



**F.Y.B.COM.
(ACCOUNTING & FINANCE)
ELECTIVE COURSE (EC)
SEMESTER - I**

**COST ACCOUNTING -
INTRODUCTION AND
ELEMENTS OF COST - I**

SUBJECT CODE : UA&FFSI.2

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Revised Syllabus of the Courses of F.Y.B.Com.
(Accounting and Finance)
Effective Courses (EC)
Cost Accounting - Introduction and Basic Concepts
SEMESTER - I
Modules at a Glance

Sr. No.	Modules
1.	Introduction of Cost Accounting
2.	Material Cost
3.	Labour Cost
4.	Overheads

Sr. No.	Modules / Units
1.	<p>Introduction of Cost Accounting</p> <p>a) Objectives and scope of Cost Accounting</p> <p>b) Cost centres and Cost units</p> <p>c) Cost classification for stock valuation, Profit measurement, Decision making and control</p> <p>d) Coding systems</p> <p>e) Elements of Cost</p> <p>f) Cost behaviour pattern, Separating the components of semi-variable costs</p>
2.	<p>Material Cost</p> <p>(i) Procurement procedures—Store procedures and documentation in respect of receipts and issue of stock, Stock verification</p> <p>Inventory control —Techniques of fixing of minimum, maximum and reorder levels, Economic Order Quantity, ABC classification; Stocktaking and perpetual inventory</p> <p>(i) Inventory accounting</p> <p>Simple practical problems based on</p> <p>Calculation of EOQ</p> <p>Raw Material Turnover ratio</p> <p>Preparation of stock ledger and pricing of material cost based on FIFO and Weighted average cost and valuation of inventory</p>
3.	<p>Labour Cost</p> <p>(i) Attendance and payroll procedures, Overview of statutory requirements, Overtime, Idle time and Incentives</p> <p>(ii) Labour turnover</p> <p>(iii) Utilisation of labour, Direct and indirect labour, Charging of labour cost, Identifying labour hours with work</p>

	<p>orders or batches or capital jobs</p> <p>(iv) Efficiency rating procedures</p> <p>(v) Remuneration systems and incentive schemes.</p> <p>Simple practical problems based on</p> <p>Preparation of labour cost statement</p> <p>Remuneration and incentive systems based on Piece work plan, Haley Premium Plan, Rowan system, Gantt's Task</p>
4.	<p>Overheads</p> <p>Functional analysis — Factory, Administration, Selling, Distribution, Behavioural analysis — Fixed, Variable, Semi variable cost</p> <p>Simple practical problems on</p> <p>Departmentalization and apportionment of primary overheads,</p> <p>Computation of overhead rates including Machine overhead rates</p> <p>Basic concepts of treatment of over/under absorption of overheads- Direct Labour method and Prime Cost method</p>



INTRODUCTION TO COST ACCOUNTING

Unit structure

- 1.0 Objectives
- 1.1 Evolution
- 1.2 Objectives and Scope of Cost Accounting
- 1.3 Importance and Advantages of Cost Accounting
- 1.4 Difference between Cost Accounting and Financial Accounting
- 1.5 Limitations of Financial Accounting
- 1.6 Definitions: Cost, Costing and Cost Accounting
- 1.7 Classification of Cost on Different Bases
- 1.8 Cost Allocation and Apportionment
- 1.9 Coding System
- 1.10 Essentials of Good Costing System
- 1.11 Cost Centre and Units
- 1.12 Elements of Costs
- 1.13 Summary
- 1.14 Exercise

1.0 OBJECTIVES

After studying this unit students will be able to:

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

1.1 EVOLUTION:

Introduction

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

Financial accounting is developed over the time to record, summarise and present the financial transaction or events which can be expressed in terms of money. This function was primarily concerned with record keeping, leading to preparation of Profit and Loss Account and Balance Sheet. The information obtained through financial statements is useful to the Management or Owner in several respects. However, the information provided by financial accounting is not sufficient for several purposes of decision making in many areas such as : determining output level, determining product selection – addition or dropping or changing product combination in the case of multi product company, determining or revising prices of products, whether Profit earned is optimum as compared with competitors and in comparison to earlier years. The need of data for such details lead to the development of Cost Accounting.

The age of the industrial revolution resulted in the first swept of large businesses and organizations. So these organizations were more complex and dynamic. So the origin and evolution of cost accounting can be traced back to the industrial revolution. The idea was to help the businessmen to record and keep a track of their costs and expenses. This is what lead to the invention of what is now the modern cost accounting process in use. The period 1880 AD- 1925 AD saw the development of complex product designs and the emergence of multi activity diversified corporations like Du Pont, General Motors etc. It was during this period that scientific management was developed which led the accountants to convert physical standards into Cost Standards, the latter being used for variance analysis and control. During the World War I and II the social importance of Cost Accounting grew with the growth of each country's defence expenditure. In the absence of competitive markets for most of the material required for war, the governments in several countries placed cost-plus contracts under which the price to be paid was cost of production plus an agreed rate of profit. The reliance on cost estimation by parties to defence contracts continued after World War II.

In addition to the above, the following factors have made accountants to find new techniques to serve the industry:

- (i) Limitations placed on financial accounting
- (ii) Improved cost consciousness
- (iii) Rapid industrial development after industrial revolution and world wars
- (iv) Growing competition among the manufacturers
- (v) To control galloping price rise, the cost of computing the precise cost of product / service
- (vi) To control cost several legislations passed throughout the world and India too such as Essential Commodities Act, Industrial Development and Regulation Act...etc

Due to the above factors, the Cost Accounting has emerged as a specialised discipline from the initial years of 20th century i.e after World War I and II.

1.2 OBJECTIVES AND SCOPE OF COST ACCOUNTING

1.2.1 Objectives of Cost Accounting are as follows:

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

- c) The figures of actual performance are to be compared with the targets to find out the variation.
 - d) Analysing the variance, whether favourable or adverse.
 - e) Immediate action has to be taken in case of adverse variation.
- 7) Optimum Product Mix :** Advise the management in deciding optimum product mix merits and demerits of alternative courses of action viz. make or buy decisions, introduction or Automation mechanization, rationalization, system of production etc.
- 8) Future Policies :** Advise management on future policies regarding Expansion, growth, capital investment, etc.

1.2.2 Scope of Cost Accountancy

The scope of Cost Accountancy is very wide and includes the following:-

- (a) Cost Ascertainment: The main objective of Cost Accounting is to find out the Cost of product/services rendered with reasonable degree of accuracy.
- (b) Cost Accounting: It is the process of Accounting for Cost which begins with recording of expenditure and ends with preparation of statistical data.
- (c) Cost Control: It is the process of regulating the action so as to keep the element of cost within the set parameters.
- (d) Cost Reports: This is the ultimate function of Cost Accounting. These reports are primarily prepared for use by the management at different levels. Cost reports help in planning and control, performance appraisal and managerial decision making.
- (e) Cost Audit: Cost Audit is the verification of correctness of Cost Accounts and check on the adherence to the Cost Accounting plan. Its purpose is not only to ensure the arithmetic accuracy of cost records but also to see the principles and rules have been applied correctly.

To appreciate fully the objectives and scope of Cost Accounting, it would be useful to examine the position of Cost Accounting in the broader field of general accounting and other sciences. i.e Financial Accounting, Management Accounting, Engineering and Service Industry.

1.3 IMPORTANCE AND ADVANTAGES OF COST ACCOUNTING

The importance and advantages of cost accounting are presented below:

1. Helps in controlling cost: Cost accounting helps in controlling cost by applying some techniques such as standard costing and budgetary control.
2. Provides necessary cost information: It provides necessary cost information to the management for planning, implements and controlling.
3. Ascertains the total per unit cost of production: It ascertains the total and per unit cost of production of goods and services that helps to fix the selling prices as well.
4. Introduces cost reduction programs: It helps to introduce and implement different cost reduction programs.
5. Discloses the profitable and non profitable activities: It discloses the profitable and non profitable activities that enable management to decide to eliminate or control unprofitable activities and expand or develop the profitable activities.
6. Provides information for the comparison of cost: It provides reliable data and information which enable the comparison of cost between periods, volume of output, determent and processes.
7. Checks the accuracy of financial accounts: It helps checking the accuracy of financial accounts. This is done by preparing cost reconciliation statement.
8. Helps investing and financial institutions: It is also advantageous to investment and financial institutions since it discloses the profitability and financial position in which they intend to invest.
9. Beneficial to workers: It is beneficial to workers as well since it emphasizes the efficient utilization of labour and scientific systems of wages payment.

1.4 DIFFERENCE BETWEEN COST ACCOUNTING AND FINANCIAL ACCOUNTING

Meaning	The cost accounting system is an accounting system that captures the profitability of different products, processes or projects, etc.	Financial accounting is an accounting system that captures the overall profitability of the company and the financial position of the company and maintains the transparency of business.
Dependency	It is depending on the information provided by financial accounting.	It does not depend on the information provided by cost accounting.

Type of data used	It is used both types of data historical cost and pre-determined cost.	It uses historical cost only.
Objective	The main objective of cost accounting is to find out per unit cost of product, projects, or process.	The main objective of financial accounting is to provide accurate financial results and financial position of the company to external stakeholders.
Estimate	Cost accounting is based on a comparison of estimate and actual data.	Financial accounting records the only actual transaction. There is no place for estimation.
Reporting period	The reporting period of cost accounting is done as per the requirement of management.	The reporting period of financial accounting is at the end of each financial year. The reporting period of financial accounting is usually yearly.
Valuation of inventory	Inventory should be valued at always cost under the cost accounting.	Inventory should be valued at 'cost or market price whichever is less'.
Fixation of the selling price	Cost accounting provides sufficient information which helpful for setting up the selling price of products and services.	Fixation of the selling price is not an objective of financial accounting.
End results	The end result of cost accounting is the cost sheet of the product.	The end result of financial accounting is the income statement (also known as profit and loss account) and the balance sheet of the company.
Users	Users of the information provided by cost accounting are used by only internal management such as	Users of the information provided by financial accounting are used by internal management as well as external users such as

	employees, directors, managers, and supervisors, etc.	shareholders, bankers, suppliers, and customers.
Forecasting	Under cost accounting, forecasting is possible using budgeting techniques.	There is no technique for forecasting.
Mandatory	Cost accounting is not compulsory for all companies. It is applicable to the only big company.	Financial accounting is compulsory for all companies.

1.5 LIMITATIONS OF FINANCIAL ACCOUNTING

1. Historical in Nature: Financial accounting is based upon historical cost method, which means that financial accounting requires recording of the financial transactions at the cost of purchase or acquisition of the product or asset.

It fails to recognize the fact that the product or asset may have a completely different market value as on date. The products or assets may fetch a little value if disposed of at the current date or vice versa.

This limitation ends up providing an inaccurate picture to the user of the financial statement.

2. Overall Profitability: Moving on to the profitability aspect, it is crucial to understand that financial accounting gives financial information on an overall entity basis.

In other words, it provides information concerning the business of the entity as a whole; it does not give financial information per product or department or job.

3. Segmental Reporting: An entity could also be doing business under several different segments. Consequently, the entity earns revenue from these segments and incurs costs to run these businesses.

Financial Accounting does not provide any information or inputs, i.e., the profit margin per segment and the costs specific to those segments, respectively.

Financial accounting fails to consider the fact that all types of businesses have differentiable profit margins and also that each business has a unique requirement of costs under various heads.

Additionally, it becomes a cumbersome process to trace which segment is the most profitable unit and which is the least profit earning or a sick unit.

4. Inflation Impact: Financial accounting requires recording assets on a historical cost basis. The same applies to long term wealth-generating assets as well.

In an economy with relatively high inflation, financial accounting entails risk by not adjusting such assets towards inflation changes, thus exhibiting a not so strong balance sheet of the entity to the extent of these long-term assets.

5. Fixed Period Financial Statements Information: Financial accounting requires the preparation of financial statements for a specific period.

The user may not get a correct view of the financial information by merely referring to the specific period financial statement. Also, the business cash flows vary on account of any sudden changes or the business being seasonal.

Thus, the user will be required to refer to financial reports about different periods along with to get the correct picture of the business.

6. Fraud and Window Dressing: To showcase a powerful financial net worth, the accountant or the management may resort to window dress the financial statements.

In such a scenario, it will be difficult for the user to know this fact, and the user may make the decision based on such financial statements that do not give an accurate and fair view of the state of a business carried on.

7. Non-Financial Aspects: The first and foremost important aspect of financial accounting is that it records only those transactions which can be measured in monetary terms.

It has no scope for the recording transactions, which are, although non-monetary, but have an important effect on running the business.

Factors such as employee efficiency, market competition, laws, and statute governing the business, economic and political scenarios, affect the business operations. However, they find no place in financial accounts of the entity.

8. Intangible Assets: Financial accounting does not recognize many intangible assets. Intangible assets such as brand value, goodwill, and development of new assets find no place in financial statements.

On the contrary, it requires creating a charge towards the expenditure incurred on generating these intangible assets.

This gives a very weak picture of the balance sheet and impacts the net worth of those organizations which are highly invested in assets but low on sales.

It is a major problem for many start-ups being IT-based companies invested heavily in intellectual property.

9. Audit Concerns: Various business entities are working on a small and medium level considering the level of operations of such businesses, and avoiding unnecessary hardships, the audit is not mandatory, provided they fall under the specified category.

This small and medium business, however, does have to prepare financial statements but are simply not required to be audited.

In the absence of an audit, it is not just that they have followed the policies and principles appropriately. Thus, leading to the question of whether the financial statements are reliable?

10. Future's Prediction: The whole financial statements theory is formulated on the historical cost basis and specific to the period as required by statute.

In simple words, all the financial data is based on past transactions and provides no scope for analyzing on what shall be the expected or future viability of the business.

It does not provide any information on the stability or growth aspects of the business in the years to come.

11. Comparability: To compare the financial statements of different companies, the accounting policies followed by the companies must be the same.

However, that's not the case practically, as accounting policies involve the use of judgments and experience, and the same can vary from entity to entity based on different business models and different accountants having unique expertise and competence.

12. Personal Biases: Although the books of accounts are prepared to keep in mind the accounting principles, a lot of these principles require the accountant to use his judgment and experience in practical cases.

Thus, the basis on which the principles have been applied may differ based on the varied experience and competence of the accountant involved in the preparation of the financial statements.

1.6 DEFINITIONS: COST, COSTING AND COST ACCOUNTING

1.6.1 Cost:

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

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

1.6.2 Costing:

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

Therefore costing involves the following steps.

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

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

1.6.3 Cost Accounting:

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

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

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

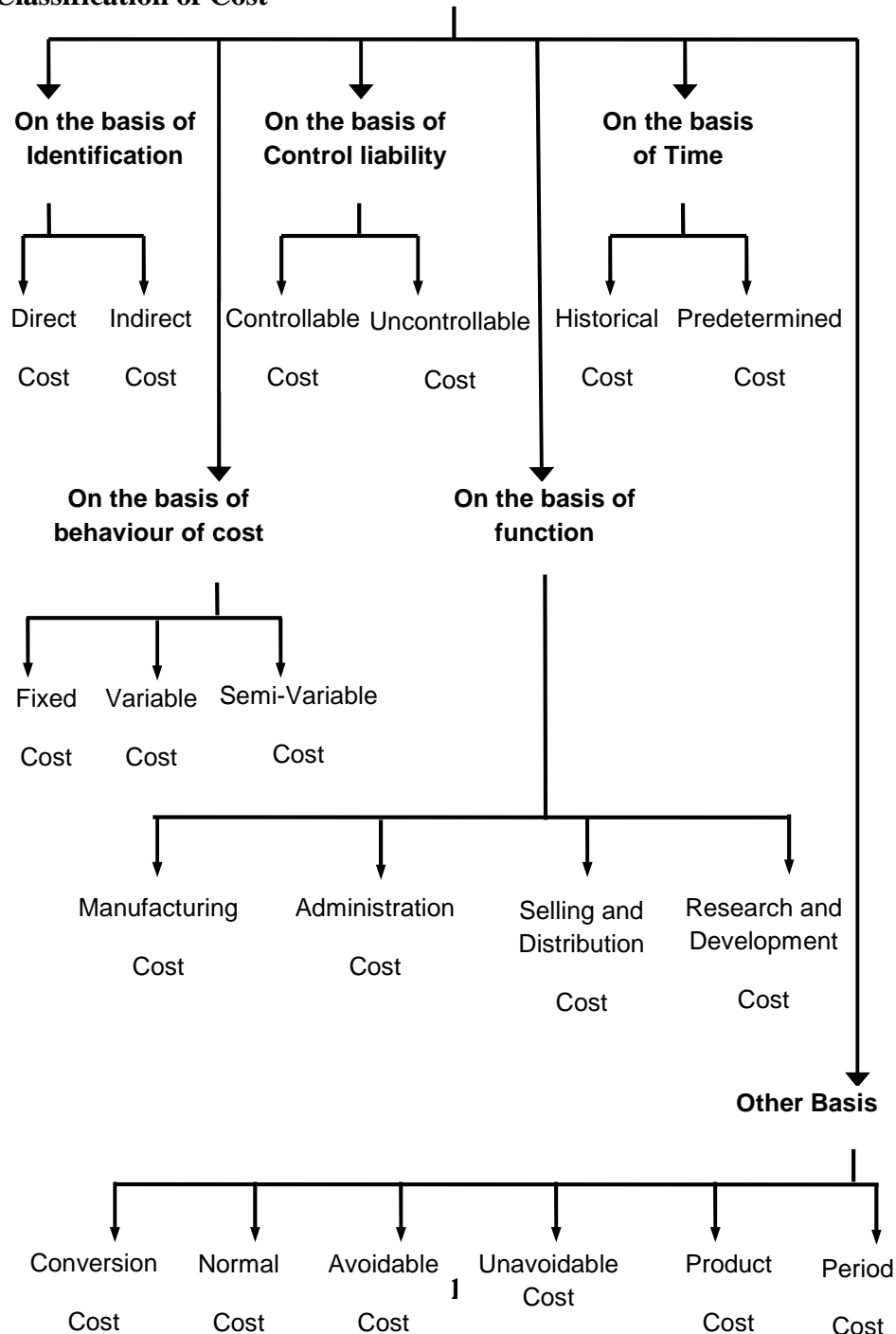
optimum use of scarce resources and ultimately add to the profitability of business.

