
	₹	₹
Material Issued	95,48,500	1,17,65,000
Direct Labour	31,37,800	45,40,000
Sub Contract Charges	7,88,900	28,13,000
Administrative Overheads	15,85,400	31,42,000
Supervision Charges	3,45,600	8,05,500
Material Returned to Stores	1,32,400	2,44,300
Work Uncertified	5,23,200	--
Work Certified (Cumulative)	2,00,00,000	5,00,00,000
Material at Site	1,00,600	--
Cash Received	1,80,00,000	3,20,00,000
Architect Fees	4% of Work Certified	4% of Work Certified

The Plant and Machinery purchased on 01/08/2012 for the contract was ₹84,25,000 and the estimated scrap value of the plant and machinery at the end of the contract was ₹4,25,000. It realized on completion of contract at its estimated scrap value.

You are required to prepare:

- a) Contract A/c for the period indeed 31<sup>st</sup> March 2013 and
- b) Contract A/c for the year ended 31<sup>st</sup> March 2014.

Q.6 Parna Kutir Ltd. furnishes you with the following information for the year ended 31<sup>st</sup> March 2013 and 31<sup>st</sup> March 2014.

Particulars	31-03-2013	31-03-2014
Material Issued	13,000	24,700
Sub - Contract Charges	4,500	20,000
Value of Work Certified During the year	20,000	80,000
Closing Stock of Material at Site	3,000	--

To Total contract Price is ₹1,00,000. The entire amount was received by 31<sup>st</sup> March 2014. As per the accounting policy adopted by the company no profit is to be considered unless the value of the work certified at the year end excess 25% of the contract price.

Prepare contract account for the years ended 31<sup>st</sup> March 2013 and 31<sup>st</sup> March 2014.



## PROCESS COSTING

### Unit Structure :

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Costing Procedure
- 11.3 Treatment to Several Items
- 11.4 Format of Process A/C
- 11.5 Solved Problems
- 11.6 Exercises

---

### 11.0 OBJECTIVES

---

After studying the unit the students will be able to:

- Understand the meaning and costing procedure of Process Costing
- Know how to Normal and Abnormal process losses and Abnormal Gains.
- Calculate Process Cost per unit.
- Solve the problems on process costing.

---

### 11.1 INTRODUCTION

---

A process means a difference manufacturing operation or stages. When a product is produced, it means a raw material will be converted into finished product it is passes through difference stages, it is called as a process.

Process costing means to find out the cost or each process. For eg. - if a product passes through 3 processes at that time we have a find out the cost of each process.

---

### 11.2 COSTING PROCEDURE

---

Under Process Costing following procedures are as follows:

#### 1) **Separate Process A/c:-**

Under process costing different process accounts are prepared, it means how many process are given separate process A/c is prepared.

**2) Debit Side of Process A/c:-**

Under each process the cost of each process divided as follows:-

- i) Material : Whatever Material used for each process is debited to a Particular Account.
- ii) Labour : Whatever labour used or wages paid to worker are debited to the particular process A/c.
- ii) Overheads : Whatever expenses or overhead paid for particular process are debited to that A/c.

**3) Credit Side of Process A/c:-**

Any sale of scrap related to a particular process are credited to process A/c.

**4) Cost of Process:-**

To find out the net cost of process is total of Debit side Less Credit Side of process A/c which gives the net cost of a particular process i.e. (Total expenses (Dr. Side) - Sale or scrap (Cr. Side)).

**11.3 TREATMENT TO SEVERAL ITEMS****11.3.1 PROCESS LOSS:-**

In many process, there is a weight loss. It means under any process there is surety of some % of loss on input. If there are total three process, we introduced input in process I, then there is surety that same % of loss on that input whatever balance transfer to next process i.e. process II. Again in process II if there is weight loss, and balance transfer to next process i.e. process III again in process III there is weight loss what balance is an actual output.

The loss may be divided into two categories.

- i) Normal Loss
- ii) Abnormal Loss.

**i) Normal Loss :-**

Under any process, before production we assume that there is a loss under each process which is called as normal loss. It is already assume before production process start.

**ii) Abnormal Loss:-**

As per above we can say that before production, assume some % of loss i.e. weight loss or normal loss. But after the production if there is an increase in normal loss, it means loss is over and above expectation is called as abnormal loss.







## Normal Loss A/c

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Process I				By Actual <u>Sale</u>			
To Process II				Process I			
To Process III				II			
				III			
				By Abnormal Gain (Process III)			

## Abnormal Loss A/c

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Process II				By Actual Sales			
				Process II			
				By Costing P & L A/c			

## Abnormal Gain A/c

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Normal Loss				By Process III A/c			
To Costing Profit & Loss A/c							

## Quantity Reconciliation

Particulars	I	II	III
Input			
( - ) Normal Loss			
Expected Output			
( - ) Actual Output			
Abnormal Loss / Gain			

- ❖ Abnormal Loss = Actual Output is Less than the expected Output.
- ❖ Abnormal Gain = Actual output is more than the expected output.

---

## 11.5 SOLVED PROBLEMS

---

### Illustration : 1

Samar Ltd. manufactures a product which passes through two consecutive process viz. Purvardha and Uttarardha. The company provides you with the following information for the year ended 31<sup>st</sup> March 2014.

Particulars	Purvardha	Uttarardha
Basic Material	5000 units	--
Rate Per Unit	₹2.20	--
	₹	₹
Process Material	4,000	3,000
Wages	3,000	4,000
Factory Overheads	2,000	2,630
Process Loss as percentage of input	10%	10%
Scrap Value of process loss (per 100 units)	40	60

Prepare Process A/c and other relevant accounts.

The entire output of Uttarardha process was sold for ₹30,000.

**Solution:-**

### Quantity Reconciliation

Particulars	Purvardha	Uttarardha
Input	5,000	4,500
( - ) Normal Loss	500	450
Expected / Actual Output	4,500	4,050

**Purvardha Process A/c**

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Material	5,000	2.20	11,000	By Normal Loss	500	0.40	200
To Process Material			4,000				
To Wages			3,000	By Transfer to Uttarardha Process	4,500	4.40	19,800
To Factory Overheads			20,000				
	5,000		20,000		5,000		20,000

$$\text{Cost Per Units} = \frac{\text{Total Cost} - \text{Scrap Value or Normal Loss}}{\text{Input} - \text{Normal Loss}}$$

$$= \frac{20,000 - 200}{5,000 - 500} = \frac{19,800}{4,500} = 4.40$$

**Uttarardha Process A/c**

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Transfer from Purvardha Process	4,500	4.40	19,800	By Normal Loss	450	0.60	270
To Process Material			3,000	By Output c/d	4,050	7.20	29,160
To Wages			4,000				
To Factory Overheads			2,630				
	4,500		29,430		4,500		29,430
To Output b/d	4,050	7.20	29,160	By Sale	4,050		30,000
To Costing P/L A/c			840				
	4,050		30,000		4,050		30,000

$$\text{Cost Per Units} = \frac{\text{Total Cost} - \text{Scrap Value of Normal Loss}}{\text{Input} - \text{Normal Loss Units}}$$

$$= \frac{29,430 - 270}{4,500 - 450} = \frac{29,160}{4,050} = ₹7.20$$

**Illustration : 2**

Y Ltd. Manufacture a Chemical product which passes through three process. The cost records show the following particulars for the year ended 30<sup>th</sup> June 2014.

Particulars	Process I	Process II	Process III
Material	48,620	1,08,259	1,03,345
Labour	32,865	84,553	77,180
Expenses	2,515	10,588	16,275
Normal Loss	20%	15%	10%
Scrap Value Per Unit	1	2	3
Actual Output (Units)	18,000	16,000	15,000

Input to Process I 20000 Units @ ₹28 per unit. Prepare Process Accounts, Abnormal gain / Loss A/c Also show process cost per unit for each process.

**Solution:-**

**Quantity Reconciliation**

Particulars	I	II	III
Input	20,000	18,000	16,000
( - ) Normal Loss	4,000	2,700	1,600
Expected Output	16,000	15,300	14,400
( - ) Actual Output	18,000	16,000	15,000
Abnormal	2,000	700	600
	Gain	Gain	Gain

**Process I A/c**

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Input	20,000	28	5,60,000	By Normal Loss	4,000	1	4,000
To Material			48,620	By Transfer To Process II	18,000	40	7,20,000
To Labour			32,865				
To Expenses			2,515				
To Abnormal Gain	22,000	40	80,000				
	22,000		7,24,000		22,000		7,24,000

$$\text{Cost Per Units} = \frac{\text{Total Cost} - \text{Normal Loss Scrap Value}}{\text{Input} - \text{Normal Loss Units}}$$

$$= \frac{6,44,000 - 4,000}{20,000 - 4,000} = \frac{6,40,000}{16,000} = 40$$

**Process II A/c**

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Transfer				By Normal Loss	2,700	2	5,400
From Process I	18,000	40	7,20,000	By Transfer to Process III A/c	16,000	60	9,60,000
To Material			1,08,259				
To Labour			84,553				
To Expenses			10,588				
To Abnormal Gain	700	60	42,000				
	18,700		9,65,400		18,700		9,65,400

$$\text{CPU} = \frac{9,23,400 - 5,400}{18,000 - 2,700} = \frac{9,18,000}{15,300} = 60$$

**Process III A/c**

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Transfer from Process II	16,000	60	9,60,000	By Normal Loss	1,600	3	4,800
To Material			1,03,345	By Output (Finished Stock A/c)	15,000	80	12,00,000
To Labour			77,180				
To Expenses			16,275				
To Abnormal Gain	600	80	48,000				
	16,600		12,04,800		16,600		12,04,800

$$\text{CPU} = \frac{11,56,800 - 4,800}{16,000 - 1,600} = \frac{11,52,000}{14,400} = 80$$

## Normal Loss A/c

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Process I	4,000	1	4,000	By Actual Sale			
To Process II	2,700	2	5,400	Process I	2,000	1	2,000
To Process III	1,600	3	4,800	II	2,000	2	4,000
				III	1,000	3	3,000
				By Abnormal Gain			
				Process I	2,000	1	2,000
				II	700	2	1,400
				III	600	3	1,800
	8,300		14,200		8,300		14,200

## Abnormal Gain A/c

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Normal Loss A/c				By Actual Sales			
Process I	2,000	1	2,000	Process I	2,000	40	80,000
II	700	2	1,400	II	700	60	42,000
III	600	3	1,800	III	600	80	48,000
To Costing Profit & Loss A/c			1,64,800				
	3,300		1,70,000		3,300		1,70,000

## Illustration : 3

Product A is manufactured after it passes through three distinct processes. The following information is obtained from the records of a company for the year ended 31<sup>st</sup> December 2013.

Particulars	Process I	Process II	Process III
Direct Material	2,500	2,000	3,000
Direct Wages	2,000	3,000	4,000
Output during the week	950	840	750
Percentage of Normal Loss to Input	5%	10%	15%
Value or Scrap Per Unit ₹	3/-	5/-	5/-

Product Overheads are ₹9,000. 1000 Units at ₹5 each were introduced to process I. There was no stock or materials or work in progress at the beginning and at the end of the year. The output of each process passes direct to the next process and finally to the finished stock A/c. Production overheads are recovered on 100% of direct wages.



Prepare Process Cost Accounts and Abnormal Gain or Loss Account for the year ended 31<sup>st</sup> December, 2013.

**Solution:-**

**Quantity Reconciliation**

Particulars	Process I	Process II	Process III
Input	1,000	950	840
( - ) Normal Loss	50	95	126
Expected Output	950	855	714
( - ) Actual Output	950	840	750
Abnormal	NIL	15	36
		Loss	Gain

**Process I A/c**

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Input	1,000	5	5,000	By Normal Loss	50	3	150
To Direct Material			2,500	By Transfer to Process II A/c	950	11.95	11,350
To Wages			2,000				
To Product Overheads (100% of Wages)			2,000				
	1,000		11,500		1,000		11,500

$$\text{Cost Per Units} = \frac{\text{Total Cost} - \text{Normal Loss Scrap Value}}{\text{Input} - \text{Normal Loss Units}}$$

$$= \frac{11,500 - 150}{1,000 - 50} = \frac{11,350}{950} = 11.95$$

## Process II A/c

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Transfer from Process I	950	11.95	11,350	By Normal Loss	95	5	475
To Material			2,000	By Abnormal Loss	15	22.07	331
To Wages			3,000	By Process III A/c Transfer	840	22.07	18,544
To Product Overheads			3,000				
	950		19,350		950		19,350

$$\text{Cost Per Unit} = \frac{19350 - 475}{950 - 95} = \frac{18875}{855} = 22.07$$

## Process III A/c

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Transfer from Process II	840	22.07	18,544	By Normal Loss	126	5	630
To Material			3,000	By Finished Stock A/c	750	40.49	30,372
To Wages			4,000				
To Product Overheads			4,000				
To Abnormal Gain	36	40.49	1,458				
	876		31,002		876		31,002

$$\text{Cost Per Unit} = \frac{29,544 - 630}{840 - 126} = \frac{28,914}{714} = 40.49$$

**Normal Loss A/c**

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Process I	50	3	150	By Actual Sales			
To Process II	95	5	475	Process I	50	3	150
To Process III	126	5	630	Process II	95	5	475
				Process III	90	5	450
				By Abnormal Gain Process III	36	5	180
	271		1,255		271		1,255

**Abnormal Loss A/c**

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Process II	15	22.07	331	By Actual Sales	15	5	75
				Process II By Costing Profit & Loss A/c			256
	15		331		15		331

**Abnormal Gain A/c**

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Actual Sale Process III	36	5	180	By Process III	36	40.49	1,458
To Costing Profit & Loss A/c			1,278				
	36		1,458		36		1,458

**PARTLY OUTPUT - TRANSFER / STOCK / SALE**

After completing each and every process, partly material either sold or transfer to next process and finally from last process 100% material or output will be sold or transfer to warehouse.

**Illustration : 4**

M/s XYZ and company manufacture a chemical which passes through three processes. The following particulars gathered for the month of January, 2014.

Particulars	Process I	Process II	Process III
Material (Litre)	400	208	168
Material Cost	₹38,400	₹18,800	₹6,000
Wages	₹7,680	₹7,600	₹2,200
Normal Loss (% of input)	4%	5%	5%
Scrap Sale Value	--	₹3 Per Ltr.	--
Output Transferred to Next Process	50%	40%	--
Output Transferred to ware houses	50%	60%	100%

Overheads are charged @ 50% of Direct Wages. You are required to prepare Process Account.

**Solution:-**

**Quantity Reconciliation**

Particulars	Process I	Process II	Process III
Transfer from Process	-	192	152
( + ) Input	400	208	168
Total	400	400	320
( - ) Normal Loss	16	20	16
	384	380	304
Transfer to Next Process →	192	152	--
Transfer to Warehouse →	192	228	304

## Process I A/c

Particulars	Ltr	Rate	₹	Particulars	Ltr	Rate	₹
To Material	400		38,400	By Normal Loss	16	--	--
To Wages			7,680	By Transfer to Next Process (50%)	192	130	24,960
To Overheads (50% of wages)			3,840	By Transfer to Warehouse (50%)	192	130	24,960
	400		49,920		400		49,920

$$\text{Cost Per Unit} = \frac{\text{Total Cost} - \text{Scrap Value of Normal Loss}}{\text{Input} - \text{Normal Loss Units}}$$

$$\text{C. P. U.} = \frac{49,920 - \text{Nil}}{400 - 16} = \frac{49,920}{16} = 130$$

## Process II A/c

Particulars	Ltr	Rate	₹	Particulars	Ltr	Rate	₹
To Transfer from Process II	192	130	24,960	By Normal Loss	20	3	60
To Material	208		18,800	By Transfer to Next Process III (40%)	152	145	22,040
To Wages			7,600	By Transfer to Warehouse (60%)	228	145	33,060
To Overheads (50% of wages)			3,800				
	400		55,160		400		55,160

$$\text{Cost Per Unit} = \frac{55,160 - 60}{400 - 20} = \frac{55,100}{380} = 145/-$$

## Process III A/c

Particulars	Ltr	Rate	₹	Particulars	Ltr	Rate	₹
To Transfer from Process II	152	145	22,040	By Normal Loss	16	--	--
To Material	168		6,000	By Transfer to Warehouse (100%)	304	103.09	31,340
To Wages			2,200				
To Overheads (50% of wages)			1,100				
	320		31,340		320		31,340

$$\text{Cost Per Unit} = \frac{31,340 - \text{Nil}}{320 - 16} = \frac{31,340}{304} = 103.09$$

❖ **Output Partly Sold and Partly Transferred to Next Process.**

**Illustration : 5**

KT Ltd. provides you the following information for the year ended 31<sup>st</sup> March 2014.

Particulars	Process A	Process B	Process C
Raw Material (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 (% of Total No. of Units entering to the process)	4%	5%	3%
Wastage (% of Total No. of Units Entering to the Process)	6%	5%	4%
Scrap Per Unit of Wastages ₹	3	4	5
Output Transferred to Subsequent Process	70%	60%	--
Out Sold at the End of the Process	30%	40%	100%
Selling Price Per Unit ₹	12	16	17

**Prepare Process A, B and C.**

Solution:-

## Quantity Reconciliation

Particulars	Process A	Process B	Process C
Input	12,000	2,440	2,600
(+) Transfer from Process	--	7,560	5,400
Total	12,000	10,000	8,000
(-) Normal Loss	480	500	240
(-) Wastage	720	500	320
	10,800	9,000	7,440
→ Transfer to Next Process	7,560	5,400	--
→ Partly Sold	3,240	3,600	7,440 Sold

## Process A A/c

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Material	12,000	5	60,000	By Normal Loss	480	--	--
To Wages			34,000	By Wastage	720	3	2,160
To Production Overheads			16,160	By Output c/d	10,800	10	1,08,000
	12,000		1,10,160		12,000		1,10,160
To Output b/d	10,800	10	1,08,000	By Transfer to Process B (70%)	7,560	10	75,600
To Costing Profit & Loss A/c (Profit)			6,480	By Sold (30%)	3,240	12	38,880
	10,800		1,14,480		10,800		1,14,480

## Process B A/c

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Process A	7,560	10	75,600	By Normal Loss	500	--	--
To Material	2,440	5	12,200	By Wastage	500	4	2,000
To Wages			24,000	By Output c/d	9,000	14	1,26,000
To Overheads			16,200				
	1,000		1,28,000		10,000		1,28,000
To Output b/d	9,000	14	1,26,000	By Transfer to Process C / 60%)	5,400	14	75,600
To Costing Profit & Loss A/c (Profit)			7,200	By Sold (40%)	3,600	16	57,600
	9,000		1,33,200		9,000		1,33,200

## Process C A/c

Particulars	Units	Rate	₹	Particulars	Units	Rate	₹
To Process B	5,400	14	75,600	By Normal Loss	240	--	--
To Material	2,600	5	13,000	By Wastage	320	5	1,600
To Wages			15,000	By Sales	7,440	17	1,26,480
To Overheads			9,600				
To Costing Profit & Loss A/c (Profit)			14,880				
	8,000		1,28,080		8,000		1,28,080



**Illustration : 6**

Assemblers Ltd. have three Assembly shop viz. General Assembly, Lower Assembly and Higher Assembly. Part of the output is transferred to the next assembly and part is sold directly. The company furnished the following in formations.

