

COST ACCOUNTING

Objectives: To enable students

- Understand the basic concepts of cost accounting,
- Gain knowledge on principles and procedures of cost accounting and
- Apply the costing techniques in different practical situations.

Unit – I: Meaning and Scope of Cost Accounting – Concept and Classification of Cost – Elements and Methods of Cost – Relationship of Cost Accounting and Financial Accounting – Preparation of Cost Sheet.

Unit – II: Materials – EOQ - Levels of Stock – Receipts and Issues of materials – ABC Analysis - Stores Ledger – FIFO, LIFO, Simple Average and Weighted Average.

Unit – III: Labour – Time-Keeping and Time-Booking – Methods of Remuneration and Incentive Schemes – Overtime and Idle time – Labour Turnover – Causes, Types and Measurement.

Unit – IV: Overheads – Collection, Classification, Allocation, Apportionment and Absorption – Recovery Rates – Over and Under Absorption -Machine Hour Rate – Job Costing – Contract Costing.

Unit – V: Operating Costing – Process Costing: Normal Loss, Abnormal Loss and Abnormal Gains (excluding Equivalent Production and Inter process).

(Marks: Theory 40% and Problems 60%)

Text Book Recommended:

Cost Accounting Principles and Practice– S.P. Jain and K.L. Narang, Kalyani Publishers

Books for Reference:

1. Cost Accounting – S.P. Iyengar, Sultan Chand & Sons.
2. Cost Accounting – R.S.N. Pillai And V. Baghavaghi, S.Chand& Company Ltd.
3. Cost Accounting – S.N. Maheshwari, Sultan Chand & Sons.
4. Principles and Practice of Cost Accounting – N.K. Prasad, Book Syndicate Pvt.Ltd.
5. Cost Accounting – Bhabotosh Banerjee, The World Press Private Ltd.

Cost Accounting

Based on the terminology published by the Institute of Cost and Management Accountants of England, Cost Accounting is defined as the process of accounting for cost. This process begins with the recording of income and expenditure or the bases on which they are calculated and ends with the preparation of periodical statements and reports for the purpose of ascending and controlling costs.

Cost accounting is the process of recording, classifying, analysing, summarizing, and allocating costs associated with a process, and then developing various courses of action to control the costs.

Cost: Cost represents the amount of expenditure (actual or notional) incurred on or attributable to a given thing. It represents the resources that have been or must be sacrificed to attain a particular objective.

Cost Accountancy

The Institute of Cost and Management Accountants of England defines Cost Accountancy as follows: "The application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability. It includes the presentation of information, derived therefrom for the purpose of managerial decision making."

Key activities of Cost accounting

- Defining costs as direct materials, direct labour, fixed overhead, variable overhead, and period costs.
- Assisting the engineering and procurement departments in generating standard costs, if a company uses a standard costing system.
- Using an allocation methodology to assign all costs except period costs to products and services and other cost objects.
- Defining the transfer prices at which components and parts are sold from one subsidiary of a parent company to another subsidiary.
- Examining costs incurred in relation to activities conducted, to see if the company is using its resources effectively.
- Highlighting any changes in the trend of various costs incurred.
- Analysing costs that will change as the result of a business decision.
- Evaluating the need for capital expenditures.
- Building a budget model that forecasts changes in costs based on expected activity levels.

- Determining whether costs can be reduced.
- Providing cost reports to management, so they can better operate the business.
- Participating in the calculation of costs that will be required to manufacture a new product design.
- Analysing the system of production to understand where bottlenecks are positioned, and how they impact the throughput generated by the entire manufacturing system.

Features Cost accounting

1. It is a process of accounting for costs.
2. It records income and expenditure relating to production of goods and services.
3. It provides statistical data on the basis of which future estimates are prepared and quotations are submitted.
4. It is concerned with cost ascertainment, cost control and cost reduction.
5. It establishes budgets and standards so that actual cost may be compared to find out deviations or variances.
6. It involves the presentation of right information to the right person at the right time so that it may be helpful to management for planning, evaluation of performance, control and decision making.

Objectives of Cost Accounting:

1. **Ascertainment of Cost:** It can be done in two ways, namely,
 - Post Costing, where the ascertainment of cost is done based on actual information as recorded in financial books.
 - Continuous Costing, where the process of ascertainment is of a continuous nature i.e. where cost information is available as and when a particular activity is completed, so that the entire cost of a particular job is available the moment it is completed
2. **Determination of Selling Price:** Though there are various other considerations for fixing the selling price of a product (like the market conditions etc.), cost of the product is an important factor which cannot be side-lined.
3. **Ascertainment of Profit:** The purpose of any business activity is to earn a profit and profit can be computed by matching the revenue and cost of that particular product/activity.
4. **Cost Control and Cost Reduction:** Cost Control and Cost Reduction are two different concepts. Cost Control aims at maintaining the costs in accordance with established standards. It involves the following steps –
 - a. Determination of target cost
 - b. Measurement of actual cost
 - c. Analysis of variation with respect to target cost
 - d. Initiation of corrective action.

Cost Reduction on the other hand aims at improvement established targets. It is defined as "the achievement of real and permanent reduction in the unit cost of goods manufactured or services rendered without impairing their suitability for the use intended or diminution in the quality of the product.

The difference between Cost Control and Cost Reduction

Cost Control	Cost Reduction
• It represents efforts made towards achieving a target or a goal	• It represents achievement of reduction of cost.
• The process of cost control is to setup a target, investigate the variation and take remedial action.	• Cost reduction is not contended merely with the maintenance of performance with standards.
• It assumes existence of norms or standards which are not challenged.	• It assumes that the standards can be improved.
• It is preventive function.	• It is a corrective function.
• Sometimes, it lacks a dynamic approach.	• It is continuous process of analysis of all the factors affecting cost.

5. **Facilitation of Inventory Valuation:** As per the Accounting Standard on Valuation of Inventories, Inventories are to be valued at "lower of cost and net realisable value". Costing accounting determines the ascertainment of this "cost" based on which the inventory is valued.
6. **Assisting Management in Decision-making:** Decision-making is a process of choosing between two or more alternatives, based on the resultant outcome of the various alternatives. A Cost Benefit Analysis also needs to be done. All this can be achieved through a good cost accounting system.

Other objectives

- 1) To provide a correct analysis of cost both by process or operations and by different elements of cost;

- 2) To disclose sources of wastage whether of material, time or expense or in the use of machinery, equipment and tools and to prepare such reports which may be necessary to control such wastage;
- 3) To provide requisite data and serve as a guide for fixing prices of products manufactured or services rendered;
- 4) To present and interpret data for management planning, evaluation of performance and control;
- 5) To help in the preparation of budgets and implementation of budgetary control;
- 6) To provide specialised services of cost audit in order to prevent the errors and frauds and to facilitate prompt and reliable information to management.

Difference between Costing and Cost Accounting

Basis	Costing	Cost Accounting
Definition	System of computing cost of production or of running a business, by allocating expenditure to various stages of production or to different operations of a firm.	"Cost accounting is the application of accounting and costing principles, methods and techniques in the ascertainment of costs and the analysis of saving/or excess cost incurred as compared with previous experience or with standards"
Nature	It is a technique and process of ascertaining costs.	It is regarded as specialised branch of accounting.
Scope	The costing techniques include principles and rules which govern the procedure of ascertaining the cost of products/ services.	It involves classifications, accumulation, assignment and control of costs.
Process	The process of costing consists of routines of ascertaining costs by historical or conventional costs, standard costing or marginal costing.	It involves establishment of budgets, standard costs or actual costs of operations, classification, recording and appropriate allocation of expenditure.

Importance of Cost Accounting:

1. **Control of Material Cost:** Normally, material cost constitutes a major portion of the cost of the product. Hence control of material cost can ensure a good amount of benefit. Control of material cost can be exercised as follows:
 - Maintaining optimum level of stock to avoid unnecessary locking up of capital.
 - Maintaining an uninterrupted supply of materials.
 - Use of techniques like value analysis, standardisation etc.
2. **Control of Labour Cost:** Labour cost control can be exercised as follows:
 - Setting standard time for each activity and keeping adverse variance to the minimum.
 - Laying down proper remuneration schemes.
 - Control over labour turnover.
 - Control over idle time, overtime.
3. **Control of Overheads:** Overheads are nothing but indirect expenses incurred at the factory, office and sales depots. Again control over overheads will ensure a control over the total cost of the product and a higher profit margin.
4. **Determination of Selling Price:** Though there are various other considerations for fixing the selling price of a product (like the market conditions etc.), cost of the product is an important factor which cannot be side-lined.
5. **Budgeting:** Any commercial activity begins with the preparation of budgets for the same. A budget serves as a guideline against which the actual performance can be measured and continuous corrective action can be taken to ensure that the budget is adhered to.
6. **Measuring Efficiency:** Efficiency can be measured by comparing actuals against standards and corrective action can be taken.
7. **Strategic Decision-making:** Cost accounting enables the management to take up various strategic decisions like "Make or Buy", "Shut down or Continue", "Replace or Continue", "Status quo or Expansion" etc.

Objections Against Cost Accounting:

- Want of Necessity.
- Inapplicability.
- Failure in Many Cases.
- Mere Matter of Forms and Rulings.
- Expensive.

Advantages and limitations

Advantages	Limitations
- Helps optimum utilization of men, materials and machines. - Identifies areas requiring corrective action. - Identifies unprofitable activities, losses, inefficiencies. - Helps price fixation. - Facilitates cost control and cost reduction. - Facilitates use of various cost accounting techniques, like, variance analysis, value analysis etc. - Helps management in formulation of policies. - Helps management in making strategic financial decisions. For e.g.: the technique of marginal costing helps the management in making various short term decisions. - Helps in formation of cost centres and responsibility centres to exercise control. - Marginal Cost having a linear relationship with production volume enables in formulation and solution of "Linear Programming Problems". - Provides a data-base for reference by government, wage tribunals and trade unions etc.	- It is not an exact science and involves inherent element of judgement. - Cost varies with purpose. Therefore, cost collected for one purpose will not be suitable for another purpose. - Cost accounting presents the base for taking the best decisions. It does not give an outright solution. - Most of the cost accounting techniques are based on some pre-assumed notions. - The apportionment of common costs comes under a lot of criticism. - There are different views held by different experts on the treatment of certain items of cost.

General Principles of Cost Accounting:

- Cause-Effect Relationship:** Cause-effect relationship should be established for each item of cost. Each item of cost should be related to its cause as minutely as possible and the effect of the same on the various departments should be ascertained. A cost should be shared only by those units which pass through the departments for which such cost has been incurred.
- Charge of Cost Only after its Incurrence:** Unit cost should include only those costs which have been actually incurred. For example, unit cost should not be charged with selling cost while it is still in factory.
- Past Costs Should Not Form Part of Future Costs:** Past costs (which could not be recovered in past) should not be recovered from future costs as it will not only affect the true results of future period but will also distort other statements.
- Exclusion of Abnormal Costs from Cost Accounts:** All costs incurred because of abnormal reasons (like theft, negligence) should not be taken into consideration while computing the unit cost. If done so, it will distort the cost figures and mislead management resulting in wrong decisions.
- Principles of Double Entry Should Be Followed Preferably:** To lessen the chances of any mistake or error, cost ledgers and cost control accounts, as far as possible, should be maintained on double entry principles. This will ensure the correctness of cost sheets and cost statements which are prepared for cost ascertainment and cost control.