1.7 CLASSIFICATION OF COST :-

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

Chart showing classification of cost :

Classification of Cost



I On the basis of Identification:

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

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

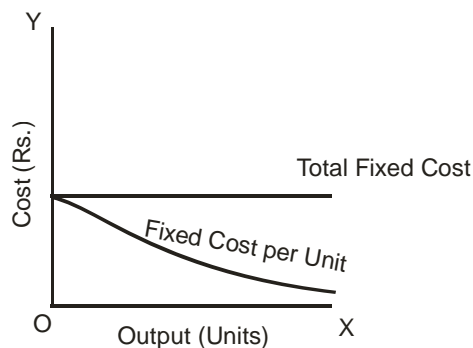
II On the basis of behaviour of Cost

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

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

Characteristics of Fixed Cost are :

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

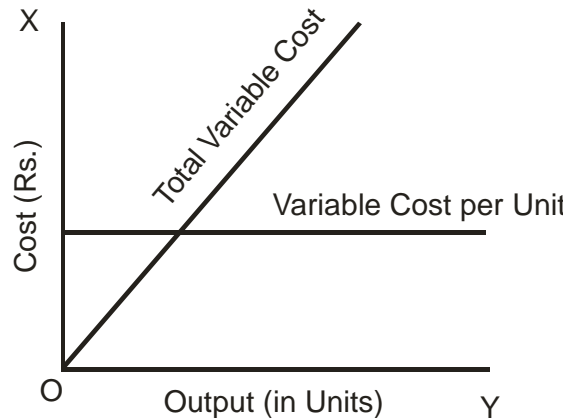


Behaviour of Fixed Cost

- 2) **Variable Cost** : It is that cost which directly vary with the volume of activity. In other words, it is a cost which changes according to the changes in the volume of output. It tends to vary in direct proportion to output. It means when the volume of output increases, total variable cost also increases when the volume of output decreases, total variable cost also decreases. But the variable cost per unit remains same. Direct material, Direct Labour, Direct Expenses are the examples of variable costs.

Characteristics of Variable Cost are :

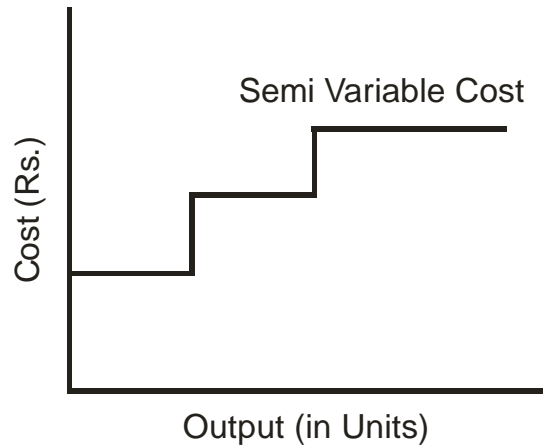
- Total cost changes in direct proportion to the change in total output.
- Cost per unit remains constant.
- It is quite divisible.
- It is identifiable with the individual cost unit.
- Such costs are controlled by functional manager.



Behaviour of Variable Cost

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

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



Behaviour of Semi-Variable Cost

III. On the basis of Controllability

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

- 1) Controllable Cost
 - 2) Uncontrollable Cost
- 1) **Controllable Cost** : These are the costs which can not be influenced or controlled by the concerned cost centre or responsibility centre. These costs may be directly regulated at a given level of management authority.
 - 2) **Uncontrollable Cost** : These are the costs, which can not be influenced or controlled by the action of a specific member of an enterprise. For eg. it is very difficult to control costs like factory rent, managerial salaries etc.

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

IV On the basis of Functions

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

- 1) **Manufacturing Costs** :It is the cost of all items involved in the manufacturing of a product or service. It includes all direct costs and all indirect costs related to the production. It includes cost of direct

materials, direct labour, direct expenses, and overhead expenses related to production. Overhead expenses, means all indirect costs involved in the production process. This is termed as factory overhead or manufacturing overheads. Eg. Salaries of staff for production department, technical supervision, Expenses of stores department, Depreciation of Plant and Machinery, Repairs and maintainance of Factory Building and Machineries etc.

- 2) **Administration Cost :** These are costs incurred for general management of an organisation. It is the cost which is incurred for formulating the policy, directing the organisation of controlling the operations. These are in the nature of indirect costs and are also termed as administrative overhead. Eg. Salaries of Administrative Stall, General Office expenses like rent, lighting, telephone, stationery, postage etc.
- 3) **Selling and Distribution Costs :** Selling costs are the indirect costs relating to selling of products or services. They include all indirect cost in sales management for the organisation. Selling costs include all expenses relating to regular sales and sales promotion activities. Examples of expenses which are included in selling costs are :
- 1) Salaries, Commission and traveling expenses for sales personnel
 - 2) Advertisement cost
 - 3) Legal Expenses for debt realization
 - 4) Market research cost
 - 5) Show room expenses
 - 6) Discount allowed
 - 7) Sample and free gifts
 - 8) Rent on Sales room
 - 9) After sale services

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

- 1) Packing charges
- 2) Loading charges
- 3) Carriage on Sales
- 4) Rent of warehouse
- 5) Insurance and lighting of warehouse
- 6) Transportation costs
- 7) Salaries of godown keeper, driver, packing staff etc.

- 4) **Research and Development Cost :** Research and development costs are incurred to discover new ideas, processes, products by experiment. It includes the cost of the process which begins with the implementation of the decision to produce or improved product.

V On the basis of Time

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

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

VI Other Basis

- 1) **Normal Cost** : Normal cost may be defined as a cost which is normally incurred on expected lines at a given level of output, in the condition in which that level of output is normally attained. This cost is a part of production.
- 2) **Abnormal Cost** : Abnormal cost is that cost which is not normally incurred at a given level of output, in the condition in which that level of output is normally attained. Such cost is over and above the normal cost and is not treated as a part of the cost of production.
- 3) **Avoidable Cost** : The cost which can be avoided under the present conditions is an avoidable cost. These are the costs which under given conditions of performance efficiency should not have been incurred. They are logically associated with some activity and situation and are ascertained by the difference of actual cost with the happening of the situation and the normal cost. Eg. when spoilage occurs in manufacturing in excess of normal limit, the resulting cost of spoilage is avoidable cost.
- 4) **Unavoidable Cost** : The cost which can not be avoidable under the present condition is an unavoidable cost. They are inescapable costs which are essentially to be incurred within the limits or norms provided for. It is the cost that must be incurred under a programme of business restriction.

1.8 COST ALLOCATION AND APPORTIONMENT

Cost Allocation: When items of cost are identifiable directly with some products or departments such costs are charged to such cost centres. This process is known as cost allocation. Wages paid to workers of service

department can be allocated to the particular department. Indirect materials used by a particular department can also be allocated to the department. Cost allocation calls for two basic factors - (i) Concerned department/product should have caused the cost to be incurred, and (ii) exact amount of cost should be computable.

Cost Apportionment: When items of cost cannot directly charge to or accurately identifiable with any cost centres, they are distributed amongst the cost centres on some predetermined basis. This method is known as cost apportionment. Thus we see that items of indirect costs residual to the process of cost allocation are covered by cost apportionment. The predetermination of suitable basis of apportionment is very important and usually following principles are adopted - (i) Service or use (ii) Survey method (iii) Ability to bear. The basis ultimately adopted should ensure an equitable share of common expenses for the cost centres and the basis once adopted should be reviewed at periodic intervals to improve upon the accuracy of apportionment

Basis of difference	Allocation of overheads	Apportionment of overheads
Meaning	Allocation is the process of identification of overheads with cost centers.	Apportionment is done in case of those overhead items which cannot be wholly allocated to a particular department.
Nature of costs	Assignment of particular cost to a particular department or cost center is called as allocation.	These costs are common to various departments and cannot be charged to a particular department or cost center.
Proportions of costs	Allocation deals with whole items of costs.	Apportionment deals with proportions of items of costs.
Basis for apportionment or allocation	No base is required for allocation of cost to a department, it is a direct process.	An equitable base is required for Apportionment of cost to the production or services department.

Applies	When the overhead costs are related to specific or single departments.	When the overhead costs are related to different departments.
Examples	Salary paid to the employees of the maintenance department, can be allocated to that department.	Wages paid to the head of the factory, rent of factory, electricity, etc. cannot be charged to a particular department, and then these can be apportioned amongst various departments.

1.9 CODING SYSTEM

Classification and Codification of Material:

In case of large organizations the number and types of materials used is considerable and unless each item is distinguished and stored separately it would be impossible to find them out when they are required for production or any other operation. It may happen that either one type of material is in excess or another type may be altogether non-existent. It is therefore, essential that a proper system of classification and codification.

Classified into different categories according to their nature or type, viz., mild steel, tool steel, brass, bronze, copper, glass, timber, etc., and then again within such broad classification into rounds; bars, strips; angles, etc. There are two steps in the classification and codification of materials - determination of the number of items, their nature, other characteristics and classification of the items of comparable nature or type into suitable groups or classes.

Various classes of coding are in practice and the common types are stated below:

- (a) Alphabetical Scheme: Alphabets are only used for codification. Like Mild Steel Sheets are coded as MSS.
- (b) Numeric Scheme : In this scheme numerals are used instead of alphabets, For example If steel is given main code of 300 mild steel may be coded as 310 and mild steel sheet may be coded as 311, mild steel bar may be coded as 3112.
- (c) Decimal Scheme: It is similar to the numeric scheme in which the groups are represented by number and digits after the decimal indicate sub-groups of items. For example, where the steel is coded as 3.00

mild steel may be coded as 3.10 and mild steel sheet can be coded as 3.11 and mild sheet bar as 3.12 and so on.

- (d) **Block Scheme:** In this case block of number are allotted for classification of specific groups such as for material classification the block of number 1 to 999 may be reserved, for raw materials; 1000 to 1999 for stores and spares; 2000 to 2999 for finished goods.
- (e) **Combination Scheme :** Here the code structure takes in account both alphabetic and numeric schemes and strikes a balance between the two. Mild steel by coded as MS and the sheets, bars, strips, rounds of mild steel may be coded as MS01, MS02, MS04 and so on. This code is most commonly used because this system has got the advantage of both the alphabetic and numeric systems and is quite flexible in nature.

1.10 ESSENTIALS OF GOOD COSTING SYSTEM

1. Flexibility: A codification system, should last a long time to derive proper benefits from it. It is not something which we change every quarter or every other year. Therefore, the long term requirements of materials for the organization should be kept in mind while providing the digits or alphabets for the items.

2. Precision: The codification system should ensure a unique code for reach item. A proper dictionary or vocabulary for the decoding should be made while installing a codification system. The number of letters or digits should be the same for all items.

3. Brevity: The total number of letters or numbers should not be too large so as it lose its immediate meaning to the user of the material. 7-10 digits or spaces are adequate for many of the coding systems.

4. Comprehensiveness: While classifying and sub classifying the items for coding purposes, the nature of the item, its specifications, its end use and the suppliers etc should all be comprehensively taken into account; and therefore, for the codification system to work, prior consultations with the concerned departments such as the operations department, purchasing department, engineering department and finance department, etc. should be absolutely necessary.

5. Standardization: A good system of codification helps in the standardization of items in the inventory. Standardization consists of reducing the variety of items stocked in the inventory to a workable minimum, by fixing sizes, shapes, dimensions and other quality characteristics of the item. For instance, paint may be bought from a number of suppliers in different sizes of containers and different shades of colour. All of these might blow up the inventory of paints considerably. The same could be reduced if the number of suppliers is cut down, if the variety in the sizes of the containers is reduced and if the number of shades of colour is also reduced.

1.11 COST CENTRE AND COST UNITS:

1.11.1 Cost Centre :

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

• Types of cost centers :

I. Personal Cost Centre :

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

II. Impersonal Cost Centre :

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

III. Operational Cost Centre :

This consists of machines or persons carrying on similar operations.

IV. Process Cost Centre :

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

V. Production Cost Centre :

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

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

VI. Service Cost Centre :

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

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

1.11.2 Cost unit :

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

Few examples of cost unit are given below.

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

CHECK YOUR PROGRESS

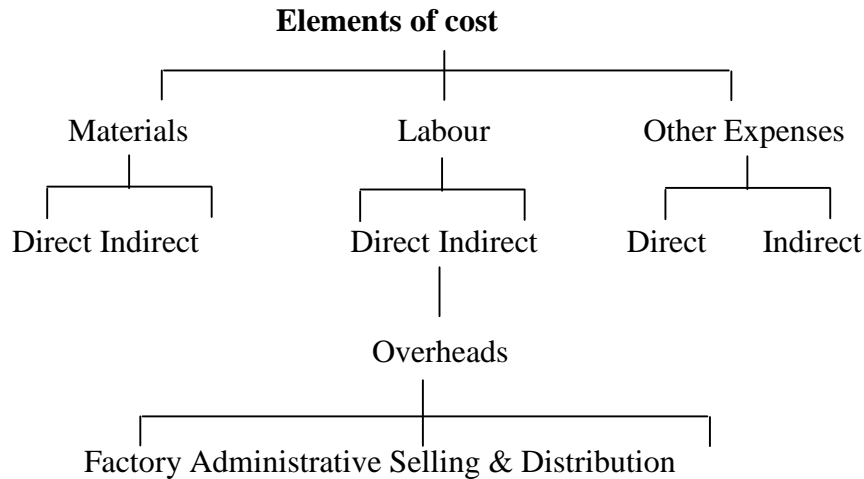
- Draw the chart showing Classification of Cost.
- Define the following terms:
 1. Costing
 2. Cost Accounting
 3. Impersonal cost center
 4. Service Cost center
 5. Direct Cost
 6. Uncontrollable cost
 7. Predetermined cost
- Give Examples:
 1. Fixed cost
 2. Variable cost
 3. Semi variable cost
 4.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

1.12 ELEMENTS OF COST :-

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

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

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



1.12.1 Material Cost

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

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

Examples-

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

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

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

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

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

1.12.2 Labour Cost

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

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

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

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

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

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

1.12.3 Expenses

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

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

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

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

- Indirect expenses / Overheads can be sub-divided into following main groups.

