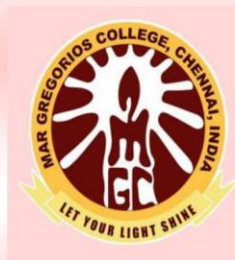


# **MAR GREGORIOS COLLEGE OF ARTS & SCIENCE**

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Affiliated to the University of Madras  
Approved by the Government of Tamil Nadu  
An ISO 9001:2015 Certified Institution



## **DEPARTMENT OF COMMERCE**

**SUBJECT NAME: ELEMENTS OF COST ACCOUNTING**

**SUBJECT CODE: CPZ5A**

**SEMESTER: V**

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## **V SEMESTER SYLLABUS**

### **UNIT I: Introduction of Cost Accounting**

Definition - Nature and Scope – Principles of Cost Accounting – Cost Accounting and Financial Accounting - Cost Accounting Vs Management Accounting – Installation of Costing System – Classification of Costs – Cost Centre – Profit Centre

### **UNIT – II: Cost sheet and methods of costing**

Preparation of Cost Sheet. Reconciliation of Cost and Financial Accounts - Unit Costing- Job Costing.

### **UNIT III: Material Costing**

Material Control – Meaning and Objectives – Purchase of Materials – Stock Levels of Materials– EOQ – Stores Records – ABC Analysis – Issue of Materials – Methods of Issue – FIFO – LIFO– HIFO – Base Stock Method – Specific Price Method – Simple and Weighted Average Method– Standard and Inflated Price Method.

### **UNIT IV: Labour Costing**

Direct Labour and Indirect Labour – Time Keeping – Methods and Calculation of Wage Payments – Time Wages – Piece Wages – Incentives – Different Methods of Incentive Payments- Idletime – Overtime – Labour Turnover - Meaning, Causes and Measurement.

### **UNIT V: Overheads Costing**

Overheads – Definition – Classification – Allocation and Apportionment of Overheads – Basis of Allocation – Absorption of Overheads - Preparation of Overheads Distribution Statement – Machine Hour Rate – Computation of Machine Hour Rate.

## UNIT-1

### COST ACCOUNTING

**COST ACCOUNTING:** It is the method of accounting for cost. The process of recording and accounting for all the elements of cost is called 'cost accounting'.

#### **DEFINITION OF COST ACCOUNTING:**

**I.C.M.A. (Institute of Cost and Management Accountants)** has defined cost accounting as follows: The process of accounting for cost from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units. In its widest usage it embraces the preparation of statistical data, the application of cost control methods and the ascertainment of the profitability of activities carried out or planned".

#### **NATURE AND SCOPE OF COST ACCOUNTING:**

##### **NATURE:**

1. **Cost accounting is a branch of knowledge:** Though considered as a branch of financial accounts, cost accounting is one of the important branch of knowledge, i.e., a discipline by itself. It is an organized body of knowledge consisting of its own principles, concepts and conventions. These principles and rules vary from industry to industry.
2. **Cost accounting is a science:** Cost accounting is a science as it is a body of systematic knowledge relating to not only cost accounting but relating to a wide variety of subjects such as law, office practice and procedure, data processing, production and material control, etc. It is necessary for a cost accountant to have intimate knowledge of all these field of study in order to carry on his day-to-day activities. But it is to be admitted that it is not a perfect science as in the case of natural science.
3. **Cost accounting is an art:** Cost accounting is an art in the sense it requires the ability and skill on the part of cost accountant in applying the principles, methods and techniques of cost accountancy to various management problems. These problems include the ascertainment of cost, control of costs, ascertainment of profitability, etc.
4. **Cost accounting is a profession:** In recent years cost accounting has become one of the important professions which have become more challenging. This view is evident from two facts. First, the setting up of various professional bodies such as the Institute of Cost accountant in India, ICAI in USA and the institute of cost and management Accountants in UK. Such professional bodies both in developed and developing countries have increased the growing awareness of costing profession among the people. Secondly, a large number of students have enrolled in these institutes to obtain costing degrees and memberships for earning their livelihood.

## SCOPE:

The term scope here refers to field of activity. Cost accounting refers to the process of determining the cost of a particular product or activity. It provides useful data both for internal and external reports reporting. Internal reporting presents details of cost data in a summarized and aggregate form. For instance, in case a company manufacturing electrical goods cost of each product.

In order to that cost accounting satisfies the requirements of both internal and external reporting. The following are the different activities which are undertaken under cost accounting system:

1. **Cost Determination:** This is the first step in the cost accounting system. It refers to determining the cost for a specific product or activity. This is a critical activity since the other three activities, explained below, depend on it.
2. **Cost Recording:** It is concerned with recording of costs in the cost journal and their subsequent posting to the ledger. Cost recording may be done according to integral or non-integral system a separate set of books is maintained for costing and financial transactions.
3. **Cost Analyzing:** It is concerned with critical evaluation of cost information to assist the management in planning and controlling the business activities. Meaningful cost analysis depends largely upon the clear understanding of the cost finding methods used in cost accounting.
4. **Cost Reporting:** It is concerned with reporting cost data both for internal and external reporting purpose. In order to use cost information intelligently it is necessary for the managers to have good understanding of different cost accounting concepts.

## GENERAL PRINCIPLES OF COST ACCOUNTING:

The following may be considered as the General Principles of Cost Accounting:

1. **A cost should be related to its causes:** Cost should be related as closely as possible to their causes so that cost will be shared only among the cost units that pass through the department of which the expenses are related. Cost Accounting Page 6 [School of Distance Education]
2. **A cost should be charged only after it has been incurred:** While determining the cost of individual units those costs which have actually been incurred should be considered. For example, a cost unit should not be charged to the selling costs, while it is still in the factory. Selling costs can be charged with the products which are sold.
3. **The convention of prudence should be ignored:** Usually accountants believe in historical costs and while determining cost, they always attach importance to historical cost. In Cost Accounting this convention must be ignored, otherwise, the management appraisal of the profitability of the projects may be vitiated. According to W.M. Harper, "a cost statement should, as far as possible, give facts with no known

bias. If a contingency needs to be taken into consideration it should be shown separately and distinctly".

4. **Abnormal costs should be excluded from cost accounts:** Costs which are of abnormal nature (e.g. Accident, negligence etc.) should be ignored while computing the cost. Otherwise, it will distort costs figures and mislead management as to working results of their undertaking under normal conditions.
5. **Past costs not to be charged to future period:** Costs which could not be recovered or charged in full during the concerned period should not be taken to a future period, for recovery. If past costs are included in the future period, they are likely to influence the future period and future results are likely to be distorted.
6. **Principles of double entry should be applied wherever necessary:** Costing requires a greater use of cost sheets and cost statements for the purpose of cost ascertainment and cost control, but cost ledger and cost control accounts should be kept on double entry principle as far as possible.

### **COST ACCOUNTING AND FINANCIAL ACCOUNTING:**

Both financial accounting and cost accounting are concerned with systematic recording and presentation of financial data. Financial accounting reveals profits and losses of the business as a whole during a particular period, while cost accounting shows, by analysis and localization, the unit costs and profits and losses of different product lines. The main difference between financial accounting and cost accounting are summarized below:

1. Financial accounting aims at safeguarding the interests of the business and its proprietors and others connected with it. This is done by providing suitable information to various parties, such as shareholders or partners, present or prospective creditors etc. Cost accounting on the other hand, renders information for the guidance of the management for proper planning, operation, control and decision making.
2. Financial accounts are kept in such a way as to meet the requirements of the Companies Act, Income Tax Act and other statutes. On the other hand cost accounts are generally kept voluntarily to meet the requirements of the management. But now the Companies Act has made it obligatory to keep cost records in some manufacturing industries.
3. Financial accounting emphasizes the measurement of profitability, while cost accounting aims at ascertainment of costs and accumulates data for this very purpose.
4. Financial accounts disclose the net profit and loss of the business as a whole, whereas cost accounts disclose profit or loss of each product, job or service. This enables the management to eliminate less profitable product lines and maximize the profits by concentrating on more profitable ones.
5. Financial accounting provides operating results and financial position usually gives information through cost reports to the management as and when desired.
6. Financial accounts deal mainly with actual facts and figures, but cost accounts deal partly with facts and figures, but cost accounts deal with facts and figures and partly with estimates.

7. In case of financial accounts stress is on the ascertainment and exhibition of profits earned or losses incurred in the business. On account of this reason in financial accounts, the transactions are recorded, classified and analyzed in a subjective manner i.e. according to the nature of expenditure. In cost accounts the emphasis is more on aspects of planning and control and therefore transactions are recorded in an objective manner.
8. Financial accounts are concerned with external transactions i.e. transactions between the business concern on one side and third parties on the other. These transactions form the basis for payment or receipt of cash. While cost accounts are concerned with internal transactions which do not form the basis of payment or receipt of cash.
9. The costs are reported in aggregate in financial accounts but costs are broken into unit basis in cost accounts.
10. Financial accounts do not provide information on the relative efficiencies of various workers, plants and machinery while cost accounts provide valuable information on the relative efficiencies of various plants and machinery.
11. In financial accounts stocks are valued at cost or market price whichever is less, whereas stocks are valued at cost price in cost accounts.

#### **DIFFERENCES BETWEEN COST ACCOUNTING AND MANAGEMENT ACCOUNTING:**

1. Cost accounting is concerned with cost ascertainment, determining profitability and control of costs through budgetary control, marginal costing and standard costing. Management accounting is concerned with providing relevant information to formulate the policies of the organization and improving its profitability.
2. Cost accounting is developed and improvised out of financial accounting. Management accounting is conceived out of cost accounting.
3. Cost accounting suggests to the management the best of the alternatives by use of different costing techniques.
4. Management accounting considers both cost as well as non-cost techniques and information for deciding upon alternatives.
5. Cost Accounting reveals variances to management by using budgets and standard costing techniques.
6. Management accounting is helpful in suggesting to the management ways and means of deletion of unfavorable variances.
7. We can conclude by saying that management accounting is an off-shoot of cost accounting with more specialized and specific purposes.

## INSTALLATION OF COSTING SYSTEM:

There is no system or method of costing which can fulfill the requirements of all types of Industries. To install the most suitable system of costing in a particular organization, the following should be noted

- (a) Requisites of a good costing system.
- (b) Steps necessary to install the system.
- (C) Problems or practical difficulties in installing a costing system.
- (d) Steps to be adopted to overcome practical difficulties.

**(a) Essentials Requisites of a good costing system:** An ideal cost accounting system provides sufficient and effective information to the management at the right time to exercise correct decisions. Following are the essentials of a good cost accounting system.

1. Simple to Operate: The cost accounting system should be simple to understand and operate so that persons involved may not be confused and follow wrong procedures or methods.
2. Flexibility: The cost accounting system should be flexible to adopt new requirements based on changes occurring in the enterprise due to external conditions.
3. Comparability: The costing system should be able to provide comparable data. Comparison can be between the figures of two or more periods of the same firm between the figures of the firm and those of the competitors for a particular period or periods.
4. Economy: The cost accounting system should justify the cost of operation through resultant benefits. The system should be operated with least cost.
5. Timeliness: The system must be capable of providing appropriate information in Time for decisions relating to cost control.
6. Suitability to the enterprise: The cost accounting system devised should be suitable to the nature of business done by the enterprise and it should fulfill the requirements of the business.
7. Minimum changes in current setup: The existing system of Authority and responsibility, delegation etc. should not be disturbed. Changes in the organizational setup should be minimum possible.
8. Minimum clerical work: The clerical work like filing up forms by workers and foremen should be minimum possible so that their basic work rhythm is not disturbed.
9. Simplicity of forms and their standardization: The forms used as part of the costing system should be a minimum in number, standardized in format and simple to operate by the personnel so that required information is obtained in time.
10. Effective system to control materials and wages: The system relating to purchase, receiving, inspection, storage and issue of materials should be effective. The method of pricing material issues should be appropriate to the situation in the firm.