Comparison between Cost accounting and management accounting

Basis	Cost Accounting	Management Accounting
Meaning	The recording, classifying and summarising of cost data of an organisation is known as cost accounting	The accounting in which the both financial and non-financial information are provided to managers is known as management accounting.
Information type	Quantitative	Quantitative and qualitative
Objective	Ascertainment of cost of production.	Providing information to managers to set goals and forecast strategies.
Scope	Concerned with ascertainment, allocation, distribution and accounting aspects of cost.	Impart and effect aspect of costs.
Specific procedure	Yes	No
Recording	Records past and present data	It gives more stress on the analysis of future projections.
Planning	Short range planning	Short range and long range planning.
Interdependency	Can be installed without management accounting	Cannot be installed without cost accounting.

Types of cost accounting

- Standard cost accounting
- Activity-based costing
- Resource consumption accounting

- Throughput accounting
- Life Cycle Costing
- Environmental accounting
- Target costing

Comparison Between Cost Accounting and Financial Accounting

Comparison	Cost Accounting	Financial Accounting
Meaning	Cost Accounting is an accounting system, through which an organization keeps the track of various costs incurred in the business in production activities.	Financial Accounting is an accounting system that captures the records of financial information about the business to show the correct financial position of the company at a particular date.
Information type	Records the information related to material, labour and overhead, which are used in the production process.	Records the information which are in monetary terms.
Which type of cost is used for recording?	Both historical and pre-determined cost	Only historical cost.
Users	Information provided by the cost accounting is used only by the internal management of the organization like employees, directors, managers, supervisors etc.	Users of information provided by the financial accounting are internal and external parties like creditors, shareholders, customers etc.
Valuation of Stock	At cost	Cost or Net Realizable Value, whichever is less.
Mandatory	No, except for manufacturing firms it is mandatory.	Yes for all firms.
Time of Reporting	Details provided by cost accounting are frequently prepared and reported to the management.	Financial statements are reported at the end of the accounting period, which is normally 1 year.
Profit Analysis	Generally, the profit is analysed for a particular product, job, batch or process.	Income, expenditure and profit are analysed together for a particular period of the whole entity.
Purpose	Reducing and controlling costs.	Keeping complete record of the financial transactions.
Forecasting	Forecasting is possible through budgeting techniques.	Forecasting is not at all possible.

Cost Concept

The term 'cost' is most widely used as the 'money cost' of production which relates to the money expenditure of a firm on:

- Wages and salaries paid to the labour.
- Payment incurred on machinery and equipment.
- Payment for materials, power, light, fuel, transportation etc.
- Payments for rent and insurance.
- Payments to Government by way of taxes.

Money costs therefore relate to money outlays by a firm or factors of a production which enable the firm to produce and sell a product. It should be remembered that every producer is interested in money costs. Besides money cost there are other costs that are equally important to take decisions on various matters.

- Pre-determined cost - It is the cost which is computed in advance, before the production starts, on the basis of specification of all the factors affecting the cost.
- Standard cost - It is a pre-determined cost which is arrived at, assuming a particular level of efficiency in utilisation of material, labour and other indirect services. It is the planned cost of a product and is expected to be achieved under a particular production process under normal conditions. It is often used as a basis for price fixing and cost control.
- Estimated Cost - It is an approximate assessment of what the cost will be. It is based on past data adjusted to anticipated future changes.
- Marginal cost - It is the amount at any given volume of output by which aggregate cost changes if the volume of output changes (increases/decreases) by one unit.
- Differential cost - It is the difference in the total cost between alternatives calculated to assist decision making. Thus, it represents the change in total cost (both fixed and variable) due to a change in the level of activity, technology, process or method of production, etc.
- Discretionary cost - It is an "escapable" or "avoidable" cost. In other words, it is that cost which is not essential for the accomplishment of a particular objective.

- Decision-driven cost - It is that cost which is incurred following a policy decision and continues to be incurred till that decision is altered. It does not vary with changes in output or with operational activities.
- Managed / Policy cost - It is that cost which is incurred as a matter of policy e.g.: R & D cost. This cost has two important features:
 - It arises from periodic (usually annual) decisions regarding the maximum outlay to be incurred.
 - This cost is not tied to a cause and effect relationship between input and output.
- Post-potable cost - It is that cost which can be shifted to the future with little or no effect on the efficiency of the current operations.
- Imputed / Notional cost - "the value of benefits where no actual cost is incurred". Thus, imputed cost is that cost which does not involve any cash outlay. Though it is a hypothetical cost, it is relevant for decision making. Interest on capital, the payment for which is not actually made, is an example of imputed cost.
- Inventoriable / Product cost - It is the cost which is assigned to the product. For e.g.: Under marginal costing at variable manufacturing cost. Under absorption costing ® total manufacturing cost (fixed and variable) constitute product or inventor able cost.
- Opportunity cost - It refers to the value of sacrifice made or benefit of opportunity forgone in accepting an alternative course of action.
- Out of pocket cost - It is that portion of total cost which involves cash outlay. It is a short term cost concept and is used in short term decision making like make or buy, price fixation during recession. Out of pocket cost can be avoided if a particular proposal under consideration is not accepted.
- Joint cost - It is the cost of the process which results in more than one main product.
- Period cost - It is the cost which is not assigned to the product but is charged as an expense against the revenue of the period in which it is incurred. All the non-manufacturing costs like administrative, selling and distribution expenses are treated as period costs.
- Sunk cost - Historical cost which is incurred in the past is known as sunk cost. This cost is not relevant in decision making in the current period. For e.g. In the case of a decision relating to the replacement of a machine, the written down value of the existing machine is a sunk cost and hence irrelevant to decision making.
- Committed cost - It is a fixed cost which results from decisions of prior period and is not subject to managerial control in the present. Examples of committed cost are depreciation, insurance premium and rent.
- Shut down cost - The fixed cost which cannot be avoided during the temporary closure of a plant is known as shut down cost.
- Relevant cost - " cost appropriate to a specific management decision".
- Replacement cost - It is the cost of replacement in the current market.
- Absolute cost - It is the total cost of any product or process. For e.g.: in a cost sheet, both absolute cost and cost per unit are depicted.

Cost centre:

Cost centre is the smallest organisational sub-unit for which separate cost collection is attempted. It is defined as a location, a person or an item of equipment (or group of these) for which cost may be ascertained and used for the purpose of cost control.

Types - Primarily there are two types of cost centres, namely:

- Personal cost centre - consisting of a person or a group of persons.
- Impersonal cost centre - consisting of a location or an item of equipment. (or a group of these).

Scope of Cost Concept:

- Techniques have to be followed in production.
- Manufactured in the factory itself end for pardon parts should depend on other firm.
- Should all the processes involved in the production be carried in the factory or some have to depend upon contracts.
- Has the firm to produce the raw-materials itself or should it depend upon other firms.
- How far the firm should specialise in production or should it depend upon other firms.
- Should all the connected goods with the main product be manufactured by the firm itself and the business scope be expanded.
- Should the marketing of the product be organised by the firm itself or should it depend upon other agencies for marketing.

- Should the after-sale services to the consumers be undertaken by the firm itself or should firm enter into some agreement with other firm for this important responsibility.

Elements of Cost

- 1) **Material:** The substance from which a product is made is known as material. It may be in a raw or a manufactured state. It can be direct as well as indirect.
 - a. **Direct Material:** The material which becomes an integral part of a finished product and which can be conveniently assigned to specific physical unit is termed as direct material. Following are some of the examples of direct material:
 - All material or components specifically purchased, produced or requisitioned from stores.
 - Primary packing material (e.g., carton, wrapping, cardboard, boxes etc.).
 - Purchased or partly produced components
 - Process material, prime cost material, production material, stores material, constructional material etc.
 - b. **Indirect Material:** The material which is used for purposes ancillary to the business and which cannot be conveniently assigned to specific physical units is termed as indirect material. Consumable stores, oil and waste, printing and stationery material etc. are some of the examples of indirect material. Indirect material may be used in the factory, office or the selling and distribution divisions.
- 2) **Labour:** For conversion of materials into finished goods, human effort is needed and such human effort is called labour. Labour can be direct as well as indirect.
 - a. **Direct Labour:** The labour which actively and directly takes part in the production of a particular commodity is called direct labour. Direct labour costs are, therefore, specifically and conveniently traceable to specific products. Direct labour can also be described as process labour, productive labour, operating labour, etc.
 - b. **Indirect Labour:** The labour employed for the purpose of carrying out tasks incidental to goods produced or services provided, is indirect labour. Such labour does not alter the construction, composition or condition of the product. It cannot be practically traced to specific units of output. Wages of storekeepers, foremen, timekeepers, directors' fees, salaries of salesmen etc., are examples of indirect labour costs. Indirect labour may relate to the factory, the office or the selling and distribution divisions.
- 3) **Expenses:** Expenses may be direct or indirect.
 - a. **Direct Expenses:** These are the expenses that can be directly, conveniently and wholly allocated to specific cost centres or cost units. Examples of such expenses are as follows:
 - Hire of some special machinery required for a particular contract.
 - Cost of defective work incurred in connection with a particular job or contract etc.
 - Direct expenses are sometimes also described as chargeable expenses.
 - b. **Indirect Expenses:** These are the expenses that cannot be directly, conveniently and wholly allocated to cost centres or cost units. Examples of such expenses are rent, lighting, insurance charges etc.
- 4) **Overhead:** The term overhead includes indirect material, indirect labour and indirect expenses. Thus, all indirect costs are overheads. A manufacturing organization can broadly be divided into the following three divisions:
 - Factory or works, where production is done
 - Office and administration, where routine as well as policy matters are decided
 - Selling and distribution, where products are sold and finally dispatched to customers

Overheads may be incurred in a factory or office or selling and distribution divisions. Thus, overheads may be of three types:

Factory Overheads They include the following things:

- Indirect material used in a factory such as lubricants, oil, consumable stores etc.
- Indirect labour such as gatekeeper, timekeeper, works manager's salary etc.
- Indirect expenses such as factory rent, factory insurance, factory lighting etc.

Office and Administration Overheads They include the following things:

- Indirect materials used in an office such as printing and stationery material, brooms and dusters etc.
- Indirect labour such as salaries payable to office manager, office accountant, clerks, etc.
- Indirect expenses such as rent, insurance, lighting of the office

Selling and Distribution Overheads They include the following things:

- Indirect materials used such as packing material, printing and stationery material etc.
- Indirect labour such as salaries of salesmen and sales manager etc.
- Indirect expenses such as rent, insurance, advertising expenses etc.

Elements of Cost

- Direct material
- Direct labour
- Direct expenses
- Overheads
- Factory overheads
- Selling and distribution overheads
- Office and administration overheads
- Indirect material
- Indirect labour
- Indirect expenses
- Indirect material
- Indirect labour
- Indirect expenses

These categories are flexible and sometimes overlapping. For example, in some companies, machine cost is segregated from overhead and reported as a separate element altogether, and payroll costs are sometimes separated from other production costs.