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

Examples :

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

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

Examples:

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

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

Examples :

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

1.13 SUMMARY

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

1.14 EXERCISE

1. What is cost Accounting? What are its objectives?
2. What are the various elements of costs?
3. What is meant by Cost Accounting? Explain in brief different ways of Cost Classification.
4. Write short notes on:
 - a. Cost centers
 - b. Cost units
 - c. Elements of costs
5. Choose the correct alternative
 1. Cost accounting is an important system developed for
 - i) shareholders
 - ii) government
 - iii) **management**
 - iv) financial institutions
 2. The costing which determines cost after it has been actually incurred is
 - i) **historical**
 - ii) standard
 - iii) Estimated
 - iv) marginal
 3. A cost center is a
 - i) **location for which cost is incurred**
 - ii) an organisation
 - iii) a unit of cost
 - iv) profit center
 4. A cost center which is engaged in production activity is called
 - i) **production cost center**
 - ii) process cost center
 - iii) impersonal cost centre
 - iv) production unit
 5. Variable cost per unit remains _____.
 - i) **Constant**
 - ii) flexible
 - iii) (i) & (ii)
 - iv) none of the above

6. Cost which is related to capacity is called :
- | | |
|-----------------|--------------------|
| i) Fixed cost | ii) Capacity cost |
| | none of the |
| iii) Plant cost | iv) above |
7. Cost which is unaffected by the change in output is called as :
- | | |
|----------------------|-----------------------|
| i) Fixed cost | ii) Variable cost |
| iii) Period cost | iv) None of the above |
8. Variable cost per unit remains ____.
- | | |
|--------------------|-----------------------|
| i) Constant | ii) flexible |
| iii) (i) & (ii) | iv) none of the above |
9. Cost which is related to capacity is called :
- | | |
|-----------------|------------------------------|
| i) Fixed cost | ii) Capacity cost |
| iii) Plant cost | iv) none of the above |
10. Cost which is unaffected by the change in output is called as :
- | | |
|----------------------|-----------------------|
| i) Fixed cost | ii) Variable cost |
| iii) Period cost | iv) None of the above |



MATERIAL COST (INVENTORY CONTROL)

Unit structure

- 2.0 Objectives
- 2.1 Material Cost: The Concept
- 2.2 Material Control Procedure
- 2.3 Documentation : Material Requisition
- 2.4 Stock Ledger, Bin Card
- 2.5 Stock Levels
- 2.6 Inventory Control Systems : Economic Order Quantity (EOQ)
- 2.7 Summary
- 2.8 Exercise

2.0 OBJECTIVES

After studying the unit the students will be able to

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

2.1 MATERIAL COST: THE CONCEPT

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

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

2.1.1 Definition of Inventory

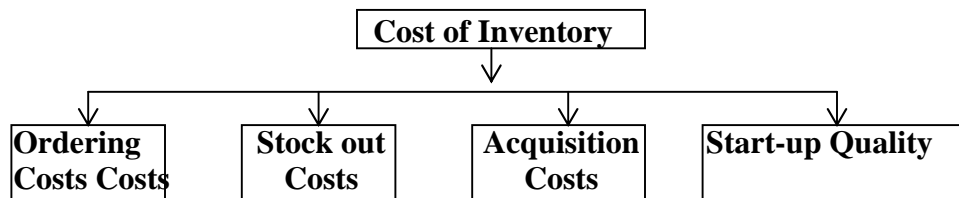
According to **Gordon B. Carson**, inventory includes raw materials and component parts. Inventories consist of raw material, component parts, supplies and finished assemblies which an organisation purchases from an outside source and parts, assemblies and finished products which the company manufactures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

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

2.1.2 COST OF INVENTORY / COST OF MATERIAL

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

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



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

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

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

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

2.1.3 IMPLICATIONS OF HOLDING INVENTORIES :

Certain costs increase with higher levels of inventories. The main implications of holding inventories are as follows :-

1. Carrying Costs : Interest on debt, interest income foregone, warehouse rent, cooling, heating, lighting, cleaning, repairing, protecting, shipping, receiving, materials handling, taxes, insurance, and management are some of the costs incurred to insure, finance, store, handle, and manage larger inventories.

2. Cost of Customer Responsiveness : Large in-process inventories clog production systems. The time required to produce and deliver customer orders is increased, and our ability to respond to changes in customer orders diminishes.

3. Cost of Coordinating Production : Because large inventories clog the production process, more people are needed to unsnarl traffic jams, solve congestion-related production problems, and coordinate schedules.

4. Cost of Return on Investment (ROI) : Inventories are assets, and large inventories reduce return on investment. Reduced return on investment adds to the finance costs of the firm by increasing interest rates on debt and reducing stock prices.

5. Reduced-Capacity Costs : Inventory represents a form of waste. Materials that are ordered, held, and produced before they are needed waste production capacity.

6. Large-Lot Quality Cost : Producing large production lots results in large inventories. On rare occasions, something goes wrong and a large part of a production lot is defective. In such situations, smaller lot sizes can reduce the number of defective products.

7. Cost of Production Problems : Higher in-process inventories camouflage underlying production problems. Problems like machine breakdowns, poor product quality, and material shortages never get solved.

2.2 MATERIAL CONTROL PROCEDURE

There is a purchase department which carries out the function of purchases of materials. The purchase manager is responsible for ensuring the items ordered are of the standard quality, lower cost and received in time.

2.2.1 MATERIAL PURCHASE PROCEDURE

The purchase procedure varies with different business firms. The purchase procedure is given below:

a) Purchase Requisition:

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

b) Purchase order:-

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

c) Receiving and Inspection of materials:

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

d) Approval of Invoices and Payment

Invoice received by the purchase department is forwarded to the Accounts department for payment with their recommendation. Accounts department has to check the authenticity, arithmetical accuracy and G. R. Note in order to make sure that the goods are as per purchase order. When it is found that everything is in order, it is passed for payment by the Accountant. Then the cashier will draw the cheque as per terms and conditions of the purchase order and invoice and finally payment is made to the supplier.

2.2.2 STORAGE OF MATERIALS

After purchase, receipt and inspection of materials, the next important step is storage of materials. It is known as storekeeping. It is physical storage of materials. The storekeeper is appointed to look after this work in the stores department. The storekeeper should have the technical knowledge and experience in stores routine and storekeeping. He has to ensure regular supply event overstocking and under stocking and minimize the cost of materials. The storekeeper has to perform the following functions:

- i) Receipts of materials.
- ii) Issue purchase requisitions.
- iii) Maintain proper record of receipt, issue and balance stock of materials.
- iv) Placing and arranging materials at proper place.
- v) Issue of materials against proper authorization.
- vi) Minimizing storage handling and maintaining costs.
- vii) Ensure that the stock neither exceed maximum level or go below the minimum level.

2.3 DOCUMENTATION

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

2.4 STOCK LEDGER CARDS & BIN CARD

STOCK LEDGER CARD: It is also known as Stores Ledger Cards/ Material Ledger Cards. It refers to tracking the inventory levels in the company during a given period of time. It provides a complete details as to the date, time, value, vendor, types of materials flowing in and out of the company. It is maintained on continuous basis by the cost accountant.

FORMAT OF STOCK/ STORES/ MATERIAL LEDGER ACCOUNT:

STORES LEDGER															
Name of the Article.....										Minimum Qty.					
SymbolUnit.....															
Maximum Qty.															
Bin No.										Previous Year's Consumption.....					
Bin Card No.										Period of Delivery.....					
ORDERED			QUANTITY					AMOUNT						Rate	Remarks
Quantity	Order No. & Date	Date Received	Date	Reference	Receipt	Issue	Balance	Receipt		Issue		Balance			
								₹.	P.	₹.	P.	₹.	P.		
RESERVED															
Quantity	Job No.	Date Issued													

Source: Image downloaded from <https://commerceiety.com/perpetual-inventory-system/>

BIN CARD: It is maintained by the storekeeper providing details where the material is kept ie. The shelf number, the box number with labelling codes. It shows the various quantities of the given material of each type with receipt and issued details. It also refers to sorting of the material into different categories and bins for easy accessibility.

FORMAT OF BIN CARD:

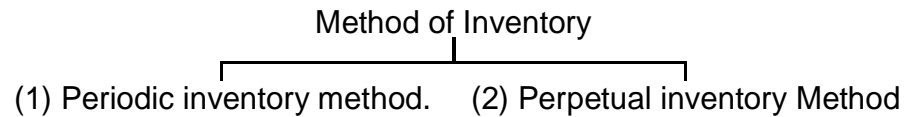
Bin Card						
Material Code:						
Material Description:			Maximum Level:			
Location:			Minimum Level:			
Unit of Measurement:			Reorder Level:			
Date	Doc No.	Received from/Issued to	Receipt	Issue	Balance	Verification with SL Date & Verified by

Source: Image downloaded from <https://commerceiety.com/perpetual-inventory-system/>

NOTE: Stock Ledger Cards are maintained by the cost accountant involving quantity and value both while Bin Card is maintained by storekeeper maintain quantities alone.

2.4.1 METHODS OF STOCK TAKING

Methods of taking inventories / stock



1. Periodic inventory method :

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

2. Perpetual Inventory Method :

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

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

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

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

Difference between Periodic inventory and Perpetual inventory.

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

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

2.5 STOCK LEVELS

Regular availability of required stocks act as a bridge between production and sales department. To ensure the company is neither overstocked or falls under stock at any given point of time maintaining optimum stock level is important. A manufacturing concern maintains three types of stock i.e raw materials, work in process and finished goods

while a trading concern generally deals with stock of finished goods alone. While deciding on the stock levels to be maintained factors such as storage space, cost of inventory, lead time, carrying costs etc too are considered.

The four different stock levels are as follows:

1. **Re-Order Level:** It refers to that level of point where the required stock is reordered. It generally lies between the minimum and maximum stock levels to avoid abnormal situations or stock outs. The formula is as below-

$$\text{Reorder level of stock} = \text{Maximum Re-Order period} \times \text{Maximum Usage}$$

OR

$$\text{Reorder level of stock} = \text{Minimum Level} + (\text{Average rate of consumption} \times \text{Average lead time})$$
2. **Minimum Level:** It refers to that level of stock which needs to be maintained throughout to ensure there are no hindrances in the production process.

$$\text{Minimum Stock Level} = \text{Re-Order Level} - (\text{Average rate of consumption} \times \text{Average lead time})$$

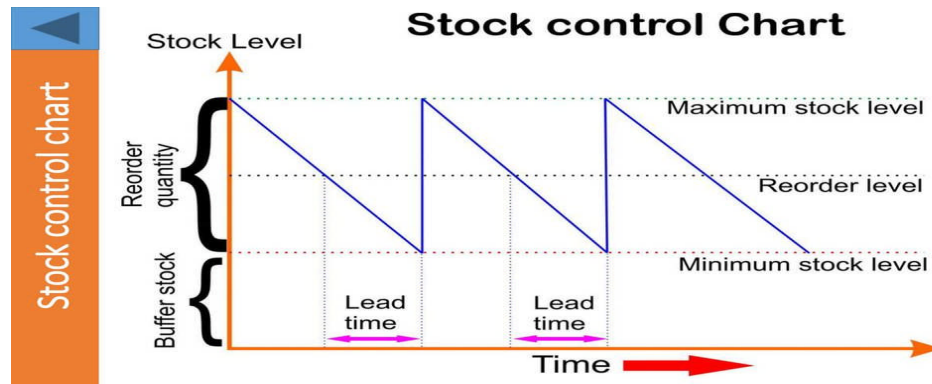
OR

$$\text{Minimum Stock} = \text{Reordering Level} - (\text{Normal Consumption} \times \text{Normal Reordering Period})$$
3. **Maximum Level:** As the name itself suggests it is the maximum level of stock quantity held by the company at the given point of time. It is the upper threshold limit.
$$\text{Maximum Stock Level} = \text{Reordering Level} + \text{Reordering Quantity} - (\text{Minimum Consumption} \times \text{Minimum Reordering period})$$
4. **Danger Level:** It refers to that level below which the quantity of stock should not fall.
$$\text{Danger Level} = \text{Average Consumption} \times \text{Lead time for emergency purchases.}$$
5. **Safety/ Buffer Stock:** It refers to that contingency stock that shall be maintained to meet unwarranted or last minute emergencies.
6. **Lead Time / Re-order Period:** It refers to time gap between placing an order and receiving an order.

Other Terms:

1. Average Consumption:
$$\frac{\text{Minimum Consumption} + \text{Maximum Consumption}}{2}$$
2. Average Lead Time =
$$\frac{\text{Minimum Lead time} + \text{Maximum Lead time}}{2}$$

2.5.1 STOCK CONTROL CHART



Source: <https://resource.cdn.icaai.org/38596bos28170mod1-cp2.pdf>

2.5.2 ILLUSTRATIONS

1. Calculate minimum stock level, maximum stock level, and re-ordering level:

- Maximum Consumption = 450 units per day
- Minimum Consumption = 270 units per day
- Normal Consumption = 285 units per days
- Reorder period = 10-15 days
- Reorder quantity = 3,000 units
- Normal reorder period = 13 days.

Solution:

- Reordering Level = Maximum Consumption x Maximum Reorder period
 $= 450 \text{ units} \times 15 = 6,750 \text{ units}$
- Minimum Stock = Reordering Level – (Normal Consumption x Normal Reordering Period)
 $= 6,750 - (285 \times 13) = 6,750 - 3,705 = 3,045 \text{ units}$
- Maximum Stock Level = Reordering Level + Reorder Quantity – (Minimum Consumption x Reorder period)
 $= 6,750 + 3,000 - (270 \times 10) = 6,750 + 3,000 - 2,700 = 7050 \text{ units.}$

2. Calculate for each component: Minimum Stock Level, Maximum Stock Level, Average Stock.

	Component A	Component B
Normal Usage	35 units per week	30 units per week
Maximum Usage	50 units per week	40 units per week
Minimum Usage	25 units per week	20 units per week
Re-Order quantity	150	100
Re- order Period	4-6 weeks	2-4 Weeks

Solution:

1. Reordering Level = Maximum Consumption x Maximum Reorder period
Component A = 50 units X 6 = 300 units
Component B = 40 units X 4 = 200 units
2. Minimum Stock = Reordering Level – (Normal Consumption x Normal Reordering Period)
Component A = 300 – (35 X 5)* = 125 units
Component B = 200 units - (30 X 3) = 110 units
(Note when normal re-ordering period is not given use average lead time i.e (Minimum lead time + Maximum lead time)/2 i.e. Component A (4+6)/2 = 5 weeks.
3. Maximum Stock Level = Reordering Level + Reorder Quantity – (Minimum Consumption x Reorder period)
Component A = 300 + 150 units – (25 X 5)* = 325 units
Component B = 200 + 100 units - (20 X 3) = 240 units
4. Average Stock = $\frac{\text{Minimum Stock} + \text{Maximum Stock}}{2}$

Component A = (125 + 325)/2 units = 225 units
Component B = (110 + 240)/2 units = 175 units

2.6 INVENTORY CONTROL SYSTEMS OR TECHNIQUES

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

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

A. RE-ORDER POINT (ROP) :

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

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

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

Re-order Level = Maximum usage \times Minimum re-order period.

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

B. ECONOMIC ORDER QUANTITY :

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(a) Where rate of consumption fluctuates very often ordering a fixed quantity may lead to over or under stocking.

(b) Very often, consumption rate cannot be anticipated because of certain unavoidable reasons such as power failure, slackening of customers' demand etc.

(c) Sometimes, estimating of carrying cost and ordering cost in advance is not easy.

C. A.B.C. ANALYSIS:

A most useful guide to devising stock control system is often known as 'Pareto Analysis' (after the name of an Italian Philosopher). The term is also known as ABC analysis because it analyses the range of stock items held into three sectors, known as A, B and C.

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

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

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

1. Selective Control : This approach helps the materials manager to exercise selective control and focus his attention only on a few items when he is concerned with lakhs of store items.

2. Control Inventories : By concentrating on 'A' class items, the materials manager is able to control inventories and show visible results in a short span of item.

3. Obsolete Stocks : By controlling the 'A' items obsolete stocks are automatically pin pointed.

4. Clerical Cost : The system also helps in reducing the clerical cost and better planning and improved inventory turnover.

5. Equal Attention : ABC Analysis has to be resorted to because equal attention to A, B and C items will not be worthwhile and would be very expensive.

D. H.M.L. Techniques :

H.M.L. (High, medium, low) technique is the opposite of ABC concept of selective inventory control technique. It also follows the same procedure of distribution of inventory items by money value. The only difference in the application of ABC (Always Better Control) analysis in H.M.L. technique is that the unit value is the criterion and not the annual consumption value. The items should be listed out in descending order of unit value and management may fix limits for deciding the three categories.

Example : Management may for example decide that all items of the unit value above Rs.500/- will be H items, between Rs.100 to 500 will be M items and below Rs.100 will be L items. On this basis, management may delegate authorities to various subordinate officers to purchase petty cash items. Management may decide that items of the value above a unit value of Rs.500 are H items and may decide that all such items will only be sanctioned by the purchase manager.

E. V.E.D. Classification

V.E.D. is the acronym for vital (V) essential (E) and (D) desirable. This type of classification is mostly applicable in the case of spare parts. Spare parts do not have a materials. The requirements of spare parts are age of machine. Older machines require frequent maintenance and replacement of spare parts. To get over this difficulty, V.E.D. classification is used. Here, the categorisation is made in terms of the importance or critically of the part to the operation of the plant. It is very vital, it is given a V classification and D part. How such a classification is done will depend upon the machinery or equipment involved and one's own experience, case of availability of the items etc. For example, if the item was available off the shelf from the supplier's showroom, there would be no purpose in categorising it as V. If on the other hand, a minor imported item might automatically get a V classification, for V items, a reasonably large quantum of stocks might be necessary, while for D items, no stocks need perhaps be kept, especially if that item also happens to be in the A or B classification. For V items of A classification, close control should be kept on stock levels, but if it is a C item, then large quantities, may be stored.