Particulars	General	Lower	Higher
Raw Material (In Ltrs)	5,000	1,920	3,576
Material Cost Per Ltr.	₹60	₹40	₹80
Labour Cost	4,28,000	1,06,000	2.10.000
Direct Expenses	88,000	2,85,200	1,04,800
Wastage as percentage of Total input	4%	5%	10%
a) Output Transferred			
To Lower Assembly	60%	--	--
To Higher Assembly	--	40%	--
b) Output Sold in Market	40%	60%	100%
Sales Price Per Ltr.	₹200	₹205	₹250

Administrative Overheads - ₹36,000

Marketing Overhead - ₹48,000

Prepare Various Assembly A/c and costing Profit & Loss A/c

**Solution :**

**Quantity Reconciliation**

Particulars	General	Lower	Higher
Input	5,000	1,920	3,576
(+) Transfer from Process	--	2,880	1,824
Total	5,000	4,800	5,400
(-) Normal Loss	200	240	540
Actual Output	4,800	4,560	4,860
(-) Sold Out	1,920	2,736	4,860
(-) Transfer to Next Process	2,880	1,824	--

## General Process A/c

Particulars	Ltrs	Rate	₹	Particulars	Ltrs	Rate	₹
To Material	5,000	60	3,00,000	By Normal Loss (Wastage)	200	--	--
To Labour			4,28,000	By Output c/d	4,800	170	8,16,000
To Direct Exp.			88,000				
	5,000		8,16,000		5,00		8,16,000
To Output b/d	4,800	170	8,16,000	By Transfer to Lower	2,880	170	4,89,600
To Costing P/L A/c (Profit)			57,600	By Sales	1,920	200	3,84,000
			8,73,600				8,73,600

## Lower Assembly A/c

Particulars	Ltrs	Rate	₹	Particulars	Ltrs	Rate	₹
To General Assembly Transfer	2,880	170	4,89,600	By Wastage	240	--	--
To Material	1,920	40	76,800	By Output c/d	4,560	210	9,57,600
To Labour			1,06,000				
To Direct Exp			2,85,200				
	4,860		9,57,600		4,860		9,57,600
To Output b/d	4,560	210	9,57,600	By Transfer to Higher	1,824	210	3,83,040
				By Sales	2,736	505	5,60,880
				By Costing P/L A/c (Loss)			13,680
	4,560		9,57,600		4,560		9,57,600

## Higher Assembly A/c

Particulars	Ltrs	Rate	₹	Particulars	Ltrs	Rate	₹
To Lower Assembly A/c (Transfer)	1,824	210	3,83,040	By Wastage	540	--	--
To Material	3,576	80	2,86,080	By Output c/d	4,860	202.45	9,83,920
To Labour			2,10,000				
To Direct Exp.			1,04,800				
	5,400		9,83,920		5,400		9,83,920
To Output b/d	4,860	202.45	9,83,920	By Sales	4,860	250	12,15,000
To Costing P/L A/c (Profit)			2,31,080				
	4,860		12,15,000		4,860		12,15,000

$$\text{Cost Per Unit} = \frac{\text{Total Cost} - \text{Normal Loss Scrap Value}}{\text{Input} - \text{Normal Loss (Units)}}$$

$$\begin{aligned} \text{General Assembling} &= \frac{8,16,000 - \text{Nil}}{5,000 - 200} \\ &= \frac{8,16,000}{4,800} = 170 \end{aligned}$$

$$\begin{aligned} \text{Lower Assembly} &= \frac{9,57,600 - \text{Nil}}{4,800 - 240} \\ &= \frac{9,57,600}{4,560} = 210 \end{aligned}$$

$$\begin{aligned} \text{Higher Assembly} &= \frac{9,83,920 - \text{Nil}}{5,400 - 540} \\ &= \frac{9,83,920}{4,860} = 202.45 \end{aligned}$$

### Costing Profit & Loss A/c

Particulars	₹	Particulars	₹
To Lower Assembly	13,680	By General Assembly	57,600
To Administrator Overheads	36,000	By Higher Assembly	2,31,080
To Marketing Overheads	48,000		
To Net Profit c/d	1,91,000		
	2,88,680		2,88,680

#### Process Stocks:-

Under Process Costing, Whatever output of each and every process is transfer to next process or sold out partly or entirely transfer to next process and after completion of process at the end the output is sold. But when there is process stock given then the entire output of a particular process would be transfer to particular process stock A/c, then added opening stock and deducting closing stock whatever balance remain it transfer to next process. For eg. In a process a input are 1000 units normal loss is 50 units. Process stock A/c shows opening balance 100 units, closing stock is 150 units then transfer to next process is calculated as

Input	-	1000	
(-) Normal Loss	-	<u>50</u>	
Expected Output	-	950	Actual Output
(+) Opening Stock	-	<u>100</u>	
		1,050	
( - ) Closing Stock	-	<u>150</u>	
		<u>900</u>	- Transfer to Next Process

**Illustration : 7**

Reliance Yarn Ltd. manufactures a yarn product. The product passes through three consecutive processes F.Y., S. Y., and T. Y., Relevant details for the months of March 2014 are as under:

Particulars	F. Y.	S. Y.	T. Y.
Quantitative in Formation in Kg.			
Basic input kg @ 10 Per Kg.	2000	--	--
Output during the month	1950	1925	1679
Stock of Process			
- On 1 <sup>st</sup> March 2014	200	300	100
- On 31 <sup>st</sup> March 2014	150	400	59
% of Normal Loss to input in process	2%	5%	8%
Monetary Information	₹	₹	₹
Process Material	9000	2100	2716
Wages	9064	1860	4000
Value or Opening Stock	3880	6720	2800
Scrap Value per kg	₹1	₹2	₹4

Closing Stock is to be valued at the respective cost of each process.

Prepare process A/c, Process Stock A/c, Abnormal Loss and Abnormal Gain A/c. Find out the costing profit, when the sales out of T.Y. Process Stock are made at ₹40 per kg.

**Solution:****Quantity Reconciliation**

	Particulars	F. Y.	S. Y.	T. Y.
	Input	2000	2000	1825
( - )	Normal Loss	40	100	146
	Expected Output	1960	1900	1679
( - )	Actual Output	1950	1925	1679
	Abnormal Loss / Gain	10 (Loss)	(25) Gain	-
	Actual Output	1950	1925	1679
( + )	Opening Stock	200	300	100
( - )	Closing Stock	(150)	(400)	(59)
	Transfer to Next Process	2000	1825	1720 Sold

**F. Y. Process A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Input	2000	10	20,000	By Normal Loss	40	1	40
To Material			9,000	By Abnormal Loss	10	19.40	194
To Wages			9,064	By Transfer to F.Y. Process Stock A/c	1950	19.40	37,830
	2000		38,064		2000		38,064

$$\text{Cost Per Unit} = \frac{\text{Total Cost} - \text{Normal Loss Scrap Value}}{\text{Input} - \text{Normal Loss Units}}$$

$$= \frac{38064 - 40}{2000 - 40} = \frac{38024}{1960} = 19.40$$

**F. Y. Process Stock A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Balance b/d	200	19.40	3,880	By Transfer to S. Y. Process A/c	2000	19.40	38,800
To Transfer From F. Y. Process	1950	19.40	37,830	By Balance c/d	150	19.40	2,910
	2150		41,710		2150		41,710

**S. Y. Process A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Transfer from F. Y. Process Stock	2000	19.40	38,800	By Normal Loss	100	2	200
To Material			2,100	By Transfer to S. Y. Process Stock A/c	1925	22.40	43,120
To Wages			1,860				
To Abnormal Gain	25	22.40	560				
	2025		43,320		2025		43,320

## S. Y. Process Stock A/c

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Balance b/d	300	22.40	6,720	By Transfer to T. Y. Process	1825	22.40	40,880
To Transfer from S. Y. Process	1925	22.40	43,120	By Balance c/d	400	22.40	8,960
	2225		49,840		2225		49,840

$$\begin{aligned} \text{S.Y. Process} &= \frac{42760 - 200}{2000 - 100} \\ &= \frac{42560}{1900} = 22.40 \end{aligned}$$

## T. Y. Process A/c

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Transfer from S. Y. Process Stock A/c	1825	22.40	40,880	By Normal Loss	146	4	584
To Material			2,716	By Transfer to T. Y. Process Stock A/c	1679	28	47,012
To Wages			4,000				
	1825		47,596		1825		47,596

## T. Y. Process Stock A/c

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Transfer from T. Y. Process A/c	1679	28	47,012	By Transfer to Costing P/L A/c	1720	28	48,160
To Bal b/d	100	28	2,800	By Balance c/d	59	28	1,652
	1779		49,812		1779		49,812

$$\text{Cost Per Unit} = \frac{\text{Total Cost} - \text{Normal Loss Scrap Value}}{\text{Input} - \text{Normal Loss Units}}$$

$$\text{T.Y. Process} = \frac{47596 - 584}{1825 - 146} = \frac{47012}{1679} = 28$$

**Normal Loss A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To F. Y. Process	40	1	40	By Actual Sales			
To S. Y. Process	100	2	200	F. Y. Process	40	1	40
To T. Y. Process	146	4	584	S. Y. Process	75	2	150
				T. Y. Process	146	4	584
				By Abnormal Gain			
				Process S. Y.	25	2	50
	286		824		286		824

**Abnormal Loss A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To F. Y. Process	10	19.40	194	By Actual Sales	10	1	10
				By Costing P/L A/c			184
	10		194		10		194

**Abnormal Gain A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Normal Loss	25	2	50	By S. Y. Process A/c	25	22.40	560
To Costing P/L A/c			510				
	25		560		25		560

**Costing Profit & Loss A/c**

Particulars	₹	Particulars	₹
To TY Process Stock A/c	48,160	By Abnormal Gain A/c	510
To Abnormal Loss A/c	184	By Sales (1720 x 40)	68,800
To Net Profit c/d	20,966		
	69,310		69,310



**Illustration : 8**

Satyug Times Ltd. submits the following information in respect of its product which passes through 3 consecutive process viz Ingestion process, Idigestion process and Assimilation process for the month ended 31<sup>st</sup> January, 2014.

Particulars	Ingestion	Digestion	Assimilation
Quantitative Information (kgs)			
Basic Raw Material @ ₹40 per kg.	80,000	--	--
Normal Yield	80%	60%	70%
Output during the month	62,000	36,000	21,000
Stock of Process Output:			
31-12-2013	8,000	8,000	5,000
31-01-2014	10,000	4,000	4,000
Other Additional Informational			
Process Material	₹3,45,000	₹8,26,000	₹6,17,000
Labour Mandays	2,400	1,500	1,000
Labour Rate Per Manday	₹80	₹100	₹150
Machine Overheads	60% of Wages	50% of Process Material	₹2,34,000
Other Manufacturing Overheads	2,75,800	1,63,000	1,27,000
Value of Opening Stock Per Kgs.	₹60	₹140	₹300
Scrap Value Per Kgs.	₹10	₹15	₹20

Finished Stock of assimilation process was sold at ₹350 per kg.

Prepare the process A/c, Process Stock A/c, Normal Loss A/c and the Abnormal Gain / Loss A/c.

## Ingestion Process A/c

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Input	80000	40	32,00,000	By Normal Loss	16000	10	1,60,000
To Process Material			3,45,000	By Abnormal Loss	2000	62	1,24,000
To Labour (2400 x 80)			1,92,000	By transfer to Process Stock A/c	62,000	62	38,44,000
To Machine Overheads (60% of Labour)			1,15,200				
To Manufacturing Overheads			2,75,800				
	80000		41,28,000		80,000		41,28,000

## Ingestion Process Stock A/c

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Balance b/d	8000	60	4,80,000	By Transfer to Digestion Process	60,000		37,04,000
To Transfer from Ingestion Process A/c	62000	62	38,44,000	By Balance c/d	10000	62	6,62,000
	70,000		43,24,000		70,000		43,24,000

## Digestion Process A/c

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Transfer from Ingestion Process Stock	60000		37,04,000	By Normal Loss	24000	15	3,60,000
To Process Material			8,26,000	By Transfer to Process Stock A/c	36,000	136	48,96,000
To Labour (1500 x 100)			1,50,000				
To Machine Overheads (50% of Process Material)			4,13,000				
			52,56,000				52,56,000

**Digestion Process Stock A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Balance b/d	8,000	140	11,20,000	By Transfer to Assimilation Process A/c	40,000		54,72,000
To Transfer from Digestion Process A/c	36,000	136	48,96,000	By Balance c/d	4000	136	5,44,000
	44000		60,16,000		44000		60,16,000

**Assimilation Process A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Transfer from Digestion Process Stock A/c	40000		54,72,000	By Normal Loss	20000	20	4,00,000
To Process Material			6,17,000	By Transfer To Process Stock A/c	21000	310	65,10,000
To Labour (1000 x 150)			1,50,000				
To Machine Overheads			2,34,000				
To Manufacturing Overheads			1,27,000				
To Abnormal Gain	1000	310	3,10,000				
	41000		69,10,000		41000		69,10,000

**Assimilation Process Stock A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Bal b/d	5000	300	15,00,000	By Sales	22000	350	77,00,000
To Transfer from Assimilation Process Stock A/c	21000	310	65,10,000	By Balance c/d	4000	310	12,40,000
To Costing P/L A/c			9,30,000				
	26000		89,40,000		26000		89,40,000

**Normal Loss A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Ingestion	16000	10	1,60,000	By Actual Sales			
To Digestion	24000	15	3,60,000	Ingestion	16000	10	1,60,000
To Assimilation	20000	20	4,00,000	Digestion	24000	15	3,60,000
				Assimilation	19000	20	3,80,000
				By Abnormal Gain			
				Assimilation	1000	20	20,000
	60,000		9,20,000		60,000		9,20,000

**Abnormal Loss A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Ingestion Process	2000	62	1,24,000	By Actual Sale	2000	10	20,000
				By Costing P/L A/c (Loss)			1,04,000
	2000		1,24,000		2000		1,24,000

**Abnormal Gain A/c**

Particulars	Kgs.	Rate	₹	Particulars	Kgs.	Rate	₹
To Normal Loss A/c	1000	20	20,000	By Assimilation Process A/c	1000	310	3,10,000
To Costing P/L A/c (Profit)			2,90,000				
	1000		3,10,000		1000		3,10,000

## Costing Profit &amp; Loss A/c

Particulars	₹	Particulars	₹
To Abnormal Loss	1,04,000	By Assimilation Process A/c	9,30,000
To Net Profit c/d	11,16,000	By Abnormal Gain	2,90,000
	12,20,000		12,20,000

$$\text{Cost Per Unit} = \frac{\text{Total Cost} - \text{Scrap Values of Normal Loss}}{\text{Input} - \text{Normal Loss Units}}$$

$$\text{Ingestion} = \frac{4128000 - 160000}{80,000 - 16,000} = \frac{39,68,000}{64,000} = 62$$

$$\text{Digestion} = \frac{52,56,000 - 3,60,000}{60,000 - 24,000} = \frac{48,96,000}{36,000} = 136$$

$$\text{Assimilation} = \frac{6600000 - 400000}{40000 - 20000} = \frac{62,00,000}{20,000} = 310$$

## Quantity Reconciliation:

Particular	Ingestion	Digestion	Assimilation
Input	80,000	60,000	40,000
(-) Normal Loss	16,000	24,000	20,000
Expected Output	64,000	36,000	20,000
(-) Actual Output	62,000	36,000	21,000
Abnormal Loss / gain	2,000 (Loss)	Nil	1,000 (Gain)
Actual Output	62,000	36,000	21,000
(+) Opening Stock	8,000	8,000	5,000
(-) Closing Stock	(10,000)	4,000	4,000
Transfer to Next Process	60,000	40,000	22,000
			Output Sold

\* Instead of Normal Loss, Normal Yield is given. It means total input - Normal Yield = Normal Loss.

If input is 100%

∴ Ingestion Process Normal Yield is 80%

∴ Normal Loss = Input - Normal Yield  
= 100 - 80

∴ Normal Loss = 20%

Input of Ingestion Process 80,000 x 20% = 16,000

Some way of Digestion & Assimilation Process.

---

## 11.6 EXERCISE

---

### A. Objective Questions

#### Q.1 Multiple Choice Questions

1. The cost of units of abnormal Loss is

- A. Credited to the process A/C
- B. Debited to the process A/C
- C. Credited to the normal Loss A/C
- D. Debited to the normal Loss A/C

2. The cost of units of abnormal loss is

- A. Credited to the normal loss A/C
- B. Debited to the normal loss A/C
- C. Credited to the process A/C
- D. None of the above

3. The cost of units of abnormal gain is

- A. Debited to the process A/C
- B. Debited to profit and loss A/C
- C. Credited to the process A/C
- D. None of the above

4. Normal loss is calculated as

- A. Actual output – Normal output
- B. Normal output – Actual output
- C. Input x % of Normal loss
- D. None of the above

5. Normal output is equal to

- A. Input – normal loss
- B. Input – abnormal loss
- C. Input – abnormal gains
- D. None of the above

6. Abnormal loss is equal to

- A. Input – Actual output
- B. Actual output – Normal output
- C. Normal output – Actual output
- D. Actual output – input

7. Abnormal gain is equal to  
 A. Actual output – Normal output  
 B. Normal output –Actual output  
 C. Actual output – Input  
 D. Input –Actual output
8. Cost Per Unit is calculated as  
 A. Total Cost /Normal output  
 B. Normal cost/ Total cost  
 C. Cost of process –sale value of normal loss / Input – Normal Loss  
 D. Total cost/ Total Output
9. Allocation of joint cost deals with -----  
 A. CAS-3  
 B. CAS-5  
 C. CAS-4  
 D. CAS-2
10. Sale of residue or scrap is -----  
 A. Credited to process A/C  
 B. Credited to P & L A/C  
 C. Credited to Abnormal Loss A/C  
 D. None of the above

**(Answers :- 1. A 2.C 3.A 4. C 5. B 6. C 7. A 8.C  
 9. C 10. A)**

Q.2 True and False

1. The cost of good units is increased by the abnormal gain in process costing.
2. The cost of units of abnormal loss is debited to the process A/C.
3. Invisible waste has sale value .
4. The cost of units of abnormal gain is credited to the process A/C.
5. The sale value of residue is credited to the process A/C.
6. Under contribution margin method , variable costs apportion on the basis of units produced.
7. Joints products are of unequal importance.

8. Under Net Realizable value method, the estimated profit margin deducted.
9. The proportion of joint products can be changed at the will of the management.
10. Joint products are produced from the different processes.

(Answer: True :- 1, 5, 6, 8. False :- 2, 3, 4, 7, 9, 10.)

### B. Practical Problems:

- 1) Product *x* is obtained after it is processed through 3 distinct processes:-

The following information is available for the month of March 2014.

Particulars	Process A	Process B	Process C	Total
Material Consumed	10,400	8,000	4,100	22,500
Direct Labour	9,000	14,720	5,600	29,320
Production Overhead	-	-	-	29,320

2000 Units at ₹4 per unit were introduced in process A. Production overheads to be distributed as 100% on direct labour. The actual output and normal loss of the respective process are:

Particulars	Output in Units	Normal Loss on Input	Value of Scrap Per Unit
Process A	1800	10%	2.00
B	1360	20%	4.00
C	1080	25%	5.00

There is no stock or work in progress in any process. You are required to prepare process a/c.

- 2) Product 'A' is obtained after it is processed through process *x*, *y* and *z*.



The following cost information is available for the month ended 31<sup>st</sup> March, 2014.

Particulars	x	y	z
Number of Units introduced in the process	500	--	--
Rate per unit of units introduced ₹	04	--	--
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 of each Process)	10%	20%	25%
Value of Scrap per Unit	2/-	4/-	5/-
Output in Units	450	340	270

There is no stock in any process. You are required to prepare the Process A/c.

3) The product of a company process through of distinct processes to completion. These process or known as  $x$ ,  $y$  and  $z$ . From the past experience, it is ascertained that wastage is incurred in each process as under - process  $x$  - 2%, Process  $y$  - 4%, Process  $z$  - 10%

The Wastage at each process possess scrap value. The wastage of process  $x$  and  $y$  is sold at ₹2.50 per unit, and that of process  $z$  at ₹5.00 per unit. The output of each process passes immediately to the next process and finished units are transferred from process  $z$  into stock. The following information is obtained.

Particulars	x	y	z
Material	2,70,000	2,60,000	1,20,000
Wages	4,30,000	2,40,000	1,30,000
Direct Expenses	1,37,500	1,45,000	1,80,000
Output of each process (in units)	48,750	47,000	42,000

50,000 units were put in process  $x$  at a cost of ₹10/- per unit. There is no stock of work in progress in any process. Prepare process A/c. Abnormal Loss and Gain A/c.

4) A product of a manufacturing concern passes through two process viz A and B and then to finished stock. The following figures have been taken from its books for the year ended 31<sup>st</sup> March 2013.

Particulars	Process A	Process B
Raw Material Introduced in Process (Units)	10,000	700
Cost of Raw Material introduced (per unit ₹)	125	200
Wages (₹)	2,80,000	1,00,000
Machine Expenses (₹)	20,000	10,000
Direct Expenses (₹)	10,000	10,000
Other Factory Expenses (₹)	45,000	22,500
Indirect Material (₹)	5,000	10,000
Normal Loss in Weight (% of total units introduced in each process)	5%	5%
Normal Scrap (% on total Units Introduced in each process)	10%	10%
Realizable Value of Scrap (per 10 units)	(₹) 800	(₹) 2,000
Output (Units)	8,300	7,800

Prepare Process A/c, Abnormal Loss and Abnormal Gain A/c.

5) ABC and Co. manufactures a chemical which passes through three processes. The following particulars garnered for the month of January 2014.

Particulars	Process I	Process II	Process III
Material (Litre)	4000	208	168
Material Cost	₹38,400	₹18,800	₹6,000
Wages	₹7,680	₹7,600	₹2,200
Normal Loss (% of input)	4%	5%	5%
Scrap Sale Value	--	₹3 per Ltr.	--
Output Transferred to Next Process	50%	40%	--
Output Transferred to Warehouse	50%	60%	100%

Overheads are charged @ 50% of Direct Wages. You are required to prepare Process A/c.



## STANDARD COSTING

### Unit Structure

- 12.0 Objectives
- 12.1 Introduction
- 12.2 Material Variances
- 12.3 Labour variances
- 12.4 Fixed Factory Overheads Variances: (Based on Absorption Costing)
- 12.5 Variable Factory Overheads Variances:
- 12.6 Sales Variances
- 12.7 Profit Variances
- 12.8 Formulas Used in Standard Costing
- 12.9 Solved Problems
- 12.10 Exercises

---

### 12.0 OBJECTIVES

---

After studying the unit the students will be able to:

- Understand the meaning of Standard Costing and how it to be apply.
- Explain how to calculate Material Variances, Labour Variances, Overhead Variances, Sales Variances and Profit Variances.
- Solved the practical problems on calculating Variances.

---

### 12.1 INTRODUCTION:

---

In corporate sector, there is a separation of ownership from management. The owners do not manage the business and the managers are not the owners. Even in non-corporate sector, with gigantic business affairs, it is almost impossible for the owners to manage the business themselves.

Accordingly, owners are compelled to delegate authority to the managers. Since the managers have no proprietary interest in the business, it is quite possible that they may tend to be inefficient and a bit careless and because of this, the sales may come down, cost and rejection may increase resulting thereby in substantial loss of profit.

For this reason, the owners fell, and rightly so, that the performance of various managers should be subjected to some degrees of stringent control. There is a need to follow carrot and stick approach.

Control always presupposes some yardstick or standard. Accordingly, well before the period commences, detailed standards are laid down for various managers. These standards clearly show what is expected of the concerned managers. For example, in respect of sales, we lay down for sales manager, the types of products to be sold, the quantity of each of them to be sold and the price to be charged. At the end of the relevant period the actual results are compared with the expected ones (the standards) and the difference, known as VARIANCE, is analysed to throw light on the precise factors responsible for the variation. As far as the examination is concerned, this is the end. In real life, further investigation is undertaken, if the variance amount is varied significant and corrective actions are taken so as to prevent adverse past from repeating itself in future.

We apply Standard Costing Technique to Six Area in all.