Performa of Cost Sheet or Statement of Cost

Particulars	Amount (Cost) ₹	Total Amount (Total Cost) ₹
Opening Stock of Raw Materials	XXXX	
Add: Purchase	XXXX	
Add: Carriage Inward	XXXX	
Add: Import and Customs Duty	XXXX	
Less: Closing Stock of Raw Materials	XXXX	
Cost of Direct Materials Consumer		XXXX
Direct Wages		XXXX
Prime Cost		XXXX
ADD: Works of Factory Over heads		
Indirect Materials	XXXX	
Indirect Wages	XXXX	
Leave Wages	XXXX	
Bonus to Workers	XXXX	
Fuel and Power	XXXX	
Rent and Taxes (factory)	XXXX	
Insurance (factory)	XXXX	
Factory Lightings	XXXX	
Supervision	XXXX	
Works stationery	XXXX	
Depreciation of Plant and Machinery	XXXX	
Works Expenses	XXXX	
Gas and Water	XXXX	
Technical Director's Fees	XXXX	
Laboratory Expenses	XXXX	
Works Transport Expenses	XXXX	
Works Telephone Expenses	XXXX	
Add: Opening Stock of Work in Process	XXXX	
Less: Closing Stock of Work in Process	XXXX	
Less: Sale of Waste (Scrap)	XXXX	
Works Cost		XXXX
ADD: Office and Administration Overheads		
Office salaries	XXXX	
Directors fees	XXXX	
Office Rents and Rates	XXXX	
Office stationary and printing	XXXX	
Sundry office expenses	XXXX	
Depreciation of office furniture	XXXX	
Subscription to trade journals	XXXX	
Office lightings	XXXX	
Establishment charges	XXXX	
Directors traveling expenses	XXXX	
Consultant fees	XXXX	

Particulars	Amount (Cost) ₹	Total Amount (Total Cost) ₹
Contribution to provident fund	XXXX	
Postage	XXXX	
Legal charges	XXXX	
Audit fees	XXXX	
Bank charges	XXXX	
Depreciation and repairs of office equipment	XXXX	
Bonus to staff	XXXX	
Cost of Production	XXXX	
Add: Opening Stock of Finished goods	XXXX	
Less: Closing Stock of Finished goods	XXXX	
Cost of Goods Sold		XXXX
ADD: Selling and Distribution Overheads		
Advertising	XXXX	
Show room expenses	XXXX	
Salesman's salaries and expenses	XXXX	
Packing expenses	XXXX	
Carriage outward	XXXX	
Commission of sales agents	XXXX	
Cost of catalogues	XXXX	
Expenses of delivery vans	XXXX	
Collection charges	XXXX	
Travelling expenses	XXXX	
Cost of tenders	XXXX	
Warehouse expenses	XXXX	
Cost of mailing literature	XXXX	
Sales manager's salaries	XXXX	
Insurance of showroom	XXXX	
Sales director's fees	XXXX	
Sales offices expenses	XXXX	
Rent of sales office	XXXX	
Depreciation of delivery van	XXXX	
Expenses of sales branch establishments	XXXX	
Branch office expenses	XXXX	
Total Cost Of Sales		XXXX
Profit or loss		XXXX
Sales		XXXX

Components of Total Cost

- Prime Cost: Prime cost consists of costs of direct materials, direct labours and direct expenses. It is also known as basic, first or flat cost.
- Factory Cost: Factory cost comprises prime cost and, in addition, works or factory overheads that include costs of indirect materials, indirect labours and indirect expenses incurred in a factory. It is also known as works cost, production or manufacturing cost.
- Office Cost: Office cost is the sum of office and administration overheads and factory cost. This is also termed as administration cost or the total cost of production.
- Total Cost: Selling and distribution overheads are added to the total cost of production to get total cost or the cost of sales.

Calculation of Relative percentage of various expenses

- Percentage of works on cost with direct materials = $\frac{\text{Works overheads or Works on Cost}}{\text{Direct Materials}} \times 100$
- Percentage of works on cost with direct wages = $\frac{\text{Works overheads or Works on Cost}}{\text{Direct wages}} \times 100$
- Percentage of works on cost with Prime Cost = $\frac{\text{Works overheads or Works on Cost}}{\text{Prime Cost}} \times 100$
- Percentage of Office on cost with Work cost = $\frac{\text{Office on cost or office overheads}}{\text{Works Cost}} \times 100$

- $\text{Percentage of Office on Cost with Works on Cost} = \frac{\text{Office on cost or office overheads}}{\text{Works on Cost}} \times 100$

of Percentage of each expense with Total Cost

- $\text{Percentage of Direct Materials Consumed with Total Cost} = \frac{\text{Materials Consumed}}{\text{Total Cost}} \times 100$
- $\text{Percentage of Direct Wages with Total Cost} = \frac{\text{Direct Wages}}{\text{Total Cost}} \times 100$
- $\text{Percentage of Works on Cost with Total cost} = \frac{\text{Works on Cost}}{\text{Total Cost}} \times 100$
- $\text{Percentage of office on cost with total cost} = \frac{\text{Office on Cost}}{\text{Total Cost}} \times 100$

Calculation of profit by given percentage of profit

- $\text{Profit} = \frac{\text{Total Cost} \times \text{Percentage}}{100}$ when percentage of profit is given on total cost.
- $\text{Profit} = \frac{\text{Total Cost} \times \text{Percentage}}{100 - \text{Percentage}}$ when percentage of profit is given on sales.

Classification of costs

- By Nature, or Traceability: Direct Costs and Indirect costs.* Direct Costs Are Directly attributable/traceable to Cost object. Direct costs are assigned to Cost Object. Indirect Costs are not directly attributable/traceable to Cost Object. Indirect costs are allocated or apportioned to cost objects.
- By Functions:* production, administration, selling and distribution, R&D.
- By Behaviour:* fixed, variable, semi-variable. Costs are classified according to their behaviour in relation to change in relation to production volume within given period of time. Fixed Costs remain fixed irrespective of changes in the production volume in given period of time. Variable costs change according to volume of production. Semi-variable costs are partly fixed and partly variable.
- By Control Ability:* controllable, uncontrollable costs. Controllable costs are those which can be controlled or influenced by a conscious management action. Uncontrollable costs cannot be controlled or influenced by a conscious management action.
- By Normality:* normal costs and abnormal costs. Normal costs arise during routine day-to-day business operations. Abnormal costs arise because of any abnormal activity or event not part of routine business operations. E.g. costs arising of floods, riots, accidents etc.
- By Time:* Historical costs and predetermined costs. Historical costs are costs incurred in the past. Predetermined costs are computed in advance on basis of factors affecting cost elements. Example: Standard Costs.
- By Decision Making Costs:* These costs are used for managerial decision making. And these are: -
 - *Marginal costs:* Marginal cost is the change in the aggregate costs due to change in the volume of output by one unit.
 - *Differential costs:* This cost is the difference in total cost that will arise from the selection of one alternative to the other.
 - *Opportunity costs:* It is the value of benefit sacrificed in favour of an alternative course of action.
 - *Relevant cost:* The relevant cost is a cost which is relevant in various decisions of management.
 - *Replacement cost:* This cost is the cost at which existing items of material or fixed assets can be replaced. Thus this is the cost of replacing existing assets at present or at a future date.
 - *Shutdown cost:* These costs are the costs which are incurred if the operations are shut down and they will disappear if the operations are continued.
 - *Capacity cost:* These costs are normally fixed costs. The cost incurred by a company for providing production, administration and selling and distribution capabilities in order to perform various functions.
 - *Sunken cost:* cost already incurred
 - Other costs

Types/Techniques of Costing

- 1) **Historical Costing** - It is the ascertainment of costs after they have been incurred. This costing is based on recorded data and the cost arrived at are verifiable by past events. This type of costing has limited utility.

- 2) Uniform Costing - it as " the use by several undertakings of the same costing system, i.e., the same basic costing methods, principles and techniques."
- 3) Standard Costing - standard costing as " a control technique which compares standard costs and revenues with actual results to obtain variances which are used to stimulate improved performance."
- 4) Direct Costing - Under direct costing, a unit cost is assigned only the direct cost, i.e., all the direct costs are charged to the relevant operations, products or processes. The indirect costs are charged to the profit and loss account of the period in which they arise. As a result, inventory is valued at direct cost only.
- 5) Marginal Costing - Under marginal costing, marginal cost is ascertained by differentiating between fixed and variable costs. In this type of costing, variable costs are charged to cost units and fixed costs of the period are written off in full against the aggregate contribution.
- 6) Absorption Costing - It is the technique of assigning all costs i.e. both fixed and variable, to the respective product/service.

Methods of Costing & Their Applicability

- Unit costing: This method is also known as "single output costing." This method of costing is used for products that can be expressed in identical quantitative units. Unit costing is suitable for products that are manufactured by continuous manufacturing activity: for example, brick making, mining, cement manufacturing, dairy operations, or flour mills. Costs are ascertained for convenient units of output.
- Job Costing: The objective under this method of costing is to ascertain the cost of each job order. A job card is prepared for each job to accumulate costs. The cost of the jobs is determined by adding all the costs against the job when it is completed. This method of costing is used in printing press, foundries, motor-workshops, advertising etc.
- Batch Costing: This method of costing is used where small parts/components of the same kind are required to be manufactured in large quantities. Here a batch of similar products is treated as a job and the cost of such a job is ascertained as mention.
- Contract Costing: If a job is very big and takes a long time for its completion, then the method appropriate for costing is called contract costing. Here the cost of each contract is ascertained separately. It is suitable for firms engaged in erection activities like construction of bridges, roads, buildings, dams etc.
- Process Costing: This method of costing is used in those industries where the production comprises of successive and continuous operations or processes. Here specific units lose their identity in the manufacturing operation. Under this method of costing, costs are accumulated by 'processes' for a particular period regardless of the number of units produced. This method of costing is followed by chemical industry, soap industry, rubber industry, paints industry.
- Operating Costing or service cost: The method of costing used in service rendering undertakings is known as operating costing. This method of costing is generally made use of by transport companies, gas and water works departments, electricity supply companies, canteens, hospitals, theatres, schools etc.
- Single Output/Unit Costing: This method of costing is used where a single product is produced. The total production cost is divided by the total number of units produced to get the unit/single output cost. This method of costing is normally used in marble quarrying, mining, brick kilns, breweries, etc.
- Multiple Costing or composite costing: It is a combination of two or more methods of costing mentioned above. Suppose a firm manufactures bicycles, including its components, the parts will be costed by way of batch costing but the cost of assembling the bicycle will be done by unit costing. This method is also called composite costing.
- Uniform costing: This is not a separate method of costing, but rather a system in which a number of firms in the same industry use the same method of costing, using agreed-on principles and standard accounting practices. This helps in setting the price of the product and in inter-firm comparisons.

Materials

The first element of the cost of the product is raw material. This is "the cost of commodities supplied to an undertaking." Material form an important part of the cost of a product and therefore proper control over materials is necessary. The term 'materials', generally used in manufacturing concerns, refers to raw material used for production, sub-assemblies and fabricated parts."

Production of every product requires some form of basic materials. Materials are therefore, indispensable for every production process. Materials constitute the substances or the essential parts of which product is made. They may be classified into three broad categories:

- **Raw Materials**: The term raw materials include materials which are in their natural or raw form e.g. cotton for a textile unit, etc.

- **Semi-finished Materials:** The term semi-finished materials include materials which are not completely finished in all respect. In other words, some processing till remains to be done before the product can be sold. For instance, a furniture manufacturer may purchase unpolished furniture from market and may sell it after polishing.
- **Finished Materials:** The materials comprise finished components which are used as raw materials for manufacturing a product.

Direct and Indirect Material

Direct Material: "All materials which can be allocated to a product or batch of products is direct materials. Such material thus becomes an essential part of the product."

- Direct material is an integrated part of manufacturing unit.
- Value of direct material is comparative by higher than that of other materials.
- Direct material can be related to unit produced. It increases in same ratio as the increase in production. So, these are also known as variable material costs.
- If material is brought for a specific job or process, then that material is direct material.
- If the nature of product is such that it cannot be sold without primary packing, then the cost of primary packing will also be treated as cost of direct material.
- If any material is used in a specific cost center then that material will be direct material for that specific cost center although it is indirect from the point of view of total cost of production.

Indirect Material: Indirect material is all other material used in the manufacturing process. The cost of indirect material is treated as one of the cost elements of indirect manufacturing expense. Typical indirect material are factory supplies of various sorts such as machine lubricants or janitors' supplies. In addition, some materials entering into the final product may be treated as indirect for accounting purposes because of the difficulty or expense of identifying them with specific job order.