F. S.D.E. Classification

This classification is used for source items, those which are difficult to obtain and those which are fairly easy to obtain. If an item is scarce it is taken as an A item, we cannot apply the same procedure or yardstick for its stocking. Take for example, an item which is imported. It would be quite absurd for anyone to say that it should be procured once in

six weeks. It would be best to obtain it once in a year, considering the time, effort and expenditure involved in the procedures for import.

A scarce item might be an item which is not easily available in the market and might require source development, or else it might be an item which is very difficult to manufacture or there are only one or two manufactures who have to be given orders several months in advance, and so on.

Let us take an item which is easy to obtain and it is an A item. One can bestow on it all the care required for treatment of A items. But if it is a C item, the inventory controller really does not have to bother very much.

G. G.O.L.F. Classification :

This classification is used for Government-ordinary-local and foreign. There are many imported items which are channelised through the State Trading Corporation, MMTC, Indian Drugs and Pharmaceuticals Ltd., Metals to be followed for procuring such item. As such, ordinary procedures of inventory control may not work in respect of these materials and they would require special treatment.

Items which are available within the country could be treated differently if they were available locally, compared to their being available only in very distant towns or where they have to be specially manufactured. Imported items would be a special class by themselves and have to be accorded a treatment quite unique.

H. F.S.N. Classification

F-S-N Stands for fast-moving, slow-moving and non-moving. This classification comes in very handy when we desire to control obsolescence. Items classified as S and N require very great attention, especially N items. There may be several reasons why an item has got into the N category. There might have been a change in technology or change in the specification of a particular spare part or the item might no longer be in use. When an F.S.N. classification is made, all such information stand out prominently enabling managers to act on the information in the best interests of the organisation.

I.S-O-S Classification

Some of the item required may be seasonal in nature and may require special purchasing and stocking strategies. Many commodities, especially of agricultural origin and seasonal in character, have to be purchased at the best time. One cannot apply E.O.Q. here for example, inventories at the time of procurement will be extremely high but this cannot be helped.

A buying and stocking strategy for seasonal items would depend on a large number of factors and more and more sophistication is taking place in this matter. Operational research techniques would have to be used to obtain optimum results.

J.X-Y-Z Classification

This classification is based on the value of inventory stored. If the values are high, special efforts should be made to reduce them. This exercise can be done once in a year.

The different types of classifications suggested would give an executive a clear idea as to what are the implications and this would give him the necessary clues as to how to act and what decisions to take. It will also be clear that none of these classifications should be used in isolation. A person should take an integrated view and decide the best course that will give the best overall results.

2.6.1 ILLUSTRATIONS (EOQ METHOD)

1. Calculate Economic Order Quantity from the following information.

Also state number of orders to be placed in a year.

Consumption of Material per annum : 20000 kg

Order placing costs per order : Rs. 100

Cost per kg of materials : Rs. 5

Storage Costs : 10% on average inventory

Solution :

Annual Consumption (A) = 20,000 kg

Ordering Cost per order(O) = Rs.100

Carrying Cost (C) = Cost per kg x Carrying Cost %

= Rs. 5 x 10 %

= Rs. 0.50 p.kg.p.a.

$$\begin{aligned} \text{EOQ} &= \frac{\sqrt{2AO}}{C} \\ &= \frac{\sqrt{2 \times 20,000 \times 100}}{0.50} \\ &= 2,828 \text{ units. approx} \end{aligned}$$

2. A manufacturer buys certain equipment from outside suppliers at Rs. 60 per unit. Total annual needs are 2400 units. The following further data are available.

Annual return on investment : 15%

Rent, insurance, taxes per unit per year : Rs. 10

Cost of placing an order : Rs. 200

Determine the Economic Order Quantity

Solution :

A = 2400 units

O = Rs. 200

C = Cost x Carrying Cost % + Other costs per unit

= Rs. (60 x 15 %) + 6

= Rs. 15 p. u. p. a.

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

$$= \frac{\sqrt{2 \times 2400 \times 200}}{15}$$

$$= 252.98 \text{ i.e } 253 \text{ units.}$$

3. Ansemi annual consumption of a materials is 10,000 units at a price of Rs. 40 per unit. The storage cost is 20% on an average inventory and the cost is placing an order is Rs. 20. How much quantity is to be purchased at a time?

Solution :

$$A = 10000 \times 2 = 20000 \text{ units}$$

(since semi – annual consumption is given , the number of units are to be multiplied by 2, in case of quarter requirements multiply by 4, monthly multiply by 12 and weekly multiply by 52)

$$O = \text{Rs. } 20$$

$$C = \text{Cost} \times \text{Carrying Cost \%}$$

$$= \text{Rs. } 40 \times 20 \%$$

$$= \text{Rs. } 8 \text{ p. u. p. a.}$$

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

$$= \frac{\sqrt{2 \times 20000 \times 20}}{8}$$

$$= 100 \text{ units.}$$

4. A company manufactures a special product which requires a component 'GM'. The following particulars are collected for the year 2021 :

Annual Demand of GM : 16,000 units

Cost of placing an order : Rs. 400 per order

Cost per unit of GM : Rs. 600

Carrying cost % p.a.: 12%

The company has been offered a discount of 4% on the purchase price of 'GM', provided the order size is 8,000 components at a time.

Required:

- i) Compute the economic order quantity
- ii) Advise whether the quantity discount offer can be accepted.

Solution :

$$A = 16,000 \text{ units}$$

$$O = \text{Rs. } 400$$

$$C = \text{Cost} \times \text{Carrying Cost \%}$$

$$= \text{Rs. } 600 \times 12 \%$$

$$= \text{Rs. } 72 \text{ p. u. p. a.}$$

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

$$= \frac{\sqrt{2 \times 16000 \times 400}}{72}$$

= 421.63 i.e. 422 units.

Total Costs: Total Purchase Cost + Total Ordering Costs + Total carrying Cost

= (Annual Qty * Cost Per Unit) + (Annual Qty/ Ordering Qty * Cost per Order)

+ (Ordering Qty / 2 * Carrying Cost per unit)

= (16000* 600) + (16000/422 * 400) + (422/2 * 72)

= 96,00,000+ 15165.88 + 15192

= 96,30,358 ----- (I)

(Note at EOQ Level : Total Ordering Costs and Total Carrying Costs are equal. In this illustration due to round off the slight changes are visible.)

Ordering qty = 8000 units

Total Costs: Total Purchase Cost + Total Ordering Costs + Total carrying Cost

= (Annual Qty * Cost Per Unit) + (Annual Qty/ Ordering Qty * Cost per Order)

+ (Ordering Qty / 2 * Carrying Cost per unit)

= (16000* 576) + (16000/8000 * 400) + (8000/2 * (72 – 4%))

= 92,16,000+ 800 + 276480

= 94,93,280 ----- (II)

(Note : When discount is offered on bulk qty purchase the not only purchase price reduces but also the carrying cost changes.

When purchase quantity is other than EOQ level, there is tradeoff between Ordering costs and Carrying Costs.

Evaluating option I & II, the total costs is lower when discount is accepted therefore discount should be accepted.

5.MGM Factory consumes 10,000 units of a component per year. The ordering, receiving and handling costs are Rs. 2 per order while the tracking costs are Rs. 4 per order. Further details are as follows :

Interest cost Rs. 0.25 per unit per year

Deterioration and obsolescence cost Rs. 0.05 per unit per year.

Storage cost Rs. 24,000 per year for 20,000 units.

Calculate the Economic Order Quantity.

Solution :

$$A = 20,000 \text{ units}$$

$$O = \text{Rs. } 2 + \text{Rs. } 4 = \text{Rs. } 6 \text{ per order}$$

(Ordering Receiving and Handling Costs + Tracking Costs)

$$C = 0.25 + 0.05 + 1.2 (24000/20000)$$

$$\begin{aligned} & (\text{Interest Cost} + \text{Deterioration and Obsolescence Costs} + \text{Storage Costs}) \\ & = 1.5 \text{ pu. pa.} \end{aligned}$$

$$\begin{aligned} \text{EOQ} &= \frac{\sqrt{2AO}}{C} \\ &= \frac{\sqrt{2 \times 20,000 \times 6}}{1.5} \\ &= 400 \text{ units.} \end{aligned}$$

2.7 SUMMARY

1. Reorder level of stock = Maximum Re-Order period x Maximum Usage
2. Reorder level of stock = Minimum Level + (Average rate of consumption x Average lead time)
3. Minimum Stock Level = Re-Order Level - (Average rate of consumption x Average lead time)
4. Minimum Stock = Reordering Level – (Normal Consumption x Normal Reordering Period)
5. Maximum Stock Level = Reordering Level + Reordering Quantity – (Minimum Consumption x Minimum Reordering period)
6. Danger Level = Average Consumption x Lead time for emergency purchases.
7. Average Consumption: $\frac{\text{Minimum Consumption} + \text{Maximum Consumption}}{2}$
8. Average Lead Time = $\frac{\text{Minimum Lead time} + \text{Maximum Lead time}}{2}$
9. $\text{EOQ} = \frac{\sqrt{2AO}}{c}$
10. Total Purchase Cost = Annual Qty X Cost Per Unit
11. Total Ordering Costs = Annual Qty / Ordering Qty * Cost per Order
12. Total carrying Cost = Ordering Qty / 2 * Carrying Cost per unit

2.8 QUESTIONS

2.8.1 Answer in Brief

1. Define Inventory and explain the various costs of inventory?
2. What are the selecting techniques of inventory control?
3. What is the significance of Economic Order Quantity?
4. Explain the various stock levels in brief.
5. Write short notes on the following:
(a) Inventory, (b) Inventory control (c) Cost of inventory, (d) ABC analysis

2.8.2 Solve the Following

1. From the following information, calculate
a) Economic order quantity b) Total Annual Costs c) Total Carrying and ordering cost.

a. Semi-Annual consumption -	18,000 units	
b. Purchase price of input unit		Rs. 50
c. Quarterly carrying cost		2%
d. Order cost per order		Rs. 75
2. From the following information, calculate a) Economic order quantity b) Total Annual carrying and ordering cost.

a) Quarterly consumption	250 units
b) Purchase price of input unit	Rs. 100
c) Semi-Annual carrying cost	4%
d) Order cost per order	Rs. 20
3. From the following information, calculate a) Economic order quantity b) Total Annual carrying and ordering cost.

a) Purchase price of input unit –	Rs. 20
b) Annual Carrying Cost	- 7.5%
c) Ordering Cost per order	- Rs. 100
d) Normal Consumption	- 450 units per week.
4. A company manufactures a special product that requires a component 'MGM'. The following particulars are collected for the year 2021 :

a. Annual Demand of GM :	4,500 units
b. Cost of placing an order :	Rs. 100 per order
c. Cost per unit of GM :	Rs. 300
d. Carrying cost % p.a.:	8%

The company has been offered a discount of 5% on the purchase price of 'MGM', provided the order size is 1500 components at a time.

Required:

- Compute the economic order quantity
- Advise whether the quantity discount offer can be accepted.

5. A company manufactures a special product that requires a component 'GM'. The following particulars are collected for the year 2021 :
- Annual Demand of LGM: 48,000 units
 - Cost of placing an order : Rs. 300 per order
 - Cost per unit of L GM: Rs. 200
 - Carrying cost % p.a.: 12%

The company has been offered a discount of 5% on the purchase price of 'LGM', provided the order size is 12,000 components at a time.

Required:

- Compute the economic order quantity
- Advise whether the quantity discount offer can be accepted.

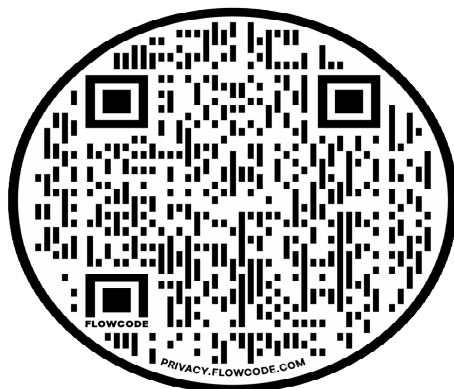
2.8.3 Multiple Choice Question

Sr. No	QUESTION TEXT	A	B	C	D
1	_____ indicates maximum stock to be maintained.	Maximum Level	Minimum Level	Re-Order Level	Danger Level
2	_____ is a periodic statement of wages.	Pay Roll	Pay slip	Job Card	Job Sheet
3	_____ is prepared for individual worker.	Job Card	Pay	Job Sheet	Wages
4	_____ labour cannot be readily identified.	Direct	Indirect	Production	Actual
5	_____ is the application of costing and cost accounting principles, methods and techniques to the art, science	Cost accounting	Cost accountancy	Cost Control	Cost Ascertainment

	and practice of cost control and the ascertainment of profitability.				
6	A cost centre which is engaged in production activity is called	Production cost centre	Process cost centre	Impersonal cost centre	Production unit
7	Cost accounting is a reporting system	Internal	External	Government	Financial
8	Cost ascertainment involves	Ascertainment of cost	Control of cost	Estimation of cost	Fixation of price
9	One of the following is not a costing system	Marginal costing	Uniform costing	Absorption costing	Process costing
10	Product cost means _____	Variable cost	Fixed cost	Prime cost	Indirect cost
11	The resources that have been used for attaining a particular objective is	Revenue	Cost	Profit	Investment
12	Workers who work outside the factory premises are called as _____ works.	Out	Job	Casual	Badli
13	Time is paid by the employer.	Idle Time	Overtime	Normal time	Abnormal time

14	_____ is decided on the basis of ordering cost and carrying cost.	EOQ	Maximum Stock Level	Minimum Stock Level	Average Stock Level
15	A Bill of Material serves the purpose of _____	Purchase order	Material requisition	Purchase requisition	Goods received note
16	A document used for time keeping	Job card	Time card	Daily time sheet	Labour sheet
17	Annual demand=12000 units, Ordering Cost per order=Rs. 45, Carrying cost per annum per unit =Rs. 3. EOQ=_____	6000 units	600 units	12000 units	1200 units
18	Economic order quantity is a tool for controlling _____	Inventory	Price	Machine ry	Cost

For Additional Reference Reading Scan the QR Code Below or visit website :



<https://resource.cdn.icai.org/38596bos28170mod1-cp2.pdf>



LABOUR COST

Unit Structure:

- 3.0 Introduction
- 3.1 Time Keeping
 - 3.1.1 Meaning
 - 3.1.2 Importance
 - 3.1.3 Procedure
- 3.2 Time Booking
 - 3.2.1 Objectives of Time Booking
 - 3.2.2 Methods of Time Booking
- 3.3 Reconciliation of Book Time with attendance Sheet
- 3.4 Piece Workers, Casual Workers and Out Workers

3.0 INTRODUCTION

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

- **Labour Cost is divided into two following categories:**

3.1 DirectLabour Cost:

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

3.2 IndirectLabour Cost:

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

3.1 TIME KEEPING

3.1.1 Meaning:

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

3.1.2 Importance :

The importance of time keeping is a following:

a) Payment of Wages:

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

b) Legal record of attendance / Service:

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

c) Discipline:

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

d) Calculation and Control of Labour Cost:

Time Keeping helps the department of cost while a) Calculating Labour Cost ii) Controlling Labour Cost. It helps in finding the time spent by the worker on work / job. Labour cost allocation to job is possible. Sometimes Labour overheads are also apportioned to each job on the basis of labour hour rate. It helps in fixing the labour hour rate.

3.1.3 Procedure:

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

1) Who Maintains the Time Keeping Records:

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

2) Place of Time Keeping record:

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

3) How Time Keeping records are kept:

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

a) Manual Time Keeping Records:

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

i) Attendance Register:

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

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

ii) Token, Disk or Check Method:

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

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

b) Mechanical / Time clock Method:

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

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

3.2 TIME BOOKING

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

3.2.1 Objectives of Time Booking:-

The objectives of time books are stated below:

i) Full Utilization of Work Time:

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

ii) Ascertainment of Labour Cost:

If facilitates the ascertainment of labour cost of each job of cost centre or each unit. Sometimes overheads are absorbed on the basis of labour hour rate. It helps in fixing the labour rate for absorption of overheads.

iii) Computation of Incentives:

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

iv) Determination of Wage or Bonus:

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

The method of Time booking are as follows:

1) Daily Time Sheet:

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

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

2) Weekly Time Sheet:

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

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

3) Job Cards:

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

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

Preparation of job card becomes burdone some because separate job cards needs to prepare for separate job. It is possible of wrong record information. It is not suitable for which involves last minute alterations.