They are as follows:-

1. Material Cost
2. Labour Cost
3. Variable Overheads
4. Fixed Overheads
5. Sales
6. Profit

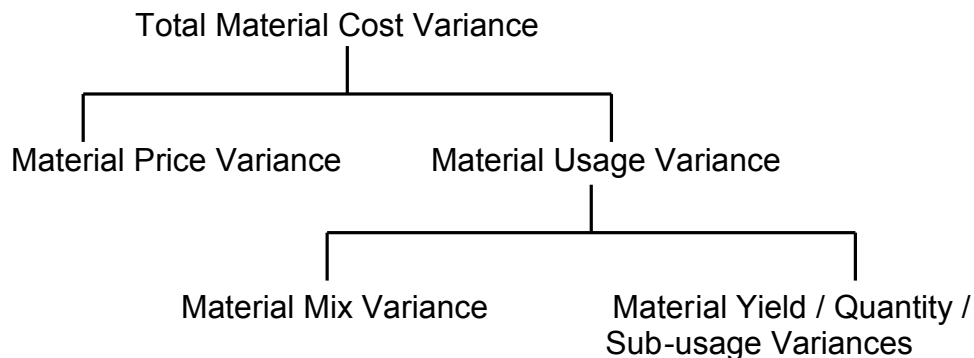
---

## 12.2 MATERIAL VARIANCES

---

### 12.2.1 Explanation of the method followed in the solution:

The following is the chart of the **Material Cost Variances**.



**Check**

Total Material Cost Variance = Material Price Variance+Material usage Variance

Material Usage Variance = Material Mix Variance+Material Yield Variance

**12.2.2 Detailed Explanation:****i) Setting the Standards:**

As we saw, the actual results are to be compared with the Standards and for this purpose, we must have comparable Standards.

The material cost is a variable cost item and the amount of cost that one incurs entirely depends on the quantity of output. thus, if the standard material cost per unit is ₹5, and if the actual output is 100 units, then, the standard cost is ₹500. In other words in the case of material cost, the standards are always for the actual output. If the production manager has produced, say, 1000 units, then we should find out the cost that he should have incurred for 1000 units and this cost should be compared with the actual cost to get the variance.

**Example:****Standards For 1 Unit of Product X:**

Material	Quantity	Price Per Unit	Total Cost (₹)
A	5 Kgs.	2	10
B	10 Kgs	3	30
	15 Kgs.		40

The production manager has produced 1000 units and incurred the cost as shown below.

Material	Quantity	Price Per Unit	Total Cost (₹)
A	4,800	2.5	12,000
B	10,600	2.9	30,740
	15,400		42,740

Very obviously, the given standards which are for the output level of 1 unit (₹40) can't be compared with the actual for 1000 units (₹42,740). The given standards are to be revised to make them represent actual output level, so that they become comparable.

This process of revising the standards is extremely simple. Since the cost is variable in nature, the quantity figures and therefore the total cost figures are just to be revised proportionately. For example, 1 unit of X needs 5 Kgs. of Material A and therefore 1000 units should need 5000 Kgs. of material A. The revised standard are shown below.

Material	Quantity	Price Per Unit	Total Cost (₹)
A	5,000	2	10,000
B	10,000	3	30,000
	15,000		40,000

In order to solve the problem, one should first pick up the information about the output level represented by the given Standards. One should, then pick up the actual output figure. If these two are same, then they are comparable and one should proceed further to calculate the variances. If they are not same, then given the Standards are to be proportionately revised to make them represent actual output level. Thus, whether the given Standard need to be revised or not depends on whether the output levels are same or not.

### 12.2.3 Calculation of Variances:

#### 1. Total Material Cost Variance:

This variance shows the total loss or gain because of change in the total material cost. The variance is the difference between the total Standard material cost (obviously for actual output) and the total actual material cost.

#### 2. Material Price Variance : (See also notes on Single / Partial Plans)

This variance accounts for that part of the total material cost variance which comes into being because of change in the material purchase price. Here, our aim is to know the total gain or loss because of change in the material purchase price.

The loss / gain per unit purchased and consumed can be calculated by simply comparing standard purchase price with the actual purchase price. However, we want to know the total gain or loss. The total loss / gain depends on the actual quantity purchased and consumed.

Thus the Price Variance is:

Actual Quantity X (Standard Price - Actual Price)

### 3. Material Usage Variance:

This variance accounts for that part of the total material cost variance which comes into being because of change in the consumption of raw material. Here, our aim is to know the total gain / loss because of the difference between material quantity consumed and the material quantity that should have been consumed.

Obviously, therefore, we have to compare the standard material quantity with the actual material quantity, the difference being the quantity of material lost or gained. In order to quantify this loss in money terms, we need to multiply this difference by the price of raw material.

We have two prices: Standard Price and the Actual Price.

Which price should be used?

We have to use standard price for this. This is based on the following reasons.

It is possible that there is some difference between the standard price and the actual price. However, it is the job of the price variance to take care of that difference and once that is taken care of, we are left with standard price alone. The difference between the two prices always gets transferred to profit & loss account.

In the organisation, there is division of labour. For change in the price, purchase manager is answerable whereas for changes in the consumption of raw material, production manager is accountable. Now, if we multiply the quantity difference by the actual price, then the efficiency or otherwise of the purchase manager would affect the variance for the production manager. The price, therefore, has to remain constant and only standard price remains constant.

The standards are developed well before the period commences and we let our production manager know the quantity of raw material that he should consume and in case the actual consumption is more (or less) then we also let him know the rate at which the penalty, or reward, will be calculated. That means the price has to be known to the production manager well before the budget period commence. Obviously only the standard price can be known in advance.

**Thus the usage Variance is:**

Standard Material Price X (Standard Raw Material Quantity - Actual Raw Material Quantity)

**4. Material Mix Variance and Material yield Variance**

These two variances, put together account for the total material usage variance. If the raw material consumed is not same as standard, then, that could be because of two reasons in all. Either the mix of the input may change and / or the absolute quantity of material may change. Consider the following example:

Material	Standard Quantity	Actual Quantity		
		(1)	(2)	(3)
X	50 Kgs.	40	55	55
Y	50 Kgs.	60	55	60
<b>Total</b>	<b>100 Kgs.</b>	<b>100</b>	<b>110</b>	<b>115</b>

As can be seen, in the first case, through the total input quantity is same as the standard, 10 Kgs. of Y have replaced 10 Kgs. of X. Thus total quantity remaining same, the mix of input has changed. In the second case, though the mix of input items (1:1) has remained the same as the standard mix, the absolute quantity has gone up by 10 Kgs. Thus, mix remaining constant, this time the actual quantity has changed. In the third case, the mix and the absolute quantity, both, have changed. In other words, change in the mix and / or change in the quantity account for total material usage variance. For the purpose of calculation of these variances, each of them is to be calculated by keeping the other of them constant. Thus, when we speak about the mix variance, we presume that the quantity consumed is quite upto the mark and when we take-up yield variance, we presume that the mix is quite upto the mark.

**5. Material Mix Variance:**

Here our aim is to know whether the actual input of raw materials is as per standard or has changed. For this we pick up the figure of total actual input and we apply the standard mix ratio to it and we get the mix that ought to be, given the actual input. We compare this standard mix with the actual mix and multiply the difference by the standard material price.

**6. Material Yield Variance:**

This variance accounts for that part of the usage variance that comes into being because of change in the quantity of raw material consumed, the mix remaining constant. There are four methods for the calculation of this variance, as shown below:



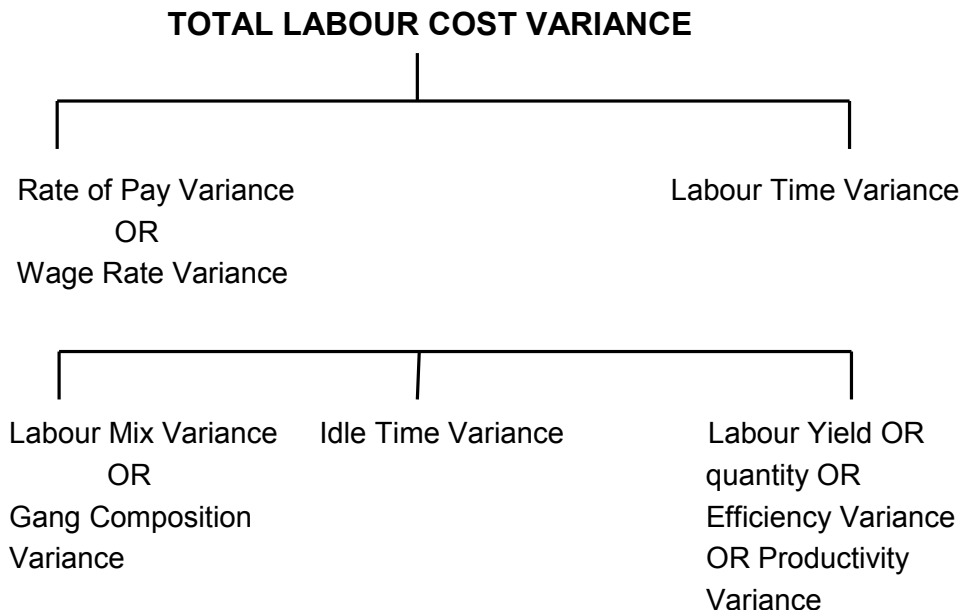
- 1) **Based on Input:**  
We just compare the total Standard input quantity with the total actual input quantity and we multiply the difference by the standard average cost. The standard average cost is the total standard cost divided by the total standard input quantity.
- 2) **Based on Process Loss:**  
Based on the actual input quantity, we find out the Standard process loss and we compare that with the actual process loss. The difference is output lost / gained because of excess / less rejection. We multiply this difference by the Standard average cost per unit of output.
- 3) **Based on Yield / Output:**  
Based on the actual input quantity, we find out the Standard output and we compare that with the actual output. The difference is the output lost / gained. We multiply this difference by the Standard average cost per unit of output.
- 4) **Based on Mix:**  
This time we compare the Standard Mix of Standard Input with the Standard Mix based on actual input (developed for the purpose of mix variance) and we multiply the difference by the Standard Price of relevant material item.

---

## 12.3 LABOUR VARIANCE:

---

### 12.3.1 Labour Cost Variances



**Check:**

Total Labour Cost Variance = Rate of Pay Variance + Labour Time Variance

Labour Time Variance = Mix Variance + Idle Time Variance + Efficiency Variance

**12.3.2 Detailed Explanation****i) Setting the Standard:**

Like Material Cost, even this cost is also a variable cost item and therefore, like material cost, here also the Standards are to be for actual output. This means if the given Standards for labour cost do not represent actual output level, then, they must be proportionately revised to make them represent actual output level.

**ii) Calculation of Variances:**

The variance chart here almost resembles material variance chart with minor changes. In most of the cases the cost changes from material to labour and the variances are same. Accordingly, the explanations provided in respect of material cost variances is equally applicable to labour cost variances and therefore these details are not repeated.

**12.3.3 Calculation of Variances****1. Total Labour Cost Variance:**

This variance is the difference between the total Standard labour Cost (for actual output) and total actual labour cost.

**Rate of Pay Variance:**

This is just like material price variance. The Variance is actual number of hours paid for multiplied by the wage rate difference.

In other words, it is:

Actual Hours X (Standard Rate - Actual Rate)

**2. Labour Time Variance:**

This is just like material usage variance. The variance is Standard wage rate multiplied by the difference between Standard hours and actual hours paid for.

**3. Idle Time Variance:**

This is abnormal idle hours for various categories multiplied by applicable standard wage rates if there are two or more categories, then category wise break-up of idle time would, normally, be given. If not given, we must put presumption to get the break up. Preferably, the presumption should be that idle hours were in standard ratio.

**4. Labour Mix Variance:**

This is just like material mix variance. Thus, we apply the Standard mix ratio to the actual input of hours worked and we get Standard Mix for actual total hours. If there is idle time, it should be deducted from the gross input hours and the Standard ratio should be applied to the actual or productive hours paid for. This is because, out of gross hours, Idle time variance accounts for idle hours. Therefore, we now have to account for new hours worked.

**5. Labour Efficiency Variance:**

This is just like material yield variance based on input. We compare total standard hours with the total actual (but net i.e. excluding idle time) input hours and we multiply the difference by Standard average rate per hour (Total Standard Cost, Standard input hours)

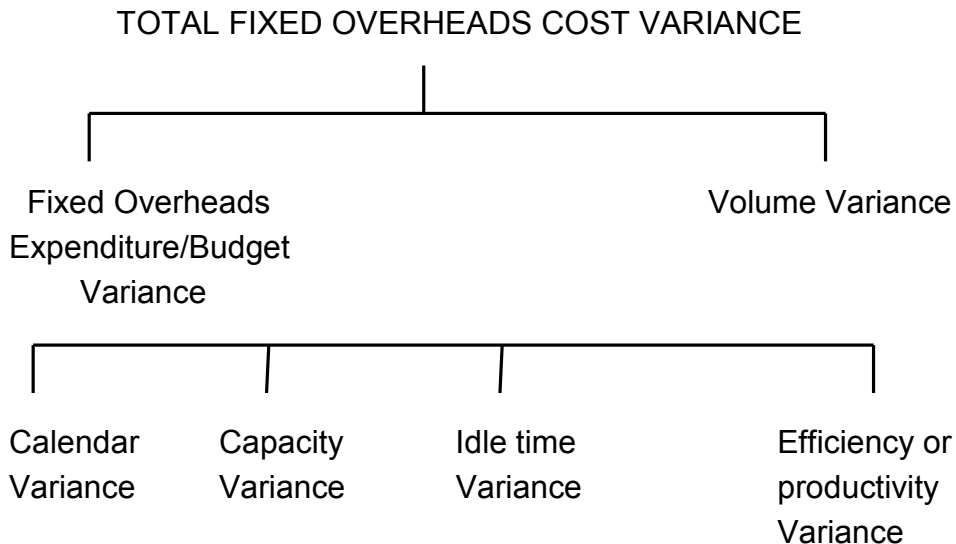
---

## 12.4 FIXED FACTORY OVERHEADS VARIANCES: (BASED ON ABSORPTION COSTING) :

---

**12.4.1 Chart**

The following is the chart of the fixed factory overheads cost variances under absorption costing:



**Check:**

$$\text{Total Cost Variance} = \text{Expenditure Variance} + \text{Volume Variance}$$

$$\text{Volume Variance} = \text{Calendar Variance} + \text{Capacity Variance} + \text{Idle time Variance} + \text{Efficiency Variance}$$
**12.4.2 Detailed Explanation:****i) Setting the Standard:**

Unlike the Raw Material Cost, this cost does not depend on the output. Rather, it depends on the period because it is a period cost. Obviously, therefore, the standards or, say budgets, are always for a period. Very soon well shall see that for calculating variances, we sometimes compare days, hours, expenditure and output figures for the given period and therefore we should know budgets as regards these items.

**ii) Basic Explanation about fixed Overheads Variance:**

For setting the selling price of a product, we generally add profit margin to the total cost. The total cost is the sum total of variable cost and fixed cost. Variable cost per unit is reasonably simple to get because it depends on the output. However, the fixed cost has nothing to do with the output, and the total cost remains constant irrespective of the quantity of the product that we produce. Then, how do we get the fixed cost per unit?

For this we have a system of recovering the overheads. Well before the budget period commences, we make an estimate as regards fixed overheads to be incurred and the quantity of the product to be produced. Though there is no nexus between the cost and the output, after all the output that we are going to have, must bear the charge of overheads cost that we are going to incur. Thus, we lay down nexus between the two and divide the budgeted overheads by the expected output and we get overheads per unit.

Once, we get the Fixed Overheads rate per unit, every time we produce a unit we charge the overheads at this predetermined rate. If everything goes as per our expectation, then, we notice at the end of the period that overhead amount charged to the output is exactly equal to the overheads cost incurred and thus, there is no variance. In other words, the overheads cost variance comes into being if the overheads charged or, say, recovered are not same as overheads incurred.

### 12.4.3 Calculation of Variances:

#### 1. Fixed Overheads Cost Variances:

This variance comes into being if there is some difference between overheads recovered (obviously, on the basis of actual output) and overheads cost incurred. Thus, this variance is under or over absorption of overheads.

Consider the following example:

Actuals					
	Budget	A	B	C	D
Fixed Overheads ₹	1,00,000	1,00,000	90,000	1,10,000	96,000
Output (units)	25,000	24,000	25,000	24,000	24,000
Absorption rate per unit	₹4				

In situation A, the amount recovered is ₹96,000 (24,000 X 4) whereas amount spent is 1,00,000. The amount spent is more which means there is under-recovery of overheads and the variance comes into being. Here, whereas fixed overheads, have remained constant, the output has changed. In situation B, the amount recovered is ₹1,00,000 whereas amount spent is ₹90,000. There is over recovery of overheads and the variance comes into being. Here, whereas output has remained the same, the overheads have changed.

In situation C, the amount recovered is ₹96,000 whereas the amount spent is ₹1,10,000. Again, there is under recovery of overheads. This time overheads and output, both, have changed but not proportionately.

In situation D, though overheads and output, both, have changed, there is still not variance because the amount spent (₹96,000) and the amount recovered (24,000 X 4) are same.

This should suggest that the total overheads cost variance comes into being, if either only overheads change, output remaining constant, or only output changes, overheads remaining constant, or both of them change, but not in the due proportion. Under-absorption implies that the actual fixed overheads cost per unit is more than the standard cost whereas over-absorption implies that the actual fixed overheads cost per unit is less than the standard cost. Absence of under / over absorption implies that the actual fixed overheads cost, per unit is same as standard cost. Accordingly, under-absorption is an adverse variance whereas over absorption is a favourable variance.

In other words, if output and overheads, both remain constant or both of them change but just in due proportion, then, there is no overheads cost variance at all.

To conclude, one should compare the amount of overheads recovered with the amount of overheads spent and the difference is the variance. Over-recovery signifies the favourable variance whereas under recovery signifies the adverse variance.

## 2. Fixed Overheads Expenditure Variance:

We just compare the volume or the output figures and the difference is to be multiplied by the recovery rate per unit. If the actual output is more than the budgeted output, the variance is favourable (because higher output reduces the overheads cost per unit) and if the actual output is less, the variance is adverse.

The analysis of volume variance is required to know the precise factors responsible for change in the output. The output depends on so many factors like number of working days, number of hours in working days, unproductive (idle) time and efficiency level.

Consider the following budget:

No. of days	250
Hours per day	500
Hours per unit	5
∴ Total Hours p.a.	1,25,000
∴ Total Output p.a.	25,000

Now if, instead of working for 250 days, the workers work for 251 days, then, other factors remaining constant, hours would increase by 500 and the output would increase by 100. The variance that comes into being because of change in number of day is called calendar Variance. We should compare the number of days as per budget with actual number of days and the difference should be multiplied by the recovery rate per day. If the actual number of days is more, then, the variance is favourable because the more the days, the more the hours and the more the output.

Now, days remaining constant, if the workers work for more or less than 500 hours per day, then, again the output would change. The variance that comes into being because of change in such capacity utilization is known as capacity Variance. We find out the number of hours that should have been paid for in actual number of days and we compare this with the actual number of hours paid for. The difference is multiplied by the recovery rate per hour. If the actual number of hours is more, then, the result

variance is favourable because the more the hours, the more the output.

Sometimes in the problem, the student is not given information about number of days. In such cases, the calendar variance cannot be calculated. Even the capacity variance, in the manner shown above, cannot be calculated. In such cases, we compare budgeted hours with actual hours paid for. The difference is to be multiplied by the recovery rate per hour. This comparison takes care of calendar and capacity both. Therefore, if the information about days is not given, then, we calculate this variance and call it capacity variance. If the information about days is given, then we calculate calendar variance and capacity variance in a normal way but we use this variance (direct comparison of hour) as crosscheck. This variance has to be equal to calendar variance plus capacity variance.

The idle time variance is calculated by multiplying idle hours by recovery rate per hour.

The Efficiency Variance can be calculated in one of the two possible ways, as shown below:

- i) We find out the number of units that should have been produced in actual number of hours (net, excluding idle time). We compare this with the actual output and the difference is to be multiplied by the recovery rate per unit.

**OR**

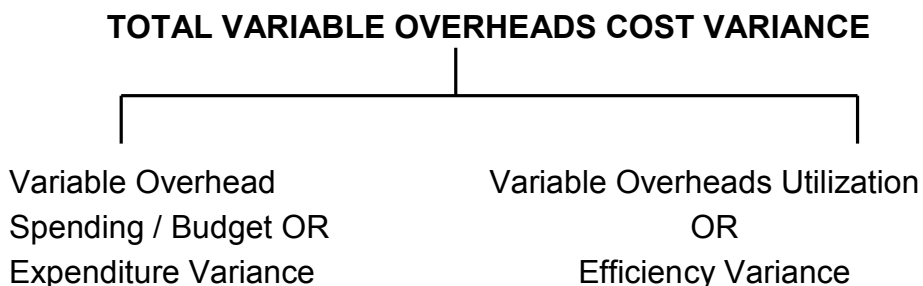
- ii) We find out the number of hours that should have been taken for the actual production and we compare this with actual number of hours (net, excluding idle time) taken. The difference is to be multiplied by the recovery rate per hour.

---

## 12.5 VARIABLE FACTORY OVERHEADS VARIANCES:

---

### 12.5.1 Chart



**Check:**

Total Variable Overheads Cost Variance = Spending Variance + Utilization Variance

**12.5.2 Detailed Explanation:****i) Setting the Standards:**

This cost, being variable in nature, depends on the actual output and therefore, like material cost and labour cost, the Standards are always for actual output.

**12.5.3 Calculation of Variances:****1. Total Variable Overheads Cost Variance:**

This is the difference between total Standard Variable Cost and total actual variable cost.

**2. Variable Overheads Spending Variance:**

This is just like labour rate of pay variance. Thus, we multiply the rate difference by the actual labour hours paid for.