- Indirect material cost does not change in proportion to the production.
- It does not become part of production cost.
- Even if it becomes part of production cost, the cost of indirect material is low than that of direct material.

Materials Cost: The amount of money invested in the production of a product. The ingredients of a meal or the parts of a machine would be things that incur material costs. This cost is apart from the cost of labour to produce the product. The material cost together with the cost of labour helps determine the total cost of a product and its eventual sale price.

Constituents of Material Cost: When materials are purchased, we do not pay for the materials only but sales tax, excise duty, octroi, freight, insurance etc. are also paid by us. Sometimes, the cost of packing or hire charge for packages is also paid by us. At the same time, trade and cash discounts are also enjoyed by us. The material cost therefore includes the following:

- **Invoice Price:** Invoice price is the price of materials which is calculated at the agreed rate subject to any deduction of trade discount.
- **Excise duty, Sales tax, Octroi etc.:** These are the levies which the government has made on production or sales. So the cost of materials purchased includes these.
- **Freight, Insurance etc.:** Cost of materials includes the cost of bringing the materials from the supplier's end when borne by the buyer. Thus, carriage inward and insurance cost on inward goods is included in the cost of materials.
- **Packing Cost:** If in addition to the invoice price, packing cost is also charged, cost of materials includes such cost. When in returnable packages which are charged to the buyer, materials are delivered & buyer is given credit at a lower rate of return, the difference between the rate charged and the rate credited is known as hire charges (or rental) and the same is included in the cost of materials.
- **Cash Discount:** When deductions are available in respect of invoice value, on the condition that payment must be made within the prescribed time, this is called cash discount. Thus, this is a reward for good financial management and hence has got nothing to do with the purchase. So, in order to ascertain the cost of materials, cash discount should not be deducted.

Material Control System: The term 'materials control' is of great importance, encompassing within its scope for all the activities relating to purchasing, receiving and inspection, store-keeping and inventory control, materials handling, accounting and controlling materials in an optimum manner so as to provide a pre-decided service to the customers at a minimum cost. Materials control is thus, concerned with the entire range of functions which effect the flow, conservation and utilization and the quality and cost of materials.

Thus, materials control involves efficient functioning of the following operations:

- Purchasing of materials
- Receiving of materials
- Inspection of materials
- Storage of materials
- Issuing of materials
- Maintenance of stores record
- Stock audit.

Essentials of Material Control System

1. A proper co-operation and co-ordination among the departments dealing with material purchasing, receiving, testing, storing, production planning and accounting.
2. A centralized purchasing department.
3. A proper perpetual inventory system, which reflects physical movement of stocks and their current balance.
4. A good method of classification and codification of materials.
5. A standard form for requisitions, order, issue, return and transfer of materials.
6. A carefully planned materials storage facilities to avoid losses from damage, evaporation, pilferage, theft and deterioration.
7. Materials and supply should be properly stored.
8. Stock of different levels should be fixed to ensure that there is no under and over-stocking of materials.
9. The quantity of each type of materials to be ordered should be fixed to reduce the ordering and carrying costs.
10. An effective system of internal check to ensure that all transactions relating to materials are automatically checked.

Objectives of Material Control:

- a) To receive materials and store them properly.
- b) To ensure proper production and preservation of materials.
- c) To make sure proper classification and codification of materials.
- d) To provide proper information to the management about stock of materials.
- e) To ensure good housekeeping and effective material handlings.
- f) To assist in verification and provision of supporting information for effective purchase action.
- g) To minimize obsolescence of materials adopted through effective control measures.
- h) To ensure the optimum investment in materials to avoid overstocking or understocking of materials.
- i) To maintain proper records about materials, receipts, issues and balances.
- j) To issue materials as per specifications.
- k) To make sure of the availability of all types of materials.
- l) To ensure proper utilization of floor space.

Techniques of Material Control:

- 1) Level setting.
- 2) Economic Order Quantity. (EOQ)
- 3) Just in time inventory system.
- 4) ABC analysis.
- 5) VED analysis.
- 6) Perpetual inventory system.
- 7) Marital (or inventory) Turnover ratio.
- 8) FNSD analysis.
- 9) Material (or inventory) cost reports.

Inventory Management: Inventory management includes planning, coordinating, and controlling activities related to the flow of inventory into, through, and out of an organization. Managing inventories to increase net income requires companies to effectively manage costs that fall into the following six categories:

- *Purchasing Costs* are the cost of goods acquired from suppliers, including incoming freight costs. These costs usually make up the largest cost category of goods for sale. Discounts for various purchase-order sizes and supplier payment terms affect purchasing costs.
- *Ordering Costs* arise in preparing and issuing purchase orders, receiving and inspecting the items included in the orders, and matching invoices received, purchase orders, and delivery records to make payments. Ordering costs include the cost of obtaining purchase approvals, as well as other special processing costs.

- *Carrying Costs* arise while holding an inventory of goods for sale. Carrying costs include the opportunity cost of the investment tied up in inventory and the costs associated with storage, such as space rental, insurance, obsolescence, and spoilage.
- *Stock Out Costs* arise when a company runs out of a particular item for which there is customer demand, a stock out. The company must act quickly to replenish inventory to meet that demand or suffer the costs of not meeting it. A company may respond to a stock out by expediting an order from a supplier, which can be expensive because of additional ordering costs plus any associated transportation costs. Or the company may lose sales due to the stock out. In this case, the opportunity cost of the stock out includes lost contribution margin on the sale not made plus any contribution margin lost on future sales due to customer ill will.
- *Costs of Quality* result when features and characteristics of a product or service are not in conformance with customer specifications. There are four categories of quality costs (prevention costs, appraisal costs, internal failure costs, and external failure costs).
- *Shrinkage Costs* result from theft by outsiders, embezzlement by employees, misclassifications, and clerical errors. Shrinkage is measured by the difference between (a) the cost of the inventory recorded on the books in the absence of theft and other incidents just mentioned, and (b) the cost of inventory when physically counted.

The flow chart of material control

Material planning	Materials purchasing and receiving	Materials storing	Material issuing	Material accounting
Centralised purchasing or decentralised purchasing.	Ascertaining requirement of materials	Location and layout of stores.	Materials requisition.	Receipts of materials.
Classification and codifications.	Exploring sources of supply	Maintenance of stores records. i.e. bin cards and stores ledger.	Bills of materials	Issues of materials.
Standardisation and simplification.	Calling quotations	Perpetual inventory system.	Materials returned to stores.	Losses and surplus of materials.
Types of stores i.e. centralised stores of decentralised stores	Preparing comparative statement of quotations.	Calculation of inventory turnover ratio for ascertainment of slow moving, dormant and obsolete materials.	Transfer of materials to other job or department.	
Fixation of levels Reordering level. Minimum level. Maximum level. Danger level. EOQ.	Making a choice of the most suitable supplier and placing purchase order with him.		Loss of materials	
Selective control through ABC analysis.	Receiving and inspecting materials.		Surplus of materials.	
VED analysis.	Checking and passing of bills for payment		Methods of pricing of issues.	
Perpetual inventory system.				

Levels of Stock

Minimum Level: This represents the quantity which must be maintained in hand at all times. If stocks are less than the minimum level, then the work will stop due to shortage of materials. Following factors are taken into account while deciding minimum stock level:

- *Lead Time:* A purchasing firm requires some time to process the order and time is also required by the supplier/vendor to execute the order. The time taken in processing the order and then executing it is known as lead time. It is essential to maintain some inventory during this period to meet production requirements.
- *Rate of Consumption:* It is the average consumption of materials items in the industry. The rate of consumption will be decided on the basis of past experience and production plans.

- **Nature of Material:** The nature of material also affects the minimum level. If a material is required only against special orders of the customer then minimum stock will not be required for such materials. Wheldon has given the following formula for calculating minimum stock level

$$\text{Minimum stock Level} = \text{Re-ordering Level} - (\text{Normal Consumption} \times \text{Normal Reorder Period})$$

Re-ordering Level: When the quantity of materials reaches a certain level then fresh order is sent to procure materials again. The order is sent before the materials reach minimum stock level. Reordering level is fixed between minimum level and maximum level. The rate of consumption, number of days required to replenish the stocks, and maximum quantity of materials required on any day are taken into consideration while fixing reordering level. Re-ordering level is fixed with following formula:

$$\text{Reordering Level} = \text{Maximum Consumption Rate} \times \text{Maximum Reorder period.}$$

Maximum Level: It is the quantity of materials beyond which a firm should not exceed its stocks. If the quantity exceeds maximum level limit then it will be termed as overstocking. A firm avoids overstocking because it will result in high material costs. Overstocking will lead to the requirement of more capital, more space for storing the materials, and more charges of losses from obsolescence. Maximum stock level will depend upon the following factors:

1. The availability of capital for the purchase of materials in the firm.
2. The maximum requirements of materials at any point of time.
3. The availability of space for storing the materials as inventory.
4. The rate of consumption of materials during lead time.
5. The cost of maintaining the stores.
6. The possibility of fluctuations in prices of various materials.
7. The nature of materials. If the materials are perishable in nature, then they cannot be stored for long periods.
8. Availability of materials. If the materials are available only during seasons then they will have to be stored for the future period.
9. Restrictions imposed by the government. Sometimes, government fixes the maximum quantity of materials which a concern can store. The limit fixed by the government will become the deciding factor and maximum level cannot be fixed more than that limit.
10. The possibility of changes in fashions will also affect the maximum level.

Wheldon has suggested the following formula for calculating maximum stock level:

Maximum Stock Level =

$$\text{Reordering Level} + \text{Reordering Quantity} - (\text{Minimum Consumption} \times \text{Minimum Reordering period})$$

Danger Level: It is the level below which stocks should not fall in any case. If danger level approaches then immediate steps should taken to replenish the stocks even if more cost is incurred in arranging the materials. Danger level can be determined with the following formula:

$$\text{Danger Level} = \text{Average Consumption} \times \text{Maximum reorder period for emergency purchases.}$$

Average Stock Level: The Average stock level is calculated such as:

$$\text{Average Stock Level} = \text{Minimum stock level} + \frac{1}{2} \text{ of Reorder quantity}$$

Economic Order Quantity: The economic order quantity (EOQ) is a decision model that, under a given set of assumptions, calculates the optimal quantity of inventory to order.

- The simplest version of an EOQ model assumes there are only ordering and carrying costs.
- The same quantity is ordered at each reorder point.
- Demand, ordering costs, and carrying costs are known with certainty. The purchase order lead time, the time between placing an order and its delivery, is also known with certainty.
- Purchasing cost per unit is unaffected by the order quantity. This assumption makes purchasing costs irrelevant to determining EOQ, because the purchase price is the same, whatever the order size.
- No stock outs occur. The basis for this assumption is that the costs of stock outs are so high that managers maintain adequate inventory to prevent them.
- In deciding on the size of a purchase order, managers consider costs of quality and shrinkage costs only to the extent that these costs affect ordering or carrying costs.

EOQ analysis ignores purchasing costs, stock out costs, costs of quality, and shrinkage costs. EOQ is the order quantity that minimizes the relevant ordering and carrying costs (that is, the ordering and carrying costs affected by the quantity of inventory ordered):

Relevant total costs = Relevant ordering costs + Relevant carrying costs

We use the following notations:

D = Demand in units for a specified period. (one year in this example)

Q = Size of each order (order quantity)

Number of purchase orders per period (One Year) = $\frac{\text{Demand in units for a period (one year)}}{\text{Size of each order (order quantity)}} = \frac{D}{Q}$

Average inventory in units $\frac{Q}{2}$, because each time the inventory goes down to 0, an order for Q units is received. The inventory varies from Q to 0 so the average inventory is $\frac{0+Q}{2}$.