3.3 RECONCILIATION OF BOOK TIME WITH ATTENDANCE SHEET

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

3.4 PIECE WORKERS, CASUAL WORKERS AND OUT WORKERS

1. Piece Workers:

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

2. Casual Workers:

The workers who works in the organization on in place of absent workers. Commonly these workers are known as substitute or bodies. It need to be taken special care while recording the attendance time and payment of works to such casual workers.

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

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

3. Out Workers:

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

Pay Roll Accounting:

Pay roll accounting is The Part of Accounting which is relating to computation of gross wages and deduction from gross wages for the purpose of wages payable to each employees.

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

Following deductions are allowed as per the payment of wages Act 1963,

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

Pay Slip:

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

Labour Turnover

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

Cost of Labour Turnover:

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

a) Preventive Cost:

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

i) Personal administrative cost:

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

ii) Medical Services:

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

iii) Welfare Services:

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

iv) Miscellaneous Schemes:

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

b) Replacement Cost:

Replacement Cost are the cost which arises due to high labour turnover. It refers to those cost which are associated with replacement. These casts are included for recruitment, training and absorption of new workers. If the work is new, it results into losses, wastages and lower productivity due to inefficiency and lack of experience to new workers.

It means a company will incur very high replacement costs if labour turnover is high.

• Measurement of Labour Turnover / Method of Measurement of Labour Turnover.

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

Following are the methods of Labour Turnover adopted.

1) Separation Method:-

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

Therefore, Labour Turnover Rate= $\frac{\text{Number of separation in a period}}{\text{Average Number of workers during the period}} \times 100$

2) Replacement Method:

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

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

3) Basis of Accession Method:

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

Labour Turnover Rate = Accessions / Average number of workers during the period x

4) Available Separation Method:

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

Therefore, separation should be avoidable and unavoidable. The Labour turnover is calculated by considering the relation of avoidable separation and average working force (workers) during the period.

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

5) Fulxy Method:

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

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

Practical Questions:

Illustration No: 01

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

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

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

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

Solution :

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

a) **Replacement Method:**

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

b) **Separation Method:**

$$\text{Labour Turnover Rate} = \frac{(\text{No. of Workers left} + \text{No. of Workers}) \text{Discharged}}{\text{Average No. of Workers}} \times 100$$

$$\begin{aligned}& \qquad \qquad \qquad (11) \\ &= \frac{40 + 180}{4000} \times 100 \\ &= 4.5\%\end{aligned}$$

c) **Fluxy Method:**

$$\begin{aligned}\text{Labour Turnover Rate} &= \frac{(\text{No. of Seperation} + \text{No. of addition})}{\text{Average No of Wrokers}} \times 100 \\ &= \frac{(220 + 1000)}{4000} \times 100 \\ &= 122 \\ &= 30.5\%\end{aligned}$$

• REMUNERATION SYSTEM / METHODS :

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

a) Time Rate System:

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

$\text{Wages} = \text{Actual time devoted} \times \text{Time Rate}$

This case is suitable in case of the following:

- 1) Where attendance and quality of work are more important than output.
- 2) Where it is difficult to measure quality.
- 3) Where highly skilled and unskilled workers including apprentices and learners.
- 4) Where the work requires close supervision which ensure “fair day’s work”.

Advantages:

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

Disadvantages

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

b) Piece Rate System:

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

$\text{Wages} = \text{Pieces Completed} \times \text{Piece Rate}$

Advantages:

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

Disadvantages

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

c) Incentive Plans

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

• Good Incentive Schemes

Following are the feature of good incentives schemes:

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

a) Wage Payment:

1) High Wage Plan:-

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

2) Measured Day Work:

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

3) Differential Time Rate:

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

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

4) Taylor's Differential Piecework System:

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

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

5) Merick differential Rate System:

Under this method, there is some modification have been taken place of taylor's differential piece rate system. Merick has three rate of

remuneration. First rate is for the beginners, the second for developing workers and third for highly skilled workers.

These piece rate as follows.

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

6) Gantt Task Bonus Plan:

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

Production below Standard	Guaranteed Time Rate (15)
Production Equal to Standard	120% of Normal rate or 20% Bonus of time or Piece Rate
Production above Standard	High Piece Rate or 120% of Piece rate

7) Emerson's Efficiency System:

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

8. Hayne's System:

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

9. Accelerated Premium System:

Under this system, earnings increases with output, infact the earning increases in greater proportion than the increase in production. This

system acts as a strong incentives for skilled workers to earn high wages by increasing output and production beyond standard.

• **INDIVIDUAL BONUS PLANS**

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

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

Methods of Individual Bonus Plan:

1) Halsey Premium Plan:

This plan has been introduced by F.A. Halsey, an American Engineer. Under this method, bonus is paid on the basis of time saved. Bonus is paid at 50% of the line saved.

A worker is assured of time wages if he takes longer time than actual time allowed.

Total wages is calculate by using the following formula.

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

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

2) Halsey Weir Premium Plans:

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

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

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

3) Rowan Premium Plan:

This premium bonus plan was introduced by Mr. James Rowan. It is similar to that of Halsey plan in respective of time saved, but bonus hours are ascertained as the proportion of time taken which the time saved bears to time allowed and they are paid for at the rate.

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

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

4) Barth Variable Sharing Plan:

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

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

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

Illustration : 2

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

Normal Rate per hour –Rs 1.80
Standard Time per unit = 20 seconds
Differentials to be applied are:
80 % of Piece rate below the standard,
120% of the Piece rate above standard.

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

Solution:

Basic Calculations:

Pieces per minute = $60/20 = 3$ minutes
Unit per hour = $60 \times 3 = 180$ units
Normal Piece Rate = $\text{Rs } 1.80/180 \text{ units} = \text{Rs } 0.01$
Standard Production in actual time = $8 \text{ hrs} \times 180 \text{ units} = 1440 \text{ Units}$.

Earnings under Straight Piece Rate:

Earnings of A = $1400 \text{ units} \times \text{Rs } 0.01 = \text{Rs } 14$
Earnings of B = $1800 \text{ units} \times \text{Rs } 0.01 = \text{Rs } 18$

Earnings under Taylor's Differential Piece Rate

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

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

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

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

Illustration : 3

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

(18)

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

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

Solution:

Rate = R = 2/8 Hrs. = 0.25 Paise

Statement Showing Earnings of A Worker.

Particulars	Rs	Rs
1) Amount to be paid to Job No. 248.		
Wages = $T \times R + \frac{S - T}{S} \times T \times R$		
$= 20 \times 0.25 + \frac{25 - 20}{25} \times 20 \times 0.25$		
$= 5 + 0.2 \times 5$	6.00	
$= 5 + 1$		
DA = $12 \times \frac{25}{55}$	5.45	11.45
2) Amount to be paid to Job No.248		
Wages = $T \times R + \frac{S - T}{S} \times T \times R$		
$= 20 \times 0.25 + \frac{30 - 20}{30} \times 20 \times 0.25$		
$= 5 + 0.333 \times 5$	6.67	
$= 5 + 1.655$		
DA = $12 \times 25 / 55$	6.55	13.22
3) Idle Time to be paid to overheads.		
Wages 8 hours x 0.25 paise		2.00
Gross Wages of a workers for the week		<u>26.67</u>

Illustration : 4

A workman's wage for a guarantee 44 hours week is Rs0.19 per hour. The estimated time to produce one article is 30 minutes and under

incentive scheme the time allowed is increased by 20%, During one week the workman manufactured two articles.

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

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

Solution:

a) Wages Under Time Rate Method

44 hours x Rs0.19	Rs8.36
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b) Wages Under Piece Rate Method

Estimated Time for on Article - 30 Minute

Time allowed increased by 20%

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

Time allowed for 100 articles at 36 minutes -60 minutes

∴ Wages = 60 hours x Rs 0.19	Rs11.40
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c) Wages Under Rowan Premium Bonus

Wages for 44 hrs @ Rs0.19	Rs 8.36
---------------------------	---------

$(+)\text{ Bonus} = \frac{S-T}{S} \times T \times R = \frac{60-44}{60} \times 44 \times 0.19$	Rs 2.23
---	---------

Where S = Standard Time,

T = Time Taken

R = Rate Per hours

Wages Paable	Rs	10.59
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d) Wages Under Halsey Premium

Wages for 44 hrs x `0.19	Rs8.36
--------------------------	--------

$(+)\text{ Bonus} = \frac{S-T}{2} \times R$ $= \frac{60-44}{2} \times 0.19$	Rs1.52
---	--------

Wages Payable	Rs 9.88
---------------	---------

Illustration : 5

The following are the particulars applicable a process.

Time rate - Rs 8 per hour

High Task - 200 units per week

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

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

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

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

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

b) Actual Output = High Task ie. at Standard

$$\therefore \text{B's Earning} = 40 \text{ hrs} \times \text{Rs } 8 + 20\% \text{ of } (40 \times 8) \\ (21)$$

$$= 320 + 20\% \text{ of } 320$$

$$= 320 + 64 = \underline{\text{Rs } 384/-}$$

c) Actual Output > High Task ie above & Standard

$$\therefore \text{C's earning} = 205 \times \text{Rs } 2.00 = \underline{\text{Rs } 410}$$

Illustration : 6

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

82% efficiency - 5% bonus

90% efficiency - 9% bonus

100% efficiency - 20% bonus

Future increase of 1% for every 1% future every in efficiency. In a 6 days week produced the following:

Mr. A 180 units, Mr. B 164 units Mr. C - 200 units, Mr. D. 210 units.

Calculate the earnings of each workers.

Solution: Earning of workers is as follows:

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

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

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

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

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

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

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

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

Illustration : 7

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

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

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

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

Solution:

Calculation of Earnings and Lost to Company

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

Illustration : 8

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

- | | | |
|----|--|---------------|
| a) | Salary | Rs3,000 P.M. |
| b) | Dearness Allowance | Rs5,250 P.M. |
| c) | Employees Contribution to
P.F. 9 % Salary & DA
ESI 4% of Salary & DA | |
| d) | Bonus 20% of Salary & DA | |
| e) | Other Allowances | Rs28,250 P.M. |
| f) | Medial Allowance | Rs5,000 P.M. |

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

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

Solution:

Company of Labour Cost per hour Earnings of Ajay.

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

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

Illustration : 9

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

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

Solution:

Normal Rate Per Hour = Rs 6.60

Standard Output Per Hour

(1 minute = 1 units) = 60 units

Normal Wage Rate Per Unit =
Rs

6.60/60 units = Rs 1.10 per unit

Standard Out Put = 60 unit is per hour x 8 hrs
= 480 units

a) Efficiency Level

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

b) Straight Piece Rate System

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

c) Multiple Piece Rate:

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

d) Wages Payable to Rs

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

3.5 EXERCISES

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

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

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

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

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

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

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

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

Standard production per hour – 8 units

Standard working hours-7

Normal rate per hour-Rs 1.50

Madhavi produced 35 units, Ram produced 45 units and Prasad produced 60 units.

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

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

4) Calculate earnings of workers of Nilesh and Suresh under Taylor's Differential Piece Rate System:

Standard Time – one hour 125 units.

Normal Rate- Rs 10 per hour.

Differential Piece Rate:

- i) 80 % piece rate below standard.
- ii) 120% of piece rate at or above standard.

In a day of 6 hours Nilesh produced 800 units and Suresh produced 990 units.

(Ans : Nilesh- Rs 51.20 and Suresh-Rs 95.04)

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

Particulars	Rs
i) Basic pay	2,500 p.m.
ii) D.A.	4,500 p.m.
iii) Employer's contribution to P. F.	12% of D. A. and salary

- iv) Employer's contribution to ESI 4.75 % of Salary and D.A.
- v) Bonus 20 % of Salary and D.A.
- vi) Other allowance 27,750 p.a.
- vii) Ashok works 2,500 hours out of which 400 hours are normal idle time.
- viii) Find out the effective hourly cost of Ashok.
(Ans Rs. 67.91)

6) From the following information, find out net wages payable in cash and also find out cost of wages for March 2015.

- a) Basic salary p.m. Rs 60,000
 - b) D.A. 100% of basic
 - c) Total amount deposited to P.F. Rs 12,000
 - d) Amenities Rs 4,500
 - e) Employer's contribution to P.F. is equal employee's contribution.
 - f) The ratio of employer's and employee's share in to the contribution to ESI is 2:1.
 - g) Recovery of staff quarter Rent Rs 6,000.
 - i) Recovery of provisions supplied Rs 5,000.
- (Ans : Rs 1,01,500 ; Rs 1,33,000)

7) From the following information prepare statement showing employee cost.

- i) Basic pay Rs 7,00,000.
- ii) Lease rent paid for accommodation provided to an employee Rs 2,00,000, amount recovered from the employees Rs 40,000
- iii) Employer's contribution to P F Rs 75,000.
- iv) Employee's contribution to P F Rs 75,000.
- v) Reimbursement of medical expenses Rs 67,000.
- vi) Hospitalization expenses of employee's family member borne by the Employer Rs 18,000.
- vii) Festival bonus Rs 20,000.
- ix) Festival advance Rs 30,000.

OBJECTIVE QUESTION :

A) Multiple Question:

1. Cost of idle time arising due to non-availability of raw material is -----
 - a) Charged to costing profit & loss A/c
 - b) Charged to factory overheads
 - c) covered by inflating the wage rate
 - d) ignored
2. Wages sheet is prepared by -----
 - a) Time keeping department b) Personnel department
 - c) Pay roll department d) Cost accounting department

3. Time and Motion study is conducted by-----.
 a) Time keeping department b) The personnel department
 c) Engineering department d) Pay roll department
4. Productivity of labour is measured by comparing -----.
 a) Actual time with standard time
 b) Total output with total man hours
 c) Added value for the product with total wages cost
 d) All of the above.
5. Labour turnover is -----.
 a) Productivity of labour b) Change in labour force
 c) Efficiency of labour d) Total cost of labour
6. Idle time is time spent by workers-----.
 a) in factory b) Off their work
 c) on their job d) in office
7. Time wages are paid -----.
 a) on the basis of actual time
 b) on the basis of standard time
 c) on the basis of time saved
 d) on the of overtime
8. Time keeping refers to time spent by the workers -----.
 a) on their job b) in factory
 c) off their job d) without job
9. Difference between attendance time and job time is-----.
 a) overtime b) idle time
 c) standard time d) Actual time
10. Differential piece wages means-----.
 a) Different wages for different level of performance
 b) Different wages for different level time consumed
 c) Different wages for different of workers
 d) Different wages for different types of industries
11. Normal idle time is -----.
 a) can be avoided b) can not be avoided
 c) can be minimized d) can be controlled
12. Labour turn over measured by,
 a) Replacement Method b) Seperation method
 c) Flux method d) All of the above

13. Salary of foremen should classified as,
 - a) Fixed overhead
 - b) Variable method
 - c) Semi-fixed or semi-variable method
 - d) None of the above
14. How many rate are used to calculate wages under Taylor's differential piece rate system
 - a) Two b) Three c) Four d) Five
15. The card which records idle time is
 - a) Idle time Card b) Job Card
 - c) Job Sheet d) I Card
16. Pay roll accounting is concerning with
 - a) Computation of wages b) Appointment of workers
 - c) Termination of workers d) All of the above
17. Labour turnover can be reduced by
 - a) Exit interview b) Better facilities c) Better pay d) All of the above
18. The method if time booking include
 - a) Daily time sheet b) Attendance Register
 - c) Time clock d) None of the above
19. Casual workers work in place of
 - a) Absentees b) Retrenched workers
 - c) Sincere workers d) None of the above
20. Deductions allowed as per payment of wages Act include
 - a) House Rent b) Income Tax
 - c) P.F. Deductions d) All of the above
21. Replacement cost is associated with
 - a) Replacement of labour b) Appoint of labour
 - c) Treminatio0n of labour d) All of the above
22. The met5hod acceptable to labour union is
 - a) Time rate b) Piece rate c0 Rowan rate d) None of the above
23. Over time is paid to the worker who for extra time than -----working hours Specified.
 - a) Extra b) Additional c) Normal d) Idle
24. Travelling time from one job to another job is
 - a) Normal idle time b) Abnormal idle time
 - c) Over time d) None of the above
25. Over time paid due to negligence of a worker is charged to the concerned Worker
 - a) Worker b) Department
 - b) Overheads d) All of the above

(Ans : 1-a, 2-d,3-c, 4-d, 5-b,6-b, 7-a,8-b, 9-b,10-a,11-b 12-d,13-c, 14-b, 15-a, 16-a,17-d,18-a, 19-a, 20-d, 21-a, 22-a, 23-b, 24a, 25-b)

B) Fill in the blanks :