**3. Variable Overheads Utilization Variance:**

This is just like labour time variance. Thus, we multiply the labour hours differenced by the standard variable overheads rate per hour.

Here, the actual number of hours to be used should be gross number of hours if the variable overheads cost is incurred during the idle time. If it is not incurred during the idle time, then, we should use net number of hours.

**Note:**

Though the analysis of Variable Overheads Cost variance, as explained above is possible, normally people calculate only the total variable overheads cost variance. The other variances are not calculated normally. There are some obvious reasons for this. The Spending Variance is rarely controllable. (Example: Increase in the electricity rate). The Utilization Variance comes into being if workers take more or less time and this factor is looked into when we calculate labour time variance. There is no point, in real life situation, in repeating the investigation. Thus, once workers take more time, variable overheads utilization also increases. Therefore, the people are not interested in analysing the total variable overheads cost variance.

It may also be noted that labour hours are common for labour cost variances and variable overheads cost variance.



---

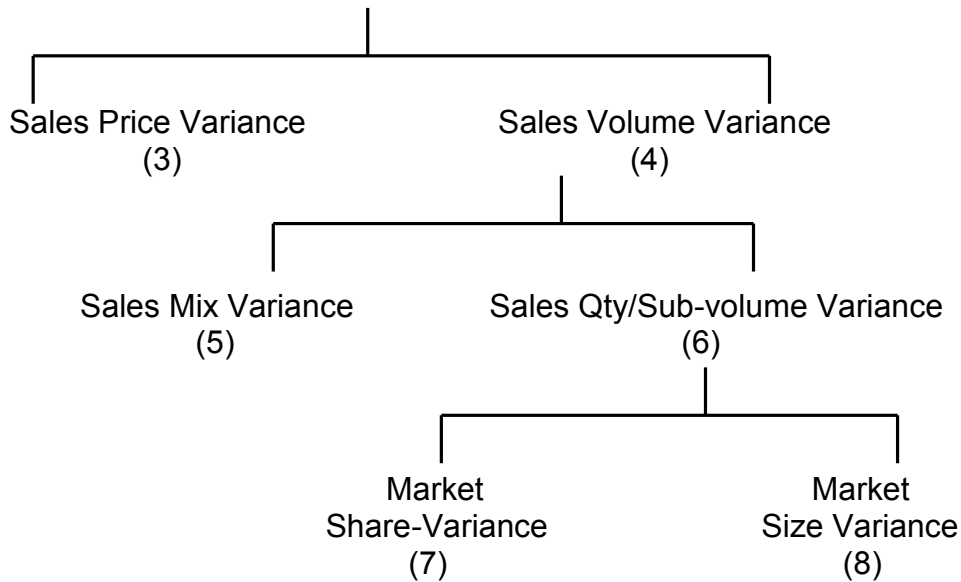
## 12.6 SALES VARIANCES:

---

### 12.6.1 Chart

The chart is as shown below:

#### TOTAL SALES VALUE VARIANCE (1)



#### Notes:

- 1) **Budget for Comparison** : The sales targets are always for a period. The budget to be compared with the actual result has to be for the same period for which the actual results are given. Thus whenever the budget is for the same period for which the actual results are given, the given budget itself is comparable with the actual and no revision is required. On the other hand, if the budget is not for the same period for which the actual results are given, the given budget has to be revised to make it represent the same period for which the actual results are given. Since we are talking about revenue and not the expenses, it is obvious that if actual quantity or price is more than the budget, then it gives us favourable variance.

### 12.6.2 Calculation of Variances

1. **Total Sales Value Variance:** This is the difference between the budgeted sales and the actual sales.
2. **Sales Price Variance:** This is just like material price variance and we get it by multiplying the sales price difference by actual quantity sold.
3. **Volume Variance:** This is just like material usage variance and we get it by multiplying the sales quantity difference of each product by standard selling price.

4. **Sales Mix Variance:** This is very usual mix variance. Accordingly, we apply standard ratio to the actual total quantity sold and we develop standard sales mix.

We compare this with the actual sales mix and the difference is to be multiplied by standard selling price of each product.

5. **Sales Qty./Sub-volume Variance:** This is just like material yield variance based on input and we get it by multiplying the total sales quantity difference by the standard average selling price per unit.
6. **Market Share Variance:** This is the change in total sales quantity due to change in market share. We multiply the actual market size by standard market share percentage to get standard sales quantity figure. We compare this with actual sales quantity and multiply the difference by standard average sales price per unit.
7. **Market Size Variance:** This is the change in total Sales quantity due to change in market size, multiplied by standard average sales per unit. We multiply the market size difference by standard market share percentage to get the change in total sales quantity.

---

## 12.7 PROFIT VARIANCES

---

The Chart is as shown on the last page of notes on this chapter.

### NOTES:

- 1) Like Sales, the profit targets are also for the period and whenever the given budget is not for the same period for which the actuals are given, the given budget has to be revised. Also, the actual profit being more would be a favourable variance.

#### 12.7.1 Calculation

1. **Total Profit Variance:** This is the difference between total budgeted profit and actual profit.
2. **Profit Variance due to Change in Sales:** This part of the chart is very similar to sales value variance chart. The only difference being the sales quantity difference is to be multiplied by standard sales price in sales value chart whereas the same quantity difference is to be multiplied by standard profit per unit in this part of the chart. The quantity variances in the two charts

would be different only because of the difference between standard sales price and standard profit. The sales price variance in both charts is the same.

3. **Profit Variance due to change in S. P.:** This is usual price variance which we get by multiplying actual sales quantity by the sales price difference.
4. **Profit Variance Due to Change in Sales Volume:** We get this variance by multiplying the sales quantity difference of each product by the standard profit per unit.
5. **Profit Variance Due to Change in Sales Mix:** This is usual mix variance and we get in by multiplying standard profit by the mix difference.
6. This is usual quantity variance and we get it by multiplying the total sales quantity difference by standard average profit per unit.

(a) / (b) : These Variances are same as those in the sales chart, the only difference being, we multiply the quantity difference by standard average net profit per unit.

7. **Profit Variance Due to Change in Cost:** If only the total standard cost and actual cost per unit are given without breakup into material cost, labour cost etc., then we calculate only the total variance in the same way as we calculate sales price variance. Thus we get it by multiplying the cost difference by the actual quantity Produced per unit.

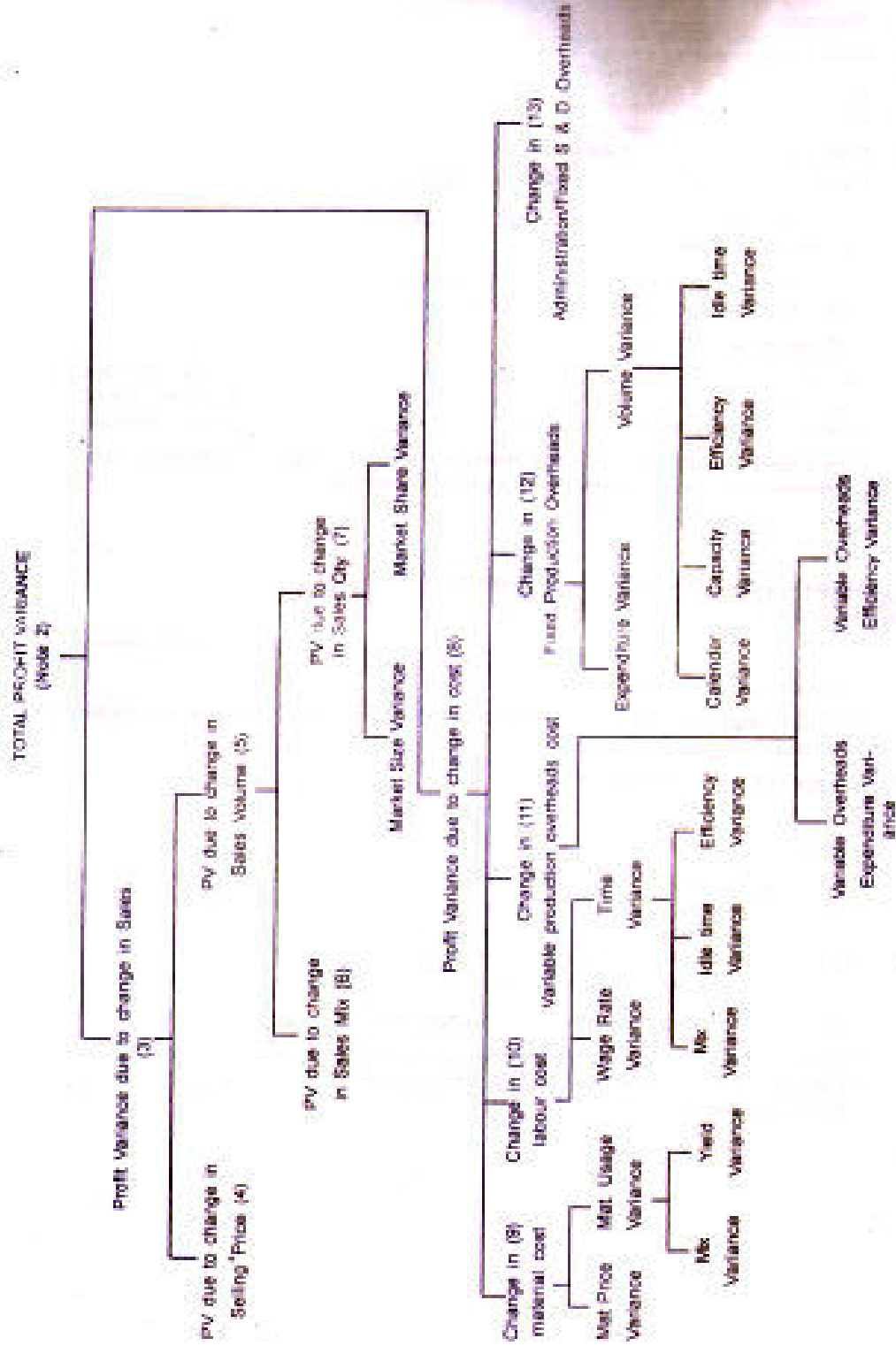
If the break-up of cost is given then all variances in respect of each cost item are to be calculate by following usual principles applicable to a particular cost item.

8. **Change in Material Cost:** These are usual material cost variances and we compare the standards for actual output with the actuals and get normal Material Cost Variances.
9. **Change in labour Cost:** We follow usual principles applicable to labour cost variances and get the normal variances.
10. **Change in Variable Cost:** We follow usual principles applicable to Variable Overheads cost Variances and get the normal variances.
11. **Change in Fixed Overheads Cost:** We follow usual principles applicable to fixed overheads cost variances and get the normal variances.

**12. Change in Administration / Fixed A & D Overheads :**  
**(under financial accounting)** As regards fixed expenses, we calculate only one variance which is Fixed Overheads expenditure variance. We calculate the same by comparing budgeted fixed overheads with actual Fixed Overheads. It should be noted that whereas fixed production overheads cost variance is to be analysed into expenditure and volume variance, under absorption costing, the admn. and S & D fixed cost variance is only in respect of expenditure and there is nothing like volume variance here.

Under marginal costing, there would be only expenditure variance for all types of fixed overheads.

If there is variable S & D overheads given then we develop the standards for actual quantity sold and the standard S & D variable cost would be compared with actual S & D cost to get Total variable S & D cost variance.



## 12.8 FORMULAS USED IN STANDARD COSTING

Material Cost Variance	Standard Material Cost Less Actual Material Cost
Material Price Variance	(Standard Price Less Actual Price) X Actual Quantity Purchased or Used.
Material usage Variance	(Standard Quantity for Actual Output Less Actual Quantity) X Standard Price
Material Mix Variance	(Actual Mix Less Standard Mix) X Standard Price
Material Yield Variance	(Standard Yield Less Actual Yield) X Standard Cost
Labour Cost Variance	Standard Wage Cost Less Actual Wage Cost
Labour Rate Variance	(Standard Rate Less Actual Rate) X Actual Hours
Labour Efficiency Variance	(Standard Hours for Actual Output Less Actual Hours Worked) X Standard Rate
Idle Time Variance	Idle Time X Standard Rate
Variable Production Cost Variance	Standard Variable Overhead Less Actual Variable Overhead
Variable Overhead Expenditure Variance	(Standard Overhead Rate Less Actual Overhead Rate) X Actual Hours
Fixed Overhead Cost Variance	Overhead Absorbed Less Overhead Incurred
Fixed Overhead Expenditure Variance	(Budgeted Fixed Overhead Less Actual Fixed Overhead)
Fixed Overhead Volume Variance	(Budgeted Volume-Actual Volume) X Standard Absorption Rate
Fixed Overhead Capacity Variance	(Budgeted Hours-Actual Hours) X Standard Absorption Rate
Fixed Overhead Productivity Variance	(Standard Hours for Actual Output-Actual Hours Worked) X

	Standard Absorption Rate
Sales value Variance	(Budgeted Quantity X Standard Selling Price) Less (Actual Quantity X Actual Selling Price)
Sales Price Variance	(Standard Selling Price-Actual Selling Price) X Actual Quantity Sold
Sales Volume Variance	(Budgeted Quantity - Actual Quantity) X Standard Selling Price or Standard Profit or Standard Contribution
Sales Margin Variance	(Budgeted Quantity X Standard Profit) - (Actual Quantity X Actual Profit)
Sales Contribution Variance	(Budgeted Quantity X Standard Contribution) - (Actual Quantity X Actual Contribution)
Sales Allowance Variance	(Budgeted Allowance-Actual Allowance) X Actual Quantity Sold
Sales Mix Variance	(Standard Mix-Actual Mix) X Standard Selling Price or Standard Profit or Standard Contribution
Sales Quantity Variance	(Budgeted Quantity-Actual Quantity in Standard Mix) X Standard Price or Standard Profit or Standard Contribution

---

## 12.9 SOLVED PROBLEMS

---

Q.1 From the following information Compute Fixed Overhead Variances.

	Standard	Actual
Days	50	54
Hours	5,000	5,500
Idle Hrs	.....	200
Units	5,000	5,100
Overheads	1,00,000	1,15,000

Also compute ratios for fixed overheads.

**Std Rate**

- 1) Abs Rate P. U. = ₹20 =  $\left[ \frac{10,00,000}{5,000} \right]$
- 2) Abs Rate P. H. = ₹20 =  $\left[ \frac{1,00,000}{5,000} \right]$
- 3) Abs Rate P. Day = ₹2,000/- =  $\left[ \frac{1,00,000}{5,000} \right]$
- 4) Std Hrs Per Day = 100 hrs =  $\left[ \frac{5,000}{50} \right]$
- 5) Std Hrs Per Unit = 1 hr =  $\left[ \frac{5,000}{5,000} \right]$

**Calculation of Variances**

$$\begin{aligned} \text{FOH Cost Var} &= \text{Actual FOH} - \text{FOH Abs} \\ &= 1,15,000 - [5,100 \times 20] \\ &= 13,000 \text{ A} \end{aligned}$$

$$\begin{aligned} \text{FOH Exp..... Var} &= \text{Budg FOH} - \text{Actual FOH} \\ &= 1,00,000 - 1,15,000 = 15,000 \text{ A} \end{aligned}$$

$$\begin{aligned} \text{FOH Volume Var} &= \left[ \frac{\text{Budg O/p} - \text{Actual O/p}}{\text{O/p}} \right] \times \text{Abs Ratw PU} \\ &= [5,000 - 5,100] \times 20 \\ &= 2,000 \text{ F} \end{aligned}$$

$$\text{Check} \rightarrow 13,000 \text{ A} = 15,000 \text{ A} + 2,000 \text{ E}$$

$$\begin{aligned} \text{Calender Var} &= [\text{Budg.Days} - \text{Actual Days}] \times \begin{matrix} \text{Abs. Rate} \\ \text{Per Day} \end{matrix} \\ &= [50 - 54] \times 2,000 \\ &= 8,000 \text{ F} \end{aligned}$$

**OR**



Calender Var	→	↑ in no. of days	4
		X Std hrs per day	100
		↑ in no of hours	400
		÷ Std hrs P. U	1
		↑ in o/p (Units)	400
		X A. R. P. U.	20
			₹8,000 F
Budgeted Out Put			5,000
Calender			+ 400
Capacity			+ 100
Idle Time Var			- 200
Efficiency			- 200
Actual Output			5,100

**Capacity Variances:**

$$\begin{aligned}
 &= \left[ \frac{\text{Std hrs in} - \text{Actual}}{\text{Act. Days} \quad \text{Hours}} \right] \times \text{A. R.} \\
 &= \left[ \frac{5,400 - 5,500}{\quad \quad \quad} \right] \times 20 \\
 &= 2,000 \text{ F}
 \end{aligned}$$

**OR**

↑ in no. of hours		100	
÷ Std hrs P. U		1	
↑ in o/p		100	
X A. R.		20	
		200 F	

If No of Days Are Not Given

$$\begin{aligned}
 \text{Capacity Var} &= \left[ \frac{\text{Budgt} - \text{Actual}}{\text{Hrs} \quad \text{Hrs}} \right] \times \text{A. R.} \\
 &= \left[ \frac{5,000 - 5,500}{\quad \quad \quad} \right] \times 20 = 10,000 \text{ F}
 \end{aligned}$$

$$\begin{aligned}
 \text{Cap Var By Alternate} &= \text{Calender} + \text{Cap. Var By} \\
 10,000 \text{ F} &= \text{Var Normal Method} \\
 &= 8,000 \text{ F} + 2000 \text{ F}
 \end{aligned}$$

$$\begin{aligned}
 6) \quad \text{Idle Time Var} &= \text{Idle Times} \times \text{Abs Rate P. H.} \\
 &= 200 \times 20 \\
 &= 4,000 \text{ A}
 \end{aligned}$$

OR

Idle Time (Hrs	200	
÷ Std Hrs P. U	1	
↓ in o/p (Units)	200	
X A. R. P. U.	20	
	400	

$$\begin{aligned}
 7) \quad \text{FOH Efficiency Var} &= \left[ \frac{\text{Std o/p in Actual}}{\text{Actual Net hrs O/P}} \right] \times \text{Ab. Rate P. U.} \\
 &= \{ 5,300 - 5,100 \} \times 20 = 4,000 \text{ A}
 \end{aligned}$$

# WNI Std O/P in Actual Net hrs.

	Hrs	Unit
Std	1	1
	5300	? → 5,300 units

$$2000 \text{ F} = 8,000 \text{ F} + 2,000 \text{ F} + 4,000 \text{ A} + 4,000 \text{ A}$$

- 1) FOH Volume Ratio  $= \frac{\text{Actual o/p}}{\text{Budge o/p}} \times 100$ 

$$= \frac{5100}{5000} \times 100$$

$$= 102\%$$
- 2) Calender Ratio  $= \frac{\text{Actual Days}}{\text{Budgied Days}} \times 100$ 

$$= \frac{54}{50} \times 100$$

$$= 108\%$$
- 3) Capacity Ratio  $= \frac{\text{Actual hrs}}{\text{Std hrs in actual days}} \times 100$ 

$$= \frac{5500}{5400} \times 100$$

$$= 101.86\%$$

IF NO. OF DAYS NOT GIVEN

$$\begin{aligned}\text{Cap Ratio} &= \frac{\text{Act Hrs}}{\text{Budg Hrs}} \times 100 \\ &= \frac{5500}{5000} \times 100 \\ &= 110\%\end{aligned}$$

$$\begin{aligned}\text{FOH EFF Ratio} &= \frac{\text{Actual o/p}}{\text{Std o/p in Act Net hrs}} \times 100 \\ &= \frac{5100}{5300} \times 100 \\ &= 96.23\%\end{aligned}$$

Q.2 In department A the following data is submitted for the week ended 31<sup>st</sup> October.

Standard output for 20 hours per week	700 Unit
Standard fixed overheads	₹700/-
Actual output	600 Units
Actual hours worked	16
Actual Fixed overheads	₹750/-

Prepare a Statement of Variances and ratio in respect fixed overheads.

	1 Week Budget	1 Week Actual	Std Rate
Output (Units)	700	600	1 → Abs Rate P.O.
Hours	20	10	35 → Abs Rate P. H.
FOH (₹)	700	750	Std o/p P. Hrs = 35 unit p. hrs
Output Std hrs.	20 hrs	17.14285 hrs	

**Calculation Variances:-**

$$\begin{aligned}1) \text{ FOH Cost Var} &= \text{Actual FOH} - \text{Abs FOH} \\ &= 750 - (600 \times 1) = 150 \text{ A}\end{aligned}$$

- 2) FOH Exp. Var = Budgeted - Actual  
FOH FOH  
= 700 - 750  
= 50 A
- 3) FOH Vol. Var =  $\left[ \frac{\text{Budgeted} - \text{Actual}}{\text{o/p} \quad \text{o/p}} \right] \times \text{Abs Rate pu}$   
= (700 - 600) x 1 = 100 A  
Check 150 A = 50A + 100A
- 4) Capacity Var = (Budg. Hrs - Act. Hrs) x Abs Rate  
= (20 - 16) x 35  
= 140 A
- 5) Efficiency Variance =  $\left[ \frac{\text{Std o/p for} - \text{Actual}}{\text{Actual Net ms} \quad \text{o/p}} \right] \times \text{Abs Rate pu.}$   
Std.  $\frac{\text{Hrs Unit}}{1 \quad 35}$  = [ 560 - 600 ] x 1  
16 560 = 40 F

(We are comparing low much o/p should her been produce in actual net has & how much o/p is actual produced)

$$\text{FOH EFF} = \left[ \frac{\text{Std hrs for} - \text{Actual}}{\text{Act o/p} \quad \text{Net hrs}} \right] \times \text{A. R Per hrs}$$

Hrs	Unit	
1	35	= (17.14285 - 16) x 35
17.14285	600	= 40 F

Check 100 A = 140 A + 40 F

Q.3 From the following information about state calculate necessary sales variances.