11. The procedures for Time recording, Time booking, overtime, payroll preparation, etc. should be systematic and effective.
12. Procedure for overheads: lead to proper allocation, apportionment and absorption of overheads.
13. Reconciliation of cost accounting with financial accounting is to be facilitated to reveal the reasons for difference in profits.
14. External Factors: The costing system should ensure compliance of statutory and legal requirements like cost audit, cost accounting rules etc.
15. Cost Accountant's role: The responsibilities and duties of the cost accountant should be clearly defined. He should have access to all the departments and divisions of the firm.

**(b) Steps necessary to install the costing system:** The following steps have to be carefully followed to install a costing system successfully.

1. Objectives: While installing the cost accounting system the objectives of the system have to be finalized, like materials management, fixing selling prices, etc. The approach to install the system will depend on its objectives.
2. Organization structure of the business: Organization structure of the business determines the scope of authority and responsibility of each individual in the organization. While installing the system, minor changes, if any, to be made in the structure for the advantage of management may be carried out,
3. Type and method of Costing: Nature of business decides the type of costing to be introduced. Examples are job costing, process costing, operating costing, unit costing, etc. For the purpose of cost control appropriate technique is to be introduced i.e., standard costing or budgetary control or any other appropriate technique.
4. Cost records and books: It is to be decided whether separate set of cost and financial books are to be maintained or an integrated accounting system is to followed. This depends on nature and size of the enterprise and the existing accounting system.
5. Technical Aspects: A detailed study of technical aspects of manufacturing process, operations, material control, labour control, wage disbursement, factory layout, etc. is of great significance. This will be helpful in preventing wastage of labour, material, etc. and designing effective procedures and forms.
6. Control System: Cost accounting system would have to be designed to record and control different elements of cost in accordance with costing procedures and principles and the limitations imposed by the type of organization that exists.
7. Nature of Product and Business: Nature of the product and the type of business decide the emphasis of cost control. If the material forms major part of the total cost, emphasis is laid on material control. If labour constitutes major portion of the total cost, labour is to be controlled with special emphasis.
8. Collection of Data: Cost data is the basis for decision making. An efficient system of collection and verification of the data is to be devised for prompt collection of cost data.
9. Cooperation of Staff: Details of the system should be explained to the staff so that the cost accounting system can work efficiently by cooperation among the staff.



10. Organizing the Cost office: It is preferable to have a separate cost office which has access to the factory. The staff in the cost office should have facilities and access to
  - a. Stores - to account for receipts, issues & loss of materials
  - b. Works - to account for labour Time and output.
11. Relationship of cost office to other departments: All the departments, with which the cost office interacts, like purchasing, production, stores etc., should be instructed by the Top management that appropriate cooperation and coordination with cost office are essential. The cost office should establish smooth working relationship with the departments concerned.
12. The cost office is expected to record, analyze and finalize all cost data and achieve the desired level of control over costs.

### **(C) Problems or Practical difficulties in installing a costing system**

In addition to the technical problems, the practical difficulties which usually arise when a costing system is proposed to be introduced are as under:

1. Absence of cost consciousness Cost control measures may be adversely affected due to absence of cost consciousness among the employees at all levels.
2. Lack of Support from senior executives and Top management: Unless thoroughly convinced in advance, some senior executives and even individual members of top management may not welcome introduction of costing system under the impression that it may reduce their importance and freedom.
3. Suspicion and resistance from workers and employees: Lower level employees may resist the system and suspect that it is introduced to control and hamper them in their work.
4. Shortage of Trained staff: Suitably trained staff may not be readily available in the organization to take care of different aspects and phases of a costing system.
5. Cost of introduction: Introduction of an elaborate system of costing may involve huge expenditure which may not be affordable to small and medium sized firms.

### **(d) Steps to be adopted to overcome practical difficulties**

The following measures may be implemented to overcome practical difficulties to introduce a costing system.

1. Top management support: Support from the Top management should be ensured before the decision to introduce a costing system is made. The decision should not be made by one individual who is at the top. A consensus of the senior directors, executives etc., is essential for successful introduction of a costing system.
2. Employee Trust and confidence: A broad outline of the system is to be explained to all employees concerned to gain their confidence and trust All necessary clarifications and explanations can help to sustain morale of the staff.
3. Selection of suitable system and minimizing forms: The costing system chosen should be suitable to the requirements of the firm. Minimizing paper work by avoiding or eliminating unnecessary forms and procedures is necessary.

4. Training to the staff: Existing staff should be trained as per the requirements of the system so that it can be implemented smoothly. In conclusion, we may say that willing acceptance of both managerial and clerical staff along with the workers ultimately decides the success or failure of a newly introduced costing system.

### **CLASSIFICATION OF COST:**

Costs can be classified or grouped according to their common characteristics. Proper classification of costs is very important for identifying the costs with the cost centers or cost units. The same costs are classified according to different ways of costing depending upon the purpose to be achieved and requirements of a particular concern. The important ways of classification are:

1. **By Nature or Elements:** According to this classification the costs are classified into three categories i.e., Materials, Labour and Expenses. Materials can further be sub-classified as raw materials components, spare parts, consumable stores, packing materials etc. This helps in finding the total cost of production and the percentage of materials (labour or other expenses) constituted in the total cost. It also helps in valuation of work-in-progress.
2. **By Functions:** This classification is on the basis of costs incurred in various functions of an organization i.e. Production, administration, selling and distribution. According to this classification, costs are divided into Manufacturing and Production Costs and Commercial costs.
  - **Manufacturing and Production Costs** are costs involved in manufacture, construction and fabrication of products.
  - **Commercial Costs** are (a) administration costs (b) selling and distribution costs.
3. **By Degree of Traceability to the Product:** According to this, costs are divided into direct costs and indirect costs. Direct Costs are those costs which are incurred for a particular product and can be identified with a particular cost center or cost unit. E.g., Materials, Labour. Indirect Costs are those costs which are incurred for the benefit of a number of cost center or cost units and cannot be conveniently identified with a particular cost center or cost unit. E.g., Rent of Building, electricity charges, salary of staff etc.
4. **By Changes in Activity or Volume:** According to this costs are classified according to their behavior in relation to changes in the level of activity or volume of production. They are fixed, variable and semi-variable. Fixed Costs are those costs which remain fixed in total amount with increase or decrease in the volume of the output or productive activity for a given period of time. **Fixed Costs** per unit decreases as production increases and vice versa. E.g., rent, insurance of factory building, factory manager's salary etc. **Variable Costs** are those costs which vary in direct proportion to the volume of output. These costs fluctuate in total but remain constant per unit as production activity changes. E.g. direct material costs, direct labour costs, power, repairs etc. Semi-variable Costs are those which are partly fixed and partly variable. For example; Depreciation, for two shifts working the total

depreciation may be only 50% more than that for single shift working. They may change with comparatively small changes in output but not in the same proportion.

5. **Association with the Product:** Cost can be classified as product costs and period costs. Product costs are those which are traceable to the product and included in inventory cost, thus product cost is full factory cost. Period costs are incurred on the basis of time such as rent, salaries etc. thus it includes all selling and administration costs. These costs are incurred for a period and are treated as expenses.
6. **By Controllability:** The CIMA defines controllable cost as "a cost which can be influenced by the action of a specified member of an undertaking" and a non-controllable cost as "a cost which cannot be influenced by the action of a specified member of an undertaking".
7. **By Normality:** There are normal costs and abnormal costs. Normal costs are the costs which are normally incurred at a given level of output under normal conditions. Abnormal costs are costs incurred under abnormal conditions which are not normally incurred in the normal course of production. E.g. damaged goods due to machine break down, extra expenses due to disruption of electricity, inefficiency of workers etc.
8. **By Relationship with Accounting Period:** There are capital and revenue expenses depending on the length of the period for which it is incurred. The cost which is incurred in purchasing an asset either to earn income or increasing the earning capacity of the business is called capital cost, for example, the cost of a machine in a factory. Such cost is incurred at one point of time but the benefits accruing from it are spread over a number of accounting years. The cost which is incurred for maintaining an asset or running a business is revenue expenditure. E.g. cost of materials, salary and wages paid, depreciation, repairs and maintenance, selling and distribution.
9. **By Time:** Costs can be classified as 1) Historical cost and 2) Predetermined Costs. The costs which are ascertained and recorded after it has been incurred are called historical costs. They are based on recorded facts hence they can be verified and are always supported by evidences. Predetermined costs are also known as estimated costs as they are computed in advance of production taking into consideration the previous period's costs and the factors affecting such costs. Predetermined costs when calculated scientifically become standard costs. Standard costs are used to prepare budgets and then the actual cost incurred is later-on compared with such predetermined cost and the variance is studied for future correction.

### COST CENTER

A **cost center** is a department or function within an organization that does not directly add to profit but still **costs** the organization money to operate. **Cost centers** only contribute to a company's profitability indirectly, unlike a profit **center**, which contributes to profitability directly through its actions.

### PROFIT CENTRE:

A profit center is that segment of activity of a business which is responsible for both revenue and expenses and discloses the profit of a particular segment of activity. Profit centers are created to delegate responsibility to individuals and measure their performance.

### **DIFFERENCE BETWEEN PROFIT CENTRE AND COST CENTRE:**

The various points of difference between Profit center and cost center are as follows. Cost center is the smallest unit of activity or area of responsibility for which costs are collected whereas a profit center is that segment of activity of a business which is responsible for both revenue and expenses.

- (i) Cost centers are created for accounting conveniences of costs and their control whereas as a profit center is created because of decentralization of operations i.e., to delegate responsibility to individuals who have greater knowledge of local conditions etc.
- (ii) Cost centers are not autonomous whereas profit centers are autonomous.
- (iii) A cost center does not have target cost but efforts are made to minimize costs, but each profit center has a profit target and enjoys authority to adopt such policies as are necessary to achieve its targets.
- (iv) There may be a number of cost centers in a profit center in a profit center as production or service cost centers or personal or impersonal but a profit center may be a subsidiary company within a group or division in a company.

## **UNIT-2**

### **COST SHEET**

#### **COST SHEET – INTRODUCTION**

A cost sheet is a statement designed to show the output of a particular accounting period along with its break-up of costs. The data incorporated in cost sheet are collected from various statements of accounts which have been written in cost accounts.

Cost Sheet is a statement, prepared at given intervals of time, which provides information regarding elements of cost incurred in production. It discloses the total cost as well as the cost per unit of the product manufactured during the given period. If it is desired to compare the costing results of a particular period with any of the preceding periods, comparative columns can be provided in the Cost Sheet.

In a cost sheet, the total cost and the unit cost of a product are presented in analytical form showing the details of various elements of cost in total and /or per unit depending on the requirements. Cost sheets are generally prepared under the unit costing method.

The cost sheet is prepared to ascertain cost of product/job/operation or to give quotations or to determine tender price for supply of goods or providing service. A cost sheet helps in the determination of cost per unit and in the fixation of selling price of the product.

By comparing the cost sheets of the two periods, the management can ascertain the inefficiencies, if any, in production and take corrective action whenever required. If the same product is being produced in two or more factories under the same management or under different managements, cost comparisons are possible by preparing cost sheets for various factories. Thus a cost sheet can be used as a basis for cost control and cost reduction.

Depending on the situation, a cost sheet can be a simple cost sheet or a cost sheet with adjustment for opening and closing stock of work-in-progress and finished goods. It may be observed that there is no hard and fast rule of the sequence of unit cost and total cost column. The total cost column can precede the unit cost column.

### **COST SHEET – MEANING**

Cost sheet is a statement presenting the items entering into cost of products and services, analyzed by their elements, functions and even by their behavior. It is a statement prepared to show the different elements of cost.

Cost sheet is a document which provides estimated detailed cost in respect of a cost center or a cost unit. It analyses and classifies in a tabular form the expenses on different items for a particular period. It may be prepared on the basis of actual data (Historical cost sheet) or on the basis of estimated data (Estimated cost sheet).