- 1) _____means keeping a record of the attendance of the workers and time spent by them in actual work, idle time, over time, etc. (Time Keeping)
- 2) _____is the time spent beyond the normal working hours which is usually paid at higher rate than the normal time rate. (Over Time)
- 3) If the over time is abnormal, it is debited to_____. (Costing P & L Account)
- 4) Under _____ rate system , worker assured of a stead and regular income. (Time rate)
- 5) Labour in percentage =(Time allowed as per standard/_____) X100. (Time taken)
- 6) Cost of welfare service _____cost. (Preventive)
- 7) Muster roll is kept at the _____of the factory. (Gate)
- 8) Workers who works out side factory premises is called as_____.(Out work)
- 9) Piece workers are paid on the basis of _____. (Piece rate)
- 10) Under _____ plan thrice piece are paid. (Merrick Differencial Piece Rate)
- 11) Under ____ plan bonus is to the workers on the basis of time saved. (Halsey Plan)
- 12) Under piece rate system wages are paid at a _____per unit. (Fixed Rate)
- 13) Over premium increases _____ of plant and machinery. (Depreciation)
- 14) Normal idle time are charged to _____overheads. (Factory)
- 15) Time booking means recording of _____ time.(attendance)
- 16) Cost of normal idle time is charged to _____. (Costing P and L Account)
- 17) In Halsey Plan , a worker gets bonus equal to _____of the time saved. (50%)
- 18) Idle time arises only when workers are paid on _____basis. (Time Rate)
- 19) Under Gantt Task and Bonus Plan, no bonus is payable to worker , if his efficiency is less than _____. (Standard output)
- 20) The formula for computing wages under time rate is _____. (Hours worked x Time taken)

- 21) _____ time is the difference between the time for which the employees are paid and the employees' time booked against the cost object. (Idle)
- 22) _____ helps in the preparation of labour requirement budget. (Efficiency Rate)
- 23) According to _____ plan time rate wages are guaranteed.(Rowan Bonus)
- 24) _____ is the combination of the wages by time rate and wages by piece rate method. (Time and Piece Rate)
- 25) Under _____ method (system),the minimum wages are not guaranteed .(Piece work)

C) True or False

- 1) Overtime wages are to be paid at double the normal wage rate.
- 2) Cost of idle time due to labour strike should be treated as factory overhead.
- 3) In Taylor's Piece Rate Plan, time wages are guaranteed to each worker.
- 4) Earning under Halsey and Rowan plan is the same.
- 5) The cost of labour turnover is recovered through departmental overhead recovery rate.
- 6) Time booking means recording of attendance time.
- 7) Productivity of workers can be improved on if they are supervised closely.
- 8) The wages paid to a worker (joiner) who construct wooden mould for concrete laying on building contract should be as direct labour cost of the contract.
- 9) Labour productivity is automatically improves(increases) when production increases.
- 10) Cost of normal idle time may be treated as production overheads.
- 11) Idle time arises when workers are paid on time basis or pieces basis.
- 12) Increase in production may or may not be accompanied by increase in labour productivity.
- 13) Job evaluation is a comparative appraisal of jobs and of workers.
- 14) Time-cum-job card shows the attendance records as well as effective time work of each.
- 15) Bonus is payable at efficiency of 66 2/3 %.
- 16) Cost of abnormal idle time is transferred to costing profit and loss account.
- 17) Labour turnover may be caused due to low wages.

- 18) Pay roll accounting is concerned with calculation of wages.
 19) The objective of time booking is ascertainment of labour cost.
 20) Overtime premium is always treated as factory overheads.
 21) Tea and lunch break is normal idle time.
 22) Overtime increases depreciation of Plant and Machinery.
 23) Strike and lock out time is abnormal idle time.
 24) Abnormal idle time wages is included in in cost of production.
 25) Machine setting time is abnormal idle time.

(Answer : True – 1,5,6,7,8,10,14,17,18,19,21,22,23:

False-2,3,4,9,11,12,13,15,16,20,24,25)

D) Match the following:

a)

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

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

b)

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

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

c)

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

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



OVERHEADS

Unit Structure :

- 4.1 Introduction
- 4.2 Definition of Overheads
- 4.3 Composition of Overheads
- 4.4 Basis of Apportionment or Distribution of Overheads
- 4.5 Solved Problems

4.1 INTRODUCTION

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

4.2 DEFINITION OF OVERHEADS

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

→ By Blocker and Wellmer.

- b) 'In Cost accounting all indirect, costs are termed as 'Overhead'.

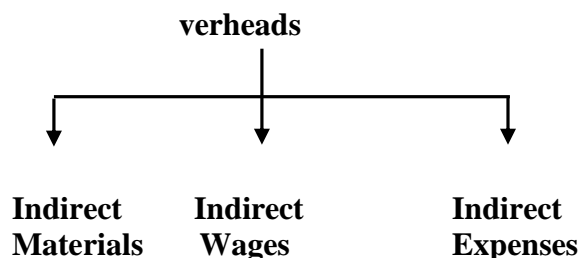
→ By W W.Bigg.

- c) "The Aggregate of Indirect Material Costs, indirect wages (labour cost)and indirect expenses".

→ By The Institute of Cost and Management

Accountants,
London.

01. Composition of Overheads :



1. Overheads - the Concept :

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

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

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

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

2. Codification of Overheads:-

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

For Example -

Turning Department .A1 or A
Grinding Department. A2 or B
Component of Manufacturing - 101
Maintaince - 102

3. Classification of Overheads:-

It means the process of grouping overheads according their common features or characteristics or nature.

It can be classified in the following ways.

- a) On the Basis of Behaviour -
 - Fixed and Variable Overheads
- b) On The Basis of Function -
 - Production Overheads, Selling and Distribution Overheads and Administration Overheads.

This classification is already stated earlier.

3.1 Allocation of Overheads :-

It means Charging of whole items of cost of suitable and identifiable cost centers or cost units. It is the transfer of the cost of a goods or services from primary account to one or more secondary accounts.

3.2 Apportionment of Overheads:-

It is the distribution of cost over several periods of time in proportion to anticipated benefits. It consists of dividing a joint or common cost

between two or more cost objectives. It means distribution of overheads to more than one cost centers on some equitable basis. This also known as 'departmentalisation of overheads'.

3.3 Absorption of Overheads:

It is charging of overheads from cost centers to product or service by means of absorption rate for each cost centre.

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

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

4.4. BASIS OF APPORTIONMENT OR DISTRIBUTION OF OVERHEADS

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

The Table Showing the Apportionment of Overheads.

a)	Overheads Expenses	Basis of Apportionment
1)	Rent, Rates, Taxes, Air Conditioning	Floor Area Occupied
2)	Labour Welfare Exps, Perquisites, Time Keeping, Personnel Office, Supervision	No. of Workers
3)	Compensation to Workers, Holiday Pay ESI and PF Contribution	Direct Wages
4)	Depreciation on P & M, Repair & Maintenance of P & M	Capital Value or Value of Assts
5)	Insurance of Stock	Stock Value
6)	Lighting expenses, electric power	No. of light points or area occupied or material unit or house power of machine or No. of machine hours or value of machine or consumption of unit.
7)	Material landing and store overheads	Weight of materials or volume of material or value of materials or unit of materials

8)	Delivery expenses	Weight, volume or tone mile
9)	Telephone expenses.	No. of Calls or No. of telephone machine
10)	Audit fees	Sales or total cost
11)	Advertising	Actual expenses or % age of sales
12)	Store keeping	Weight or value of materials
13)	Recreation	No. of employees or total wages

b)	Cost of Service Department	Basis of Apportionment
1)	Purchases	No. of purchases or value of purchases
2)	Account	No. of employees or value of purchases
3)	Maintained, repairs of shop, planning & progress, tool room	Direct Labour Hour, Machine Hours, Direct Labour Wages
4)	Canteen & welfare, hospital (medical), dispensary, personal department, time keeping	No. of workers, No. of employees

5)	Computer Section	No. of Card punched, computer hour, specific allocation to departments
6)	Power House (electric lighting cost)	Floor area, cubic content, No. of electric points, wattage
7)	Power House (electric power cost)	Horse power, KWH, Horse Power x Machine Hours KWH x Machine Hours
8)	Store Department	value or weight of material issued
9)	Transport Department	Crane hours, truck hours, truck mileage, truck tonnage, truck non-hours, tonnage handled, No. of packages of standard size.
10)	Fire Protection	Capital value of assets
11)	Inspection / Quality	Inspection labours
12)	Purchase Departments	No. of purchase order, value of purchases

4.4 COMPUTATION OF OVERHEAD RATES

We have seen the methods of apportionment of overheads in the earlier chapter. The next step is to see how overheads are absorbed in the cost of production. Absorption of overheads means recovery of overhead in the cost of production.

It means charging of overheads to cost centers in such a manner that the cost of production of such unit includes an appropriate or equal share of overheads of cost centers.

Overheads Absorption Rates:

The overhead absorption rate is determined for the purpose of absorption of overheads in cost of job, products, etc. There are several methods of determination of overheads absorption rate.

Overhead absorption rate is the relation between amount of overheads and total numbers of units of the base selected.

$$\text{Overhead Absorption Rate} = \frac{\text{Amount of Overheads}}{\text{Quantity or Value Base}}$$

Actual Rate:

Actual Rate is determined by dividing actual overheads incurred during the period by actual quantity or value of base selected.

$$\therefore \text{Actual Rate} = \frac{\text{Actual Overhead Expenses Incurred During the Period}}{\text{Actual Quantity or Value of The Base Related to Production during the period}}$$

Pre - Determined Rate:

This rate is decided on the basis of budgeted overheads and the budgeted base for the certain period.

$$\text{Pre - Determined Rate} = \frac{\text{Budgeted Overhead for The Period}}{\text{Budgeted Base for The Period}}$$

This ratio facilitates calculation of cost in advance and helps while preparing bills promptly. No extra clerical staff is required.

Blanket Rate:

This is the single or general overheads rates applicable to the whole factory. This rate is suitable in those factories where several products pass through many departments.

$$\text{Blanket Rate} = \frac{\text{Overhead Cost for Entire Factory}}{\text{Total Quantum of Base Selected}}$$

Multiple Rate:-

A concern may use multiple overhead rates separately for each producing department, for each service department for each cost centers and for each product line. It is determined where the product lines are varied or machinery is used for varying degrees in different department. It means the incidents of overhead cost each department is different.

This calculated as follows.

$$\text{Multiple Overhead Rate} = \frac{\text{Each Department Cost Centres or Product}}{\text{Corresponding Base}}$$

4.5 METHODS OF ADSORPTION OF OVERHEAD

Following are the various method adapted for absorption of overhead.

1. Machine Hour Rate:

It is the cost of running a machine for one hour. Under this method, machines are used as the basis of overhead absorption rate.

$$\text{Machine Hour Rate} = \frac{\text{Production Overhead}}{\text{Machine Hours}}$$

This method is suitable where major portion of production of goods is performed with the help of machine. Machine Hour Rate facilitates the calculation of correct and reliable cost. Relative efficiencies of Machines can be compared. It helps management to understand the difference between usefulness of machine and Manual Work.

It is not suitable where major work is done by manual labour. It requires detailed record of machines for each job. It is difficult to understand and operate and also difficult to calculate machine hour in advance.

Computation of Machine Hour Rate:

Computation of Machine Hour Rate involves the following:

- i) Consider each machine or a group as a separate cost centre.
- ii) Compute fixed or Standing Charges which vary with line and not with Machine.

Fixed / Standing Charges	Base of Apportionment
a) Rent	Area Occupied
b) Heating & Lighting	No. of Light Point or Floor Area Occupied
c) Supervision Charges	Time devoted by Supervisor
d) Insurance	Insured Value of each Machine
e) Cleaning Materials	No. of Machines
f) Miscellaneous Expenses	Based on the facts

iii) Computation of Machine Hours

a) No. of Effective Working Days	xxx
b) No. of Working Hours Per Day	xxx
c) Total Working Hours (a x b)	xxx
d) Less: No Hours required for machine and repairs	xxx
e) Effective Machine Hours (c - d)	xxx
f) Unproductive setup time	xxx
g) Effective Machine Hours (e - f)	xxx

iv) Standing Charges per hour II / III xxx

v) Running Charges for Each Machine

Running Charges	Base of Apportionment
a) Depreciation	Value / Useful Life
b) Repairs and Maintenance	Machine Hours
c) Power	Meter Reading / HD / Machine Hours
d) Miscellaneous expenses	Equitable basis based on factor.

vi) Hourly Running Charges for each Machine.

$$\text{Hourly Running Charges Per Machine} = \frac{\text{Total Running Charges}}{\text{Machine Hours}}$$

vii) Machine Hour Rate (IV + VI) xxx

Format for Computation of Machine Hour Rate

	✓	✓
A) Standing Charges:		
i) Rent & Rates	xxx	
ii) Heating & Lighting	xxx	
iii) Supervision Charges	xxx	
iv) Insurance	xxx	
v) Miscellaneous Expenses / Overheads	xxx	
	xxx	
Standing Charges Per Hour = $\frac{\text{Standing Charges}}{\text{Effective Machine Hours}}$		xxx
B) Running Charges / Expenses Per Hour		
i) Depreciation		xxx
ii) Power		xxx
iii) Repair & Maintenance		xxx
iv) Consumers & Lubricants		xxx
v) Miscellaneous Expenses		xxx
C) Machine Hour Rate		xxx

2. Labour Hour Rate:

This method is referred to production hour rate method and adopted in those factors where labour prominent. This rate express the relation between the expenses incurred other than wages paid to workers and number of machine hours put by the workers during the period.

$$\text{Labour Rate} = \frac{\text{Budgeted or Actual Overheads(Expenses)}}{\text{Budgeted or Actual Labour Hours}}$$

$$\text{Budgeted Labour Hour} = \left(\begin{array}{l} \text{No - 4 workers} \\ \text{employed during} \\ \text{the period} \end{array} \right) \times \left(\begin{array}{l} \text{No. Hours for} \\ \text{which factor} \\ \text{workes each day} \end{array} \right)$$

3. Percentage of Prime Cost Method:

This method shows relationship between budgeted actual overheads and prime cost. This method is used where standard product requires constant quality of materials and number of labour hour produced.

$$\text{Percentage on Prime Cost} = \frac{\text{Budgeted Actual Overheads}}{\text{Budgeted Prime Cost}} \times 100$$

4. Percentage of Direct Material Cost Method:-

Under this method, the cost of Material consumed in production is considered as base of overhead absorption. This method gives relationship between actual budgeted overheads and budgeted or actual direct materials cost in percentage.

$$\text{Direct Materi Cost Rate} = \frac{\text{Budgeted or Actual Overhead}}{\text{Actual Direct Materials}} \times 100$$

5. Percentage of Direct Labour Method:-

Under this method, Labour Overheads are recovered on the basis of actual rate. This method is useful where production is in uniform nature and all workers are more or less the same hourly rate and Labour is predominant.

$$\text{Direct Labour Rate} = \frac{\text{Factory Overheads}}{\text{Direct Labour}} \times 100$$

6. Combined Machine Hour and Labour Hour Rate:

This method is useful where company having various department in which work is completed by Machine work and Labour work (Manual). This method is used where separate allocation of running charges in not possible and are allocated on the basis of machine labour rate and other expenses, which are not directly related to machines, are allocated on the basis of labour rate.

4.6 UNDER AND OVER ABSORPTION OF OVERHEADS

MEANING

Under absorption of Overhead means the amount of overheads absorbed in production is less than the actual overheads incurred and over absorption of overheads means the overheads absorbed in the production is more than the actual overheads incurred. This is made understand by the following example.

Overheads	Recovered in Costing `	Actual Incurred `	Over/Under Absorption `
Factory Overheads	50,000	75,000	25,000 under
Office Overheads	80,000	60,000	20,000 Over

Over or under absorption may arises due to the following reasons.

- Errors in estimation of overhead expenses.
- Errors in estimation of production level.
- Errors in estimation of machine hours.
- Sudden Changes in method of productive.
- Seasonable changes in overhead expenses.

ACCOUNTING TREATMENT:

Under or over absorption of overheads may be disposed by following any one of the methods stated .

a) Use of Supplementary Rate:

This method is used when the amount of over or under absorption of overheads is quite large and is due to normal circumstances i.e. increase in material piece and labour rate. This can be calculated by the following formula.

$$\text{Supplimentary Rate} = \frac{\text{Amount of Under or Over Obsorting of Overheads}}{\text{Actual Base}}$$

b) Writing Off to Costing Profit and Loss A/c:

This method is used where the amount of under or over absorption of overhead is not large or arises due to abnormal circumstances i.e. defective planning, idle capacity. Under absorbed overhead amount is debited to costing P & L A/c and over absorbed amount of overhead is credited to costing P& L A/c.

c) Carry Forwarded to Next Accounting Period:

Logically this method is not recommended as it is inconsistent with accounting standard. Amount of under absorption of overhead is transferred to debit side of Reserve A/c or Suspense A/c and amount of over absorption of overhead is created to suspense A/c or Reserve A/c.