Product	Standard			Actual		
	Nos	Rate in ₹ P.U	Total ₹	Nos	Rate in ₹ P.U.	Total ₹
A	5,000	5	25,000	6,000	6	36,000
B	4,000	6	24,000	5,000	5	25,000
C	3,000	7	21,000	4,000	8	32,000
	12,000		70,000	15,000		93,000

The company's budgeted market share was 20% and the actual market size was 90,000 units.

Total Sales = Std Sales - Actual Sales

Value Var = 70,000 - 93,000

= 23,000 F

SP Variances = (Std SP - Act SP) x Actual Sales Qty.

A = (5 - 6) x 6,000 = 6,000 F

B = (6 - 5) x 5,000 = 5,000 A

C = (7 - 8) x 4,000 = 4,000 F

Sales Vol V = (Std Sales Qs-Act Sales Qty) x Std SP

A = (5,000 - 6,000) x 5 = 5,000 F

B = (4,000 - 5,000) x 6 = 6,000 F

C = (3,000 - 4,000) x 7 = 7,000 F

Check 23,000 F = 5,000 F + 18,000 F

Sales Mix Var =  $\left[ \frac{\text{Std Mix For} - \text{Actual}}{\text{Act S. Qty} \quad \text{Mix}} \right] \times \text{Std S.P.}$

A = (6,250 - 6,000) x 5 = 1250 A

B = (5,000 - 5,000) x 6 = -

C =  $\frac{3,750 - 4,000}{15,000} \times 7 = \frac{1,750}{500} \text{ F}$

15,000

500 F

Sales Qty Var / Sub Vol. Var

= (Total Std Sales Qty - Total Actual Sales Qty)

x Std Weighted Avg SP

= (12,000 - 15,000) x 70/12 = 17,500 F

18,000F = 500 F + 17,500 F

Budge. Mkt. Size

Budge Mkt

Budge Mkt

Share

Size

20

100

1200

2 (66,000 Units)

## 6) Mkt Size Variances

Budg Mkt Size	=	60,000
Act Mkt Size	=	90,000
↑ in Mkt (Units)	=	<u>30,000</u>
Std Mkt Share		20%
↑ in Sales due to		
↑ in Mkt Size		6,000
x Std wt Avg pr		<u>5.83</u>
		<u>35,000 F</u>

## 7)

Mkt Share Variance	Units
Actual Mkt Size	90,000
x Std Mkt share	20%
Expected Sale	18,000
( - ) Actued Sales	15,000
↓ in Mkt share	3,000
x Std wt Avg sp	70/12
	17,500 A

---

**12.10 EXERCISE**


---

**A. Objective Questions**

Fill in the blanks:

1. Material Price Variances + Material Usage variances =-----  
----.(Total Material Cost Variances)
2. Material Mix Variances + Material Yield Variances = -----  
(Material Usage Variances).
3. Difference between the budgeted sales and the actual sales is --  
------(Total Sales value variances)
4. Change in total Sales quantity due to change in market size \*  
standard average sales per unit = ----- (Market Size Variance)
5. The difference between total Standard Variable Cost and total  
actual variable cost means ------(Total variable overheads cost  
variance)

**B. Practical Problems**

1. X Ltd. manufactures product X which requires 2 hours of skilled men, 3 hours of semi-skilled men and 5 hours of unskilled men, per unit at ₹5, 3 & 2 per hour respectively. During April 2003, the production department reported output of 2500 units of product X. The labour cost incurred was as detailed below:

Type of labour	Hours paid for	Rate per hour
Skilled	4,500	₹7.00
Semi - Skilled	8,500	₹2.75
Unskilled	15,000	₹1.50
	28,000	

The total hours paid for included 500 idle hours due to machine break down etc., out of which 250 hours pertained to skilled men, 200 hours pertained to semi-skilled men and the balance to unskilled men.

**Required:**

- 1) Calculate the labour cost variances.
  - 2) Recalculate the labour cost variances, given that the break up of 500 idle hours is not given.
2. Given the following data, compute the variances.

	Skilled	Semi-Skilled	Unskilled
Number in Standard gang	16	6	3
Standard Rate Per Hour	3	2	1
Actual Number in Gang	14	9	2
Actual Rate of Pay	4	3	2

In a 40 hours week, the gang as a whole produced 900 standard hours.

3. From the following information compute fixed overhead variances.

	Standard	Actual
Days	50	54
Hrs.	5,000	5,500
Idle Hrs.	----	200
Units	5,000	5,100
Overheads	1,00,000	1,15,000

Also compute ratios for fixed overheads.

4. From the following information about sales, calculate necessary sales variances.

Product	Standard			Actual		
	Nos	Rate in ₹ Per Unit	Total ₹	Nos	Rate in ₹ Per Unit	Total ₹
A	5,000	5	25,000	6,000	6	36,000
B	4,000	6	24,000	5,000	5	25,000
C	3,000	7	21,000	4,000	8	32,000
	12,000		70,000	15,000		93,000

The company's budgeted market share was 20% and the actual market size was 90,000 units.

5. The Company has Budgeted the following data for a month.

Product	SP	Cost Per Unit	Units
A	10	4	600
B	20	15	400

Budgeted Market size of the industry in which company is operating is 5000 units. The actual data for the month was:

Product	SP	Cost Per Unit	Qty.
A	12	5	800
B	19	13	700

Actual market share of the company was 25%.

**Required:**

- 1) Sales Variances
- 2) Profit Variances
- 3) Reasons for Sales mix variance being favourable but profit mix variance being adverse.



6. single product company operates a system of standard costing. The following data relate to actual output, sales, costs and variances for a month:

Actual Output	18,000 units
	₹
Actual Sales and costs incurred:	
Sales	12,15,000
Direct Materials Purchased and Used 63,000 kg.	2,04,750
Direct Wages	2,12,040
Variable Overheads	2,77,020
Fixed Overheads	3,25,000
Total Costs	10,18,810
Profit	1,96,190

Standard wage rate is ₹6 per hour. Budgeted output for the month is 20,000 units. Variance are:

<b>(Direct Materials</b>	- <b>Price Variance</b>	<b>15,750 A</b>
	- <b>Usage Variance</b>	<b>27,000 A</b>
<b>Direct Labour</b>	- <b>Rate Variance</b>	<b>6,840 A</b>
	- <b>Efficiency Variance</b>	<b>10,800 F</b>
<b>Variable Overheads</b>	- <b>Efficiency Variance</b>	<b>14,400 F</b>
	- <b>Expense Variance</b>	<b>3,420 A</b>
<b>Fixed Overheads</b>	- <b>Expense Variance</b>	<b>25,000 A</b>
	- <b>Sales Price Variance</b>	<b>45,000 F)</b>

**Required:**

- i) Present the original budget alongwith cost sheet showing the standard cost and profit per unit.
- ii) Calculate the sales gross margin volume and fixed overheads volume variances.
- iii) Prepare an operating statement reconciling the budgeted profit with actual profit.



## MARGINAL COSTING

### Unit Structure

- 13.0 Objectives
- 13.1 Introduction
- 13.2 Marginal Cost Equations and Basic Concepts
- 13.3 Solved Problems
- 13.4 Exercises

---

### 13.0 OBJECTIVES

---

After studying the unit the students will be able to:

- Distinguish between Marginal Costing and Absorption Costing.
- Understand the equations and basic concepts in Marginal Costing.
- Solve the practical problems on Marginal Costing.

---

### 13.1 INTRODUCTION

---

Marginal costing is defined as the ascertainment of cost by differentiating between fixed and variable costs and also find out the effect on profit changes whenever change in the volume as well as type of output.

Marginal cost is the aggregate of all variable cost excluding fixed expenses. It is increased by adding every extra unit. If output increase the marginal cost increases.

#### **Absorption Costing:-**

It refers to the analysis of the total cost for the purpose of distribution of cost unit wise. All fixed as well as variable cost charged to products.

---

### 13.2 MARGINAL COST EQUATIONS AND BASIC CONCEPTS

---

- 1) Sales - Variable Cost = Contribution
- 2) Contribution - Fixed Cost = Profit
- 3) Sales - Variable Cost = Fixed Cost + Profit

$$4) \text{ Profit Volume Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$5) \text{ Contribution} = \text{Sales} \times \text{PV Ratio}$$

$$6) \text{ Sales} = \frac{\text{Contribution}}{\text{PV Ratio}}$$

$$7) \text{ BEP (In Units)} = \frac{\text{Fixed Cost}}{\text{Contribution Per Unit}}$$

$$8) \text{ BEP (in ₹)} = \frac{\text{Fixed Cost}}{\text{PV Ratio}}$$

**OR**

$$\text{BEP (in ₹)} = \frac{\text{Fixed Cost}}{\text{Contribution}} \times \text{Sales}$$

$$9) \text{ Required Sales}$$

$$(\text{₹}) = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}}$$

$$10) \text{ Required Sales (in Units)} = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution Per Unit}}$$

$$11) \text{ Actual Sales} = \frac{\text{Fixed Cost} + \text{Profit}}{\text{PV Ratio}}$$

$$12) \text{ Margin or Safety (₹)} = \text{Actual Sales} - B \in P \text{ Sales}$$

$$13) \text{ Margin of Safety (in Units)} = \text{Actual Sales (in Units)} - B \in P \text{ (in Units)}$$

$$14) \text{ Profit} = \text{Margin of Safety} \times \text{PV Ratio.}$$

### **Contribution:-**

Contribution is the profit before deducting fixed cost and after deducting variable cost.

### **Profit Volume Ratio:-**

Marginal costing is the ascertainment of cost as well as the effect on profit of changes in value and type of output. Such impact of changes in volume of output on profit is called as profit volume ratio.

### **Break Even Point:-**

$(B \in P -)$   $B \in P$  Means the point at which no profit and no loss. Whatever total cost = total income. Total cost include fixed as well as variable cost. There is no profit, no loss.

---

### 13.3 SOLVED PROBLEMS

---

**Illustration 1**

1) From the following data, calculate Break-even Point ( $B \in P$ )

Selling Price Per Unit ₹40/-

Variable Cost Per Unit ₹30/-

Fixed overheads ₹40,000.

If sales are 20% above  $B \in P$ , calculate the net profit.

**Solution:-**

$$i) \quad PV \text{ Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

Contribution = Selling Price - Variable Cost

$$= 40 - 30$$

$$= 10$$

$$\therefore PV \text{ Ratio} = \frac{10}{40} \times 100 = 25\%$$

$$ii) \quad B \in P \text{ (in ₹)} = \frac{\text{Fixed Overheads}}{PV \text{ Ratio Ratio}}$$

$$= \frac{40,000}{25\%} = 1,60,000$$

iii) If sales are 20% above  $B \in P$ , then profit is,

$$B \in P = 1,60,000 + (20\%) 32,000 = 1,92,000$$

$$\therefore \text{Sales} \quad - \quad 1,92,000$$

$$(-) \text{ Variable Cost} \quad \underline{1,44,000} \quad 75\%$$

$$\text{Contribution} \quad \rightarrow \quad 48,000$$

$$(-) \text{ Fixed Cost} \quad 40,000$$

$$\text{Profit} \quad \rightarrow \quad 8,000$$

If PV Ratio = Contribution

then  $100\% - PV \text{ Ratio} = \text{variable Cost}$

$$\text{i.e. } 100 - 25 = 75\%$$

**Illustration 2**

From the following data compute -

- 1) P / V Ratio
- 2)  $B \in P$  in Rupees and Unit.
- 3) Number of Units to be sold to earn a profit of ₹7,50,000.

Sale Price - ₹20 per unit.

Direct Material - ₹5 per unit.

Direct Wages - ₹6 per unit

Variable Administrative overheads - ₹3 per unit

Fixed Factory Overhead ₹6,40,000 per year

Fixed Administrative Overheads ₹1,52,000 per year.

**Solution:-**

Total Variable Cost = Direct Material + Variable Adm. Overhead +  
Direct Wages ₹14 = 5 + 6 + 3

Total Fixed Overheads = Fixed Factory Overheads + fixed Adm.  
Overheads

7,92,000 = 6,40,000 + 1,52,000

∴ Contribution Per Unit = Selling Price - Variable Cost

6 = 20 - 14

$$\begin{aligned} \text{i) PV Ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 \\ &= \frac{6}{20} \times 100 = 30\% \end{aligned}$$

ii)  $B \in P$  in ₹. & Unit

$$B \in P (\text{in ₹}) = \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{7,92,000}{30\%} = 2,64,000$$

$$B \in P (\text{in Unit}) = \frac{\text{Fixed Overheads}}{\text{Contribution Per Unit}} = \frac{7,92,000}{6}$$

= 1,32,000 Unit

iii) Number of Units Sold to earn a profit of ₹7,50,000

$$\begin{aligned} \text{Required Sales (in Units)} &= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution Per Unit}} \\ &= \frac{7,92,000 + 7,50,000}{6} \\ &= 2,57,000 \text{ Units} \end{aligned}$$

**Illustration 3**

The Following Figures relates to M/s. Deepak Industries:

Fixed Overheads	₹2,40,000
Variable Overheads	₹4,00,000
Direct Wages	₹3,00,000
Direct Material	₹8,00,000
Sales	₹20,00,000

Calculate (1) PV Ratio (2)  $B \in P$  (3) Margin of Safety.

**Solution:-**

Total Variable Overheads = Variable Overheads + Direct Wages + Direct Material

$$15,00,000 = 4,00,000 + 3,00,000 + 8,00,000$$

∴ Contribution = Sales - Total Variable Cost

$$5,00,000 = 20,00,000 - 15,00,000$$

$$i) \quad PV \text{ Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$25\% = \frac{5,00,000}{20,00,000} \times 100$$

$$2) \quad B \in P \text{ (in ₹)} = \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{2,40,000}{25\%} = 9,60,000$$

$$3) \quad \text{Margin of Safety} = \text{Actual Sales (in ₹)} - B \in P \text{ Sales (in ₹)}$$

$$= 20,00,000 - 9,60,000$$

$$\text{MOS} = 10,40,000$$

**Illustration 4**

Following Particulars are available for A Ltd and B Ltd.

Particulars	A Ltd.	B Ltd
Sales	6,00,000	6,00,000
PV Ratio	25%	20%
Fixed Cost	90,000	80,000

Calculate for each company.

i) Break even Point.

ii) Margin of Safety.

iii) Sales required to earn a profit of ₹90,000.

- i)  $B \in P$  (in ₹) =  $\frac{\text{Fixed Cost}}{\text{PV Ratio}}$
- A Ltd =  $\frac{90,000}{25\%} = 3,60,000$
- B Ltd. =  $\frac{80,000}{20\%} = 4,00,000$
- ii) Margin of Safety = Actual sales =  $B \in P$  Sales
- A Ltd = 6,00,000 - 3,60,000  
= 2,40,000
- B Ltd = 6,00,000 - 4,00,000 = 2,00,000
- iii) Sales Required to earn a profit of ₹90,000
- Required Sales =  $\frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}}$
- A Ltd =  $\frac{90,000 + 90,000}{25\%} = 7,20,000$
- B Ltd =  $\frac{80,000 + 90,000}{20\%} = 8,50,000$

\* Whenever 2 periods or 2 years are given in the problem then PV Ratio is calculated as,

$$\text{PV Ratio} = \frac{\text{Changes in Profit}}{\text{Changes in Sales}} \times 100$$

All other formula's are same as it is.

### Illustration 5

From the following particulars you are required to calculate:

- 1) Profit Volume Ratio,
- 2)  $B \in P$
- 3) Profit when sales is ₹2,00,000
- 4) Sales required to earn a profit of ₹40,000,
- 5) Margin of Safety in the 2<sup>nd</sup> year.

Year	Sales ₹	Profit ₹
I	2,40,000	18,000
II	2,80,000	26,000

You may assume that the cost structure and selling price remain constants in two years.

$$\begin{aligned}
 \text{i) PV Ratio} &= \frac{\text{Changes in Profit}}{\text{Changes in Sales}} \times 100 \\
 &= \frac{26,000 - 18,000}{2,80,000 - 2,40,000} \times 100 \\
 &= \frac{8,000}{40,000} \times 100 = 20\%
 \end{aligned}$$

$$\text{ii) } B \in P = \frac{\text{Fixed Cost}}{\text{PV Ratio}}$$

	1 <sup>st</sup> Year	2 <sup>nd</sup> Year
Sales	2,40,000	2,80,000
( - ) Variable Cost (80%)	1,92,000	2,24,000
Contribution (20%)	48,000	56,000
( - ) Fixed Cost	30,000	30,000
Profit	18,000	26,000

$$\therefore B \in P = \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{30,000}{20\%} = 1,50,000$$

iii) Profit when Sales are ₹2,00,000

Sales	2,00,000
( - ) Variable Cost (80%)	<u>1,60,000</u>
Contribution (20%)	40,000
( - ) Fixed Cost	<u>30,000</u>
Profit	→ 10,000

iv) Required Sales to earn a profit of ₹40,000.

$$\begin{aligned}
 \text{Required Sales} &= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}} \\
 &= \frac{30,000 + 40,000}{20\%} \\
 &= 3,50,000
 \end{aligned}$$

$$\begin{aligned}
 \text{v) Margin of Safety (2<sup>nd</sup> Year)} &= \text{Actual Sales} - B \in P \text{ Sales} \\
 &= 2,80,000 - 1,50,000 \\
 &= 1,30,000
 \end{aligned}$$



**Illustration 6**

The following data have been extracted from the books of Alfa Ltd.

Year	Sales	Profit
2012	5,00,000	50,000
2013	7,50,000	1,00,000

You are required to calculate:-

- i) PV Ratio
- ii) Fixed Cost
- iii) Break even sales
- iv) Profit on Sales of ₹4,00,000
- v) Sale to earn a Profit of ₹1,25,000.

$$\begin{aligned}
 \text{i) PV Ratio} &= \frac{\text{Changes in Profit}}{\text{Changes in Sales}} \times 100 \\
 &= \frac{1,00,000 - 50,000}{7,50,000 - 5,00,000} \times 100 \\
 &= \frac{50,000}{2,50,000} \times 100 = 20\%
 \end{aligned}$$

- ii) Fixed Cost -

	2012	2013
Sales	5,00,000	7,50,000
( - ) Variable Cost (80%)	4,00,000	6,00,000
Contribution (20%)	1,00,000	1,50,000
( - ) Fixed Cost	<b>50,000</b>	<b>50,000</b>
Profit	50,000	1,00,000

$$\begin{aligned}
 \text{iii) Break Even Sales} &= \frac{\text{Fixed Cost}}{\text{PV Ratio}} \\
 &= \frac{50,000}{20\%} = 2,50,000
 \end{aligned}$$

iv) Profit on Sales of ₹4,00,000.

Sales	4,00,000
( - ) Variable Cost (80%)	<u>3,20,000</u>
Contribution (20%)	80,000
( - ) Fixed Cost	<u>50,000</u>
Profit	<u>30,000</u>

v) Sales to earn a Profit of ₹1,25,000

$$\begin{aligned} \text{Required Sales} &= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}} \\ &= \frac{50,000 + 1,25,000}{20\%} = 8,75,000 \end{aligned}$$

### Illustration 7

Z Ltd. produces and sells a single article at ₹10 each. The marginal cost of production is ₹6 each and Fixed Cost is ₹400 per annum. Calculate:-

- PV Ratio
- The break even Sales (in ₹. and Nos.)
- The Sales to earn a Profit of ₹500.
- Profit at Sales of ₹3,000.
- New break even point if sales price is reduced by 10%
- Margin of Safety at sales of ₹1,500 and
- Selling price per unit if the break even point is reduced to 80 units.

### Solution:-

$$\begin{aligned} \text{Contribution} &= \text{Sales} - \text{variable Cost (Marginal Cost)} \\ 4 &= 10 - 6 \end{aligned}$$

$$\begin{aligned} \text{i) PV Ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 \\ 40\% &= \frac{4}{10} \times 100 \end{aligned}$$

$$\begin{aligned} \text{ii) Break in Point (in ₹)} &= \frac{\text{Fixed Cost}}{\text{PV Ratio}} \\ &= \frac{400}{40\%} = 1000 \end{aligned}$$

$$\begin{aligned}
 B \in P \text{ (in Units)} &= \frac{\text{Fixed Cost}}{\text{Contribution Per Unit}} \\
 &= \frac{400}{4} = 100 \text{ Unit}
 \end{aligned}$$

iii) Sales to earn a profit of ₹500

$$\begin{aligned}
 \text{Required Sales (in ₹)} &= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}} \\
 &= \frac{400 + 500}{40\%} = ₹2,250.
 \end{aligned}$$

iv) Profit at Sales or ₹3,000

Sales	3,000
( - ) Variable Cost (60%)	1,800
Contribution (40%)	1,200
( - ) Fixed Cost	400
Profit	800

v) New  $B \in P$  if Sales Price is reduced by 10%

S.P. (Original)	- 10
( - ) Reduced by 10%	1
New S. P.	9

Contribution = Sales - Variable Cost

$$3 = 9 - 6$$

$$\begin{aligned}
 \text{PV Ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 \\
 &= \frac{3}{9} \times 100 \\
 &= 33.33\%
 \end{aligned}$$

$$B = \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{400}{33.33\%} = ₹1,200$$

vi) Margin of Safety at Sales of ₹1,500.

$$\begin{aligned}
 \text{a) Old MOS} &= \text{Actual Sales} - B \in P \text{ Sales} \\
 &= 1,500 - 1,000 \\
 &= 500
 \end{aligned}$$

$$\begin{aligned} \text{b) New MOS} &= \text{Actual Sales} - B \in P \text{ Sales} \\ 300 &= 1,500 - 1,200 \end{aligned}$$

vii) Selling Price per unit if the break even point is reduced to 80 units.

$$B \in P \text{ (in Units)} = \frac{\text{Fixed Cost}}{\text{Contribution Per Unit}}$$

$$80 = \frac{400}{\text{CPU}}$$

$$\text{CPU} = \frac{400}{80}$$

$$\therefore \text{CPU} = 5$$

$$\therefore \text{New Selling Price} = \text{Contribution} + \text{Variable Cost}$$

$$11 = 5 + 6$$

$$\therefore \text{New Selling Price ₹11}$$

## 13.4 EXERCISE

### A. Objective Questions

#### Q.1 Multiple Choice Question

- When variable cost per unit increases then the break even point will
  - Increase
  - Decrease
  - Remain Constant
  - None of these
- If a company increases fixed costs, then the break even point will be
  - Lower
  - Higher
  - Remain Constant
  - None of these
- Contribution is equal to fixed cost is the point
  - Break even point
  - Margin of safety
  - PV Ratio
  - None of these
- A decrease in variable cost per unit then PV Ratio also
  - Increase
  - Decrease
  - Remain Constant
  - None of these
- A decrease in the contribution margin then the PV Ratio
  - Increase
  - Decrease
  - Remain Constant
  - None of these



**B. Practical Problem:-**

- 1) K. T. and Co. has prepared the following budgets estimates for the year 2002 - 2003. Sales 15,000 units, Sales Value ₹1,50,000, Fixed expenses ₹34,000. Variable Cost per unit ₹6/-. You are required to find:
- Profit Volume Ratio,
  - Break Even Point,
  - Margin of Safety.