P = Relevant ordering cost per purchase order.

C = Relevant carrying cost of one unit in stock for the time period used for D (one year)

For any order quantity, Q

$$\text{Annual relevant ordering costs} = \frac{D}{Q} \times P$$

(Number of purchase orders per year × Relevant ordering cost per purchase order)

$$\text{Annual relevant carrying costs} = \frac{Q}{2} \times C$$

(Average inventory in units × Annual relevant carrying cost per units)

$$\text{Annual relevant total costs} = \frac{D}{Q} \times P + \frac{Q}{2} \times C$$

(Annual relevant ordering costs × Annual relevant carrying costs)

The formula underlying the EOQ model is:

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

where:

EOQ = Economic order quantity

D = Demand in units for a specified time period (1 year in this example)

P = Relevant ordering costs per purchase order

C = Relevant carrying costs of 1 unit in stock for the time period used for D (1 year in this example).

Total Annual Relevant Costs (TRC)

$$\text{TRC} = \frac{DP}{Q} + \frac{QC}{2}$$

TRC = Total annual relevant ordering costs + total annual relevant carrying costs

TRC = {(Number of Purchase orders per year) × (Relevant ordering costs per purchase order)} + {(Average stock in units) × (Annual relevant carrying costs of 1 unit for a year)}

Material Inventory Period: It represents the period of one Consumption Cycle $= \frac{365}{\text{Turnover Ratio}}$

Material Inventory Turnover Ratio: $= \frac{\text{Yearly Consumption in Quantity}}{\frac{(\text{Opening Stock Quantity} + \text{Closing Stock Quantity})}{2}}$

Receipts of materials

The store-keeper receives the goods supplied by the supplier, in case of small and medium sized organizations. So, no separate receiving department is there in this case and a copy of the purchase order is received by the store keeper, while in big concerns, the receiving department receives the same. The goods are inspected by the store keeper with reference to quality and quantity. However, separate receiving and inspection department are there in the big concerns. In this respect, the following is the routine work:

- Get the challans and invoices and unloading of the materials.
- Physical survey, regarding the number of packs, physical conditions outwardly shown etc. is made.
- The materials are unpacked, marked, physical verification of the quantity received is made with reference to the challan and the purchase order, any shortage, breakage or surplus is brought to the notice of the supplier.
- The quality of the material required to be checked with reference to the sample or grade. Sometimes inspection department, where there is such a separate department, performs laboratory testing and the report of the testing is prepared in triplicate- one copy is for the office copy, second copy is for the receiving department and the third is for the purchase department.
- The challan needs to be signed a a copy required to be returned to the supplier as acknowledgement of receipt.

- After all the above have been done, goods received note in five copies will be prepared by the receiving department, out of which the original is to be retained, and the others need to be sent to the purchase department, the accounts department, the store-keeper (if the material is not received by him) and the department which is responsible for making purchase order.

Functions of a purchase department

- 1) Receiving indents.
- 2) Assessment of demand or description of need.
- 3) Selection of sources of supply.
- 4) Receiving of quotation.
- 5) Placing order.
- 6) Making delivery at the proper time by following up the orders.
- 7) Verification of invoices.
- 8) Inspection of incoming materials.
- 9) Meeting transport requirements of incoming and outgoing materials.
- 10) Maintaining purchasing records and files.
- 11) Reporting to top management.
- 12) Developing coordination among other departments.
- 13) Creating goodwill of the organisation in the eyes of the suppliers.

Issues Of Materials

Materials are kept in stores so that the storekeeper may issue them whenever the production department requires these. A storekeeper cannot issue materials unless a properly authorized material requisition is presented to him.

Method of pricing of material issues: When materials are issued to production department, a difficulty arises regarding the price at which materials issued are to be charged. The same type of material may have been purchased in different lots at different times at several different prices. This means the actual cost can take on several different values and same method of pricing the issue of material must be selected.

1. Cost Price Methods
 - a) Specified Price.
 - b) First in First out (FIFO)
 - c) Last in First Out (LIFO)
 - d) Highest in First Out (HIFO)
 - e) Base stock.
2. Average Price Methods
 - a. Simple Average.
 - b. Weighted Average.
 - c. Periodic Simple Average.
 - d. Moving Simple Average.
 - e. Moving Weighted Average.
3. Notional Price Methods.
 - a. Standard Price.
 - i. Current Standard.
 - ii. Basic Standard.
 - b. Inflated Price.
 - c. Market Price.
 - i. Replacement price.
 - ii. Realisable price.

Cost Price Methods

- a. *Specified Price (Identifiable) Method:* Sometimes materials are purchased to be utilised in a particular job or issues can be identified with a particular receipt. In these cases, the actual purchase price can be charged. This method can be adopted when prices are stable or when the materials are covered by price control orders. This method has limited application only.
- b. *First in First out (FIFO) Method:* This method is based on the assumption that materials are purchased first are issued first. It uses the price of the first batch of materials purchased for all issues until all units from this batch have been issued. In other words, the materials are issued at the oldest cost price listed in the stores ledger account and thus, the materials in stock valued at the price of the latest purchases. It should be noted that the assumption of FIFO is only for accounting purpose i.e., the physical flow of materials need not necessarily be in the order of the flow of the cost, though normally materials would be expected to move out of stock on approximately a FIFO basis because oldest stocks are usually used up first.

<i>Advantages</i>	<i>Disadvantages</i>
- It is a good inventory management system since the oldest units are used first and inventory consists of the latest stock. - It is logical. - It is easy to understand and operate. - It facilitates inter firm and intra firm comparisons. - Valuation of inventory and cost of finished goods is consistent and realistic.	- The cost of production is not linked to the current prices. - If prices are rising, production cost is underestimating. But if stock turnover rate is high, the inventory will have reflected current prices. The effect of current market prices is not revealed in issues when prices are rising. - It does not present the true picture when many lots are purchased at different prices. The calculation becomes complicated. - The pricing of material returns is difficult. - High inflation creates problems in replacing used materials, this aspect is not dealt with in FIFO. - Usually more than one price has to be adopted for a particular issue. - Cost comparisons between two batches of production become difficult when issues are priced differently.

- c. *Last in First Out (LIFO) Method:* The principle adopted is that the materials used in production are from the latest purchase. The Inventory is priced at the oldest costs. As the method applies the current cost of materials to the cost of units, it is also known as the replacement cost method. It is the most significant method in matching cost with revenue in the income determination procedure.

<i>Advantages</i>	<i>Disadvantages</i>
- It is simple and useful when transactions are few. - It is a good method of avoiding tax. - It is a systematic method. It matches current costs with current revenues in a better way. - It reveals real income in times of rising prices. - It minimises unrealised inventory gains and losses and tends to stabilise reported operation profits especially when the industry is prone to sharp price fluctuations.	- When rates of material receipts are highly fluctuating, the method becomes complicated. - More than one price may have to be adopted for issue. - Cost of different batches vary greatly, making inter firm and intra firm comparison difficult. - The stocks require to be adjusted during falling prices. - Unless purchases and sales occur in equal quantities the current costs cannot be easily matched with current revenue. - The company can time the purchases to cause high or low costs thus changing reported income at will. - Existing profit sharing and bonus can be affected by an accounting change. Employees will have difficulty in understanding the cause for these changes.

- d. *Highest in First Out (HIFO) Method:* The principle adopted is that costliest materials are issued first; inventory is valued at the lowest possible price. The method requires detailed records. It is mainly used for monopoly products or cost plus contracts. When stocks are undervalued, a secret reserve is created.
- e. *Base Stock Method:* A certain minimum stock of a material is always carried and is priced at the original cost (usually at the lowest purchase price). The portion of stock above this level is issued and priced under any one of the methods. The disadvantages of this method is that the stock may be undervalued and hence the computation of return on capital will not be reliable.

Average price Methods

- 1) *Simple Average Method:* The simple average is the average of prices ignoring the quantities involved. It can be used when the prices are normally stable and the stocks purchased are in equal quantities or the stock value is small. It is calculated by dividing the total rates of materials by the number of rates of prices. A new average is worked out after every receipt.
- 2) *Weighted Average Method:* In this method, the total quantities and total costs are taken into account while calculating the average price. It is calculated after every purchase by adding the quantity received to the stock in hand and the cost of this purchase to the cost of stock in hand. The total cost is divided by the total quantity to arrive at the value. This method avoids price fluctuations and reduces the number of calculations and gives an acceptable figure for stock.

<i>Advantages</i>	<i>Disadvantages</i>
- It is logical and consistent. - Changes in prices do not affect issues and inventory. - The values reflect actual costs.	- It involves considerable amount of clerical work. - When prices change frequently, it is inconvenient and complex. - As it is not the actual price, it is not realistic.

- 3) *Periodical Simple Average Method:* Some companies may price materials by taking average of the prices of all receipts during a period, e.g., a month, a week etc., for the subsequent period. Only those prices relevant to the period are taken into account. Purchase made during the period and closing stock are taken into account.

$$= \frac{\text{Total Prices of Materials}}{\text{Total number of prices}}$$

Advantages	Disadvantages
- It is simple to operate, as it avoids calculation of issue price after every receipt. - This method can usefully be employed in costing continuous processes where each individual order is absorbed into the general cost of producing large quantities of articles.	- Pricing of issues ignores heavy fluctuations in price during the current period. - It is not an exact cost method. - It involves heavy clerical work.

- 4) *Periodic Weighted Average Method:* The average price is calculated periodically and not every time the materials is received. It is calculated by dividing the total value of materials purchased during a period by the total quantity purchased.

Advantages	Disadvantages
- Clerical costs are reduced. - It is useful in process costing. - The issue price is not affected by short term fluctuations.	- At the end of the accounting period, heavy clerical work is involved. - Violent fluctuations are ignored till the end of the period. - Closing stock can be erroneously valued and nil stock may have a residual value.

- 5) *Moving Simple Average Method:* In this method, periodic simple average prices are further averaged. By dividing periodic average prices by the number of periods taken, the moving average is calculated. The period chosen should cover the period in which the material is issued. The value of closing stock may be undervalued or overvalued. When prices are rising, the issue price worked out is lower than the periodic average prices for the period concerned and vice versa.

- 6) *Moving Weighted Average Method:* The material issue price is calculated by dividing the total of the periodic weighted average prices for a number of periods by the total number of such periods.

Notional Price Methods:

- a) *Standard Price Method:* The price of issues for each item is pre-determined for a stated period taking into account all the factors affecting price, e.g., market trends, transportation costs, etc., standard prices are determined for each material. All issues and inventory are kept at the standard price. These should be revised from period to period. Standard can be basic or current standard. The basis standard is fixed for long periods and it gives the ideal price. It assists forward planning. Current standard keeps cost of the products adjusted to prevailing trends in markets. Basic standard on the other hand, helps to study trends in production costs over period. The difference between standard and actual is transferred to the purchase price variance account.

Advantages	Disadvantages
- It simplifies accounting as only quantities are recorded. - As only one rate is adopted, inconsistency is avoided. - It helps to determine purchase efficiency. If actual cost is more than the standard than there is unfavourable purchasing efficiency and vice versa. - It is simple to operate. - It provides stability to the costing system.	- It does not reflect the actual or expected cost but only a target. - It is not considering lead-time, quality, services, demand. - It very difficult to handling the small concern.

- b) *Inflated Price Method:* inflated price includes carrying costs, losses due to evaporation etc. It aims to recover full costs of materials purchased.

- c) *Market price method:* Materials may be issued at the replacement price. The replacement price is the cost of the same type of materials in the market at any given time.