Illustration:1

Factory Overhead Cost of Four Production Department of ABC Ltd as are as follows .

Depts.	Overheads Rs
P	18,300
Q	4,300
R	4,000
S	1,900

Overheads has been applied as under:

- P - 15000 Machine hour @ Rs 1.50 per hour.
 Q - 3000 Labour Hours @ Rs 1.30 per hour
 R - 80% of Direct Labour Cost of Rs 6,000
 S - 950 Pieces @ Rs 2 per piece

Calculate department wise under or over absorbed overheads.

Solution:

Calculation of Overhead absorbed

- P - 14000 Hrs @ Rs 1.50 per hour = Rs 21,000
 Q - 3000 Labour hours @ Rs 1.30 per L. H. = Rs 3,900
 R - 80% of Rs 6,000 = 6,000 x 80/100 = Rs 4,800
 S - 950 Pieces @ Rs 2 per Piece = 950 x 2 = Rs 1,900

Statement showing under over absorption of overheads.

Departments	Overheads Insured (Actual)	Absorbed Overhead	Absorption	
	Rs	Rs	Under Rs	Over Rs
P	18,300	21,000	-	2,700
Q	4,300	3,900	400	-
R	4,000	4,800	-	800
S	1,900	1,900	-	-

EXERCISE

- Calculate the machine hour rate, from the following particulars.
 Cost of machine - Rs 42,000
 Estimated scrap value - Rs 2,000
 Estimated working life -10 years Of 2,000 hours each
 Running time for a 4 week period -150 hours
 Estimated repairs for life - Rs 10,000
 Standing charges allocated to this machine for a period-Rs 300

Power consumed per hour -5 units @ 10 paise per unit
 Ans : Rs 11.00)

2. Compute the machine hour rate from the following data .

Cost of machine : Rs 1,00,000
 Installation charges : Rs 10,000
 Estimated scrap value after the expiry of its life (15 years) : Rs 5,000
 Rent and rates for the shop per month : Rs 200
 General lighting for the shop per month : Rs 300
 Insurance premium for the machine per annum : Rs 960
 Repairs and maintenance expenses per annum : Rs 1,000
 Power consumption – 10 units per hour : -
 Rate of power per 100 units : 20
 Estimated working hours per annum : 2,200
 (This includes non- setting up time of 200 hrs)
 Shop supervisor's salary per month : Rs 600
 The machine occupies $\frac{1}{4}$ th of the total area of the shop. The supervisor is expected to devote $\frac{1}{6}$ th of time for supervising the machine.

(Ans :Rs 7.83)

3. From the following data of a factory machine room, compute an hourly machine rate, assuming that machine room will work on 90% capacity throughout the year and that a breakdown of 10% is reasonable . There are three days holiday at Deepavali, 2 days at Holi and 2 days Christmas exclusive of holidays. The factory works 8 hours a day and 4 hours on Saturday. Number of Machines (each of the same type) – 40.

Expenses per annum	Rs
Power	3,12,000
Light	64,000
Salaries to foreman	1,20,000
Lubrication oil (Assumed fixed)	6,600
Repairs to machine	1,44,600
Depreciation	78,560

(Delhi University 2006)
 (Ans : 9.00)

Working Notes:

	Hrs
• Total hours (365 X 80)	2,920
Less : Saturday only 4 weeks (52X 4)	208
Sundays holiday (52x8)	416
Holidays on Deepavali, Holi and Christmas (3+2+2)	56
Total	680
 Machine hours worked	 2,240
Less : 10% breakdown (Normal)	224
 Effective Machine Hours per Machine	 2,016

- Total machine hours = Effective machine hours per machine X Number

$$\begin{aligned} & \text{Of machines} \\ & = 2,016 \times 40 \\ & = 80,640 \text{ Hrs.} \end{aligned}$$

4. Compute the machine hour rate from the following details.

Particulars	Rs
Cost of machine	1,00,000
Installation chargers	10,000
Scrap value of machine (10 yrs life)	5,000
Rent and taxes p.m.	2,000
General lighting for the shop p.m.	3,000
Insurance premium for shop per quarter	2,400
Repairs and maintenance p.m.	1,000
Power – 10 units per hour – rate per 100 units	20
Estimated working hours p.a.	2,000
Supervisor's salary p.m.	600
Machine occupies 1/4 th of the shop area and supervisor gives 1/5 th of his time for the looking after the machine.	
(Ans Rs 29.15)	

5. The following information relates to the activities of a production of a factory for a period.

Direct material used Rs. 3,000

Direct wages Rs 7,000

Direct labour worked 12,000 hours (including 2,000 hours on machine)

Overcharged to the department Rs 5,000

For a particular order No. 1.2 carried out in the production department, the relevant data were ;

Direct material used Rs 1,000

Direct wages Rs 1,500

Direct labour worked 240 hours

Calculate the overhead chargeable to Order No. 102 by different cost rates.

Ans Prime cost method- 50%, Direct labour rate Rs - 0.417 per hour,

Direct labour cost method – 71.43%, Machine hour rate-Rs 2.50 per hour

6. The factory overhead cost of four production department of a company engaged in executing job orders, for an accounting year, are as follows :-

Department	Rs
A.	19,800
B.	4,500
C.	4,000
D.	2,000

Overhead has been applied as under :-

- i) Dept. A Rs 3.00 per Machine Hour for 7,000 hours.
- ii) Dept. B Rs 1.30 per Direct labour rate for 3,000 hours.
- iii) Dept. C 70 % of Direct labour cost of Rs 7,000.
- iv) Dept. D Rs 2/- per piece , for 950 pieces.

Find out the amount of department wise Under or Over absorbed factory overheads.

(Dept. A- Over- absorption Rs 1,200 ;

“ B- Under- absorption Rs 600;

“ C- Over- absorption Rs 900;

“ D- Under absorption Rs 100)

4.6 SOLVED PROBLEMS

Illustration : 1

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

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

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

Solution:

Statement Showing Distribution of Overheads

Expenditures	Base	Departments				Total
		A (Rs`)	B (`Rs)	C (Rs`)	S (Rs`)	Rs
Power & Lighting	Given	200	300	360	240	1,100
Supervisor's Salary	% age	600	600	400	400	2,000
Rent	Floor	240	320	240	200	1,000

Welfare	Area No. of Workers Given	270	360	180	90	900
Other Expenses.		200	400	400	200	1,200
Total		1,510	1,980	1,580	1,130	6,200
Allocation of Expenses of Service Dept to Manu. Dept	% age	565	339	226	(1,130)	
		2,075	2,319	1,806	--	6,200

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

2) Total Labour hours in each Dept

Dept A = 200 x 30 Hrs = 6000 Hrs

B = 200 x 40 Hrs = 8000Hrs

C = 200 x 20 Hrs = 4000Hrs

3) Labour Hour Rate For Department

A - $\frac{2075}{6000} = 0.3458$ = Rs0.35 Paise

B - $\frac{2319}{8000} = 0.289$ = Rs0.29 Paise

C - $\frac{1806}{4000} = 0.451$ = Rs0.45 Paise

Illustration : 2

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

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

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

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

Solution:**Statement of Overhead Distribution**

Particulars	Total	Production Department			Service Department	
	₹	A ₹	B ₹	C ₹	D ₹	E ₹
Rent	12,000	2,400	4,800	2,000	2,000	800
Electricity	4,000	800	2,000	500	400	300
Indirect Labour	6,000	1,200	2,000	1,000	800	1,000
Depreciation on Machinery	5,000	2,500	1,600	200	500	200
Sundries	4,500	910	2,143	847	300	300
Total	31,500	7,810	12,543	4,547	4,000	2,600
Dept. D	31,500	1,200	1,600	800	(4000)	400
		9,010	14,143	5,347	00	3,000
		300	600	1,500	600	(3,000)
		9,310	14,743	6,847	600	00
		180	240	120	(600)	60
		9,490	14,983	6,967	00	60
		6	12	30	12	(60)
		9,496	14,995	6,997	12	00
		4	5	3	(12)	--
		9,500	15,000	7,000	00	--
		1,000	2,500	1,400	--	--
		9,500	15000	7000	-	-
		1,000	2500	1400		
Total Estimated Working Hrs						
Rate Per Hour						
Rate per hour		9.50	6.00	5.00	-	-

Illustration : 3

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

Particulars	Departments			Total
	A	B	C	
No. of Workers	200	200	400	800
No. of Machine Hours	30,000	30,000	40,000	1,00,000
% age of Horse Power	40	25	35	100
Value of Assets (Rs)	10,00,000	16,00,000	14,00,000	40,00,000

Direct (Rs)	Wages	8,00,000	10,00,000	12,00,000	30,00,000
Depreciation (Rs)					4,00,000
Indirect (Rs)	Labour				9,00,000
Insurance (Rs)	Charges				2,00,000
Electricity (Rs)					3,00,000
Supervisory (Rs)	Salary				1,60,000
Staff Welfare (Rs)	Expenses				3,00,000
Other (Rs)	Expenses				6,00,000

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

Solution:

Computation of Composite Machine Hour Rate

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

Machine Hour Rate	a ÷ b	53.50	63.666 or 63.67	58.625 or 58.63	-
					-

Illustration : 4

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

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

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

particulars	Production Dept.			Service Dept.	
	A	B	C	R	S
Service Dept R	40%		30%	--	
Service Dept S	20%			10%	
	30%		30%	20%	
	20%			--	

You are required to apportion the cost of service department to production department under Repeated Distribution Method.

Solution:

Particulars	Base of allocation	Prod. Dept. A Rs	Prod. Dept. B Rs	Prod. Dept. C Rs	Service Dept. R Rs	Service Dept. S Rs
Primary Distribution of Overheads		46,000	12,000	13,000	9,000	4,000
Dept. 'R' Overhead	4:3:2:1	3,600	2,700	1,800	-9,000	900
Dept. 'S' Overheads	3:3:2:2	1,470	1,470	980	980	-4900
Dept. 'R' Overheads	4:3;2;1	396	294	196	-980	98
Dept. 'S' overheads	3:3:2:2	30	30	20	18	-98
Dept.' R' Overheads	4:3:2:1	8	6	4	-18	-
Total		51,500	16,500	16,000	—	—

Exercises:-

01. The overhead expenses of a company are recovered by the cost accountant according to the production departments 'X' and 'Y' and service department 'S'.From the following information prepare aprimary distribution schedule.

Expenses	Rs.
Indirect Wages	8,000
Rent and Rates	15,000

Power	4,500
Light	3,200
Depreciation on Machinery	24,000
Sundries	20,000

Following information is also available for department :

Particulars	'X'	'Y'	'S'
Working Hours	4,000	3,500	3,600
H.P. of Machine	15	25	05
Direct Wages (Rs)	12,000	4,000	4,000
Value of Machinery (Rs)	100,000	80,000	60,000
Floor space area (Sq. ft.)	600	500	400
Light Points	10	05	05

(Ans :Dept. X-Rs.35,900; dept. Y- Rs 21,900 and Dept. S- Rs 20,900)

02. A Ltd. furnish you the following half yearly budgeted data for for the half year ended 31st March 2015. Distribute the overheads by most equitable method.

Particulars	Production Dept.			Service Dept.	
	A	B	C	D	E
Direct Wages (Rs)	40,000	60,000	80,000	20,000	40,000
Direct Materials (Rs in lacs)	1	2	4	2	1
No. of employees	10	15	15	05	05
Electricity (MWH)	8,000	6,000	4,000	2,000	2,000
Light Point	5	8	2	3	2
Asset Value (Rs in lacs)	12	8	6	2	2
Area occupied, (Sq. meters.)	150	250	100	50	50

The overheads for the above period were :

Particulars	Rs	Particulars	Rs
Motive Power	17,500	Lighting	1,600
Store Expenses	20,000	Staff Welfare Expenses	4,000
Depreciation	30,000	Repairs	15,000
Rent, Rates and Taxes	12,000	General Expenses	12,000

03. A company is having two production departments namely A and B and two service departments S-1 and S-2. The expenses incurred during the of March,2014 are as following :

Expenses	Rs
Electricity	3,600
Insurance on Assets	9,000
Power	15,000
Rent and Taxes	28,000
Depreciation	18,000
Canteen expenses	5,400

The following information is also available for the above departments.

Particulars	A	B	S-1	S-2
Floor Space (sq. ft.)	6,000	4,000	2,000	2,000
No. of Workers	100	50	50	25
H. P. of Machine	120	30	30	15
Direct wages	10,000	10,000	5,000	3,000
Value of Assets(Rs. in thousands)	10	4	3	1
Direct Materials	15,000	10,000	5,000	-
No. of Light Points	30	15	15	5

Prepare statement showing primary distribution of overheads.

04. The following data were obtained from the books of Four Square Engineering for the following half year ended 30th June , 2014.
Prepare overhead distribution summary.

Items	Production Dept.			Service Dept.	
	A	B	C	X	Y
Direct Wages (Rs)	7,000	6,000	5,000	1,000	1,000
Direct Materials (Rs)	3,000	2,500	2,000	1,500	1,000
Employees (Nos.)	200	150	150	50	50
Electricity(kwh)	8,000	6,000	6,000	2,000	3,000
Light Points (Nos)	10	15	15	5	5
Assets Value (Rs)	50,000	30,000	20,000	10,000	10,000
Area Occupied (Sq. Mtrs.)	800	600	600	200	200

Expenses for the 6 months were as follows:

Expenses	Rs	Expenses	Rs
Stores overheads	400	Depreciation	6,000
Motive power	1,500	Repairs and Maintenance	1,200
Electric Power	200	General Expenses	10,000
Labour Welfare	3,000	Rent and Taxes	600

Apportion the expenses of Department X in the ratio of 4:3:3 and that of Department Y in proportion to direct wages, to department A, B and c respectively.
(Answer : Dept. A – Rs 11,396; Dept. B- Rs 8,663 ; Dept. C- Rs 7,341)

Illustration : 1

Calculate the Machine Hour Rate from the following:

Particulars	Rs
Cost of Machine	12,000
Cost of Installation	3,000
Scrap Value	3,000

Rent, Rates for a quarter for the shop	300
General Lighting	20 P.M.
Supervisor's Salary for Shop	600 per quarter
Insurance Premium for Machine	60 p.a.
Estimate Repairs	400 p.a.

Power 2 units per hour @ Rs 5 per 100 units. Estimate working hours p.a. 2,000. The machine occupies $\frac{1}{4}$ th of the total area of the shop. The supervisor is expected to devote $\frac{1}{6}$ th of his time for supervising the machine. General lighting expenses are to be apportioned on the basis of the floor area.

Solution:

Statement Showing Machine Hour Rate

Particulars	Working	P.A. `	Per Hour `
Standing Charges			
Rent & Rates	$\left(\frac{1}{4} \times 300 \times 4\right)$	300	
General Lighting	$\left(20 \times \frac{1}{4} \times 12\right)$	60	
Shop Supervisor's Salary	$6000 \times \frac{1}{6} \times 4$	400	
Insurance Premium		60	
		820	
Standing Charges	$= \left(\frac{820}{2000 \text{ Hrs}}\right)$		0.41
Running Charges	$\frac{12000 + 3000 - 3000}{20000 \text{ Hrs}}$		0.60
Depreciation			
Repairs	$\left(\frac{400}{2000}\right)$		0.20
Power	$\left(\frac{2 \text{ units} \times 05}{100}\right)$		0.10
Machine Hour Rate			1.31

Illustration : 2

From the following information, Calculate Machine Hour Rate.

Cost of Machine	Rs 45,000
Scrap Value	Rs 5,000
Rent for workshop	Rs 30,000
General Lighting	Rs 200 PM.
Power Consumption 20 Units Per Hour	@ Rs 20 per every 100 units

Administrative Expenses	Rs 4,000 p.a.
Repairs and Maintenance	75% of Depreciation
Workshop Supervisor's Salary	Rs 4,000 P.M.
Estimated Working Time per year	50 weeks of 40 hours each
Selling up time for production	200 hours per year
Effective Life of Machine	10 Years

The Machine Occupies $\frac{1}{4}$ th area of workshop. The supervisor is expected to $\frac{1}{4}$ th of time in supervising the machine.