Also calculate revised Profit Volume Ratio, Break Even Point and Margin of Safety, if the selling price per unit is reduced by 10%.

- 2) A product is sold at ₹80 per unit. Its Variable Cost is ₹60, Fixed Cost is ₹6,00,000.

Compute the following:

- PV Ratio, 2) Break Even Point, 3) Margin of Safety at a sale of 50,000 Units, 4) At What sale the producer will earn profit at 15% on sales?
- 3) The following is the cost structure or a product selling price ₹100 unit.

Variable Cost	Per Unit
Material	₹38
Labour	₹14
Direct Expenses	₹8
Fixed Overheads for the Year	
Factory Overheads	₹2,80,000
Office Overheads	₹2,20,000

No of units produced and sold 40,000.

Calculate :-

- PV Ratio,
- $B \in P$  in Units
- Martin of Safety Amount
- $B \in P$  if fixed overheads increased by 20%.
- Revised PV Ratio when selling price increased by 20%.

- 4) A company produces and sells 1500 units of a commodity at ₹20 each. The variable cost of production is ₹12 per unit and Fixed Cost ₹8,000 per annum.

Calculate:-

- 1) PV Ratio
- 2) Sales at  $B \in P$  and
- 3) Additional Sales required to earn the same amount of profit if selling price is reduced by 10%.

- 5) You are given the following information:-

Selling Price ₹40 Per Unit.

Variable Cost ₹30 Per Unit

Fixed Cost ₹1,80,000

Calculate:-

- 1) PV Ratio
- 2)  $B \in P$  (in ₹. and units)
- 3) Profit at Sales ₹9,60,000
- 4) New  $B \in P$  Sales in ₹. if sale price is reduced by 10%.

- 6) Following information is available in respect of G. Ltd and D. Ltd.

Calculate:-

- 1) P/V Ratio of Both Companies.
- 2) Fixed Cost of Both Companies.
- 3) Sales to earn profit of ₹2,10,000 by each company.
- 4) Break Even Point of Both Companies.
- 5) Margin of Safety of 'D' Ltd.

Particulars	G. Ltd (₹)	D Ltd. (₹)
Sales	11,00,000	14,00,000
Variable Cost	8,80,000	10,50,000
Profit	1,20,000	2,00,000

- 7) M/s. EAR Enterprises furnish the following information:-

Year	Sales (₹)	Profit (₹)
2013	6,00,000	60,000
2014	8,00,000	1,00,000

From the above calculate the following

- i) PV Ratio
  - ii) Fixed Cost
  - iii)  $B \in P$
  - iv) Sales to Earn Profit of ₹2,00,000.
  - v) Margin of Safety of 2014.
- 8) From the following particulars, you are required to calculate:-
- i) Fixed Cost
  - ii) Profit volume Ratio.
  - iii) Break Even Sales
  - iv) Sales to Earn Profit or ₹6,00,000.
  - v) Margin of Safety of the year 2012.

<b>Particulars</b>	<b>2012 (₹)</b>	<b>2013 (₹)</b>
Total Cost	12,96,000	18,72,000
Sales	14,40,000	21,60,000

Hint :- First Find out Profit by Sales - Total Cost.





## SOME EMERGING CONCEPTS OF COST ACCOUNTING

### Unit Structure

- 14.0 Objectives
- 14.1 Introduction
- 14.2 Target Costing
- 14.3 Life Cycle Costing
- 14.4 Bench Marking
- 14.5 Activity based costing (ABC)
- 14.6 Exercises

---

### 14.0 OBJECTIVES

---

After studying the unit the students will be able to:

- Explain the meaning and stages involved under target costing.
- Know the Meaning of Life cycle Costing and Phases of product life cycle.
- Understand the meaning, steps and important terms in Activity Based Costing
- Explain the meaning, Steps and types of Bench Marking.

---

### 14.1 INTRODUCTION

---

There are number of drawback in traditional costing. Under traditional costing we have to differential between direct cost and material cost, which also induce in material, Labour and overhead. Under this method, the profit and overhead are distributed as per volume and labour hours or machine hours of particular product but we have to also consider non volume factor. Therefore due to this traditional costing leads to over costing or under costing.

Total Cost of the product is required to calculate the profit, which is also required to find out the total revenue. To make a profit, total revenue must exceed total costs in the long term. Due to all above there is a need to study the different concept of emerging cost accounting.

- A) Target Costing.
- B) Life Cycle Costing
- C) Bench Marking
- D) Activity Based Costing (ABC)

---

## 14.2 TARGET COSTING

---

### 14.2.1 Meaning

Target Costing is a process of developing costs for a product or service based on Market driven considerations. It is a method that allows firms to provide customers with product that they want, a price that they can afford, and also earn desired financial returns.

Target costs are derived from target selling price is follows:  
Target cost or a product (or service) = Target Selling Price Less Target Profits.

By using above formula, a firm can find out back ward from a product's selling price to arrive at target costs. It becomes goal for designer and production personnel. It is also standard costs but the significance of target costing is how these standard are developed. Target costs are market driven standards.

### 14.2.2 Steps involved

The following steps / stages are involved under target costing -

- i) Design and develop a product that customer desire.
- ii) Determine the target price of the product based on customers' perceived value for it and competitive market price.
- iii) Determine the desired profit margin.
- iv) Derive target costs by detecting desired margin from target selling price.
- v) Perform value engineering to advice target cost.

---

## 14.3 LIFE CYCLE COSTING

---

### 14.3.1 Meaning

Life Cycle costing is a technique which takes account of total cost of making a product or owing a physical asset, during its economic life. The product life cycle concept is very useful concept in sales forecasting, planning and control, as current company products cannot hold the market position indefinitely.

The concept of life cycle costing involves:-

- a) Identifying product life cycle and estimating number of units to be produced per period over the life cycle of the product.
- b) Estimating the costs involved for the same and.
- c) Determining the average cost of production over the product life.

#### **14.3.2 Phase of Product Life Cycle:-**

Each and every product has a product life cycle. It will change from a few months to several years. It can be divided into five phases.

- 1) Development
- 2) Introduction
- 3) Growth
- 4) Maturity
- 5) Decline

##### **1) Development:-**

Each and every product is passes trough development stage, at which the costs to be paid but there is no any generation of revenue.

##### **2) Introduction:-**

Under this stage, a product is introduced in the market. Then the company would find out the potential consumer for the product. The company will paid more amount on advertisement to make more aware of the product as well as to capture more market.

##### **3) Growth:-**

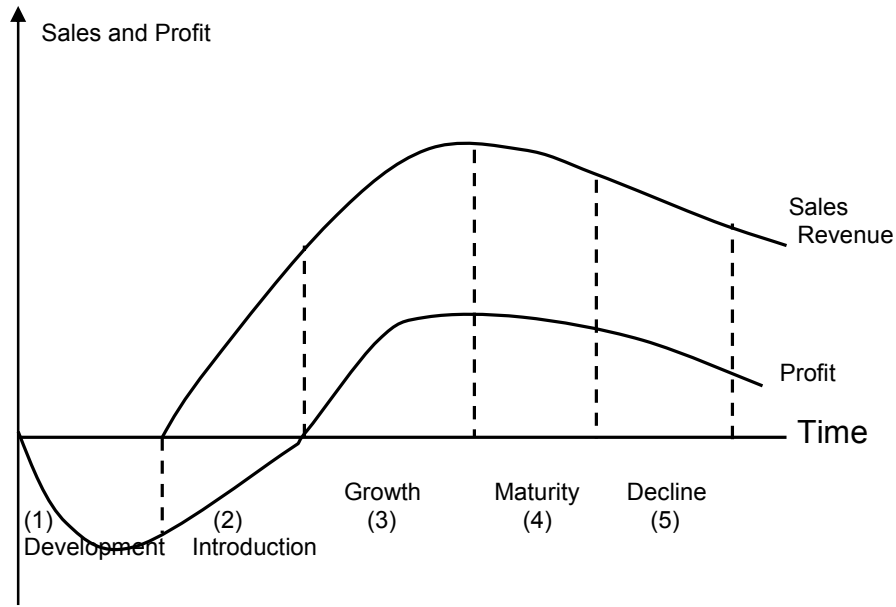
At this stage, Customers are more aware of the product as well as they buy the product at maximum level which gives more profit to the company.

##### **4) Maturity:-**

Under this stage the demand for the product slow down, which result in profitability but at minimum level. The product may be modified or improved, as a means of sustaining its demand.

##### **5) Decline:-**

At this stage, the market will have bought enough of the product and it will therefore reach 'saturation Point:' Demand will start to fall. Decline in sales volume, will leads to the last phase of the product life cycle.




---

## 14.4 BENCH MARKING

---

### 14.4.1 Meaning

A bench marking is a target fixed based on the best practice. It may be a financial or non financial measure or both. Bench marking is the continuous process of measuring products, service or activities against the best levels of performance that may be found either inside or outside the organization. It is a process or comparing a firms activities with best practices. The process involves establishments of bench marks or targets, through use of which the level of performance of the company is sought to be improved. It is a tool for continuous improvement because after identifying a best practice performance it becomes a target to beat.

### 14.4.2 Steps

The steps in bench marking are as follows:-

- i) Together relevant data of participating departments, establish the bench marks based on the best practices and communicate them to the relevant departments or participating units.
- ii) Measure actual performance to compare with the bench marks.
- iii) Analyse the reasons for variations and report than to the management for taking preventive and corrective actions.
- iv) Review the existing bench marks to set new targets for continuo's improvements.

#### 14.4.3 Types of Bench Marking:-

- 1) **Strategic Bench Marking:-**  
Strategic Bench Marking involves considering high level aspects such as core competencies, developing new products and improving capabilities for dealing with changes in external environment.
- 2) **Performance or Competitive Benchmarking:-**  
It involves the comparison of competitors product, processes and business result with own product, processes and results. This type of analysis is done through trade association or third parties to protect confidentiality.
- 3) **Process Bench Marking:-**  
It involves the comparison of in organizations critical business processes and operations against best practice organization in the same field. It also focus on improving specific critical processes and operations.
- 4) **Functional Bench Marking or Generic Bench Marking:-**  
It is used when organisations look to bench mark with partners drawn from different business sectors or areas of activity to find ways of improving similar functions or work process.
- 5) **Internal Bench Marking:-**  
It involves seeking partners from within the same organisation, for example, from business units located in different areas. It also involves bench marking business or operations from within the same organisation e.g. Branches in different countries.
- 6) **Global or International Bench Marking:-**  
It is bench marking through which distinction in international culture, business process and trade practices across companies are bridged and their ramification / branches for business process improvement are understood and utilized.
- 7) **External Bench Marking:-**  
It involves seeking help of outside organisation that are known to be best in class. It also provides opportunities of learning from those who are at the leading edge. It must be remembered that not every best practice solution can be transferred to others.

---

## 14.5 ACTIVITY BASED COSTING (ABC)

---

### 14.5.1 Meaning

According to CIMA ABC is defined as “Cost attribution to Cost units on the basis of benefits received from indirect activities i.e. ordering, setting up, assuming quality etc. ABC is a costing technique that assigns costs to products, based on the activities those products require. It includes such as ordering material, processing purchase orders, and setting up machines.

### 14.5.2 Important Terms

Important terms used in Activity Based Costing are defined below:-

**1. Activity:-**

An activity means an aggregate of closely related tasks having some specific functions which are used for completion of goals or objectives.

**2. Resources:-**

Resources are elements that are used for performing the activities or factors helping in the activities.

**3. Cost:-**

Cost is amount paid for resource consumed by the activity.

**4. Cost Object:-**

It refers to an item for which cost measurement is required.

**5. Cost Pool:-**

A cost pool is a term used to indicate grouping of costs incurred on a particular activity which drives them.

**6. Cost Driver:-**

Any element that would cause a change in the cost of activity is cost driver. Actually cost drivers are basis of charging cost of activity to cost object. They are used to trace cost to product by using a measure of resources consumed by each activity.

### 14.5.3 Different Stags/Steps in ABC:-

**1) Activities:-**

An organisation can identify major activities.

**2) Cost Drivers:-**

Identify the factors which determine the size of the cost of an activity because the cost of an activity, which are known as cost drivers.

- 3) **Cost Pool:-**  
Collect the costs associated with each cost driver into what are known as cost pools.
- 4) **Overheads Rate (OH Rate) :-**  
Calculate the overheads Rate for each and every activity (Cost Pool - Cost Driver)
- 5) **Total Cost:-**  
Charge costs to products on the basis of their usage of the activity (OH Rate x Usage of Activity)

---

## 14.6 EXERCISE

---

1. What is Target costing? Which are the stages involved in Target Costing?
2. Write a Short Note on Product Life Cycle.
3. What are the phase in Product Life Cycle explain in detail?
4. What is Bench Marking, what are its types.
5. Write Short Note on ABC analysis.
6. What is Activity Based Costing? What are steps under ABC taken by an organisation?
7. Objective Questions

### Q.1 Multiple Choice Questions.

1. The management process responsible for identifying, anticipating and satisfying customers requirements profitably is the
 

A. Target Costing	B. Life cycle costing
C. Benchmarking	D. Activity Based Costing
2. Cost allocation bases in activity based costing should be
 

A. Cost drivers	B. Cost pools
C. Activity centres	D. Resources
3. In activity based costing, final cost allocations assign costs to
 

A. Departments	B. Process
C. Products	D. Activities
4. Relative to traditional product costing, activity based costing differs in the way cost are
 

A. Processed	B. Allocated
C. Benchmarked	D. Incurred
5. A batch level activity is
 

A. Assembling	B. product design
C. Engineering changes	D. Purchase ordering

6. A unit level Activity is a  
 A. Painting  
 B. Purchase ordering  
 C. Inspection  
 D. Material handling
7. It is not included in a facility level activity  
 A. Plant depreciation  
 B. Property taxes  
 C. Engineering changes  
 D. Utilities
8. It is not a unit level activity  
 A. Drilling  
 B. Cutting  
 C. Sanding  
 D. Inspecting
9. Providing the power required to run production equipment is an example of  
 A. Unit level activity  
 B. Batch level activity  
 C. Product level activity  
 D. Organization sustaining activity
10. In an activity based costing system, direct materials used would typically be classified as a  
 A. Unit level cost  
 B. Batch level cost  
 C. Product sustaining cost  
 D. Facility level cost

**Answers : - 1. A, 2. A, 3. C, 4.B 5. D, 6. A, 7. C, 8. D, 9. A, 10. A.**

Q .2 True and False

1. Property taxes is a facility level activity.
2. Purchase ordering is a batch level activity.
3. Product design is a product level activity.
4. Inspecting is not a unit level activity.
5. Assembling is a branch level activity.
6. Material bonding is a product level activity.
7. Product line activity is the cost of designing products.
8. Unit levels activity is the cost of processing purchase orders.
9. ABC is a method of allocating indirect costs.
10. Cost pool is a collection of overhead costs related to a cost object.

**Answer: True :- 1, 2, 3, 4, 7, 9, 10. False :- 5, 6, 8,**





**Question Paper Pattern**  
**T.Y.B. Com.**  
**w.e.f. 2015-2016**

Maximum Marks: 100

Questions to be Set: 06

Duration: 03 Hrs.

Q-1	Objective Questions A) Sub Questions to be asked 12 and to be answered any 10 B) Sub Questions to be asked 12 and to be answered any 10 (*Multiple choice / True or False / Match the columns/Fill in the blanks)	20 Marks
Q-2	Full Length Practical Question OR	15 Marks
Q-2	Full Length Practical Question	15 Marks
Q-3	Full Length Practical Question OR	15 Marks
Q-3	Full Length Practical Question	15 Marks
Q-4	Full Length Practical Question OR	15 Marks
Q-4	Full Length Practical Question	15 Marks
Q-5	Full Length Practical Question OR	15 Marks
Q-5	Full Length Practical Question	15 Marks
Q-6	A) Theory questions B) Theory questions OR	10 Marks 10 Marks
Q-6	Short Notes To be asked 06 To be answered 04	20 Marks

**Note: Practical question of 15 marks may be divided into two sub questions of 7/8 and 10/5 Marks.**

**T.Y.B.Com {April – 2016}**  
**Accounts Group (Revised) (Paper –IV)**  
**Financial Accounting & Auditing**  
**Cost Accounting Introduction & Basic Concepts**

QP Code :17543

( 3 Hours)

[ Total Marks : 100

IDOL students w.e.f. 2015-16

- N.B.: (1) All questions are **compulsory**.  
(2) Question no. 2 to 6 have internal options.  
(3) **Figures to the right indicate full marks.**

1. (A) Select the most appropriate alternative and rewrite the full sentence :- 10  
(Any Ten)
- (1) Labour turnover is caused by \_\_\_\_\_  
(a) Low wages (b) Dissatisfaction with job  
(c) Discharge (d) All the above
- (2) Abnormal gain arise if \_\_\_\_\_  
(a) Output quantity is more than input quantity  
(b) There is a reduction in normal loss  
(c) Abnormal loss is avoided  
(d) None of the above
- (3) Under inflationary conditions \_\_\_\_\_ method will show highest values of closing stock.  
(a) FIFO (b) Weighted Average  
(c) LIFO (d) None of the above
- (4) Remuneration paid to a technical director is a part of \_\_\_\_\_.  
(a) Prime (b) Works  
(c) Administrative (d) All of the above
- (5) Marginal costing is \_\_\_\_\_  
(a) method of costing  
(b) a technique of costing  
(c) similar to absorption costing  
(d) None of the above

[ TURN OVER

- (6) Total of indirect material, indirect labour and indirect expenses is called \_\_\_\_\_ cost.
- (a) Prime (b) Overhead  
(c) Works (d) Chargeable
- (7) Cost of rectification of defective work is \_\_\_\_\_
- (a) Debited to Profit and Loss Account  
(b) Ignored from contract Account  
(c) Credited to contract Account  
(d) Debited to contract Account
- (8) Cash received is equal to \_\_\_\_\_
- (a) Work certified - Retention money  
(b) Work certified + Work uncertified  
(c) Contract price - Work certified  
(d) Contract price
- (9) If sales are ₹80,000 and variable cost to sales is 70%, contribution is \_\_\_\_\_
- (a) ₹56,000 (b) ₹24000  
(c) ₹70,000 (d) None of the above
- (10) Plant specially purchased for the contract is debited to \_\_\_\_\_ Account.
- (a) Contract (b) Sub-contract  
(c) Plant (d) None of the above
- (11) At Break Even point, the contribution equals total \_\_\_\_\_.
- (a) Variable cost (b) Fixed cost  
(c) Sales (d) Administrative cost

[TURN OVER

- (12) Employee Welfare Expenses are allocated on the basis of \_\_\_\_\_
- (a) Number of employees                      (b) Units produced  
(c) Working hours                                (d) Prime cost
- (B) State whether the following statements are True or False :- (Any Ten) 10
- (1) Process cost system is applicable to paper mills.
  - (2) Loss on sale of fixed asset is included in cost for calculating costing profit.
  - (3) Certified work is valued at cost.
  - (4) Activity cost pools are cost accumulation associated with a given activity.
  - (5) The main purpose of standard costing is cost control.
  - (6) Material Usage variance arises due to defective material.
  - (7) Strikes and lock-outs is abnormal idle time.
  - (8) Fixed cost per unit remains fixed irrespective of level of output.
  - (9) Abnormal gain is debited to process Account.
  - (10) Primary packing charges is an example of selling and Distribution overheads.
  - (11) Steel companies follow unit costing.
  - (12) Marginal cost is fixed cost.

[ TURN OVER

2. Following details are furnished by 'A' Ltd of expenses incurred during the year ended 31st March 2016. 15

Particulars	₹
Direct Material	6,80,000
Opening stock of finished Goods (2000 units)	1,70,500
Closing stock of finished Goods (4000 units)	?
Depreciation on plant and Machinery	1,92,000
Loss on sale of Machinery	35,000
Trade fair Expenses	1,71,000
Direct Expenses	3,20,000
General Manager's salary	7,60,000
Dividend Paid	15,600
Direct wages	5,20,000
Advertisement	3,70,500
Depreciation on Computers	3,44,000
Drawing and Designing Expenses	1,08,000
Purchase of Machinery	3,80,000
Depreciation on Delivery Van	2,28,000
Office maintenance charges	3,76,000
Factory Rent	3,00,000
Sales (38000 units)	45,60,000

Closing Stock of finished goods to be valued at cost of production.