### **COST SHEET – DEFINITIONS**

According to Harold J. Wheldon, “Cost sheets are prepared for the use of the management and consequently, they must include all the essential details which will assist the management in checking the efficiency of production.”

According to Walter W. Bigg, The expenditure, which has been incurred upon production for a period, is extracted from the financial books and the store records, and put in a memorandum statement. If this statement is confined to the disclosure of the cost of the units production during the period, it is termed cost sheet.

### **OBJECTIVES OF COST SHEET**

1. It reveals the total cost and cost per unit of goods produced.
2. It discovers the break-up of total cost into different elements of cost.
3. It provides a comparative study of the cost of current period with that of the corresponding previous period.
4. It acts as a guide to management in fixation of selling prices and quotation of tenders.
5. Cost Sheet – Basic Features

### **THE BASIC FEATURES OF COST SHEET ARE AS FOLLOWS:**

1. This statement is usually prepared under the output costing method, where the object is to ascertain per unit cost of production.
2. A cost sheet is prepared for a specified period of time, generally for a month, quarter, half year or year.
3. The cost sheet generally contains the following information –
  - a. Period,
  - b. Total Output,
  - c. Cost of raw materials consumed,
  - d. Cost of direct labour,
  - e. Details of chargeable expenses
  - f. Details of overheads namely factory, office and administration and selling and distribution, and
  - g. Aggregate of elements of cost at various stages e.g., Prime Cost, Works Cost, Office Cost and Total Cost.

### **THE MAIN DISTINCTION BETWEEN THE COST SHEET AND COST ACCOUNT**

#### **COST SHEET:**

1. It is a statement showing cost of production per unit or total output.
2. It is an independent and isolated summary of costs relating to a job or a certain volume of output.

3. It is prepared for a short period, say for three or six months while production continuous.
4. It shows the costing data in an analytical manner to suit the purpose for which it is prepared.
5. It presents costing data on unit basis.
6. It is prepared for the purpose of cost determination, cost comparison, pricing, cost control and cost estimation.

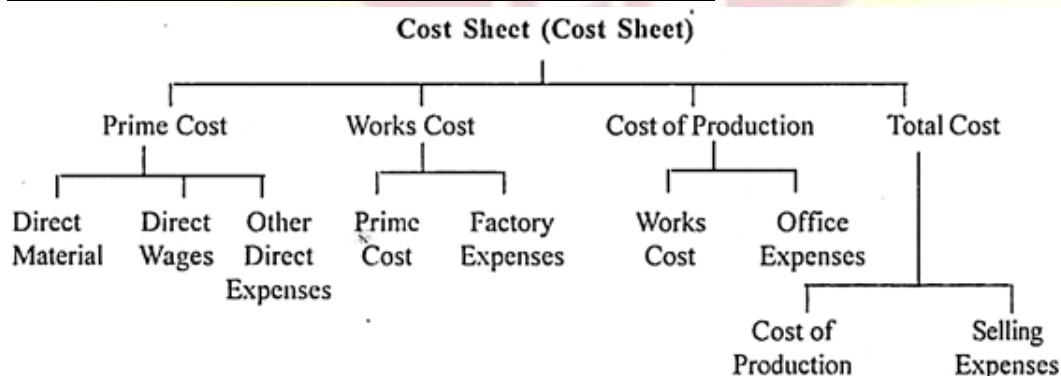
### **COST ACCOUNT:**

1. Cost account is a ledger account maintained in the Cost Ledger on the principles of double entry.
2. Every cost account is a part of integrated cost accounting system of the entire organization.
3. Cost accounts are kept for accounting period as a whole and are prepared when the production is completed.
4. Cost accounts make a presentation of total amount of costs without analysis.
5. Cost account does not depict unit cost.
6. Cost accounts make a record of actual costs incurred for the purpose of preparing Costing Profit and Loss Account.

### **PREPARATION OF COST SHEET:**

A cost sheet document can be prepared either by using historical cost or by referring to estimate costs. A historical cost sheet is prepared based on the actual cost incurred for a product. An estimated cost sheet, on the other hand, is prepared based on estimated cost just before the production begins.

### **COST SHEET – COMPONENTS (WITH CHART)**



### **IT IS PREPARED AS UNDER:**

**COST SHEET AS ON ..... (NO. OF UNITS PRODUCED: .....**)

<b>PARTICULARS</b>		<b>TOTAL</b>	<b>Per unit</b>
		<b>₹</b>	<b>₹</b>
	Opening Stock of Raw materials	xxx	
Add:	Purchase of Raw Materials	xxx	
Add:	Carriage Inwards	xxx	
		xxx	
Less:	Closing Stock of Raw materials	xxx	
Less:	Materials Returned	xxx	
	<b>DIRECT MATERIALS CONSUMED</b>	xxx	xxx
Add:	Direct Labour	xxx	xxx
Add:	Direct Expenses	xxx	xxx
	<b>PRIME COST</b>	xxx	xxx
Add:	Factory /Works expenses / works on cost	xxx	
Add:	Opening Stock of work in progress (WIP)	xxx	
		xxx	
Less:	Closing Stock of work in progress (WIP)	xxx	
Less:	Sale of Salvage (if any)	xxx	
	<b>WORKS COST or FACTORY COST</b>	xxx	xxx
Add:	Office and Administration Expenses	xxx	xxx
	<b>COST OF PRODUCTION</b>	xxx	xxx
Add:	Opening Stock of finished goods	xxx	
		xxx	
Less:	Closing Stock of finished goods (No. of units x <i>Cost of production per unit*</i> )	xxx	
	<b>COST OF GOODS SOLD</b>	xxx	xxx
Add:	Selling and Distribution expenses	xxx	xxx
	<b>COST OF SALES / TOTAL COST</b>	xxx	xxx
Add:	Profits(Pisitive figure)/Loss (Negative Figure)	xxx	xxx
	<b>SALES</b>	xxx	xxx


  
 LET YOUR LIGHT SHINE

**RECONCILIATION OF COST AND FINANCIAL ACCOUNTS:**

**MEANING OF RECONCILIATION:**



1. Where cost accounts and financial accounts are separately maintained in two different sets of books, the profit or loss shown by one may not agree with that shown by other. Therefore, it becomes necessary that periodically the profit or loss shown by the two sets of accounts is reconciled.
2. A memorandum of reconciliation is prepared showing the reasons for difference between the results disclosed by each system. It is done to check the arithmetical accuracy of both sets of accounts as well as to detect mistakes committed in the accounts.
3. Reveal the reasons for difference in profit or loss between cost and financial accounts. To check the arithmetical accuracy of both sets of accounts as well as to detect errors and omissions committed in the accounts. To ensure the reliability of cost accounts order to correct ascertainment of cost of production.

#### **NEED FOR RECONCILIATION:**

1. It reveals the reasons for difference in profit or loss between cost and financial accounts.
2. It ensures that no income or expenditure item has been omitted to record and there is no under- or over-recovery of overheads.
3. It helps in checking the arithmetical accuracy of both the sets of accounts.
4. It ensures the reliability of cost accounts in order to correct ascertainment of cost of production.
5. It facilitates internal control by highlighting the variations causing increase or decrease in profit.
6. It promotes co-ordination and co-operation between cost and financial accounting departments in order to generate correct and reliable accounting data.
7. It enables management to formulate policies regarding overheads, depreciation and stock valuation.
8. It ensures managerial decision-making.

#### **RECONCILIATION PROCEDURE:**

The cost and financial accounts are reconciled by preparing a Reconciliation Statement or a Memorandum Reconciliation Account.

### 1. Reconciliation Statement:

The same principles of bank reconciliation will apply here. One may start with the profit shown by one set of accounts (usually cost accounts) as base profit and items which do not tally are either added to it or deducted from it to get the profit shown by other set of accounts (i.e., financial accounts).

The treatment of items will be reversed if the starting point in the reconciliation statement is the profit as per financial accounts.

A proforma of reconciliation statement is shown below:

<b>Proforma of Reconciliation Statement</b>		
	Rs.	Rs.
		*****
	<b>Profit as per Cost Accounts</b>	
<i>Add :</i>		
(1) Over-absorption of overheads in cost accounts	*****	
(2) Financial incomes not recorded in cost accounts	*****	
(3) Under-valuation of Closing Stock in cost accounts	*****	
(4) Over-valuation of Opening Stock in cost accounts	*****	
(5) Items charged only in cost accounts (i.e., Notional rent and interest on capital etc.)	*****	*****
<i>Less :</i>		
(1) Under-absorption of overheads in cost accounts	*****	*****
(2) Financial charges not considered in cost accounts (e.g. Bad debts written off, preliminary expenses, goodwill and discount on issue of shares written off)	*****	
(3) Under-valuation of Opening Stock in cost accounts	*****	
(4) Over-valuation of Closing Stock in cost accounts	*****	*****
		*****
	<b>Profit as per Financial Accounts</b>	

Note: In case of Loss, the amount shall appear as a minus item.

### 2. Memorandum Reconciliation Account:

Here the reconciliation procedure is in the form of an account. The profit as per cost accounts is the starting point and is shown on the credit side of this account. All items which are added to costing profit for reconciliation are also shown on credit side.

The items to be deducted from costing profit for reconciliation are shown on the debit side. The balancing figure gives the profit as per financial accounts. It is only a memorandum account and does not form part of double entry system of book-keeping.

**QUESTIONS:****SUM: 1**

From the following information prepare the cost sheet.

	<b>Rs.</b>
Direct materials	1, 50,000
Direct labour	70,000
Direct expenses	5,000
Factory expense	15,000
Administrative expenses	10,000
Selling expenses	3,500
Sales	2, 75,000

**Solution:****COST SHEET**

<b>Particulars</b>	<b>Rs</b>	<b>Rs</b>
Direct materials	1,50,000	
Direct labour	70,000	
Direct expenses	5000	
<b>Prime cost</b>		<b>2,25,000</b>
Factory expenses	15,000	15,000
<b>Work cost</b>		<b>2,40,000</b>
Administrative expenses		

	10,000	10,000
<b>Cost of production</b>		<b>2,50,000</b>
Selling expenses		
<b>Cost of sales</b>	3500	3500
<b>Profit</b>		
<b>Sales</b>		<b>2,53,000</b>
		<b>21,500</b>
		<b>2,75,000</b>

**SUM: 2**

Ascertain the prime cost from the following:

Opening stock of raw materials	—	Rs. 10,000
Raw materials bought during the year	—	Rs. 60,000
Closing stock of raw materials	—	Rs. 20,000
Raw materials returned to supplier	—	Rs. 1,500
Carriage inwards	—	Rs. 1,500
Direct wages	—	Rs. 50,000
Chargeable expenses	—	Rs. 5,000.

**Solution:****CALCULATION OF PRIME COST**

Particulars	Rs	Rs
-------------	----	----

Opening stock	10,000	
Returned	- 1,500	
Closing stock	- 20,000	
Carriage inwards	1,500	
Direct material	50,000	
Direct wages	50,000	
Chargeable expenses	5000	
<b>Prime cost</b>		<b>1,05,000</b>

**SUM: 3**

Prepare reconciliation statement. Profit as per financial accounts Rs. 50,000 The following information is also available:

	<b>Cost accounts</b>	<b>Financial Accounts</b>
	<b>Rs.</b>	<b>Rs.</b>
(a) Opening stock of Raw materials	5,000	5,500
Closing stock of raw materials	4,000	5,300
Opening stock of finished goods	12,000	15,000
Closing stock of finished goods	14,000	16,000

(b) Dividends of Rs. 1,000 were received by the company

(c) A machine with net book value of Rs. 10,000 was sold during the year for Rs. 8,000

(d) The company charged 10% interest on its opening capital employed of Rs. 80,000 to its process costs.