Solution:

Calculation of Machine Hour Rate

Particulars	Working	P.A. Rs	Per Hour Rs
Standing Charges			
Rent	$(30,000 \div 4)$	7,500	
General Lighting	$(200 \times 12 \div 4)$	600	
Administrative Expenses	(4000 for years)	4,000	
Workshop Supervisor's Salary	$(4,000 \times 12 \div 4)$	12,000	
		24,100	
Standing Charges Per Hours	$(24,100 \div 2,000)$		12.05
Running Charges			
Depreciation	$\left(\frac{45,000 - 5,000}{10} = \frac{40,000}{10} = \frac{4,000}{2,000} \right)$		2.00
Repairs & Maintenance	$\left(4,000 \times \frac{75}{100} \times \frac{1}{2,000} \right)$		1.50
Power	$\left(\frac{20 \times 20 \times 1,800}{100 \times 200} \right)$		3.60
Machine Hour Rate			<u>19.15</u>

Note:

Machine Hours = $50^w \times 40^H = 2000$ Hrs . It is pressured that no current is used by the machine devising setting up time.

Illustration : 3

Computer the Machine Hour Rate from the following data.

Particulars	Rs
- Cost of Machine	- 1,10,000
- Installations Charges	- 10,000
- Estimated Scrap value after expire of 15 years life	- 5,000
- Rate and Rates for the shop per month in	- 200
- Governal Lighting for the shop per month	- 800
- Insurance Premium for Machine per annum	- 1,000
- Repairs and Maintenance Expenses per annum	- 1,000
- Consumption of Power to units per hours	- 10
- Rate of Power per 100 units	- 30
- Estimated Working Hours Per Annum	- 2,200
- This includes non-productive setting up time of 200 hours.	
- Shop Supervisor Salary P.M.	- 600

The Machine occupies $\frac{1}{4}^{\text{th}}$ of the total area of the shop: Supervisor is expected to devote $\frac{1}{5}^{\text{th}}$ of his time for supervising the machine.

Solution:

Computation of Machine Hour Rate

	Particulars	Working	P.A. Rs	Per Hour Rs
a)	Standing Charges			
	Rent and Rates	$(200 \times 12 \div 4)$	600	
	General Lighting	$(800 \times 12 \div 4)$	2,400	
	Insurance Premium	-	1,000	
	Shop Supervisor's Salary	$\left(600 \times 12 \times \frac{1}{5}\right)$	1,440	
			5,440	
	Standing Charges Per Hour	$(5,440 \div 2,000)$		2.72
b)	Running Charges			
	Power	$(30 \times 10 \div 100)$		3.00
	Repairs & Machine	$(1,000 \div 2,000)$		0.50
	Depreciation	$\left(\frac{1,10,000 + 10,000 - 5,000}{2,000 \times 15}\right)$		3.83
	Machine Hour Rate			10.05

Note:

Machine Hour = 2,200 Hrs. - 200 Non - Productive Selling Time
= 2,000 Hrs.

Illustration : 4

From the following figures, compute the machine Hour Rates for Machines A, B and C for a 4-week prior repeatedly. Each machine is expected to be working 200 hours.

Particulars	Per Annum Rs
Rent and Taxes	3,000
Lighting and halting	400
Depreciation	1,000
Indirect Wages	1,500
Power	600
Sundries	1,750
Canteen Expenses	1,200
Repairs and Maintenance	500

Four the above three machine in the factory, the necessary particulars are as follows:

Particulars	Machine A	Machine B	Machine C
Area Space Occupied (Sq. ft.)	100	200	300
No. of Light Points	1	3	--
Cost of Machine (Rs)	25,000	15,000	10,000
No of Workers	1	2	3
Power (Rs)	250	150	200
Direct Wages (Rs)	2,000	3,000	5,000

Solution:**Machine Hour Rate**

Particulars	Base of Apportionment	Machines		
		A Rs	B Rs	C Rs
a) Standing Charges				
Rent and Taxes	(1:2:3)	500	1,000	1,500
Lighting and Heating	(1:3:0)	100	300	-
Indirect Wages	(2:3:5)	300	450	750
Sundries	(2:3:5)	350	525	875
Canteen Expenses	(1:2:3)	200	400	600

Total		1,450	2,675	3,725
b) Running Charges				
Depreciation	(5:3:2)	500	300	200
Power	(Actual)	250	150	200
Repairs & Maintenance	(5:3:2)	250	150	100
Total		1,000	600	500
c) Total Charges (a + b)		2,450	3,275	4,225
Machine Hour Rate =		12.25	16.25	21.13
$C \div \text{Machine Working Hour}$				

Illustration : 5

The following expenses have been incurred in respect of a shop having four indelicate machine.

Rent and Rates	Rs 6,000 p.a.
Power Consumed by the shop at 10 paise per unit	Rs 4,800 p.a.
Repairs for 4 Machine	Rs 2,500 p.a.
Lighting for shop per machine	Rs 150 p.a.
Lubricants etc.	Rs 150 p.a.
Depreciation per machine	Rs 600 p.a.

Supervisor's Salary:

Working after 4 Machines and Paid	Rs 650 p.m.
Attendants : 2 attendants looking after five machines paid	

Rs 60 p.m.each

Each Machine consumes 10 units of power per hour.

Calculate Machine hour rate.

Solution:

W. Note:-

$$\begin{aligned}
 \text{i) No. of Units Consumed} &= \frac{\text{Rs.4800} \times 100}{100} = 48,000 \text{ units} \\
 \text{No. of units per machine} &= 48000/4 = 12,000 \text{ units} \\
 \text{Hours in a year} &= 12000/10 = 1,200 \text{ hours}
 \end{aligned}$$

$$\begin{aligned}
 \text{ii) Wages to attendant 5 Machine} &= 2 \text{ attendant} \times \text{Rs 60 each} \\
 &= (60 \times 2) \times 12 \\
 &= 1440 \\
 \therefore \text{Wages for 4 Machines} &= 1440 \times \frac{4}{5} = \text{Rs.1152}
 \end{aligned}$$

Particulars		P.A. Rs
a) Standing Charges	Rent & Rates	6,000
	Wages to attendant (Note. II)	1,152
	Supervisor's Salary (650 x 12)	7,800
		14,952
b) Running Charges	Power	4,800
	Repairs	2,500
	Lighting (150 x 04)	600
	Lubricants	150
	Depreciation (600x4)	2,400
		10,450
c) Total Expenses (a + b)		25,402
d) Machine Hour Rate =	$\frac{C}{\text{Working Hours}} = \frac{25,402}{1,200}$	21.17

Illustrations : 6

The following information is extracted from the budget of Amar Co. Ltd for the 2016.

Factory Overheads	Rs 93,000
Direct Labour Cost	Rs1,50,000
Directed Labour Hours	2,32,500
Machines Hours	75,000
Direct Material Cost	Rs3,00,000

The following details are available for job 205:

Direct Material Cost	Rs 45
Direct Labour Cost	Rs 50
Direct Labour Hours	40
Machine Hours	30

You are required to workout overhead application rates and ascertain the cost of Job 205 by using the following methods of overhead application.

- Direct Labour Hour Rate.
- Direct Labour Cost.
- Machine Hour Rate.
- Prime Cost.
- Direct Material Cost

Solution:

- Direct Labour Hour Rate =
$$\frac{\text{Overhead of the Dept}}{\text{Laour Hours}}$$

$$= \frac{93,000}{2,32,500}$$

$$= \text{Rs } 0.40 \text{ per hour}$$

ii)
$$\frac{\text{Overhead of the Dept}}{\text{Direct Labour Cost}} \times 100$$

$$= \frac{93,000}{1,50,000} \times 100$$

$$= 62\%$$

iii) Machine Hour Rate =
$$\frac{\text{Overhead of the Dept}}{\text{Machine hours}}$$

$$= \frac{93,000}{75,000}$$

$$= \text{Rs } 1.24 \text{ Per Hour.}$$

iv)
$$\frac{\text{Overhead of the Dept}}{\text{Prime Cost}} \times 100$$

$$= \frac{93,000}{1,50,000 + 3,00,000} \times 100$$

$$= \frac{93,000}{4,50,000} \times 100$$

$$= 20.67\%$$

v)
$$\frac{\text{Overheads of the dept}}{\text{Direct Material Cost}} \times 100$$

$$= \frac{93,000}{3,00,000} \times 100$$

$$= 31\%$$

Statement Showing Job Cost of Job No.205

Particulars	1	2	3	4	5
Material Cost	45.00	45.00	45.00	45.00	45.00
Labour Cost	50.00	50.00	50.00	50.00	50.00
Overheads Cost	16.00	31.00	37.20	19.63	13.95
	111.00	126.00	132.20	114.63	108.95

Working Notes Overheads:

1) $\text{DLH} \times \text{DLR} = 40 \times 0.40 = \text{Rs } 16$

2) $62\% \text{ of Labour Cost} = \frac{50 \times 62}{100} = \text{Rs } 31$

3) $\text{Machine Hours} \times \text{MHR} = 30 \times 1.24 = \text{Rs } 37.20$

4) $\text{Prime Cost} \times \frac{20.67}{100} = \frac{95 \times 20.67}{100} = \text{Rs } 19.63$

5) Material Cost $\frac{31}{100} = \frac{45 \times 31}{100} = \text{Rs } 13.95$

Objective Questions:

A) Multiple Choice Question:

1. Indirect cost can not be identified with a particular cost centre shared between centre using
 - a) A method of apportionment
 - b) A method of allocation
 - c) A recovery rate
 - d) None of the above
2. The allotment of whole items of cost to cost unit is called
 - a) Number of employees
 - b) Machine hours
 - c) KWH
 - d) Floor area
3. Administrative overheads are recovered as a percentage of
 - a) Direct materials
 - b) Prime cost
 - c) Works cost
 - d) Direct labour
4. Selling and distribution overheads are absorbed on the basis of
 - a) Rate per unit
 - b) Percentage on works cost
 - c) Percentage on selling cost
 - d) Any of these
5. Charging overheads to individual unit is known as
 - a) Allocation
 - b) Apportionment
 - c) Absorption
 - d) Collection
6. Salary of works manager is a
 - a) Office overheads
 - b) Factory overheads
 - c) Selling overheads
 - d) All of the above

7. Assigning code numbers to a group of overheads is called as
 - a) Classification
 - b) Codification
 - c) Analysis
 - d) None of the above
8. Store keeping expenses are allocated on the basis of
 - a) No. of material requisitions
 - b) Area
 - c) Direct labour hours
 - d) None of the above
9. Research cost should be treated as
 - a) Production overheads
 - b) Period cost
 - c) variable cost
 - d) None of the above
10. The process by which cost items are charged direct to a cost is called
 - a) Absorption
 - b) Apportionment
 - c) Allocation
 - d) Allotment
11. Machine expenses are
 - a) Depreciation on machine
 - b) Rent of premises
 - c) Salary of supervisors
 - d) All of the above
12. Insurance is apportioned on machine on the basis of
 - a) Insured value of each machine
 - b) Invoice price of each machine
 - c) Area
 - d) Cost of machine
13. Office overheads are recovered as a % age of
 - a) Direct materials
 - b) Direct wages
 - c) Factory cost

- d) None of the above
- 14. Labour rate is followed when most of the work is done by
 - a) Labour
 - b) Machine
 - c) Different group of machine
 - d) None of the machine
- 15. Which of the following is service department
 - a) Refining department
 - b) Machining department
 - c) Receiving department
 - d) Finishing department
- 16. When the amount of under or over absorption is significant, it should be disposed off by
 - a) Transferring to costing profit and loss account
 - b) The use of supplementary rates
 - c) Carrying over as a deferred charge to the next accounting year
 - d) Either of the three
- 17. Factory overheads should absorbed on the basis of
 - a) Relationship to cost incurred
 - b) Direct labour hour
 - c) Direct labour cost
 - d) Machine hours
- 18. When the amount of overhead absorbed is less than the amount of overhead incurred, it is called
 - a) Under absorption of overhead
 - b) Over absorption of overhead
 - c) Proper absorption of overhead
 - d) None of the above
- 19. What is the basis for distribution of indirect material cost to various department ?
 - a) Direct allocation
 - b) Cost of direct materials consumed
 - c) Machine hour worked
 - d) Either of the above

20. Rent of the business is
- a) Fixed cost
 - b) Variable cost
 - c) Semi-variable cost
 - d) None of the above

B. Fill in the blanks :

1. _____ rate is calculated by dividing the overhead by the aggregate of the productive hours of direct workers. (The labour hour rate)
2. _____ is the loss in value of asset due to its supervision at a date earlier than that foreseen.
(Obsolescence)
3. When amount of Over/Under absorbed overheads is negligible, it is disposed of by
Transferring it to _____ (Costing Profit and Loss Account)
4. The process of grouping costs according to their common characteristics is called_____
(Cost classification)
5. _____means allotment of whole items of cost to cost centers or cost units.(Allocation)
6. Under /over absorption of overheads takes place when rate _____rate of absorption is
Used. (predetermined)
7. The difference between actual and recovered overhead is termed as _____. (under/over Absorbed overheads)
8. Cost which can be controlled is_____ cost. (controllable)
9. Repairs and maintenance is _____ expenses. (Machine)
10. Machine hour rate is suitable when machine is a _____factor of production. (dominant)
11. Office overhead rate are recovered as a %age of _____ cost. (factory cost)
12. Percentage of direct is suitable when direct _____ is major factor of production. (Labour)
13. Production is suitable when output is _____.(uniform)
14. _____ cost is the aggregate of all kind of consideration paid payable for the service rendered by an employee of an enterprise. (Employee cost)

15. _____ deals with principle and method of determining employee cost .
(Cost Accounting Standard-7)

C) True or False :

1. Cost of packing is production overheads.
2. Power cost is allocated over the department on the basis of H.P. of machine.
3. Employee welfare expenses are allocated on the basis of light points.
4. Supervisors salary is allocated on the basis of time spent.
5. Overheads includes indirect materials , labour and expenses.
6. Depreciation should be excluded from cost accounts.
7. Factory overhead includes all production costs other than direct materials and salaries.
8. Carriage inwards is not really an overheads at all, but is a direct cost.
9. The application of predetermined overhead rates is a reason for the difference in costing and financial profit .
10. Cash discount is completely excluded from the cost.
11. Overhead absorption is the allotment of overhead to cost unit.
12. The use of actual overhead absorption rates results in delay in determining cost of products.
13. Direct labour cost method of absorption of factory overhead is suitable only in those departments where work is done by manual labour.
14. The principle base used for applying factory overhead are ; units of production , material cost, direct wages, direct labour hours and machine hours.
15. Administration overheads are usually absorbed as a %age of prime cost.
16. Time factor is ignored when the cost of material is used as the basic for absorption of overhead.
17. Predetermined rate of absorption of overhead helps in quick preparation of cost of estimates and quoting prices.
18. Machine hour rate is not suitable for absorption of overheads if the work is done mainly by the machine.
19. Departmentalization of overheads facilitates the control objective of cost accounting.
20. A blanket overhead rate is a single overhead rate computed for the entire factory.

(Ans- True- 2,5,8,9,10,11,12,14,16,17,19,20

False- 1,3,4,6,7,13,15,18

D) a) Match the following

Column 'A'	Column 'B'
i) Rent	a) Percentage of sales
ii) Power	b) Capital value
iii) Depreciation	c) H.P. of machine
iv) Advertising	d) Employee expenses
v) CSA-7	e) Indirect labour
vi) Office salary	f) No. of light points
vii) Lighting and heating	g) Floor space area occupied by each machine
viii) Indirect material	h) Cost of catalogue
	i) Insurance

(Ans- i)-g, ii)- c, iii)-b, iv)-a, v) –d. vi)-e, vii)-f, viii)-h)

b) Match the following

Column 'A'	Column 'B'
1) Telephone charges	a) Semi-variable overheads
2) Compensation of workers	b) Cost of each machine insured
3) Stationery	c) Time spent on machine by workers
4) Repeated distribution method	d) On the basis of wages
5) Insurance	e) Indirect material
6) Supervision	f) Method of reapportionment of same dept. cost
7) Rent and rates	g) Floor area occupied
8) Repairs and maintenance	h) Machines hour
9) power	i) Meter reading
10) Depreciation	j) Sales of goods
	k) Useful life of assets
	l) Factory cost

(Ans : 1)-a, 2)-c, 3)-e, 4)-f, 5)-b, 6)-d, 7)-g, 8)- h, 9)-i, 10)- k

c) Match the following

Column 'A'	Column 'B'
1. Absorption	a) Cost Accounting Standard-3
2. Depreciation of machine	b) Cost Accounting Standard-13
3. Under absorption of overhead	c) No. of employee
4. Machine hour rate	d) Direct wages
5. Labour hour rate	e) Weight of material issued
6. Apportionment	f) Charging overheads to cost unit
7. Service cost centre	g) Machine expenses process
8. Personnel Department	h) Recovery of less overhead
9. ESI and P F contribution	i) Recovery of more overhead
10. Store Department	j) Machine intensive industry
	k) Labour intensive industry
	l) Light points

(Ans : 1-f, 2-g, 3-h, 4-i, 5- k, 6-a, 7-b, 8-c, 9-d, 10- e)