You are required to prepare cost sheet showing various elements of cost both in total and per unit and also find out total profit and per unit profit.

OR

[TURN OVER

2. Following is the Trading and Profit & Loss Account of M/s Asmit Enterprises for the year ended 31-3-2016 15

Particulars	₹	Particulars	₹
To opening stocks (500 Units)	17,500	By Sales (10250 Units)	7,17,500
To Materials	2,60,000	By Closing Stock (250 units)	12,500
To Wages	1,50,000		
To Factory overhead	94,750		
To Gross profit c/d	2,07,750		
	7,30,000		7,30,000
To Administrative overheads	1,06,000	By Gross profit c/d	2,07,750
To Selling overheads	55,000	By Dividend Received on Investments	10,250
To Loss on Revaluation of Assests	9,000		
To Net profit	48,000		
	2,18,000		2,18,000

In cost Accounts, materials charged @ ₹25/- per Unit and wages @ ₹15/- per unit. Factory overheads taken @60% of wages. Administrative overheads applied @20% of works cost. Selling overheads taken @ ₹6/- per unit sold.

You are required to prepare :-

- Statement of cost showing total cost and cost per unit.
- Statement of Reconciliation of Profit / Loss.

[ TURN OVER

3. (a) A Company is having two production departments namely A & B and two service department S-1 & S-2. The expense incurred during the month of March 2016 are as follows.

8

Expenses	Amount (₹)
Electricity	3,600
Insurance on Assets	9,000
Power	15,000
Rent & Taxes	28,000
Depreciation	18,000
Canteen Expenses	5,400

The following information is also available for the above departments.

Particulars	A	B	S-1	S-2
Floor Space (Sq ft)	6,000	4,000	2,000	2,000
No of workers	100	50	50	25
H.P. of Machine	120	60	30	15
Direct wages(₹)	10,000	10,000	5,000	3,000
Value of Assets (₹ in Thousand)	10	4	3	1
Direct materials (₹)	15,000	10,000	5,000	-
No of Light Points	30	15	10	05

Prepare a statement showing primary distribution of overheads.

- (b) A worker produced 200 units in a weeks time, the guaranteed weekly wages payment for 45 hours in ₹ 405. The expected time to produce one unit is 15 minutes which is raised further by 20% under incentive scheme. What will be earning per hour of that worker under Halsey (50% sharing) and Rowan Bonus scheme?

7

OR

[ TURN OVER

3. (a) From the following information prepare Store Ledger Account in the books of m/s Prakash Enterprise for the month of January 2016 by using FIFO method. 8

Sr. No.	Date	Receipt		Issues
		Quantity (kgs)	Rate ₹	Quantity (kgs)
	January 2016			
1	1 <sup>st</sup>	1000	4.00	-
2	3 <sup>rd</sup>	300	6.00	-
3	8 <sup>th</sup>	-	-	1200
4	12 <sup>th</sup>	400	20.00	-
5	15 <sup>th</sup>	300	10.00	-
6	20 <sup>th</sup>	-	-	600
7	25 <sup>th</sup>	500	5.00	-
8	31 <sup>st</sup>	-	-	500

- (b) From the following information, Calculate Economic order Quantity by using formula and Tabulation method. 7
- Annual consumption of material 3000kg
  - Cost of placing an order ₹ 30
  - Cost per unit ₹ 5
  - Storage and carrying cost - 10% on average inventory.

4. From the following data in respect of a company, prepare the related cost Ledger Accounts. 15

(a) Particulars	Debit ₹	Credit ₹
Closing balance at the end of the accounting period :-		
Store control Account	2,000	
Work-in-progress control Account	6,000	-
Finished goods control Account	8,000	-
Cost Ledger control Account	-	16,000
	16,000	16,000

[ TURN OVER



(b) Financial transaction during the accounting period :-		
Store Purchases :-		
- For Stock		38,000
- For Special job		2,000
Wages :-		
Factory		40,000
Office		4,000
Sales office		6,000
Goods Sold (Sales)		2,00,000
Other Expenses		80,000
(c) Cost transaction during the period :-		
Material issued :-		
- Direct Materials		20,000
- Indirect Materials(Factory)		10,000
Wages :-		
Direct		30,000
Indirect (Factory)		10,000
Overhead incurred and recovered -	Incurred (₹)	Recovered(₹)
Manufacturing	50,000	65,000
Administration	10,000	13,500
Selling & distribution	20,000	27,000
Goods finished @ cost	1,20,000	-
Cost of Goods Sold	1,38,000	-

OR

4. Ananya Manufactures Ltd provides you the following information for June 2014 about process. 15

Particulars	Process I	Process II	Process III
Raw Material Introduced (in kgs)	1,00,000	50,000	40,000
Cost of Material per kg.(in ₹)	5	5	10
Direct Wages(₹)	2,38,840	3,11,000	2,03,200
Factory overhead (₹)	1,16,160	82,840	69,700
Normal Loss (% of total input)	6%	5%	4%
Weight Lost (% of total input)	4%	5%	3%
Scrap Value per kg (₹)	3	4	5
Actual Production (Kg)	92,000	92,000	82,000
Production transfer to next process	60%	50%	-
Production sold at the process	40%	50%	100%
Selling price per kg at process (₹)	11.00	14.50	15.75

Production is transferred to next process at cost of the process.

You are required to prepare Process I, Process II and Process III A/c for the month of June 2014.

[TURN OVER

- 5 'A' 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 2015. The following Cost information is given for the year ended 31st March 2016.

15

Particulars	₹
Material sent to the site	3,00,000
Wages	4,40,000
Architect Fee	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 contractes (Being 90% of the work certified)	9,45,000
Materials destroyed by fire	5,000
Plant and Machinery at cost (Date of purchase - 1st July 2015. The estimated working life of 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 2016.

OR

5. (a) The following data have been extracted from the books of 'A' Ltd.

8

Year	Sales ₹	Profit ₹
2015	5,00,000	50,000
2016	7,50,000	1,00,000

[ TURN OVER

You are required to Calculate :

- (i) P/V Ratio
- (ii) Fixed cost
- (iii) Break-even Sales
- (iv) Profit on Sales of ₹ 4,00,000
- (v) Sales to earn a profit of ₹ 1,25,000

(b) Calculate from the following :-

7

- (i) Material Cost Variance
- (ii) Material Price Variance and
- (iii) Material Usage Variance

Standard - for 25 unit of product - R

Material - 50 kgs@ ₹ 25per kg

Actual production - 20,000 Units

Actual Material used - 42,000 kgs

Actual Rate- ₹ 24.50 per kgs

6. (a) What is meant by 'Labour Turnover'? What are its causes? 10  
(b) What are the advantages of Marginal costing? 10

OR

6. Write short notes :- (Any four)

20

- (1) Classification of Overheads
- (2) Product Life Cycle Costing
- (3) Advantages of Cost Accounting
- (4) Need for Reconciliation of Cost and Financial Profits
- (5) Significance of Variance Analysis
- (6) Target Costing

[ TURN OVER

- सूचना : (१) सर्व प्रश्न सोडविणे अनिवार्य आहे.  
(२) प्रश्न क्रमांक २ ते ६ यांना अंतर्गत पर्याय दिलेले आहेत.  
(३) उजवीकडील अंक प्रश्नांचे गुण दर्शवितात.  
(४) इंग्रजी भाषेतील प्रश्न प्रमाण मानावेत.

१. (अ) सर्वात योग्य विकल्पाची निवड करून खालील वाक्ये पूर्ण करा :- (कोणतेही १०) १०
- (१) श्रमीक उलाढाल ----- कारणामुळे होते.  
(अ) कमी वेतन (ब) कामाबाबत असमाधान  
(क) कामावरून मुक्त करणे (ड) वरीलपैकी सर्व
- (२) असामान्य फायदा ----- असल्यास उद्भवतो.  
(अ) उत्पादन संख्या ही कच्चांमाल संख्येपेक्षा जास्त  
(ब) सामान्य तोटा कमी  
(क) असामान्य तोटा टाळता  
(ड) वरीलपैकी कोणताही नाही
- (३) अतिवृद्धीकारी परिस्थितीमध्ये ----- या पद्धतीमुळे अखेरच्या साठ्याचे मूल्य जास्तीचे दाखवले जाते.  
(अ) प्रथम आलेले प्रथम पाठविले.  
(ब) भारांकित सरासरी  
(क) शेवटी आलेले प्रथम पाठविले.  
(ड) वरीलपैकी कोणताही नाही.
- (४) तांत्रिक संचालकाला दिलेला मोबदला----- परिव्ययाचा भाग आहे.  
(अ) मूळ (ब) कारखाना  
(क) प्रशासकीय (ड) वरील सर्व

[ TURN OVER

- (५) सीमांत परिव्ययांकन ----- आहे.  
(अ) परिव्ययांकनाची पद्धत  
(ब) परिव्ययांकनाचे तंत्र  
(क) विलयन व्ययांकनासारखे  
(ड) यापैकी नाही.
- (६) अप्रत्यक्ष माल, अप्रत्यक्ष मजूरी आणि अप्रत्यक्ष खर्च याला -----परिव्यय संबोधले जाते.  
(अ) मूळ (ब) उपरी  
(क) कारखाना (ड) आकारणी योग्य
- (७) सदोष काम दुरुस्तीचे परिव्यय -----  
(अ) नफा आणि तोटा खात्यात जमा करतात.  
(ब) कंत्राट खात्यात विचारात घेतले जात नाही.  
(क) कंत्राट खात्यात जमा  
(ड) कंत्राट खात्यात नावे
- (८) मिळालेली रक्कम ही -----इतकी असते.  
(अ) प्रमाणित काम - प्रतिसाधन पैसा  
(ब) प्रमाणित काम + अप्रमाणित काम  
(क) कंत्राटाची किंमत - प्रमाणित काम  
(ड) कंत्राटाची किंमत
- (९) जर विक्री रुपये ₹८०,००० आणि चल परिव्ययाचे विक्रीशी असलेले गुणोत्तर ७०% आहे तर अंशदान -----असेल.  
(अ) रुपये ५६,००० (ब) रुपये ७०,०००  
(क) रुपये २४,००० (ड) यापैकी कोणताही नाही.

[ TURN OVER

- (१०) खास कंत्राटासाठी खरेदी केलेले संयंत्र -----खात्याच्या जमा बाजूला नोंदवले जाते.  
(अ) कंत्राट (ब) उप-कंत्राट  
(क) संयंत्र (ड) वरीलपैकी कोणतेही नाही.
- (११) ना नफा ना तोटा बिंदूपाशी, अंशदान एकूण ----- इतके असते.  
(अ) चलपरिव्यय (ब) स्थिर परिव्यय  
(क) विक्री (ड) प्रशासकीय परिव्यय
- (१२) कामगार कल्याण खर्च -----च्या आधारावर विभागला जातो.  
(अ) कामगारांची संख्या (ब) उत्पादित केलेले नग  
(क) कामाचे तास (ड) मूळ किंमत

(ब) खालील विधाने चूक किंवा बरोबर आहेत ते सांगा :- ( कोणतेही दहा )

१०

- (१) प्रक्रिया परिव्यय पद्धती ही पेपर मिलसाठी लागू आहे.  
(२) स्थिर मालमत्ता विक्रीवर झालेला तोटा परिव्ययांकन नफा शोधण्यासाठी परिव्ययात समाविष्ट केला जातो.  
(३) प्रमाणित कामाचे मूल्यांकन परिव्यय मूल्याने केले जाते.  
(४) कार्य परिव्यय संकोषी हे दिलेल्या कार्याच्या संबंधीत परिव्यय संचित असतात.  
(५) मानक परिव्ययांकनाचा मुख्य हेतू परिव्यय नियंत्रण हा आहे.  
(६) माल वापरातील फरक हा सदोष मालामुळे उद्भवतो.  
(७) संप आणि टाळेबंदी असामान्य निष्क्रिय वेळ आहे.  
(८) स्थिर परिव्यय प्रतिनग, उत्पादनात बदल झाला तरी प्रतिनग स्थिर राहतो.  
(९) असामान्य फायदा प्रक्रिया खात्याच्या नावे बाजूला दाखवला जातो.  
(१०) प्राथमिक वेष्टन खर्च हे विक्री व वितरण उपरी परिव्ययाचे उदाहरण आहे.  
(११) पोलाद कंपनी नगपरिव्यय पद्धतीचा वापर करतात.  
(१२) सिमांत परिव्यय म्हणजे स्थिर परिव्यय होय.

[ TURN OVER

२. अ लि. च्या ३१ मार्च, २०१६ रोजी संपणाच्या वर्षातील खर्चाची माहिती खालील प्रमाणे आहे. १५

तपशील	₹
प्रत्यक्ष माल	६,८०,०००
पक्का माल आरंभीचा साठा (२००० नग)	१,७०,५००
पक्का माल अखेरचा साठा (४००० नग)	?
सयंत्र आणि यंत्र सामग्रीवरील घसारा	१,९२,०००
यंत्र सामग्री विक्रीतील तोटा	३५,०००
व्यापारी जत्रावरील खर्च	१,७१,०००
प्रत्यक्ष खर्च	३,२०,०००
सामान्य व्यवस्थापकाचा पगार	७,६०,०००
लाभांश दिला	१५,६००
प्रत्यक्ष मजुरी	५,२०,०००
जाहिरात बाजी	३,७०,५००
संगणकावरील घसारा	३,४४,०००
आरेखन आणि रेखांकन खर्च	१,०८,०००
यंत्रसामग्रीची खरेदी	३,८०,०००
वितरण वाहनावरील घसारा	२,२८,०००
कार्यालयीन देखभाल खर्च	३,७६,०००
कारखाना भाडे	३,००,०००
विक्री (३८००० नग)	४५,६०,०००

पक्क्या मालाच्या अखेरच्या साठ्याचे मूल्यांकन उत्पादनाच्या परिव्ययावर केले जाते.

परिव्यय पत्रक तयार करून विविध परिव्ययाच्या घटकानुसार एकूण परिव्यय व प्रतिनग परिव्यय व तसेच एकूण नफा व प्रति नग नफा दाखवा.

किंवा

[ TURN OVER



२. अस्मित इन्टरप्राईजेसचे ३१-३-२०१६ वर्षअखेरचे व्यापारी व नफा-तोटा खाते खालील प्रमाणे १५  
आहे:-

तपशील	₹	तपशील	₹
आरंभीचा साठा (५०० नग)	१७,५००	विक्री (१०२५० नग)	७,१७,५००
माल सामान	२,६०,०००	अखेराचा माल साठा (२५० नग)	१२,५००
मजूरी	१,५०,०००		
कारखाना उपरीव्यय	९४,७५०		
स्थूल नफा	२,०७,७५०		
	७,३०,०००		७,३०,०००
प्रशासन उपरीव्यय	१,०६,०००	स्थूल नफा	२,०७,७५०
विक्री उपरीव्यय	५५,०००	गूंतवणूकीवरील लाभांश	
मालमत्ता पूर्णमूल्याकनांवरील	९,०००	मिळाला	१०,२५०
तोटा			
निव्वळ नफा	४८०००		
	२,१८,०००		२,१८,०००

परिव्यय लेखामध्ये मालसामान प्रति नग ₹ २५/- आणि मजूरी प्रति नग ₹ १५/- प्रमाणे आकारली आहे. कामखाना उपरीव्यय मजूरीच्या ६०% घेतला आहे. आणि प्रशासकीय उपरीव्यय कारखाना परिव्ययाच्या २०% इतका आकारला आहे. विक्री उपरीव्यय विकलेल्या नगावर प्रति नग ₹ ६/- आहे.

(अ) एकूण परिव्यय व प्रति नग परिव्यय दाखविणारे परिव्यय पत्रक तयार करा.

(ब) नफा-तोटा जुळणीपत्रक तयार करा.

[ TURN OVER

३. (अ) कंपनीचे 'अ' आणि 'ब' असे दोन उत्पादन विभाग आणि एस-१ आणि एस-२ असे दोन सेवा विभाग आहेत, मार्च २०१६ या महिन्यातील खर्च खालीलप्रमाणे आहेत. ८

तपशील	रक्कम (₹)
वीज	३,६००
मालमत्तेवरील विमा	९,०००
शक्ती	१५,०००
भाडे आणि कर	२८,०००
घसारा	१८,०००
कॅन्टिन खर्च	५,४००

वरील विभागांची अधिक माहिती खालीलप्रमाणे आहे.

तपशील	अ	ब	एस-१	एस-२
जागा (चौ.फूट)	६,०००	४,०००	२,०००	२,०००
कामगार संख्या	१००	५०	५०	२५
यंत्राची अश्वशक्ती	१२०	६०	३०	१५
प्रत्यक्ष मजुरी (₹)	१०,०००	१०,०००	५,०००	३,०००
मालमत्ता मूल्य (₹ हजारात)	१०	४	३	१
प्रत्यक्ष माल (₹)	१५,०००	१०,०००	५,०००	-
वीज पॉईंट संख्या	३०	१५	१०	०५

उपरी परिव्ययाचे प्राथमिक वितरण पत्रक तयार करा.

- (ब) एक कामगार आठड्यामध्ये २०० नग उत्पादित करतो, आठवड्याच्या ४५ तासांसाठी हमी वेतन रु. ४०५ आहे. एका नगाचे उत्पादन करण्यासाठी अपेक्षित वेळ १५ मिनिटे असून त्यामध्ये पुन्हा प्रेरक योजनेसाठी २०% वाढ आहे. त्या कामगाराची हॅल्से (५०% वाटा) आणि रोवन बोनस योजनेप्रमाणे मिळकत काय असेल? ७

किंवा

[ TURN OVER

३. (अ) खालील दिलेल्या माहितीच्या आधारे मेसर्स प्रकाश इंटरप्रायझेस यांच्या पुस्तकात जानेवारी ८  
२०१६ महिन्यासाठी फिफो पद्धतीचा वापर करा.

अ.क्र.	तारीख	आवक		जावक
		नग (कि. ग्रॅ)	दर ₹	नग (कि. ग्रॅ)
	जानेवारी २०१६			
१	१	१०००	४.००	-
२	३	३००	६.००	-
३	८	-	-	१२००
४	१२	४००	२०.००	-
५	१५	३००	१०.००	-
६	२०	-	-	६००
७	२५	५००	५.००	-
८	३१	-	-	५००

- (ब) खालील माहितीवरून सूत्र पद्धतीने आणि सारणी पद्धतीने लाभदायक आदेश संख्या काढा. ७
- (१) वार्षिक आवश्यकता (नग) ३००० किलो
  - (२) आदेश परिव्यय (प्रतिआदेश) ₹ ३०
  - (३) प्रति नग किंमत ₹ ५
  - (४) साठवणूक परिव्यय प्रतिनग - सरासरी साठ्याच्या १०% .

४. कंपनीशी संबंधित खालील नोंदीच्या आधारे परिव्यय खाते वहितील संबंधित नियंत्रण खाती तयार करा. १५

(अ)	तपशील	नावे ₹	जमा ₹
	वर्षाअखेरीची शिल्लक :-	-	-
	भांडार खातेवही नियंत्रण खाते	२,०००	-
	चालूकाम खातेवही नियंत्रण खाते	६,०००	-
	पक्का माल साठा खातेवही नियंत्रण खाते	८,०००	-
	परिव्यय खातेवही नियंत्रण खाते	-	१६,०००
		१६,०००	१६,०००

[ TURN OVER

(ब)वर्षभरातील आर्थिक व्यवहार:-		
सामान खरेदी :-		
मालाची खरेदी		३८,०००
विशिष्ट कामाकरीता		२,०००
मजूरी :-		
कारखाना		४०,०००
कार्यालय		४,०००
विक्री विभाग		६,०००
मालाची विक्री		२,००,०००
इतर खर्च		८०,०००
(क)वर्षभरातील परिव्यय व्यवहार :-		
कच्चा माल पाठविला:-		
प्रत्यक्ष कच्चा माल		२०,०००
अप्रत्यक्ष कच्चा माल		१०,०००
मजूरी:-		
प्रत्यक्ष		३०,०००
अप्रत्यक्ष (कारखाना)		१०,०००
खर्च केलेली रक्कम व आकारणी -	खर्च रक्कम (₹)	आकारणी (₹)
वस्तू निर्मिती	५०,०००	६५,०००
प्रशासकीय	१०,०००	१३,५००
विक्री व वितरण	२०,०००	२७,०००
पक्का माल साठा / (परिव्यय)	१,२०,०००	-
विकलेल्या मालाची किंमत	१,३८,०००	-

किंवा

[TURN OVER

४. अनन्या मॅन्युफॅक्चर्स लि. जून महिन्याकरिता प्रक्रियेबद्दलचा खालील तपशील पुरवत आहे. १५

तपशील	प्रक्रिया १	प्रक्रिया २	प्रक्रिया ३
मुलभूत कच्चा माल पुरविला (कि.ग्रॅ.)	१,००,०००	५०,०००	४०,०००
कच्चा मालाचा परिव्यय प्रतिनग (रु.)	५	५	१०
प्रत्यक्ष मजुरी (रु.)	२,३८,८४०	३,११,०००	२,०३,२००
कारखाना खर्च (रु.)	१,१६,१६०	८२,८४०	६९,७००
सामान्य नुकसान (प्रक्रियेत पाठविलेल्या नगावर प्रति)	६%	५%	४%
वजन घट (प्रक्रियेत पाठविलेल्या नगावर प्रति)	४%	५%	३%
मोडमूल्य प्रतिनग कि.ग्रॅ. (रु.)	३	४	५
वास्तव उत्पादन (कि.ग्रॅ.)	९२,०००	९२,०००	८२,०००
पुढच्या प्रक्रियेत पाठवलेले उत्पादन (%)	६०%	५०%	-
विक्री (प्रक्रियेच्या शेवटी)%	४०%	५०%	१००%
विक्रीची किंमत प्रतिनग (रु.)	११.००	१४.५०	१५.७५

उत्पादन पुढच्या प्रक्रियेस परिव्यय किमतीस पाठविले जाते.