**Solution:****RECONCILIATION STATEMENT**

<b>Particulars</b>	<b>Rs</b>	<b>Rs</b>
a).Profit as per financial accounts		50,000
1. Excess opening stock of raw material	500	
2. Excess opening stock of finished goods	<u>3,000</u> <u>3,500</u>	
		53,500
Less;		
1. Excess closing stock of raw material	1,300	
2. Excess closing stock of finished goods	2,000	
3. Dividend	<u>1,000</u>	<u>4,300</u>
d).Profit as per cost accounts		49,200
		_____
<b><u>SUM: 4</u></b>		

Prepare cost and profit statement of “Popular stoves Manufacturing Co.” for the year 2010.

<b>Particulars</b>	<b>Rs.</b>	<b>Particulars</b>	<b>Rs.</b>
Stock of Materials on 1.1.2010	35,000	Establishment expenses	10,000
Stock of materials on 31.12.2010	4,900	Completed stock in hand on 1.1.2010	Nil
Purchase of materials	52,500	Completed stock in hand on 31.12.2010	35,000
Direct wages	95,000	Sales	1,89,000
Factory expenses	17,500		

The number of stoves manufactured during the year 2010 was 4,000. The company wants to quote for a contract the supply of 1000 stoves during the year 2011. The stoves to be quoted are of uniform quality and make and similar to those manufactured in 2010; but cost of materials has increased by 15% and cost of factory labour by 10%. Prepare also a statement showing the price to be quoted to give the same percentage of net profit on turnover as was realized in 2010. Assuming that the cost per unit of overheads will be the same as in 2011.

**Solution:****COST SHEET OF “POPULAR STOVES MANUFACTURING CO.” FOR THE YEAR ENDING 2010.**

Particulars	Rs.	Rs.	Cost amount
Opening stock	35,000		
Purchase	52,500		
Closing stock	<u>(4,900)</u>		
Material consumed	82,600		
Direct wages	<u>95,000</u>	<u>1,77,600</u>	
<b>Prime cost</b>		<u>1,77,600</u>	44.4
Factory expenses	17,500	<u>17,500</u>	
<b>Work cost</b>		1,95,500	48.775
Establishment expenses	10,000	<u>10,000</u>	
<b>Cost of production</b>		2,05,100	51.275
Finished goods			
Opening	-----		
Opening	(35,000)	<u>(35,000)</u>	
<b>Cost of production of goods sold</b>		1,70,100	42.525
<b>Profit</b>		<u>18,900</u>	<u>42.725</u>
<b>Sales</b>		1,89,000	47.25

**Quotation statement for 2011**

Particulars	Rs.	Rs.	Cost amount
Direct Material	23,747.5		
Direct wages	<u>26,125</u>	49,872.5	
<b>Prime cost</b>		<u>49,872.5</u>	49.8725
Factory expenses	4,375	4,375	
<b>Work cost</b>		<u>54,247.5</u>	54.2475
Establishment expenses	<u>2,500</u>	2,500	
<b>Cost of production</b>		<u>56,747.5</u>	56.7475
<b>Profit</b>	<u>6,305</u>	6,305	6.305
<b>Sales / price to be quoted</b>		<u>63,052.5</u>	<u>63.0525</u>

**SUM: 5**

From the following particulars prepare a statement showing:

- (a) Raw materials consumed
- (b) Prime cost
- (c) Works cost
- (d) Cost of production and
- (e) Profit.

	1.1.2002 (Rs)	31.12.2002 (Rs)
Raw materials	20,000	32,000
Work-in-progress	26,500	14,000
Purchase of raw materials		90,000
Carriage inwards		2,000
Direct wages		40,000
Chargeable expenses		15,000
Works overheads		22,500
Administrative overheads		10,000
Selling and distribution overheads		14,000
Sale of finished goods		2,20,000

**Solution:****COST SHEET**

Particulars	Rs.	Rs.
Opening stock of raw materials	20,000	
Purchase	90,000	
Carriage inwards	2,000	
Closing stock of raw materials	(32,000)	



<b>(a) Material consumed</b>	80,000	
Direct wages	40,000	
Chargeable expenses	15,000	
<b>(b) Prime cost</b>		<b>1,35,500</b>
Work overhead	22,500	
Opening work-in-progress	26,500	
Closing work-in-progress	(14,000)	
<b>(c) Work cost</b>		<b>1,70,000</b>
Administrative overhead		<b>10,000</b>
<b>(d) Cost of production</b>		<b>1,80,000</b>
Selling overhead		<b>14,000</b>
<b>Cost of sales</b>		<b>1,94,000</b>
<b>(e) Profit</b>		<b>26,000</b>
<b>Sales</b>		<b>2,20,000</b>

**EXERCISE 1:****COST SHEET -AND ESTIMATED COST FOR NEXT PERIOD**

Prepare cost for the year 1986 from the following showing the total cost and cost per unit.  
Number of units produced 2,000

Particulars	Rs
Opening stock of raw materials	10,000
Purchases	1,80,000
Direct wages	56,000
Indirect wages	48,000
Closing stock of raw materials	12,000
Work-in-progress on 1-1-86	5,000
Work-in-progress on 31-12-86	6,000
Factory overheads	26,000

Office overheads	45,000
Selling overheads	16,000
Opening stock of finished goods(100 units)	20,000

Closing stock of finished goods 120 units. Profit 10% on sales.

During the year 1987, it is decided to increase the production to 2,400 units. It is anticipated that;

- Material prices will increase by 10%
- Wages will reduce by 20%
- other expenses will remain constant per unit
- Expected profit 20% on sales.

Ascertain selling price to be fixed per unit.

### **EXERCISE 2:**

#### **RECONCILIATION ACCOUNT**

From the following profit and loss account, draw up a memorandum reconciliation account, shoeing the profit as per cost accounts:

#### **Profit and loss account (31.12.09)**

Particulars	Rs	Particulars	Rs
To office salaries	11,282	By gross profit b/d	54,648
To office expenses	6,514	By dividend	400
To salesman's salaries	4,922	By interest on deposit	150
To sales expenses	9,304		
To distribution expenses	2,990		
To loss on sales of machinery	1,950		
To fines	200		
To discount on debentures	100		

To net profit c/d 17,936 -----

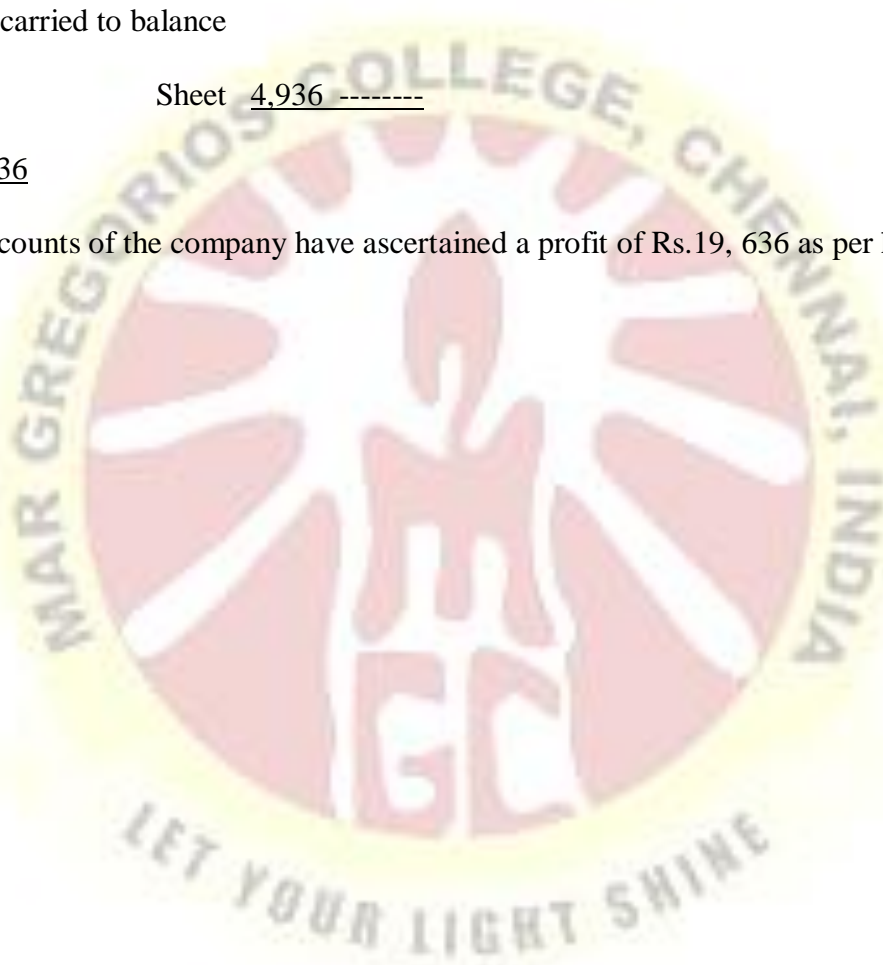
55,19,855,198

Income tax	8,000	By net profit b/d	17,936
To reserve	1,000		
To dividend	4,000		
To balance carried to balance			

Sheet 4,936 -----

17,936 17,936

The cost accounts of the company have ascertained a profit of Rs.19, 636 as per his books.



### UNIT-3

#### MATERIAL COSTING

##### MATERIAL CONTROL:

- Material control is a systematic control over the purchasing storing and using of material to minimizing the possible cost.
- Material control may be defined as the level of material maintenance so as to ensure uninterrupted production and minimizing the investment of fund.

**MEANING:**

- It can be defined as a comprehensive framework for the accounting and control of material cost designed with the object of maintaining material suppliers at a level so as to minimizing investment of funds.
- It is the systematic control over the purchasing storing and using of material so as to have the minimum possible cost of material. In simple words, it is a system which ensures that right quality of material is available in the right quantity at the right time and right place with the right amount of investment.

**OBJECTIVES:**

- Ensuring non-stop production
- Low investment in inventory
- Purchase only on proper authorization
- Protection of material or proper storage
- Lesser idle material
- Issue of material on proper authorization

**PURCHASE OF MATERIAL:**

- It is organized on centralized basis
- Full co-operation between purchasing department and other departments is assured
- A proper procedure is clearly spelled and strictly adhered to
- Purchase manager is technically qualified and experienced enough
- There is close liaison between the purchasing department and accounts department.

**STOCK LEVELS OF MATERIAL:**

- Minimum level
- Maximum level
- Average stock level
- Danger level
- Reordering level

**ECONOMIC ORDER QUANTITY**

- Economic order quantity (EOQ) is the ideal order quantity a company should purchase to minimize Inventory cost such as holding costs, shortage costs, and order costs. This production-scheduling model was developed in 1913 by Ford W.

### **STORES RECORDS:**

- A stores record is a detailed account of all items of goods, raw materials, semi-finished goods, finished goods, spare part etc., which are kept in the store.

### **ABC ANALYSIS:**

- ABC analysis is an inventory categorization technique. ABC analysis divides an inventory into the categories A items with very tight control and accurate records, B items with less tightly controlled and records, and C items with the simplest controls possible and minimal records

### **ISSUE OF MATERIALS:**

- Materials are received and kept in store carefully and finally the store keeper issue them whenever those are required for production department. Materials should be issued against proper authorization only. The objective of Material issue control is to ensure proper utilization of materials.

### **METHODS OF ISSUE:**

- Public issue or initial public offer (IPO)
- Private placement
- offer for sale
- Sale through intermediaries
- Sale to inside conterie
- Sale through managing brokers
- Privileged subscriptions

### **FIFO:**

- FIFO stands for "First in first out" it is a method used for cost flow assumption purpose in the cost of goods sold calculation.

### **LIFO:**

- LIFO stands for "Last in First-Out". It is a method used for cost flow assumption purpose in the cost of goods sold calculation.

**HIFO:**

- Highest in first out (HIFO) is a method of accounting for a firm's inventories wherein the highest cost items are the first to be taken out of stock.