Advantages	Disadvantages
- It measures results correctly and accurately as current revenues are matched against current costs. - It differentiates between holding gains and operating gains. - A realistic and competitive selling price can be determined.	- In the absence of a market price, replacement price cannot be determined. - As it is not based on actual cost, they may increase the confusion and complication in accounting.

The replacement price is used in respect of items used in manufacturing whereas the realisable price used for items kept in stock.

The realisable price is useful for calculating the issue price of obsolete and slow moving stores. If issues are priced at current market price, price reduced due to bulk purchases, are not reflected.

The market price method introduces elements of uncertainty and involves excessive classical labour to maintain records of latest prices for various items.

ABC Analysis: This technique of inventory control is also known as Always Better Control technique. ABC analysis is an analytical method of control which aims at concentrating efforts on those areas where attention is needed most.

ABC analysis is used to categorize items into three classifications, based on activity levels. The concept is most commonly applied to inventory, where the "A" classification identifies high-usage items, the "B" classification identifies medium-usage items, and the "C" classification identifies low-usage items. This breakdown can then be used to exercise high levels of monitoring over "A" classification inventory, and the least monitoring over "C" classification inventory. The "A" classification usually involves 5% of the total number of inventory items, while the "C" classification pertains to 80% of the inventory items. The remaining 15% of inventory falls within the "B" classification.

Characteristics that apply to each of these classifications include the following:

- "A" classification. Monitored on a daily basis, and replenished at frequent intervals.
- "B" classification. Monitored at relatively frequent intervals, and probably replenished using automated inventory system notifications to the purchasing staff.
- "C" classification. Monitored at longer intervals, possibly using manual tracking and reordering systems.

<i>Advantages of ABC analysis</i>	<i>Disadvantage of ABC analysis</i>
• Reduction in investment: under ABC analysis, the materials from group 'A' are purchase in lower quantities as much as possible. With this, the effort to reduce the delivery period is also made. These in turn help to reduce the investment in material. • Strict control: under ABC analysis, strict control can be exercised to the materials in group 'A' that have higher value. • Minimum storage cost: since, the, material from group 'A' are purchase in lower quantities as much as possible, it reduces the storage cost as well. • Saving in time: since a signification effort is made for management of the material from group 'A', it helps to save time as well. • Economy: this method is economical, since equal time and labour is not needed for all types of materials.	• ABC analysis will not be effective if the material is not classified into the groups properly. • It is not suitable for the organization where the costs of materials do not vary significantly. • There is no any scientific base for the classification of material under ABC analysis. • The classification of the materials into different groups may lead to extra cost. Hence, it may not be suitable for small organization.

Stores Ledger: A stores ledger is a manual or computer record of the raw materials and production supplies stored in a production facility. It is maintained by the person responsible for these assets, such as the warehouse manager. A stores ledger is particularly useful for maintaining a perpetual inventory system, since it tracks the current quantity of items on hand. A stores ledger can be used for the following purposes:

- By auditors, to see how well the company's inventory records compare to its on-hand quantities.
- By the purchasing staff, to determine when and in what quantities to purchase additional inventory items.
- By the accounting staff, to use as the basis for calculating the ending cost of inventory on hand.

The information listed on a stores ledger can follow one of two formats:

- Costed quantities. The same as the first format, except that the cost of the items is also listed in the ledger.
- Unit quantities only. The ledger shows the beginning unit quantity of an inventory or supplies item, plus or minus any subsequent additions to or subtractions from stock. When used for this purpose, the stores ledger may instead be referred to as a bin card.

Advantages of Store Ledger

- It enables distribution of work among a number of clerks due to which receipts and issues are posted quickly and regularly.
- It enables stock records to be centralized in case of an organization having a number of depots.
- The accuracy of posting can be mechanically tested more conveniently.
- The records are clearer and neater. Also the recurring cost of maintaining them is much less than those kept manually.
- If up-to-date records are available, the management will be able to exercise greater control over quantities held in stock from time to time which may result in a great deal of saving in both the amount of investment in stock and their cost.

Labour: Labour cost represents human contribution. Labour cost is sensitive in nature. The reason is that the labour cost is fully based on the human behaviour i.e. labour behaviour.

The control of labour costs requires the control of the labour behaviour. Therefore, the management should study human behaviour, performance of labour, time and motion study, labour turnover, labour approach in order to control the labour cost. Labour cannot be stored for future reference. It is very much similar to the perishable nature of materials. Some materials may lose its quality and not used for the purpose of production. Such materials will be waste one. Likewise, once labour is lost, the same cannot be recovered and not effectively used in the days to come. If labour is kept idle, the management should pay remuneration or wages for such idle time. Hence, the management incurred two losses. They are loss of labour working hours and monetary loss. Hence, the management is very keen in the control of labour cost.

Importance of Accounting for Labour

Accumulation, analysis and proper control over labour cost are most importance to every manufacturing organization for the fulfilment of following purposes:

1. To use direct labour cost as a basis for increasing the efficiency of workers.
2. To identify direct labour cost with product, job or process for ascertaining cost of production as accurately as possible.
3. To use direct labour cost as a basis for absorption of overhead, if desired.
4. To use direct labour as a basis for comparison with past labour cost and for substitution proposes.
5. To determine the amount of indirect labour cost to be treated as overhead.
6. To reduce the labour turnover.

Classification of Labour Cost

- 1) **Direct Labour Cost:** Direct Labour cost is that portion of salary or wage, which can be identified with and charged to a single unit cost of production. Characteristics of Direct Labour Cost:
 - It has direct relationship with the product or process or cost unit.
 - It can be measured quantitatively.
 - It is sufficiently material in amount.
- 2) **Indirect Labour Cost:** It is not identifiable within the production of goods and services even though directly incurred. These costs are incurred in the production place. Sometimes, some cost center may render service to the production departments or production activities. Such cost centers purchase, engineering and time keeping.
- 3) **Controllable Labour Cost:** A labour cost can be controlled by the management during production period and even during absence of production. A standard time and time rate may be fixed and request the labour to complete the job or order within such time. If so, the labour cost can be controlled to some extent.
- 4) **Non-Controllable Labour Cost:** A labour cost, which cannot be easily controlled by the management. A job or order can be completed by a group of labours. The efficiency of such group of labours differ in nature. A labour can use his/her efficiency in full as per the prevailing environment in the product place. If so, the cost cannot be controlled by the management.

Different between Direct and Indirect labour cost

	Direct Labour Cost	Indirect Labour Cost
Meaning	Is that cost which is directly involved in the production.	Is the cost which is not directly involved in the production.
Volume of production	The cost depends on the volume of production.	The cost does not depend on volume of production.
Separation	It can be separated in cost, cost center, or unit cost.	It cannot be separated.
Payment	Payment of direct cost is direct expenditure.	Payment of indirect cost is on Indirect expenditure.
Used	It is used to convert raw materials into finished goods.	It is used in the production process.
Part	This is part of prime cost.	It is a part of work, office, selling and distribution overhead.

Information required for Labour cost control

- 1) Cost of recruitment of labour.
- 2) Training cost of workers.
- 3) Labour Turnover.
- 4) Idle Time.
- 5) Over Time.
- 6) Shift Work.
- 7) Labour Efficiency.
- 8) Number of workers.

- 9) Wastage.
- 10) Spoilage.
- 11) Wages Paid.

Methods or ways of Labour cost control: The management to control the labour cost effectively may exercise the following ways.

1. Proper production planning.
2. Fixing of standard time.
3. Fixing of clear-cut wage structure.
4. An agreement with workers.
5. Preparation of labour budgets i.e. Labour Cost Budget and Labour Hours Budget.
6. Performance reports of labour.
7. Fixing of specific incentive payment.

Departments involved in labour cost control and their functions

The objective of lobar cost control is achieved through the intensive and coordinated efforts of various departments. These departments are:

- 1) Personnel department.
- 2) Engineering department.
- 3) Rate or time and motion study department.
- 4) Time-keeping department.
- 5) Pay roll department.
- 6) Cost accounting department.

Personal Department: Generally, every business organization has a recruitment policy of its own. For the execution of the recruitment policy of an undertaking, a separate 'personal department' is set up under the headship of a 'personnel manager, the main functions of this department are recruitment and selection, training, transfer, discharge, promotion and fixation of wages and salaries of employees' this department is responsible for providing an efficient force and lays down goods personal policies to be followed by the entire organization.

The functions of personal department are as follows:

1. Selection and recruitment of needed worker for the organization.
2. Maintain the detailed and up to date record of workers.
3. Promotion, transfer and discharges of the worker after their evaluation.
4. Development of different forms for maintaining the records of workers.
5. Provides training and conducts seminar, workshop for the worker.

The different forms by personal department are as follows:

- a) Labour placement requisition: it in any department, vacancy has been created within the allowed established; the department head or manager will send a formal written request to the personal department in the form of a 'labour placement requisition'. the specimen of a 'Labour placement requisition' is shown below:

Labour Placement Requisition

Department:.....			Requisition No:	
			Date:	
Place arrange workers of the following for my department with affect form:				
Number of workers requisitioned	Category	Job specification	Description	Remarks
Requisitioned by			Approved by:	

On receiving the 'labour placement requisition', the personal department arranges for the advertisement in trade journal or newspapers about the requirement of workers. Formed application are received from the candidates and after proper examination and interviewed, appointments are made. On The appointment of workers, the personal department information the department concerned about it.

- b) Employee's history card: for each person employed, the personal department proper ' employment history card' which show the particular of the employee, name and address of previous employer, cause of leaving the previous employment, previous experience, date of apartments, date of joining of joining and wages rate at commencement. The details of the following particulars are also recorded in this card:
 - Change in the name or address.
 - Change in the wages rate.
 - Promotions and transfers.

Sickness and accidents.

Date and reasons for leaving the job.

Employee's History Card or Personal Record Card					
Name:		Clock No:			
AADHAR No:		Date of Appointment:			
PAN No:		Department:			
Father's Name:		Date of Joining:			
Education:		Marital Status:			
Date of birth:		No. of Children:		Weight:	
Residential Address:		Height:			
Permanent Address:					
Local:					
References: 1. Name of previous employer:					
Reasons for leaving:					
Particulars of changes in payment and services					
Date	Department	Rank	Pay Scale	Reasons for Change (Increments, Transfer, Promotion, Demotion etc.)	Remarks
Authorised signature:					

On the reverse side card, columns re provides to give information as to details of holding taken by the workers.

Engineering department of Accounting labour: In order to ensure proper utilization of labour force in an industrial undertaking, it is necessary to make the use of proper production methods and to provide healthy working conditions to the workers. For this, an engineering department is set up. This department helps in maintaining control over working conditions and production methods for each job, departments or process by performing the following functions:

- 1) Preparation of plan and specifications for each job scheduled for production.
- 2) Supervision of production activities within production departments.
- 3) Inspection of jobs after they are completed to ensure that they are satisfactorily completed.
- 4) Conducting research and experimental workers before undertaking new job.
- 5) Maintaining safety and efficient working conditions so that there may be minimum possible accidents and conducive environment to health and efficiency of workers.

Rate or time and motion study department in accounting for labour: The department that primary concerned with the task of making of time and motion studies of labour and plant operation, job analysis and setting wage rates is called the rate or time and motion study department.