तयार करा :- जून महिना अखेरीचे प्रक्रिया खाते क्र. १, प्रक्रिया खाते क्र. २ व प्रक्रिया खाते  
क्र. ३.

[ TURN OVER

- ५ 'अ' कंत्राटद्वार कंपनीने १२,००,०००/- रुपये कंत्राट किंमतीचे घर बांधणी कंत्राट मिळविले आहे. १५ कंत्राट प्रारंभाची तारीख १ एप्रिल २०१५ ही आहे. ३१ मार्च २०१६ ला संपणाऱ्या वर्षासाठी खालील माहिती दिलेली आहे.

तपशील	₹
कंत्राट ठिकाणावर पाठविलेला मालसामान	३,००,०००
मजूरी	४,४०,०००
वास्तू विशारद शुल्क	५५,५००
कार्यालयीन व प्रशासकीय उपरिव्यय	१,५१,०००
अ-प्रमाणित काम	५५,०००
वर्षाच्या शेवटी कंत्राट ठिकाणावर असलेले माल सामान	१०,०००
कंत्राट देणाऱ्याकडून मिळालेली रोख रक्कम (जी प्रमाणित कामाच्या ९०% आहे)	९,४५,०००
आग लागल्याने नुकसान झालेले माल सामान	५,०००
संयंत्र व यंत्रसामग्री किंमत (खरेदी तारीख - १ जूलै २०१५ संयंत्र व यंत्रसामग्री चा अंदाजित कार्यकाल १० वर्षे आणि तिचे कार्यकाल संपल्यानंतरचे मोडमूल्य ₹ २०,०००)	२,००,०००
पर्यवेक्षकाचा पगार	६०,०००

वरील माहितीच्या आधारे आपण ३१ मार्च २०१६ ला संपणाऱ्या वर्षासाठी कंत्राट खाते तयार करा.

किंवा

५. (अ) 'अ' लि. च्या खाते पुस्तकातून खालील माहिती घेण्यात आली आहे.

वर्षे	विक्री ₹	नफा ₹
२०१५	५,००,०००	५०,०००
२०१६	७,५०,०००	१,००,०००

[ TURN OVER

खालील गोष्टी तयार करा :

- (i) नफा/आकारमान गुणोत्तर
- (ii) स्थिर परिव्यय
- (iii) ना नफा ना तोटा विक्री
- (iv) ₹ ४,००,००० विक्री असताना नफा
- (v) ₹ १,२५,००० नफा मिळण्यासाठी विक्री

(ब) शोधा :-

७

- (i) माल परिव्ययातील फरक
- (ii) माल किंमतीतील फरक
- (iii) माल वापरातील फरक

मानक - 'र' उत्पादनाच्या २५ नगासाठी

माल - ५० कि.ग्रॅ. ₹ २५ प्रती कि.ग्रॅ.

वास्तविक उत्पादन - २०,००० नग

वास्तविक मालाचा वापर - ४२,००० कि.ग्रॅ.

वास्तविक दर - ₹ २४.५० प्रती कि.ग्रॅ.

६. (अ) कामागारांची उलाढाल म्हणजे काय? त्याची कारणे स्पष्ट करा. १०
- (ब) सीमांत परिव्ययांकनाचे फायदे कोणते आहेत? १०

किंवा

६. टिपा लिहा :- (कोणत्याही चार) २०

- (१) उपरी परिव्ययाचे वर्गीकरण
- (२) परिव्ययांकन वस्तूजीवन चक्र
- (३) परिव्यय लेखांकनाचे फायदे
- (४) वित्तीय व परिव्यय नफ्याच्या समायोजनाची गरज
- (५) फरक विश्लेषणाचे महत्व
- (६) लक्ष परिव्ययांकन

-----

**T.Y.B.Com {April – 2016}**  
**Accounts Group (OLD) (Paper - IV)**  
**Financial Accounting & Auditing**  
**Auditing and Cost Accounting.**

QP Code : **17540**

(REVISED COURSE-OLD PATTERN)

(3 Hours)

[ Total Marks :100

- N.B. : (1) Question no. 1 2 and 7 are is **compulsory** and answer any **two** question from the remaining section
- (2) **Figures** to the **right** indicate **full** marks.
- (3) **Working notes** wherever **necessary** should from part of answer
- (4) Answer both the section in the same answer book

**Section-I**

1. (a) Explain in brief different types of error 8
- (b) How would you verify the following:-
- (i) Plant and Machinery 3
- (ii) Sundry Debtors 3
2. (a) Select the most appropriate option and rewrite the following sentences. 6
- (i) Audit programme should be-----
- Oral
  - Flexible
  - Rigid
  - Oral and Flexible
- (ii) Removal of an Auditor before expiry of the term required-----
- Resolution by Board of Director
  - Consent of the Auditor
  - Approval from the central Government
  - All of the above
- (iii) -----Asset, which is not subject to physical verification.
- Cash
  - Stock
  - Debtors
  - Furniture
- (iv) Auditing commences after-----
- Investigation is carried out
  - Accounting work is over
  - The General Meeting is over
  - None of the above
- (v) To select a sample for audit, the Auditor should consider-----
- The size of the sample
  - The Volume of the transactions
  - Adequacy of Internal Control System
  - All of the above

[ TURN OVER



(vi) Loose Tools are disclosed under-----

- Fixed Assets
- Current Assets
- Investments
- Miscellaneous Expenditure(Not written off)

(b) State whether the following statements are **True** or **False**:-

6

- (i) Internal Auditor can be appointment by the management.
- (ii) While checking dividend received auditor should check dividend warrant.
- (iii) Systematic selection method of sampling as also known as interval sampling.
- (iv) An error of principle will not affect the trial Balance
- (v) Audit plan should be primary based on knowledge of clients business
- (vi) Verification protects against misues of assets

3. (a) Distinguish between Auditing and investigation

6

(b) What is Audit Note Book? What are its contents

6

4. (a) What is Contineous Audit? What are its advantages and disadvantages?

6

(b) Discuss the technique of Auditing

6

5. (a) Briefly explain the qualification and disqualifation of an Auditor of a Limited Company

6

(b) State the provision of the companies Acts 1956 for the appointment of first Auditor and also the appointment by special resolution.

6

6. Write short notes on any **three** of the following:-

12

- (a) Balance Sheet Audit
- (b) Audit Sampling
- (c) Secret Reserve
- (d) Appointment by Central Government
- (e) Concept of True and fair view

7. Ms Aniruddha and company manufacture a chemical which passes through three process. The following particulars gathered for the month of January, 2015

20

Particulars	Process 'P'	Process'Q'	Process 'R'
Material (Liter)	1200	618	504
Material Cost(₹)	1,14,760	61,320	1,04,100
Wages(₹)	23,040	22,800	6,600
Normal loss(% of input)	3%	5%	5%
Scraps sales value	—	₹3 per liters	—
Output transferred to warehouse	50%	60%	—
Output transferred to next process	50%	40%	—

[ TURN OVER

Overhead are charged @ 50% of direct wages you are required to prepare process 'p', process Q, process R Accounts.

8. Following information relates to a building contract on 1<sup>st</sup> April 2014 for ₹500,000 15

Particulars	2014-2015	2015-2016
	₹	₹
Material issued	1,51,000	42,000
Direct wages	1,00,000	50,000
Outstanding wages	10,000	—
Sub-contract charges	6,000	5,000
Indirect Expenses	5,000	—
General expenses	3,000	700
Supervision charges	5,000	2,500
Work certified (cumulative)	3,75,000	5,00,00
Work Uncertified	4,000	—
Material at site at the end	2,500	—
Plants issued	7,000	1,000
Material Returned to stores	1,000	2,500
Cash Received form the contracts during the year	3,00,000	2,00,000

The Value of plant at the end of 2014-2015 and 2015-2016 was ₹3500 and ₹2500 respectively.  
prepare contract accounts for the years 2014-2015 and 2015-2016.

9. Following details are furnished by xyz ltd. of expenses incurred during the year ended 31<sup>st</sup> march, 2014:- 15

Particulars	₹
Direct material	3,40,000
Opening stock of finished goods(1000 units)	85,250
Closing stock of finished goods(2000 units)	?
Deprecation of plant and machinery	1,92,000
Profit on sale of Machinery	17,500
Trade fare expenses	85,500
Direct expenses	1,60,000
General managers salary	3,80,000
Dividend paid	7,800
Direct wages	2,60,000
Advertisement	1,85,250
Depreciation on computers	1,72,000
Drawing and designing expenses	54,000
Purchase of Machinery	1,90,000
Depreciation on delivery van	1,14,000
Office Maintenance charges	1,88,000
Factory Rent	1,50,000
Sales(19000 unit)	2,28,000

[ TURN OVER

Closing stock of Finished goods to be valued at cost of production.

You are required to prepare cost sheet both in total and per unit and also find out Total profit and per unit profit.

10. (a) margin of safety is ₹4,20,000 which is 25% of total sales and profit volume Ratio is 20%. From the above calculate- 9  
 (1) Total sales (2) Profit on present sales (3) Fixed cost  
 (4) Sales to earn profit ₹1,40,000.
- (b) From the following information calculate 6  
 (1) Material cost variance (2) Material price variance  
 (3) Material usage variance  
 Standard material for a unit-16kgs  
 Standard Rate per kg - ₹6.40  
 Actual production - 45,000 units  
 Actual material used - 3,50,000 kgs  
 Actual Rate Per kg - ₹6.30
11. (a) Calculate labour variance from the following:- 5  
 Standard labour cost per unit is ₹40  
 Standard labour Hours per unit are 50 Hours.  
 Actual output 50,000 units.  
 Actual Hours Worked 12,24,000 Hours  
 Actual Rate per hours ₹1.80
- (b) Calculate:- 5  
 (i) Profit Volume Ratio  
 (ii) Break even sales  
 (iii) Profit at sales of 90,000 units from the following selling price per unit ₹36.00; Variable cost ₹27.00 per unit and fixed cost ₹3,60,000
- (c) From the following details find out profit or loss as Financial sales- 5

Particulars	₹
Under absorption of works overheads	37,000
Interest on loan charged in financial accounts only	29,200
Profit as per cost Accounts	32,800
Overvaluation of closing stock in financial accounts	19,200
Depreciation charged less in financial accounts	14,200

[ TURN OVER

(3 तास)

(गुण : १००)

(मराठी रुपांतर)

सुधारित अभ्यासक्रम(जुना आकृतीबंध)

- सुचना: - (१) प्रश्न क्रमांक १, २, व ७ अनिवार्य आहेत उर्वरित प्रश्नापैकी प्रत्येक विभागातील कोणत्याही दोन प्रश्नांची उत्तरे लिहा.
- (२) उजवीकडील अंक पूर्ण गुण दर्शवितात.
- (३) उत्तरासाठीचे टाचण आवश्यक असेल तेथे उत्तराचा भाग मानला जाईल.
- (४) इंग्रजी भाषेतील प्रश्न मुळ मानावेत.

## विभाग १

१. (अ) चुकांचे वेगवेगळे प्रकार थोडक्यात स्पष्ट करा ८
- (ब) खालील बाबींचे सत्यापन कसे कराल.
- (१) संयंत्र आणि यंत्रसामग्री ३
- (२) ऋणको ३
२. (अ) सर्वात योग्य विकल्पाची निवड करून वाक्य पुन्हा लिहा. ६
- (१) हिशेबतपासणी कार्यक्रम -----असु शकतो.
- मौखिक
  - लवचिक
  - ताठर
  - मौखिक व ताठर
- (२) हिशेबतपासणीसाला कालावधी संपण्यापूर्वी पदावरून दूर करायचे असेल तर -----आवश्यक
- संचालक मंडळाचा ठराव
  - हिशेब तपासणीसाठी संमती
  - केंद्र सरकारची मान्यता
  - वरील सर्व पर्याय
- (३) -----ह्या मालमत्तेचे प्रत्यक्ष सत्यापन केले जात नाही
- रोकड
  - मालसाठा
  - ऋणको
  - उपस्कर
- (४) हिशेबतपासणीची सुरुवात-----नंतर होते.
- अन्वेषणानंतर
  - लेखाकर्म समाप्तीनंतर

[ TURN OVER

- सर्वसाधारण सभा झाल्यानंतर
  - वरीलपैकी कोणतेही नाही
- (५) हिशेबतपासणीसाले हिशेबतपासणीसाठी नमुना निवडताना-----  
बाब विचारात घेतली पाहिजे
- नमुन्याचा आकार
  - व्यवहारांचे प्रमाण
  - अंतर्गत नियंत्रण पध्दतीची योग्यता
  - वरील सर्व पर्याय
- (६) सुटे भाग-----खाली दर्शविले जातात.
- स्थिर मालमत्ता
  - चालु मालमत्ता
  - गुंतवणूक
  - अपलेखित केलेले संकीर्ण खर्च

(ब) खालील विधाने सत्य किंवा असत्य आहे ते सांगा:-

६

- (१) अंतर्गत हिशेबतपासणीसाठी नेमणूक व्यवस्थापन करू शकते.
- (२) लाभांश मिळाल्याची तपासणी करताना हिशेबतपासणीसाले लाभांश अधिपत्राची तपासणी केली पाहिजे.
- (३) पध्दतशीर नमुना निवडपध्दतीला अंतराल निवड पध्दती सुध्दा म्हणतात.
- (४) तात्विक चुकीमुळे तेरीजपत्रकावर परिणाम होत नाहीत.
- (५) हिशेब तपासणी योजना ही प्रामुख्याने पक्षकारांच्या व्यवसायाबद्दलच्या ज्ञानावर अवलंबून असते.
- (६) सत्यापनामुळे मालमत्तेचे गैरवापरापासून संरक्षण होते.

३. (अ) हिशेब तपासणी व अन्वेषण यामधील फरक स्पष्ट करा. ६
- (ब) हिशेब तपासणी नोंदवही म्हणजे काय? त्यातील मुद्दे कोणते आहेत? ६
४. (अ) सततची हिशेबतपासणी म्हणजे काय? त्याचे फायदे व तोटे कोणते ६
- (ब) हिशेबतपासणी तंत्राची चर्चा करा. ६
५. (अ) मर्यादित कंपनीच्या हिशेबतपासणीसाठी पात्रता आणि अपात्रता थोडक्यात स्पष्ट करा. ६
- (ब) कंपनी कायदा, १९५६ मधील प्रथम हिशेब तपासणीसाठी नियुक्ती तसेच त्याची विशेष ठरावाद्वारे नियुक्ती बाबतच्या तरतूदी सांगा. ६

[ TURN OVER

६. खालीलपैकी कोणत्याही तीनवर टिपा लिहा:-

१२

- (अ) ताळेबंदाची हिशेबतपासणी  
(ब) हिशेबतपासणी नमुने  
(क) गुप्त निधी  
(ड) केंद्रसरकारकडून नेमणूक  
(इ) खरे व योग्य मत.

७. मेसर्स अनिरूध्द आणि कंपनी एका रासायनिक वस्तुचे उत्पादन करते व ते तीन प्रक्रियामधून २० जाते. खालील माहिती जानेवारी २१५ या महिन्याच्या संदर्भातील आहे. खालील माहिती जानेवारी २१५ या महिन्याच्या संदर्भातील आहे.

विवरण	प्रक्रिया 'प'	प्रक्रिया 'क'	प्रक्रिया 'भ'
मालसामान (लिटर)	१२००	६१८	५०४
मालसामान खर्च (₹)	१,१४,७६०	६१,३२०	१,०४,१००
मजुरी (₹)	२३,०४०	२२,८००	६,६००
साधारण तोटा-प्रक्रियेत सोडलेल्या लिटर % प्रमाण	३%	५%	५%
मोड मुल्य प्रति लिटर	-	₹३ प्रति लिटर	-
उत्पादित माल पुढील प्रक्रियेकडे पाठविला	५०%	४०%	-
उत्पादित माल गोदामात पाठविला	५०%	६०%	-

उपपरिव्यय प्रत्यक्ष मजुरीच्या ५०% आकारले आहे. प्रक्रिया खाती 'प', 'क', 'भ' तयार करा.

८. १ एप्रिल २०१४ रोजी सुरु झालेल्या रु. ५,००,००० इमारत कंत्राटासंबंधी खालील माहिती आहे. १५

तपशील	२०१४-२०१५ ₹	२०१५-२०१६ ₹
माल पाठविला	१,५१,०००	४२,०००
प्रत्यक्ष मजुरी	१,००,०००	५०,०००
द्यावयाची मजुरी	१०,०००	-
उपकंत्राट खर्च	६,०००	५,०००
अप्रत्यक्ष खर्च	५,०००	-
सर्वसाधारण खर्च	३,०००	७००
पर्यवेक्षक खर्च	५,०००	२५००
प्रमाणित काम (एकत्रित)	३,७५,०००	५००,००
अप्रमाणित काम	४,०००	-
वर्षाच्या शेवटी कंत्राट ठिकाणी आलेला माल	२,५००	-
संयंत्र पाठविले	७,०००	१,०००
भांडारात माल परत पाठविला	१,०००	२,५००
कंत्राटीकडून वर्षभरात मिळालेली रक्कम	३,००,०००	२,००,०००

[ TURN OVER

२०१४-२०१५ आणि २०१५-२०१६ च्या शेवटी सयंताची किंमत अनुक्रमे रु. ३,५०० आणि रु. २,५०० होती.

२०१४-२०१५ आणि २०१४-२०१५ या वर्षांचे कंत्राट खाती तयार करा.

९. एक्स वाय डेड लिमिटेडच्या ३१ मार्च २०१४ रोजी संपणाऱ्या वर्षातील खर्चाची माहिती खालीलप्रमाणे आहे. १५

तपशील	रक्कम (₹)
प्रत्यक्ष माल	३,४०,०००
पक्कामाल आरंभीचा साठा(१०००नग)	८५,२५०
पक्कामाल अखेरचा साठा(२०००नग)	?
सयंत्र आणि यंत्रसामुग्रीवरील घसारा	१,९२,०००
यंत्रसामुग्री विक्रीतील फायदा	१७,५००
व्यापारी जत्रेवरील खर्च	८५,५००
प्रत्यक्ष खर्च	१६०,०००
सामान्य व्यवस्थापकाचा पगार	३,८०,०००
लाभांश दिला	७,८००
प्रत्यक्ष मजुरी	२,६०,०००
जाहीरात खर्च	१,८५,२५०
संगणकावरील खर्च- घसारा	१,७२,०००
आरेखन आणि लेखांकन खर्च	५४,०००
यंत्रसामुग्री खर्च	१,९०,०००
वितरण वहानावरील घसारा	१,१४,०००
कार्यालयीन देखभाल खर्च	१,८८,०००
कारखाना भाडे	१,५०,०००
विक्री (१९००० नग)	२२,८०,०००

पक्कामालाचा अखेरच्या साठ्याचे मुल्यांकन उत्पादनाच्या परिणामावर केले जाते.

दिनांक ३१ मार्च, २०१३ या संपलेल्या वर्षाकरीता परिव्यय पत्रक तयार करून विविध परिव्ययाच्या घटकानुसार एकूण परिव्यय व प्रतिनग परिव्यय तसेच एकूण नफा व प्रतिनग नफा दाखवा.

१०. (अ) सुरक्षितता सीमा रु. ४,२०,००० असून ती एकूण विक्रीच्या २५% आहे. आणि नफा ९ आकारमान गुणोत्तर २०% आहे. वरिल माहितीच्या आधारे खालील बाबी शोधा.
- (१) एकूण विक्री (२) सद्विक्री नफा (३) स्थिर परिव्यय  
(४) नफा रु. १,४०,००० मिळविण्याकरीता विक्री

[ TURN OVER

(ब) खालील माहितीवरून शोधा. ६

- (१) माल परिव्ययातील फरक (२) माल किंमतीतील फरक  
 (३) माल वापरातील फरक  
 मानक माल एका नगाकरीता-१६ कि. ग्रॅ.  
 मानक दर प्रति कि. ग्रॅम ₹६.४०  
 वास्तविक उत्पादन-४५,००० नग  
 वास्तविक माल वापरला-३,५०,०००  
 वास्तविक दर प्रति कि. ग्रॅ. रुपये ६.३०

११. (अ) खालील माहितीवरून परिव्ययातील फरक शोधा. ५

- मानक मजुरी परिव्यय रुपये ४०-०० प्रति नग आहे.  
 मानक मजुरी तास ५० तास प्रतिशत  
 वास्तविक उत्पादन ५०,००० नग  
 वास्तविक कामाचे तास १२,२४,०००  
 वास्तविक दर रु.१.८० पैसे प्रति तास.

(ब) खालील माहितीवरून ५

- (१) नफा/आकारमान गुणोत्तर  
 (२) ना नफा ना तोटा विक्री  
 (३) रुपये ९०,००० नगाच्या विक्रीवर नफा शोधा

विक्री किंमत रु. ३६ प्रति नग, बदलता परिव्यय रुपये २७.०० प्रति नग आणि स्थिर परिव्यय रुपये ३,६०,०००.

(क) खालील तपशीलावरून वित्तीय लेखाप्रमाणे नफा किंवा तोटा शोधा. ५

तपशील	₹
कारखाना उपपरिव्यय न्यून आकारणी(Under absorption )	३७,०००
कर्जावरील व्याज फक्त वित्तीय लेख्यात(Financial Accounts)	२९,२००
परिव्यय लेख्यानुसार (Cost Accounts ) नफा	३२,८००
अखेरचा साठा वित्तीय लेख्यात (Financial Accounts )	
अधिमुल्यांकित (Overvaluation) केला	१९,२००
वित्तीय लेख्यात (Financial Accounts) कमी घसारा आकारण	१४,२००