**BASE STOCK METHOD:**

- The base stock method is a valuation technique for the inventory asset, where the minimum amount of inventory needed to maintain operation is recorded at its acquisition cost, while the LIFO method is applied to all additional inventories.

**SPECIFIC PRICE METHOD:**

- This is used when materials are procured for a specific job
- Such materials, when received are earmarked for that specific job for which purchased, and are issued to that particular job when requisition comes.

**SIMPLE AND WEIGHTED AVERAGE METHOD:**

- **SIMPLE AVERAGE METHOD:**

- Simple average is the average of a set of values calculated with each value being assigned equal importance or weightage.

- **WEIGHTED AVERAGE METHOD:**

- Weighted average is the average of a set values calculated by giving weightage to the relative importance of each value.

**STANDARD AND INFLATED PRICE METHOD:**

- **STANDARD PRICE METHOD:**

- Standard price is the predetermined price and both the receipts and issue will be valued at the price, therefore, this price is neither the cost price nor market price. This method is used by concerns which follow standard costing technique of accounting.

- **INFLATED PRICE METHOD:**

- Inflated price method is used when the material are subject to natural loss/wastage due to climatic conditions. In this method, a predetermined percentage is added to the price to the extent of loss.

**QUESTIONS:****(A) SIMPLE EOQ PROBLEMS****SUM: 1**

Calculate the economic ordering quantity from the following information:

Consumption of material per annum..... 10,000 kg

Ordering cost per order.... Rs. 50

Cost per kg . Of raw material ..... Rs. 2

Store cost.... 8% on inventory.

**Solution:**

Given:

Annual consumption = 10,000 kg

Buying cost per order = Rs 50

Cost per day = Rs 5

Storage cost = 8%

$$EOQ = \sqrt{2AB/CS}$$

$$EOQ = \sqrt{2*(10000)*(50)/2*8/100}$$

$$= \sqrt{10,00,000/0.16}$$

$$= \sqrt{62,50,000}$$

$$EOQ = 2500 \text{ kgs}$$

**(B) EOQ – WITH DETAILS OF COSTS****SUM: 2**

A manufacturer buys certain equipment from outside suppliers at rs.30 per unit. Total annual needs are 80000 units. The following further data are available.

Annual return on investment – 10%

Rent, insurance, taxes per unit per year re.13

Cost of placing an order Rs. 100

Determine the economic order quantity.

**Solution:**

Given:

Annual cost = 80,000 units  
 Annual return on investment = 10%  
 Cost of planning = Rs 100  
 Buying/suppliers per unit = Rs 30  
 Rent & insurance tax percent per year = Rs 13

$$\begin{aligned} \text{EOQ} &= \sqrt{2AB/CS} \\ &= \sqrt{2(80,000)*100/(30*10\%)+ 13} \\ &= \sqrt{1,60,00,000/16} \\ \text{EOQ} &= \sqrt{10,00,000} \\ &= 1000 \text{ UNITS} \end{aligned}$$

### C. STOCKS LEVELS FOR TWO OR MORE MATERIALS

#### SUM: 3

Two components x and y are used as follows:

Normal usage – 600 units per week each

Maximum usage – 900 units per week each

Minimum usage – 300 units per week each

Reorder quantity:

X 4800 units

Y 7200 units

Reorder period:

X 4 to 6 weeks

Y 2 to 4 weeks

Calculate for each component:

(A) Reorder level

(B) Minimum level

(C) Maximum level

(D) Average stock level

#### **Solution:**

REORDER LEVEL FOR X = MAXIMUM CONS. REORDER \* REORDER PERIOD

$$X = 900 \text{ UNIT} * 6 = 5400 \text{ UNITS}$$

$$Y = 900 \text{ UNIT} * 4 = 3600 \text{ UNITS}$$

MINIMUM LEVEL = REORDER LEVEL – (NORMAL CONSUMPTION \* NORMAL REORDER PERIOD )

$$X = 5400 - (600 \text{ UNITS} * 5) = 5400 - 3000 = 2400 \text{ UNITS}$$

$$Y = 3600 - (600 \text{ UNITS} * 3) = 3600 - 1800 \text{ UNITS}$$



MAX. LEVEL = REORDER LEVEL + REORDER QUALITIES – ( MINI.CONNS. \* MIN. REORDER PERIOD)

$$X = 5400 + 4800 - (300 * 4) = 10,200 - 1200 = 9000 \text{ UNIT}$$

$$Y = 3600 + 7200 - (300 * 2) = 10300 - 600 = 10,200 \text{ UNIT}$$

AVERAGE LEVEL = MAXIMUM + MINIMUM LEVEL/2

$$X = 9000 + 2400/2 = 11,400/2 = 5700 \text{ UNIT}$$

$$Y = 10200 + 1800/2 = 12000/2 = 6000 \text{ UNIT}$$

### FIFO AND LIFO

#### SUM: 4

The following is a summary of the receipts and issues of materials in a factory during the month of April

Date	Particulars	Qty.	Rate per unit Rs.
1	Received	2000	10
5	Received	300	12
8	Issued	1200	—
10	Received	200	14
12	Issued	1000	—
23	Received	300	11
31	Issued	200	-

Prepare a statement showing the pricing of issues on the basis of - a) FIFO method b) LIFO method

#### **Solution:**

#### (A) FIFO

DATE	RECEIPTS				ISSUES				BALANCE		
	Ref.	Qty	Rate	Amt.	Ref.	Qty	Rate	Amt.	Qty	Rate	Amt.
April			RS.	RS.			RS.	RS.		RS.	RS.

1		2000	10	20,000					2000	10	20,000
5		300	12	3600					2000	10	20000
									300	12	3600
8					1200	10	12000	800	10	8000	
								300	12	3600	
10		200	14	2800				800	10	8000	
								300	12	3600	
								200	14	2800	
12					800	10	8000	100	12	1200	
					200	12	2400	200	14	2800	
23		300	11	3300				100	12	1200	
								200	14	2800	
								300	11	3300	
31					100	12	1200	100	14	1400	
					100	14	1400	300	11	3300	

**(B) LIFO**

DATE	RECEIPTS			ISSUES			BALANCE		
	QTY	RATE	AMT	QTY	RATE	AMT	QTY	RATE	AMT
1	2000	10	20000				2000	10	20000
5	300	12	3600				2000	10	20000
							300	12	3600
8				300	12	3600			

				900	10	9000	1100	10	11000
10	200	14	2800				1100	10	11000
							200	14	2800
12				200	14	2800			
				800	10	8000	300	10	3000
23	300	11	3300				300	10	3000
							300	11	3300
31				200	11	2200	300	10	3000
							100	11	1100

**SUM: 4**

Show the stores ledger account as it would appear when using Highest In First Out method:

April 1 Balance in hand- 300 units @ Rs. 20

April 2. Purchased- 200 units @ Rs. 22

April 4. Issued 150 units

April 6. Purchased 200 units @ Rs. 23

April 11 Issued – 150 units

April 19 Issued – 200 units

April 22 Purchased – 200 units at Rs. 24 April 27 Issued – 250 units

DATE	PARTICULARS	RECEIPTS			ISSUES			BALANCE		
		QTY	RATE	RS	QTY	RATE	RS	QTY	RATE	RS
Apr 1	Balance b/d	-	-	-	-	-	-	300	20	6000
Apr 2	Purchased	200	22	4400	-	-	-	300	20	6000
		-	-	-	-	-	-	200	22	4400
Apr 4	Issued	-	-	-	150	22	3300	300	20	6000
		-	-	-	-	-	-	50	22	1100
Apr 6	Purchased	200	23	4600	-	-	-	300	20	6000
		-	-	-	-	-	-	50	22	1100
		-	-	-	-	-	-	200	23	4600
Apr 11	Issued	-	-	-	150	23	3450	300	20	6000
		-	-	-	-	-	-	50	22	1100
		-	-	-	-	-	-	50	23	1150

Apr 19	Issued	-	-	-	50	23	1150	200	20	4000
		-	-	-	50	22	1100	-	-	-
		-	-	-	100	20	2000	-	-	-
Apr 22	Purchased	200	24	4800	-	-	-	200	20	4000
		-	-	-	-	-	-	200	24	4800
Apr 27	Issued	-	-	-	200	24	4800	150	20	3000
		-	-	-	50	20	1000	-	-	-

Closing stock = 150 units x Rs 20 = Rs. 3,000

### SUM: 5

#### SIMPLE AVERAGE METHOD

The following transactions took place in respect of an item:

- 2 March- Received 200 units @ Rs. 2 per unit
- 10 March – Received 300 units @ Rs. 2.40 per unit
- 11 March – Issued 250 units
- 18. March – Received 250 units @ Rs. 2.60 per unit.
- 20. March- Issued 200 units

Record the transactions in stores ledger, using simple average rate method.

Date	Par	Receipts			Issues			Balance		
		Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	amt
Mar 2	Rec	200	2	400	-	-	-	200	-	400
Mar 10	Rec	300	2.40	720				500	-	1120
Mar 11	Iss				250	2.2	550	250	-	570
Mar 18	Rec	250	2.60	650	-	-	-	500	-	1220
Mar 20	Iss	-	-	-	200	2.5	500	300	-	720

Simple average is calculated as follows:

$$\text{Price} = (2+2.4) / 2 = 2.2$$

The price of first goods received is not taken into account for calculating the amount for the next issues because; the goods would have been left the godown already.

### SUM: 6

#### WEIGHTED AVERAGE METHOD

Date	Par	Receipts			Issues			Balance		
		Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	amt
Mar	Rec	200	2	400	-	-	-	200	2	400

<b>2</b>										
<b>Mar 10</b>	Rec	300	2.40	720				500	2.24	1120
<b>Mar 11</b>	Iss				250	2.24	560	250	2.24	570
<b>Mar 18</b>	Rec	250	2.60	650	-	-	-	500	2.44	1220
<b>Mar 20</b>	Iss	-	-	-	200	2.44	488	300	2.44	732

Closing stock- 300 units @ Rs. 2.44 – Rs. 732

### **EXERCISES:**

#### **(A) EOQ AND ORDERING SCHEDULE**

- Calculate Economic Order Quantity. Also State The Number Of Orders To Be Placed In A Year.  
Consumption Of Material Per Annum 10,000 Kg.  
Cost Of Material Per Kilogram Rs. 2  
Order Placing Costs Per Order Rs. 50  
Storage Costs 8% On Average Inventory.

#### **(B) STOCK LEVEL FOR TWO OR MORE MATERIALS:**

- Two Materials A And B Are Used As Follows :

Normal Consumption – 50units Per Week Each

Minimum Consumption – 25 Units Per Week Each

Maximum Consumption – 75 Units Per Week Each

Reorder Quantity            A - 300 Units

B – 500 Unts

Reorder Period                    A – 4 To 6 Weeks

B – 2 To 4 Weeks

Calculate (A) Reorder Level (B) Minimum Level (C) Maximum Level (D) Average Stock Level.

#### **(C) STORES LEDGER ACCOUNT**

- The following transactions took place in respect of material x during the month of January 2010
  - Opening stock 50 tons at Rs. 1000 per ton

- 2 - Issued 30 tons
- 6 - Received 60 tons at Rs. 1100 per ton
- 9 - Issued 25 tons (Stock verification reveals loss of one ton)
- 10 - Received back from orders 10 tons (previously issued at Rs. 990 per ton)
- 11 - Issued 40 tons
- 22 - Received 22 tons at Rs. 1200 per ton
- 31 - Issued 33 tons.

You are required to write up the stores ledger Account under the - a) FIFO Method

- 2) During Jan 2011, the Para Engineering Co.Ltd. effected the purchase of a certain items of stores as under –

Date -	Units	Total Amount Rs
2-1-2011	100	190
15-1-2011	150	333

During the same period the details of the issues of the item were as under –

Date -	Units
8-1-2011	40
20-1-2011	100

Besides on 1-1-2011 there was an opening balance of 160 units valued for Rs. 200. Enter the above transactions in the stores Ledger under the following methods of pricing. Calculate Last - in - First – out (LIFO).