While performing job or work or a machine has to make movements. The motion study is the study of movements of the workers as well as machine while performing an operation. It is done for the purpose of eliminating useless motions. Time study is done to determine the required time for performing the operation. It is conducted after the motion study. For determining a standard time various methods are used under time study. An average worker is taken as model worker and basis or standard time is fixed for a job or operation giving allowances of time to the workers for smoking, drinking water and so on. The following are some importance advantages of time and motion studies:

- a) These studies help in determining proper speed of work by eliminating unnecessary movements.
- b) They help in fixation of suitable wages rates and introduction of wages plans.
- c) The efficiency of workers gets increase because they are asked to follow correct procedures and methods of work by avoiding useless motions thus save time and energy.
- d) They help in increasing output by a greater efficiency and less human fatigue.
- e) They help in increasing output by a greater efficiency and less human fatigued.
- f) They help in assessing the correct labour requirements of an organization.
- g) They facilitate labour cost budgeting and labour cost control.

Wages rates are determined on the basis of requirements of a job. Job analysis is breaking up a job into basis elements or operations and studying them in detail to find out the duties, responsibilities and skill involved in it. It is a process of determining the contents and characteristics of a job, the conditions under which performance is to be carried on, the qualifications required in the worker, methods and techniques used performance is to carried on, the basis objective of job analysis is to ascertain the relative worth of each job through and objective evaluation so that suitable remuneration can be fixed for each job.

Time-keeping department of labour: For efficient labour organization, it is necessary that all workers including those who are paid on piecework basis should be punctual. Late arrival or early department of a works causes

disturbance even as regards to the work of others. It is, therefore, necessary to have a good system of recording the time of arrival and departure of works whether they paid in the basis of time or piece work. For the purpose of exercising control over arrival and departure of workers, a separate time-keeping department is set under the headship of a time keeping. The following are the functions of time-keeping department.

1. It maintains up to date attendance of workers.
2. It finds out time idle time of each worker to control and minimized it.
3. It keeps the record of time spend by each worker including records of normal and overtime works.
4. It also keeps the detail records of the workers' arrival and departure time in the work place.

Pay roll department of labour: The pay roll department is set up for computation and disbursement of wages in a business concern. Pay-roll department is connected with the computation of gross wages of the workers and making necessary adjustments with a view to ascertain the net amount of wages payroll to them. It is concerns with how much employees have earned during a period and involves computation of gross and net amount payable to each employees. The main functions of pay-roll department are:

- a) To maintain the record of the job classification, department and wages rate for each worker.
- b) To verify and summaries the time of each worker as shown by the daily time card.
- c) To calculate the amount of wages earned each worker.
- d) To prepare the pay roll or wages sheet for each department showing:
 - The total amount of wages earned by each worker during a given period.
 - The deductions made from the gross wages.
 - The net amount of wages payable for each worker.
- e) To maintain permanent pay roll records to each worker.
- f) To make the disbursement of wages and salaries to the workers.

The payroll department prepares a wages sheet to record the gross wages earned by each worker during a particular pay period.

When wages are paid on the basis of time, the wages sheet is prepared on the basis of time cards or clock cards. But when the workers repaid on the basis of output, the wages sheet is prepared on the basis of piece work cards. Wages sheets are prepared department-wise, and its prepared is the responsible of the wages officer (pay roll department), which is under the control of costing department. After their completing, the wages sheets are passed on to the cashier for the payment of wages to the workers.

A Specimen of Pay Roll Sheet or Wages Sheet Is Given Below														
Payroll or wages sheet														
Department:									Week ending:					
		House worked		Amount earned				Gross wages	Deduction				Net wages	Signature
Workers no.	Worker name	Normal time	Overtime	Bonus	Dearness allowances	Overtime wages	Time or piece rat wages		Provided fund	Advances	others	Income tax		
Total														
Prepared by: Cashier:									Checked by:					

Cost accounting department: Cost accounting department is responsible for the accumulation, classification and analysis of cost data in a business concern following the cost accosting systems. Labour cost is one of the important elements of total cost. In a large business concern, representatives of the cost accounting department are involved in production department in order to make proper accumulation, classification and analysis of labour costs. These representatives work under the direct supervision and control of the cost accountant. They assist the cost accountant in computing the labour cost of production by department, processes, operations, production orders, job etc. The features of cost accounting are as follows:

- 1) To collect all types of information about cost and reporting to management with analysis.
- 2) To determine the cost of each work.
- 3) To calculate labour cost by using the time card, job and payroll.

Frauds in Wages Payment: If the wages are determined more than the actual to be paid or the wages is paid less than the actual to be paid, it is regarded as the fraud in wages for committing fraud in wages payment are as follows:

- Showing the absent workers as present workers.
- Showing the dummy workers.
- Showing the standard time for the early as well as late comers.
- Showing the fake extra time.
- Showing the dividend that is not under provision.
- Changing the rate of remuneration or wages.
- Committing fraud while paying cash to the workers.

Prevention of fraud in the wages payment: Since the fraud in wages payment increases the total labour cost. It must be prevented for which an effective system is required. The following are some of the ways to prevent the fraud in wages payment.

- Effective use of the job card, idle time card and piece work card.
- In case of the piece wages systems, the comparison has to be made between the actual production unit and the units produced by the workers.
- The verification of overtime by authorized personnel.
- Payment of the wages to the concerned workers only.
- Payment of wages to casual workers in the presence of the authorized personnel.

Time Keeping: This department is concerned with maintenance of attendance time and job time of workers. Attendance time is recorded for wage calculation and job time or time booking is considered for computing time spent for each department, job, Operation and Process for calculating labour cost department wise, job wise and of each process and operation.

The opening time, the closing time, the lunch break, the total working hours per day & per week & also the weekly holiday, are clearly specified in every organization. Keeping in view the provisions of the Factories Act on overtime work, the normal working hours per day & per week are fixed. Any work done beyond the normal working hours is known as overtime work.

Essentials of a good Time-keeping System

1. Good time keeping system prevents 'proxy' for one another among workers
2. Time-keeping has to be done for even piece workers to maintain uniformity, regularity and continuous flow of production.
3. Both the arrival and exit of workers is to be recorded so that total time spent by workers is available for wage calculations.
4. Mechanised methods of time keeping are to be used to avoid disputes.
5. Late arrival time and early departure time are to be recorded to maintain discipline.
6. The time recording should be simple, quick and smooth.
7. Time recording is to be supervised by a responsible officer to eliminate irregularities.

Mechanisms for time keeping:

There may be two ways of recording attendance & departure: - (a) Manually & (b) mechanically. On the basis of policy of the management, how time keeping shall be done is decided, after taking into consideration a number of factors like need, resources, number of workers, fraudulent payments, dummy workers, chances of malpractices etc.

1. Manual Recording:

Hand Recording: An attendance register is prepared in this case which has sufficient columns showing the names of the employees. One register is enough, if the number of workers is small. On the other hand, one register for each department shall be required, if the number of workers is big. Literate workers may sign; otherwise the recording of attendance is done on the basis of 'visual check' of attendance by some person who has been entrusted with the duty. With the time of attendance, late attendance & absent is also recorded.

This method is simple but because of the under mentioned difficulties, is almost out of use:

- There may be manipulation of entries by the attendance clerk due to his collusion with any worker.
- At the time of recording of late attendance, overtime work calculation & marking of short leave, mistakes may be made.
- Regarding the recording of the attendance, suspicion may arise in the minds of the illiterate workers.

- For recording the attendance of the out workers, this method is still being followed.

Disc/Token/Check Recording: In this case, a metal disc is allotted to each worker, on which his token number is engraved. Two boards, in-board & out-board are there with serially numbered hooks. Before the opening time, the disc of the workers remains hung up with the hook in the out-board which is placed at the gate. The worker takes his disc from the out-board as he enters the factory, & places the same on the respective hook on the in-board. If any worker enters after the normal attendance time, then he does not find the in-board as it has already been removed but he finds a separate box known as late box in which he has to place his disc. On the basis of discs on the in-board & the late box respectively, the timely attendance & the late attendance are recorded by the attendance clerk. The workers are marked absent whose discs remain in the out-board.

Alternatively, the respective discs may be taken by the workers from the out-board to their respective departments so that they can be placed on an attendance board. In this case, the recording of the attendance & absence is done by the gate attendance clerk on the basis of the position of discs on the out-board. The department concerned also records the departmental attendance & late attendance & the comparison of the two records are made by the internal audit or cost audit department. The checking of this record is done regularly & any discrepancy is reconciled. At the time of departure also, the discs which remain placed on the in-board are taken out by the workers who place them on the out-board.

This method is better than hand recording method but still have some defects which are as follows:

- Unless there is strict supervision, the disc of the friend who is absent may be taken out by any worker along with his own disc & placed on the in-board.
- Error may be there in recording from the discs.
- Except during normal time of Attendance & departure, recording of attendance & departure shall require separate documents, for example, separate record of 'short leave' is required to be prepared if a worker leaves the factory early. Similarly, separate record is required for overtime work.

2. Mechanical Recording:

Time clock method: A time card is allotted to each worker (bearing his name, number, grade, hourly pay & the name of his department) for each week. The cards which are meant for each clock is serially placed in out-rack beside the clock. Also there is an empty in-rack. The clock numbers are serially known by the workers who proceed in queues to the respective clock at the entrance. The cards are taken by each worker who then puts the same in the slot of the clock & pushes the button, the cards are then placed in the in-rack & the worker enters the factory. The time of punching is printed by the clock against the date on the card. At the departure time also, the same thing need to be done that is the cards are taken from the in-rack & finally placed in the out-rack. The time officer used the cards at the end of the week for the purpose of calculation of hours of normal work, overtime work, short leave, absence etc. For the ensuing week, a fresh card is allotted. Sometimes, late attendance, early or late departure are printed in different colour to facilitate recording.

Combined Time And Pay Roll Card							
Name of the worker: No. of the worker: Department:						Week ending:	
Day		Regular		Over time		Total time	
		In	Out	In	Out	Normal time	Over time
Monday	Am						
	Pm						
Tuesday	Am						
	Pm						
Wednesday	Am						
	Pm						
Thursday	Am						
	Pm						
Friday	Am						
	Pm						
Saturday	Am						
	Pm						
Sunday	Am						
	Pm						
Calculation of wages		Normal time	Hours worked	Rate	Amount	Deductions	Net amount
		Over time					
Time keeper: Foreman: Received the Net amount as above:						Pay roll clerk: Worker:	

Advantages	Disadvantages
• It is ultimately economical. • For the purpose of calculation of wages, the same card may be used, thereby substantially reducing the cost of preparation of pay rolls. • Commission of fraud on attendance & departure is not possible. • The workers should not have any suspicion as the recording is reliable.	• Heavy initial investment is involved which may not be affordable by the small concerns. • Unless done under strict supervision, there are chances that more than one card may be punched by one worker.

Dial Recording method: Under this method, a dial will be there with the recorder, around which a number of holes are there, each hole represents a number corresponding to the ticket number of the worker. A roll paper is there inside the recorder. The dial arm is pressed by the worker in the respective holes as he enters. The recording of the attendance of the worker is done automatically on the role of paper against his ticket number. The advantages are: - is economical ultimately, recording is reliable, fraud is avoided. The disadvantages are: - Initial cost is high; the possibility is there that more than one may be pressed by the same worker. As time of arrival & time of departure is recorded separately, calculation of attendance period becomes difficult. Due to limited number of holes in the dial, the recording is also slow.

Key Recording method: Under this method, a key bearing the ticket number of the worker is allotted to each worker. The key is inserted by the worker in the key hole & he gives a turn. There will be automatic recording of the ticket number & the clock time on a sheet of paper which is provided in the recorder. The greatest advantage of this method is that, the sheet of paper on which the recording of ticket time & clock time has been done, when taken out, will form a part of the pay roll. Thus the labour & expense involved for copying time record can be avoided. The disadvantages are: - There is limitation of number of holes & key, as a result of which, the recording becomes slow. Also the time of arrival & departure of a worker instead of being recorded side by side, are recorded in two places of the sheet, there by the calculation of the attendance period becomes difficult.