## UNIT - 4

### LABOUR COSTING

#### LABOUR- MEANING

Labour cost is an important element of cost. It also forms significant part of prime cost and total cost. Labour is the most perishable commodity. Unused labour, it cannot be recovered and the labour cost is bound to increase cost of production. At the same time labour is the only factor which has the unlimited productive capacity. However, labour is complex and therefore it requires systematic planning and control.

#### TYPES OF LABOUR:

- Direct Labour

- Indirect Labour

### **OBJECTIVES OF MANAGEMENT IN RELATION TO LABOUR COST:**

- To estimate the correct labour cost of orders, jobs and process to ascertain the cost of each job, process or order.
- Reductions of labour turn over.
- To find out the correct amount of overheads by ascertaining the indirect labour cost.
- To increase the efficiency of labour by taking direct labour cost as a guidance.

### **MEANING OF LABOUR TURNOVER:**

Labour turnover may be defined as change in labour force i.e., Percentage change in the labour force during a specific period. High labour turnover indicated that labour is not established and there are frequent changes by way of workers leaving the organization. High labour turnover is to be avoided. At the same time very low labour turnover indicates inefficient workers are being retained in the organization.

### **METHODS OF MEASUREMENT OF LABOUR TURNOVER**

- Labour Turnover under separation Method:

$$= \frac{\text{Numbers of employees left from the organization during a period}}{\text{Average number of employees during a period}}$$

- Labour turnover under Replacement Method:

$$= \frac{\text{Number of employees replaced during a period}}{\text{Average number of employees during a period}} \times 100$$

- Labour Turn over under Flux Method :

$$= \frac{\text{Number of employees left} + \text{Number of employees recruited during a period}}{\text{Average Number of employees during a period}}$$

- Additions Method :

$$= \frac{\text{Number of additions during a period}}{\text{Average number of workers during their period}} \times 100$$

Average number of workers during their period

### **CAUSES FOR LABOUR TURNOVER:**

- Personal Causes
- Unavoidable Causes
- Avoidable Causes.

### **EFFECTS OF LABOUR TURNOVER**

- Reduction in output due to changes in labour force
- Increase in cost of production due to newly recruited employees whomay lack expertise and skill of carrying out the jobs.
- Newly recruited employees may be unfamiliar with the work and maycause increased loss of raw materials. Defectives, scrap and spoilageultimately increase the cost of production.
- Inexperienced workers may cause more damage to tools and machinerywhich results in frequent break-down of machinery, hamperingproduction.
- Non availability of suitable employees may disrupt flow of production.

### **WORK STUDY:**

Work study of technical aspects of production. It involves a detailed study of process, operations, evaluation and analysis of jobs and work measurement. Therefore, work study involves methods study, motion study and time study.

### **MERIT RATING:**

Merit rating aims at evaluating the performance of workers. Main objective of merit rating is to reward the employee on the basis of efficiency and merit Rating brings out the comparative worth of workers. The traits generally considered for determining merit and worth of workers are as under:

1. Educational Qualification and knowledge
2. Skill and experience
3. Attitude to the work
4. Quality of work done
5. Efficiency



6. Regularity
7. Integrity
8. Reliability
9. Qualities like leadership, initiative, self-confidence and sense of
10. Judgment
11. Discipline
12. Cooperation

The above traits are allotted with points and total points scored on all traits determine the worth of workers. The employees may be rated individually as per the points they score and they may be put in groups based on their common scores of points.

### **OBJECTIVES OF TIME - KEEPING**

1. Ensures regularity of employees
2. Enforces discipline among work force.
3. Satisfies safety requirements
4. Useful for preparation to payroll
5. Keeps track of normal time, late attendance and Carly leaving of workers.
6. Used for overheads absorption on the basis of labour hours.

### **TYPES OF IDLE TIME**

It based on causes or reasons for its occurrence. Idle time can be divided into two categories i.e.

- Normal Idle time
- Abnormal Idle time

### **NORMAL IDLE TIME:**

This is inherent in all kinds of employment and cannot be avoided. The cost of this time is born by the respective jobs or products or departments.

### **ABNORMAL IDLE TIME:**

The abnormal idle time is avoidable idle time which occurs due to conditions which can be prevented reasons for abnormal idle time.

**OVERTIME:**

Employees are expected to work during a fixed schedule of hours of a day or a week. If they work beyond these hours the excess hours are called overtime hours. In other words, the work performed beyond the normal hours is called Overtime work.

**WAGE ANALYSIS:**

The wages chargeable to different jobs is shown in the analysis sheet called wage analysis sheet. This is suitable when the firm is small and less number of jobs is performed.

**TIME RATE SYSTEM**

Under this method the workers are paid on the basis of hourly, daily, weekly or monthly rate. There are five variations of time wages which are as follows ·

- (1) Flat time rate
- (2) High day rate
- (3) Measured day rate
- (4) Graduated time rate
- (5) Differential time rate

**PIECE RATE SYSTEM:**

This is also called 'payment by results'. The workers are paid on the basis of output produced by them. The earnings of the workers depend on the number of units of output produced and the wage rate per unit received by the worker. The payment by results system is successful only if the work is of repetitive nature. The effect of piece rate is that the remuneration is at constant rate and labour cost per unit remains stable throughout the range of output. The total cost per unit decreases considerably on account of reduction in the fixed overhead per unit for increased volume of production.

**VARIATION OF PIECE WAGES:**

- Straight piece rate
- Differential piece rate:
  - a. Taylor's differential piece rate system
  - b. Merrick's multiple piece rate system

c. Gantt's task and bonus plan

### PREMIUM BONUS SYSTEM

The following are some of the popular premium bonus systems

1. Halsey premium plan
2. Halsey - Weir premium plan
3. Rowan system
4. Barth variable sharing plan
5. Emerson's efficiency plan
6. Beadux point premium system
7. Accelerating premium plan, etc.

### ROWAN SYSTEM OR ROWAN PLAN:

This scheme was introduced in 1901 David Rowan of Glasgow, England. The wages are calculated on the basis off-hours worked whereas the 'bonus is that proportion of the wages of time taken which the time saved bears to the standard time allowed'.

### QUESTIONS:

Differential piece rate

- Taylor's differential piece rate
  - Low piece rate applicable for below standard output- 80%
  - High piece rate applicable for above standard output- 120%
- Merrick's differential/multiple piece rate
  - <83%- ordinary piece rate
  - 83-100%- 110% of o p r
  - >100%- 120% of o p r
- Gantt' task and Bonus plan.
  - Output is below standard, guaranteed time wages – Below 100%
  - Output is at standard, time rate + 20% bonus- At 100%
  - Output is above standard, High piece rate- Above 100%

### TIME RATE SYSTEM AND PIECE RATE SYSTEM

**SUM: 1**

The output of a worker X is 100 units in 40 hours per week. Graduated time rate is Rs. 4 per hour. Ordinary piece rate is Rs. 2 per unit. Show the earnings of the worker under piece rate and time rate system.

**Solution:**

$$\begin{aligned} \text{Piece rate} &= \text{No. of. piece} \times \text{Rate per piece} \\ &= 100 * 2 = \text{Rs.}200. \end{aligned}$$

$$\begin{aligned} \text{Time rate} &= \text{Hours worked} \times \text{Rate per hour} \\ &= 40 * 4 = \text{Rs.}160. \end{aligned}$$

**SUM: 2**

A worker is paid at rs.2 per unit for the unit for the units produced by him . His hourly wage rate is Rs.3 per hour. In a working day of 8 hours the worker has produced 10 units . Calculate the wages of the worker according to time rate and piece rate system.

**Solution:**

$$\begin{aligned} \text{Piece rate} &= \text{No. of. Piece} \times \text{Rate per hour} \\ &= 2 * 10 = \text{Rs.} 20 \end{aligned}$$

$$\begin{aligned} \text{Time rate} &= \text{Hours worked} \times \text{Rate per hour} \\ &= 8 * 3 = \text{Rs.} 24 \end{aligned}$$

**TAYLOR'S DIFFERENTIAL PIECE RATE****SUM: 3**

From the following particulars, Calculate the earnings of workers A & B under straight piece rate system and Taylor's Differential piece rate system.

Standard time allowed 25 units per hour

Normal time rate Rs. 50 per hour

In a day of 8 hours A produced 150 units and B produced 250 units.

**Solution:**

Calculation of piece rates:

Standard production for 1 hour= 25 units

Standard production for 8 hours= 25\*8= 200 units

Rate per hour= Rs. 50

Straight piece rate=  $50/25$  units= Rs. 2 per unit

Low piece rate=  $2*(80/100)$ = Rs. 1.6 per unit

High piece rate=  $2*(120/100)$ = Rs. 2.4 per unit

Calculation of Earnings of workers:

A- Under straight piece rate

Units produced \* Rate per unit=  $150*2$ = Rs. 300

B- Under straight piece rate

Units produced \* Rate per unit=  $250*2$ = Rs. 500

A- Under Taylor's differential piece rate

Standard production is 200 units

Actual production is 150 units

Efficiency is BELOW standard

Piece rate= Low piece rate at 80%

Wages=  $150*1.6$ = Rs. 240

B- Under Taylor's differential piece rate

Standard production is 200 units

Actual production is 250 units

Efficiency is ABOVE standard

Piece rate= High piece rate at 120%

Wages=  $250*2.4$ = Rs. 600

### MERRICK'S MULTIPLE PIECE RATE SYSTEM

#### SUM: 4

Calculate the earnings of 3 workers A, B and C under the Merrick's plan using the following information:

Standard prod- 120

A- 90 units

B- 100 units

C- 130 units

Ordinary piece rate- 0.10

#### Solution:

Performance of workers-  $\text{Actual prod}/\text{Standard prod} * 100$

A.  $90/120 * 100 = 75\%$

B.  $100/120 * 100 = 83.33\%$

C.  $130/120 * 100 = 108.33\%$

<83% - ordinary piece rate  
 83-100% - 110% of o p r  
 >100% - 120% of o p r

- A.  $90 \times 0.10 = \text{Rs. } 9$   
 B.  $100 \times 0.10 \times 1.10 = \text{Rs. } 11$   
 C.  $130 \times 0.10 \times 1.20 = \text{Rs. } 15.6$

### GANTT'S TASK AND BONUS PLAN

#### SUM: 5

The following particulars are applicable to a work process:

Time rate- Rs. 5 per hour, 40 hours per week  
 High task- 40 units per week  
 Piece rate above high task- Rs. 6.5 per unit

- A. 35 units  
 B. 40 units  
 C. 41 units  
 D. 52 units

Calculate the wages under Gantt's task and bonus plan.

Output is below standard, guaranteed time wages – Below 100%  
 Output is at standard, time rate + 20% bonus- At 100%  
 Output is above standard, High piece rate- Above 100%

#### Solution:

Level of Performance

- A.  $35/40 \times 100 = 87.5\%$   
 B.  $40/40 \times 100 = 100\%$   
 C.  $41/40 \times 100 = 102.5\%$   
 D.  $52/40 \times 100 = 130\%$

Wages

- A. Below standard, so time wages-  $40 \times 5 = \text{Rs. } 200$   
 B.  $40 \times 5 + 20\% (40 \times 5) = 200 + 40 = \text{Rs. } 240$   
 C. High piece rate-  $41 \times 6.5 = \text{Rs. } 266.5$   
 D.  $52 \times 6.5 = \text{Rs. } 338$

Guaranteed time rate- Re. 1 per hour, 8 hours per day  
 High piece rate- Re. 0.20 per unit  
 Standard output- 10 units per hour-  $10 \times 8 = 80$  units

In a day of 8 hours,

- A. 70 units
- B. 80 units
- C. 90 units

Performance of workers

- A.  $70/80 * 100 = 87.5\%$
- B.  $80/80 * 100 = 100\%$  ( At standard)
- C.  $90/80 * 100 = 112.5\%$

Wages

- A. Time rate-  $8 * 1 = \text{Rs. } 8$
- B.  $8 + 20\% 8 = \text{Rs. } 9.6$
- C.  $90 * 0.20 = \text{Rs. } 18$

### METHODS OF INCENTIVES

**SUM: 6**

From the following particulars, calculate earnings of a worker under:

1. Halsey plan
  2. Rowan plan
  3. Halsey-weir plan.
- Wage rate- Rs. 2 per hour  
 Production per hour- 4 units  
 Dearness allowance- Re. 1 per hour  
 Standard time fixed- 80 hours  
 Actual time taken- 50 hours  
 Production- 250 units

**Solution:**

**Halsey Plan**

$$\text{Earnings} = T * R + (50/100)(S - T) R + D.A$$

$$\begin{aligned} &= 50 * 2 + 0.5(80 - 50) * 2 + 50 * 1 \\ &= 100 + 30 + 50 \\ &= \text{Rs. } 180 \end{aligned}$$

**Rowan Plan**

$$\text{Earnings} = T * R + (S - T) / S * T * R + D.A$$

$$\begin{aligned} &= 50 * 2 + 0.375 * 50 * 2 + 50 * 1 \\ &= 100 + 37.5 + 50 \\ &= \text{Rs. } 187.50 \end{aligned}$$

**Halsey-Weir Plan**

$$\text{Earnings} = T * R + (30/100) (S-T) * R$$

$$= 50 * 2 + 0.3 (30) * 2$$

$$= 100 + 18$$

$$= \text{Rs. } 118$$

**Barth's Variable Sharing Plan**

From the following details, Calculate the earnings of worker under Barth's Variable sharing plan.

Standard time- 25 hours

Actual time- 20 hours

Standard rate per hour- Rs. 12

$$\text{Earnings} = \text{Rate per hour} * \sqrt{\text{Standard time} * \text{Actual time}}$$

$$= 12 * \sqrt{25 * 20}$$

$$= 12 * 22.36$$

$$= \text{Rs. } 268.33$$

**TREATMENT OF OVERTIME AND IDLE TIME****SUM: 7**

Calculate the overtime and idle time wages payable to a workman from the following data:

Days	Hours worked
Monday	8
Tuesday	12
Wednesday	10
Thursday	10
Friday	9
Saturday	4
Total	53

Normal working hours- 8 per day; Normal rate- Re. 0.50 per hour

Overtime rate: Upto 9 hours in a day at single rate and over 9 hours in a day at double rate.

**Solution:**

Days	Total worked hrs	Normal working hrs	Overtime	
			Single rate	Double rate
Mon	8	8	-	
Tue	12	8	1	3
Wed	10	8	1	1



<b>Thu</b>	10	8	1	1
<b>Fri</b>	9	8	1	-
<b>sat</b>	4	8	-	-
<b>Total</b>		48	4	5

Normal working hours –  $48 * 0.50 = \text{Rs. } 24$

Overtime- single rate-  $4 * 0.50 = \text{Rs. } 2$

Double rate=  $5 * 1 = \text{Rs } 5$

Total wages= Rs. 31

### LABOUR TURNOVER

**SUM: 8**

R Company gives the following information:

1. Number of employees in the beginning- 200
2. Number of employees at the end- 240
3. Number of employees resigned- 20
4. Number of employees discharged- 5
5. Number of employees replaced- 18

Calculate labour turnover by applying all three methods.

**Solution:**

**Average number of employees**=(No of workers in the beginning + No of employees in the end) / 2

$$= 200+240 / 2$$

Average no of employees = 220

**Separation method**=( No of employees resigned+discharged) / average no of employees \* 100

$$= 20+ 5 / 220 * 100= 11.36\%$$

**Replacement method**= No of workers replaced / average no of workers \* 100

$$= 18/220 * 100$$

= 8.18%

**Flux method**= no of separations+ no replaced / average employees \* 100

$$= 25+18/220 * 100= 43/220 * 100$$

= 19.54%



## UNIT - 5

### OVERHEADS

#### MEANING & DEFINITION

The indirect cost constitutes the 'overhead' which is the total of indirect material indirect labour and indirect expenses. CMA define an indirect cost as "expenditure on labour materials or services which cannot be economically identified with a specific saleable cost unit"

According to Whelden "overhead may be defined as the cost of indirect material indirect labour and such other expenses including services as cannot conveniently be charged to a specific unit. Alternatively overheads are all the expenses other than direct expenses"

#### IMPORTANCE OF OVERHEAD COST

In these days of rapid technological innovation, heavy expenditure is being incurred on plant modernization which cannot be directly allocated to any particular cost unit because it is incurred as a common cost to all units of production. Overhead requires detailed analysis for ascertaining accurate cost for pricing and control process. Overheads cannot be traced to any particular cost units, but they can be apportioned and absorbed by different methods.

#### CLASSIFICATION OF OVERHEAD COSTS

Cost classification is the process of grouping of costs according to their characteristics and establishing a series of special groups according to which costs are classified. The format refers to determination of various groups according to which are to be classified. The latter refers to the process of actually classifying the costs and accumulating according to the group.

1. Identification of group in which overheads are sub grouped

2. The process of classification of various items of overheads into cost or another of the groups. Determination of classifying groups. The method of classification of overheads depends on nature and size of the business.

(3) The various bases for classification are as under:

(4) Manufacturing overhead

(5) Administration overhead

(6) Selling overhead

(7) Distribution overhead,

### **DISTRIBUTION OVERHEAD**

It is that portion of marketing costs incurred on warehousing saleable product and in delivering product to customers. It includes all expenses incurred from the time product is made in the factory until its destination. The examples of distribution expenses are carriage outward, warehouse staff salaries, warehouse rent, packing required for transport and insurance, etc.

### **RESEARCH & DEVELOPMENT OVERHEAD**

- Fixed overhead costs
- Variable overhead costs
- Semi variable overhead costs
- Cost segregation i.e., Determination of Degree of Variability of Expenses salaries, warehouse rent, packing required for transport and insurance, etc.

### **PRIMARY DISTRIBUTION OF OVERHEADS**

- Primary distribution of overheads is the process of allocating and apportioning the costs on suitable basis to all the departments or cost centers. Primary distribution is done without distinction between production and service departments.

- In order to ascertain the correct cost of cost centres and cost units, suitable cases have to be adopted for allocation and apportionment of overhead. The under mentioned are some of the bases adopted for apportionment of manufacturing overheads.
- Direct allocation Wherever traceable, overheads are to be directly allocated to particular departments. Examples are power, overtime premium of particular departments.
- Labour hours Overheads are apportioned on the basis of direct labour hours of different departments.
- Machine: Overheads are distributed on the basis of machine hours worked in each department indirect material and material handling charges.

## SECONDARY DISTRIBUTION OF OVERHEADS

In the primary distribution of overheads, the overhead expenses are distributed among all the departments or cost centers, whether it is production department or service department.

In fact the production departments are engaged in producing goods whereas service departments assist them in the process of production. Hence ultimately the service department costs need to be spread over the production department and only then the overheads can be charged to production.

This process of apportioning service department expenses among the production departments is called secondary distribution of overheads. In other words, secondary distribution is the reapportionment of service department expenses among the production departments after completion of primary distribution. While making secondary distribution, some common bases of apportionment are taken. The various bases commonly used for this purpose are shown in the following table:

## METHODS OF SECONDARY DISTRIBUTION

There are different methods of reapportionment of service department expenses among production departments. These are depicted in the following figure: 11.6.1 Direct Redistribution Method

In this method the costs of service departments are apportioned directly to the existing production departments. Even though there are other service departments in the same organization, costs of one service department is not apportioned to other service departments. By adopting this practice the services rendered by one service department to other service departments are ignored. The following examples will make it clear.

**Note:** (i) The amount within brackets indicates negative sign.

(ii) The basis for apportionment of General Overheads is direct labour wages.

## STEP METHOD

The defect of the direct redistribution method by ignoring the service rendered by one service department to other service departments is removed in this method.

In this method the services rendered by one service department to other service departments is considered while making apportionment. But one important aspect of this method is that a service department which renders service to another service department does not receive any services from the later. For example, there are three service departments 'X', 'Y' and 'Z'.

The service department 'X' shall render services to 'Y' and 'Z', but shall not receive any services from them. Similarly Service Department 'Y' shall render service to 'Z' but shall not receive any service from 'Z'. Service Department 'Z' shall not render any service to either 'X' or 'Y' under such situation step distribution method of apportionment can be applicable.

Under this method the expenses of the most serviceable department is first apportioned to other service departments and production departments. Then the next service department is taken up for apportionment. This process shall continue till the last service department is apportioned only to the production departments.

## RECIPROCAL SERVICE METHOD

In the step method we noticed one defect that is the service department rendering services to other service departments does not receive any services from them. But very often we come across service a department which not only render services to other service departments but also receives services from them.

In other words, the services are rendered on reciprocal basis. For example, canteen as a service department renders services, to the employees of maintenance department. Hence cost of canteen must be apportioned to maintenance department. Now the maintenance department also renders services to the canteen and hence a part of its cost must be apportioned to canteen.

This method of reapportionment is known as 'Reciprocal Service Method'. Here one thing must be remembered that the calculations become very complicated if we consider more than two service departments. Hence for all practical purpose we have taken two service departments while reapportioning under reciprocal service methods.

There are three methods of reapportionment of overheads under reciprocal service method. These are:

- i. Simultaneous Equation Method
- ii. Repeated Redistribution Method

### iii. Trial and Error Method

#### (i) Simultaneous Equation Method

Under this method simultaneous equations are developed and solved to ascertain the overhead costs of each service department. These overhead costs are then redistributed to production departments on the basis of given percentage. The application of this method is explained through the following illustration:

#### (ii) Repeated Redistribution Method

Under repeated redistribution method, first of all, the total overhead costs as per primary distribution are written below the respective departments. Then as per the percentage given for distribution of service department costs, the apportionment is made to production as well as service departments.

This distribution process is repeated for the service departments one after the other till the amount to be apportioned becomes very small to matter. Finally very small amounts apportioned to the service departments are ignored. Since the service department expenses are repeatedly distributed among all departments the method is known as repeated redistribution method.

This method has an added advantage that even if the number of service departments is more than two, the reapportionment can be done conveniently. For a better understanding the following illustration is given:

#### (iii) Trial and Error Method

This method is similar to the repeated redistribution method in many respects. Under this method the cost of service departments are apportioned only to the service departments in a repeated manner to find out the total cost of respective service departments.

After obtaining the total cost of each service departments, the secondary distribution is made as per the given percentages, which is almost similar to that of simultaneous equation method. The following illustration will explain this method.

### **UNDER ABSORPTION AND OVER ABSORPTION OF OVERHEADS**

When a company uses standard costing, it derives a standard amount of overhead cost that should be incurred in an accounting period, and applies it to cost objects (usually produced goods). If the actual amount of overhead turns out to be different from the standard amount of overhead, then the overhead is said to be either under absorbed or over absorbed. If overhead is under absorbed, this means that more actual overhead costs were incurred than expected, with the difference being charged to expense as incurred. This usually means that the recognition of expense is accelerated into the current period, so that the amount of profit recognized declines.

If overhead is over absorbed, this means that fewer actual overhead costs were incurred than expected, so that more cost is applied to cost objects than were actually incurred. This means that the recognition of expense is reduced in the current period, which increases profits. For example, if the overhead rate is predetermined to be \$20 per direct labor hour consumed, but the actual amount should have been \$18 per hour, then the \$2 difference is considered to be over absorbed overhead.

### **REASONS FOR OVERHEAD UNDER ABSORPTION AND OVER ABSORPTION**

- There can be several reasons for overhead under absorption or over absorption, including:
- The amount of overhead incurred is not the same as the amount expected.
- The basis upon which overhead is applied is in an amount different than expected. For example, if there is \$100,000 of standard overhead to be applied and 2,000 hours of direct labor expected to be incurred in the period, then the overhead application rate is set at \$50 per hour. However, if the number of hours actually incurred is only 1,900 hours, then the \$5,000 of overhead associated with the missing 100 hours will not be applied.
- There may be seasonal differences in the amount of overhead actually incurred or in the basis of application, versus a standard rate that is based on a longer-term average.
- The basis of allocation may be incorrect, perhaps due to a data entry or calculation error.

### **HOW TO DEAL WITH OVERHEAD UNDER ABSORPTION OR OVER ABSORPTION**

When under or over absorption is encountered, it is normally dealt with in one of the following ways:

- The difference (either positive or negative) is charged to the cost of goods sold at once.
- The difference (either positive or negative) is applied to the relevant cost objects.
- The first approach is easier to accomplish, but less precise. Consequently, an immediate write-off is usually limited to smaller variances, while the latter method is used for larger variances.
- The entire issue of overhead absorption can be reduced by using just-in-time systems to reduce the amount of inventory on hand at the end of an accounting period. By doing so, a case can be made to charge all overhead costs to expense as incurred.

## ABSORPTION OF OVERHEAD

The last step is the process of accounting for manufacturing overhead is 'Absorption' of the overhead. The process of charging the overhead cost of a cost center to the cost units is called overhead absorption.

According to I.C.M.A, overhead absorption is "the allotment of overhead to cost units by means of rates separately calculated for each cost center." The terms 'overhead absorption', 'recovery', 'charge' and 'application of overheads' are used interchangeably. Allotment of overhead to cost units is of great importance as each unit of output should share a reasonable portion of overhead, besides bearing the cost of direct material and wages. Overhead absorption is accomplished by overhead rates.

### OVERHEAD RATES

Absorption of overheads is the 'charging' of overheads of a department or a cost center to the cost units which pass through the department or cost center. In order to equitably charge the overhead expenses to cost units a suitable base must be adopted. The base selected is used to calculate a uniform 'Rate' to absorb the overheads which is called 'Absorption rate'. The absorption rate is calculated by dividing the overhead by the units of base selected such as units of production, labour hours, machine hours, etc. The overhead cost of products or jobs is arrived at by multiplying the rate by units of base contained in the job product or process, etc.

### QUESTIONS:

#### SUM: 1

Explain different kinds of overhead absorption rates.

The "X" machine shop has 3 cost centres A, B, C each having distinct set of machines.

	A	B	C	Total
(a) No. of workers	400	400	800	1,600
(b) No. of machine hours	50,000	50,000	60,000	1,60,000
(c) Percentage of H.P.	40	25	35	100
(d) Value of assets (Rs. in lakhs)	20	35	30	85
(e) Direct wages (Rs. in lakhs)	16	20	24	60
(f) Indirect wages (Rs. in lakhs)				18
(g) Supervisory salaries (Rs. in lakhs)				7
(h) Depreciation (Rs. in lakhs)				8.50



(i) Insurance (Rs. in lakhs)	4.25
(j) Electricity charges (Rs. in lakhs)	12
(k) Welfare expenses (Rs. in lakhs)	9
(l) Office and other expenses(Rs. in lakhs)	16

Work out a composite machine hour rate for each of the cost centers.

**Solution:**

**COMPUTATION OF MACHINE HOUR RATE OF COST CENTER**

Particulars	Basis	A	B	C
Indirect wages	Workers	4.5	4.5	9
Superior salary	Workers	1.75	1.75	3.5
Depreciation	Assets	2	3.5	3
Insurance	Assets	1	1.75	1.5
E.B	% of hp	4.8	3	4.2
Welfare expenses	Workers	2.25	2.25	4.5
Office and expense	Direct wages	4.27	5.33	6.4
		<hr/> 20.57	<hr/> 22.08	<hr/> 32.1
Total		50000	50000	60000
Total machinehour		<hr/> 41.14	<hr/> 44.16	<hr/> 53.5
Machine hour rate				

**SUM: 2**

Calculate the machine hour rate for machine A

Cost of machine	—	Rs.16,000
Estimated scrap value	—	Rs.1,000
Effective working life	—	10,000 hours
Running hours for a 4 weekly period	—	160 hours

Average repairs and maintenance for a 4 weekly period – Rs. 120

Average standing charges for a 4 weekly period – Rs.40

Power 4 units per hour at a cost of 25 paise per hour.

**Solution:****MACHINE HOUR RATE**

Particulars	Cost/hour
Standing charges $40 \div 160$	0.25
Machine expenses	
Depreciation	1.5
$16000 - 100$	
<hr/>	
10000	
Repairs $120 \div 160$	0.75
Power $4 \times 0.25$	1
<hr/>	
Machine hour rate	3.5

**SUM: 3**

The following annual charges are incurred in respect of a machine in a shop where no manual labour and work done by 5 machines of same type.

	Rs.
(a) Rent and rates (proportional to floor space occupied) for shop	4,800
(b) Depreciation on each machine	500
(c) Repairs and maintenance for 5 machines	1,000
(d) Power (as per meter) at 5p per unit for shop	3,000
(e) Electric charges for light in shop	540
(f) Attendants : 2 for 5 machines and each paid Rs. 60 per month.	
(g) For the 5 machines, there is 1 supervisor paid at Rs. 250 p.m	
(h) Sundry supplies - lubricants, jute etc., for the shop	450
(i) Hire purchase instalment payable for machine (including Rs. 300 as interest) 1,200	

The machine uses 10 units of power per hour. Calculate machine hour rate.

**Solution:**

**COMPUTATION OF MACHINE HOUR RATE**

Particulars	Rs	Rs
Rent and rates 4800×1	960	
_____		
5		
Lighting charges 540 ×1	108	
_____		
5		
Attendant salary 1440×1	288	
_____		
5		
Supervision 3000×1	600	
_____		
5		
Sundry supplies 4500×1	90	
_____		
5		
Standing charges/year	2046	
Hour rate /machine	1200	1.705
Machine expenses		
Depreciation 500÷1200		0.4167
Repairs 200÷1200		0.1666
Power		0.5
Comprehensive machine hour rate		2.7884

**Working notes**

Total amount of power=rs 3000

Rate/hour=rs.050

Total working hour= $\frac{3000}{5}$ =6000hrs

0.5

Hours/machine= $\frac{6000}{5}$ =1200hrs

5

**SUM: 4**

A company has three production departments and two service departments. The expenses of the departments for a particular period are given below :

**Production departments :**

A – Rs.6,300 ;      B – Rs.7,400 ;      C – Rs.2,800

**Service departments :**

X – Rs.4,500 ;      Y – Rs.2,000

It was decided to apportion the service departments expenses as follows :

Production depts	Service depts				
Service depts : A	B	C	X	Y	
X	40%	30%	20%	–	10%
Y	30%	30%	20%	20%	–

**Solution:**

**SECONDARY OVERHEAD DISTRIBUTION**

Particulars	A	B	C	X	Y
Primary distribution	6300	7400	2800	4500	2000
X- 40:30:20:10	<u>1800</u>	<u>1350</u>	<u>900</u>	<u>4500</u>	<u>450</u>
Y- 30:30:20:20	8100	8750	3700	-----	2450

X- 40:30:20:10	<u>735</u>	<u>735</u>	<u>490</u>	<u>490</u>	<u>(2450)</u>
	8835	9485	490	490	-----
Y- 40:30:20:10	<u>196</u>	<u>147</u>	<u>98</u>	<u>(490)</u>	<u>49</u>
	9031	9632	4288	---	49
X- 40:30:20:10	<u>15</u>	<u>14</u>	<u>10</u>	<u>10</u>	<u>(49)</u>
	9046	9646	4298	10	----
	<u>4</u>	<u>4</u>	<u>2</u>	<u>(10)</u>	<u>----</u>
	9050	9650	4300	---	-----

**SUM: 5**

A company has three production departments and two service departments. Overheads distribution summary is as follows:

Production Departments:

A                      Rs. 13,600

B                      Rs. 14,700

C                      Rs. 12,800

Service Departments:

X                      Rs. 9,000

Y                      Rs. 3,000

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

A      B      C      X      Y

Dept. X      40%   30%   20%   –      10%

Dept. Y      30%   30%   20%   20%   –

Apportion the cost of service departments by using the repeated distribution method.

**Solution:**

**SECOND OVERHEAD DISTRIBUTION**

Particulars	A	B	C	X	Y
Primary distribution	13600	14700	12800	9000	3000
X- 40:30:20:20	3600	2700	1800	(9000)	900
Y- 30:30:20:20	17200	17400	14600	----	3900
	1170	1170	780	780	(3900)
X- 40:30:20:20	18370	18570	15380	780	---
	312	234	156	(780)	78
Y- 30:30:20:20	1018682	18804	15536	----	78
	23	24	16	15	(78)
X- 40:30:20:10	18705	18828	15552	15	----
Total					

overhead	7	5	3	(15)	-----
	18712	18833	15553	---	---

**SUM: 6**

Kannan industries Ltd., has four departments. A,B and C are production departments and D is the service department. The actual expenses for a month were as follows:

	Rs.		Rs.
Rent	10,000	Supervision	15,000
Repairs to plant	6,000	Insurance of stock	5,000
Depreciation	4,500	Power	9,000
Lighting charges	1,000		
Employer's liability for insurance		Rs. 1,500	

**The following information is also available:**

	Dept A	Dept B	Dept C	Dept D
Area (sq. feet)	1,500	1,100	900	500
Number of lights	75	11	9	5
Number of employees	200	150	100	50
Total wages (Rs)	60,000	40,000	30,000	20,000
Value of plant(Rs)	2,40,000	1,80,000	1,20,000	60,000
Value of stock(Rs)	1,50,000	90,000	60,000	—

Apportion the costs to four departments on the most equitable method.

**Solution:****PRIMARY DISTRIBUTION OF O/H**

Particulars	Basics	A	B	C	D	Total
Rent	Area	3750	2750	2250	1250	10000
Depreciation	Plant	1800	1350	900	450	4500
Repairs of plant	Plant	2400	1800	1200	600	6000
Lighting	No of-lights	750	110	90	50	1000
Supervisory Employees	No of-	6000	4500	3000	1500	15000
Fireinsurance	Value of-Stocks	2500	1500	1000	—	5000
Power	Plant	3600	2700	1800	900	9000
Insurance	Employees	600	450	300	150	1500
Wages	Direct	—	—	—	20000	20000
Total-overhead		21400	15160	10540	24900	72000

**SUM: 7**

Kannan industries Ltd., has four departments. A,B and C are production departments and D is the service department. The actual expenses for a month were as follows:

	Rs.		Rs.
Rent	6,000	Supervision	9,000
Repairs to plant	3,600	Insurance of stock	3,000
Depreciation	2,700	Power	5,400



Lighting charges 600

Employer's liability for insurance Rs. 900

**The following information is also available:**

	Dept A	Dept B	Dept C	Dept D
Area (sq. feet)	300	220	180	100
No. of workers	48	32	24	16
Number of employees	200	150	100	50
Total wages (Rs)	8,000	6,000	4,000	2,000
Value of plant (Rs)	24,000	18,000	12,000	6,000
Value of stock (Rs)	15,000	9,000	6,000	—

Apportion the costs to four departments on the most equitable method.

**Solution:**

**PRIMARY DISTRIBUTION OF O/H**

Particulars	Basis	Total	A	B	C	D
Rent	Area	6000	2250	1650	1350	750
Repairs	Plant	3600	1440	1080	720	360
Depreciation	Plant	2700	1080	810	540	270
Lighting-charges	Area	600	225	165	135	75
Supervision	Employees	9000	3600	2400	1800	1200
Insurance-On stock	Stock	3000	1500	900	600	—
Power	Plant	5400	2160	1620	1080	540
Employees-Insurance	Employees	900	360	240	180	120

Wages						
	Direct	2000	-	-	-	2000
Total-overhead		33200	12615	8865	6405	5315