Calculation of Attendance Time: The period of attendance is worked out from the time of attendance & the time of departure (i.e. in-time & out-time). According to the rules, the calculation of the normal hours worked & the overtime hours worked should be separate from the attendance period. Because the payment for the normal & overtime hours are made at different rates, the recording of the normal & overtime hours is done in the separate columns of the clock card.

In case of disc/token/check system, if a worker enters & leaves at prescribed times, the recording of his attendance will be for the full day. This can be known from his disc on the in-board & out-board. On the other hand, his disc will be found in the late box if he comes late or leaves earlier & thus for ascertaining the period of his attendance, suitable adjustment will be made with the full day hours.

Features of Good time keeping:

The under mentioned points must be assured for the purpose of attaining efficiency in time keeping: -

- 1) In accordance with established procedure & under the supervision of a responsible office that must be present at the gate, the attendance & departure must be signified, by whatever means.
- 2) There must be complete elimination of recording of attendance & departure of proxy.
- 3) Recording of attendance & departure should be made by all the workers, whether they are on the time wage system or on piece wage system, with equal importance.
- 4) The machines which are used for recording must be in good condition so that there is no error in recording & also must be in good number so that there is no overcrowding at the gate.
- 5) Except on gate pass duly signed by responsible officer, workers should not be allowed to leave the factory. The gate pass should record time of departure, so that on this basis, adjustment in attendance period can be made.
- 6) Late attendance must be recorded by the late comers & the extent of late coming allowed should be prescribed.
- 7) Though costlier, yet, double recording at the factory gate & in the department concerned, gives facility for checking the time recorded.

Time-Booking

Time booking is the recording of time spent by a worker on different jobs or work orders carried out by him during his period of attendance in the factory.

Objectives:

1. It ensures that the time paid for, as per time keeping is properly utilized on jobs and orders.
2. It enables the cost department to ascertain the labour cost of each job or work order.
3. It helps in allocation and apportionment of wages among different departments where labour hour rate method is used as basis.

4. It helps to calculate idle time.
5. It is helpful when incentive schemes are in operation in the factory by revealing the time spent by the workers on different jobs.
6. Time booking also helps in measuring the efficiency of workers by comparing standard time for the jobs with actual time.

Time Booking Methods:

1. **Daily Time Sheet:** In this method, each worker records the time spent by him on the work during the day, for which a sheet is provided to each worker. The time is recorded daily and hence accuracy is maintained.

Daily time sheet							
Worker's Name: Worker's Number: Department:						No: Date:	
Job Or Work Order No	Work Done	Description	Time		Hours	For Cost Office	
			On	Off		Rate	Amount
worker: Entered in wages sheet by:		Foreman:			Costed by:		

2. **Weekly Time Sheets:** The only difference between the daily time sheet and weekly time sheet is that these time sheets are maintained on weekly basis. This means that each worker prepares these sheets weekly rather than daily. This drawback of weekly sheets can be removed if they are kept with a departmental clerk and are printed on cards instead of on sheets. These sheets can be filled up by the workers or foreman or departmental clerk. It is better if these sheets are filled up by the departmental clerk so that there may not be incorrect recording by the worker and the foreman may not waste his precious time in filling up these sheets.

Weekly time sheet								
Worker's Name: Worker's Number: Department:						No: Week ending:		
Day	Job No.	Work Done	Description	Time		Hours	For Cost Office	
				On	Off		Rate	Amount
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								
Sunday								
Total								
worker: Entered in wages sheet by:			Foreman:			Costed by:		

3. **Job Card:** A job card is used to keep a close watch on the time spent by a worker on each job so that the labour cost of a job may be conveniently ascertained.

Four types of job cards are generally used:

- 1) **Combined Time and Job Card:** This type of card is useful in small organisations where the number of workers is small and the worker works for the whole day on the same job. In small organisation, there is no need of recording the arrival and departure of a worker, and the time spent by him on different jobs separately. Only combined time and job card can serve the purpose of time keeping and time booking.

A specimen of combined time and job card is given below:

Combined time and Job Card							
Worker's Name: Worker's Number: Department:						Week ending:	
Day	Job No.	Time		Time		For Cost Office	
		On	Off	Normal	Overtime	Rate	Amount
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							

Saturday							
Sunday							
Worker: Entered in wages sheet by:			Foreman:			Costed by:	

- 2) **Job Card for Each Worker.** This job card (a specimen is given below) is kept in the department and is maintained in addition to the time card to know how the worker's time shown by the time card is spent on various jobs. A reconciliation is possible between the time shown by the time card and the time booked against jobs. Every worker is given one job card at the beginning of each week and the time spent by the worker on different jobs during the week is noted in this card.

Specimen of this card is as follows:

Job Card for Each Worker							
Worker's Name: Worker's Number:						Week ending:	
Day	Job No.	Description	Time		Hours	For Cost Office	
			On	Off		Rate	Amount
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							
Saturday							
Sunday							
Total							
worker: Entered in wages sheet by:			Foreman:			Costed by:	

- 3) **Job Card for Each Job.** The two types of job cards mentioned above are issued to each worker and an analysis of the time spent on various jobs during the week is shown therein. But if the purpose is to know at a glance the total labour cost of a job, a job card should be issued for each job and not for every worker. This is a card which travels along with the job from worker to worker, and each worker records time spent by him on it. This job card is useful in those organisations where the number of jobs is very large and each job passes through different workers of different grades. The most important advantage of this type of job card is that there is no need of the preparation of separate abstracts of the job card for cost purposes and the labour cost of a job can be known at a glance.

The ruling of this card is given below:

Job Card for Each Job								
Job No: Job Description: Started on _____ at _____				Completed on _____ at _____				
Day	Worker's No.	Dept.	Brief Description of Work Done	Time		Total Time	For Cost Office	
				On	Off		Rate	Amount
Checked and Verified			Total Time				Amount total	
		Department Foremen				Costed by		

- 4) **Piece Work Card.** In a factory where workers are paid on piece basis, a piece work card (a specimen given below) is issued to each worker. In case of piece basis quantity of work done is important and time spent by the workers is not important but even then time column is provided for in these job cards because indirect expenses are apportioned to jobs on the basis of time taken for their completion.

PIECE WORK CARD										
Worker's Name: Worker's No: Department:					Week Ending					
Day	Brief Description of work done	job no.	No. of units		For Cost office			Initials		
			Tendered	Accepted	Rate per unit	Amount	Time		Worker	inspection
							On	Off		
Monday										

Tuesday										
Wednesday										
Thursday										
Friday										
Saturday										
Sunday										
Foreman: Entered in Wages Sheet:							Costed by:			

Reconciliation of Gate Time (or Time-Keeping) with Time Booked (or Time Booking):

Time booked to different jobs or work orders should agree with gate time. But usually it does not happen due to many reasons e.g., time taken in going from the factory gate to the department in which the worker is engaged, time lost in waiting for materials, tools and instructions, time lost due to breakdown of machinery or power failure, etc. Therefore, Idle Time Card should be prepared to record the time which has been wasted. Time shown by time card will agree with the time shown in the job card and idle time card. Idle time card will throw light on the reasons which are responsible for the idle time during which the workers had done no work although they were present in the factory. In process industries, need for reconciliation does not arise because there is no need to book time on job cards as the workers are usually employed on the same process throughout the period. Job cards may also not be required in case of long run jobs such as building contracts because workers are engaged on the same job for a long period. In such cases, only time cards kept under time-keeping system will serve the purpose; so there is no necessity of reconciliation. But, however, Idle Time Cards should be prepared to know the reasons of idle time so that corrective action may be taken to avoid the incurrence of idle time in future.

Specimen of the idle time card is given below:

IDLE TIME CARD						
Worker's Name:						
Worker's No:						
Department:						
Reasons for Idle Time	Time		Time lost	For Cost Office		Remarks
	On	Off		Rate	Amount	
1) Waiting for materials						
2) Waiting for tools						
3) Waiting for instructions						
4) Machine breakdown						
5) Power failure						
6) Inspection						
7) Other reasons						
Worker:	Foreman:			Costed by:		

The advantages of job card are as follows:

- It reduces normal idle time.
- It gives clear, logical and suitable information to the costing department.
- It provides a very useful link between the production control and costing.
- Job card gives information about number and particulars of job accurately.
- The entries in the job card both at the time of commencement and completion of the job is done by an assistant in the office.

Overtime:

Overtime is beyond the normal working hours spent by workers to do the extra work or to complete the incomplete work. Overtime wages is the amount payable to the worker for the extra time spent by the worker to do extra and/or incomplete work.

The following are the two principal causes of overtime. They are briefly explained below.

- Scheduling More Production:** The production department can decide the volume of production than normal production hours when the workers requested to work in overtime. Likewise, the company can decide to sell more units for which more production is required. Now, the workers are expected to work in overtime. In this way, production schedule is prepared to produce more units.
- Rush Orders or Special Order or Urgent Order:** The normal demand for the product can be fulfilled with the help of production carried on in normal working hours. In case of accepting rush order, special order or urgent order, the company is forced to employ its workers in overtime. If so, such accepted orders may be executed without any difficulty.

<i>Advantages of Overtime</i>	<i>Disadvantages of Overtime</i>
a. More benefits are derived from the same resources like men and machine. b. Timely execution of an order through overtime work. c. Goodwill of the company is increased. d. Regular customers can be satisfied. e. Provide a basis for attracting new customers. f. Extra earning is available to the existing employees by working overtime. g. Market opportunity can be availed of. h. Spoilage materials can be used in time. i. Some materials may lose its quality due to storage. The company properly uses such materials.	1. It involves high labour cost. The reason is that overtime rate is higher than normal rate. 2. Workers are getting tired during normal working hours. Hence, productivity is decreased. It leads to less production in overtime. 3. The health of the worker is affected. 4. The workers may postpone the work to be performed in normal working hours in order to get more wages. The reason is that overtime rate is high. 5. If the overtime work is not distributed evenly among all workers, there may be discontent in some section of the workers. 6. The overtime working involves incurring more indirect expenses. 7. The working life of the machine may be decreased due to continuous operation. 8. Overtime work once introduced cannot be easily discontinued due to workers' resistance. 9. Continuous work for long periods leads to fatigue and defective output. 10. Workers may slow down their performance in normal working hours intentionally in order to force the management to sanction overtime. 11. It decreases productivity during normal working hours.

How to control overtime?

- (i) Extra payment does not necessarily mean extra work. Workers fatigue curve rise sharply as their work-hours get longer.
- (ii) Workers usually become used to receive higher wages due to overtime and when overtime work is cut down, they become hostile and their resentment may be very strong.
- (iii) Overtime means extra cost, both that of wages and other variables like lighting etc., which result in reduction of profit.
- (iv) If overtime is avoided, same work may be done by additional employees. Thus from the point of view of nations employment potential, it is beneficial to control overtime.
- (v) Overtime falls upon the health of the workers, it leads to fatigue.
- (vi) Due to overtime there is unusual strain and work-load on plant and machinery,
- (vii) If overtime is allowed, there is a tendency to keep work pending to be done during overtime period or to intentionally slowdown in order to compel the management to sanction overtime.

The following steps may be suggested to control overtime:

- All overtime work should be duly authorized either by departmental head or work manager. There should be sanction of overtime after investigating its necessity.
- Overtime cost should be separately recorded in respect of each department. This will enable proper investigation and planning of production in future.
- There should be effective supervision of overtime work so that there may be no misuse of overtime allotted to workers.
- If overtime tends to become a permanent feature the management should consider of recruiting more workers or shifts may be increased.
- If overtime is due to lack of sufficient equipment, plant and resources, steps should be taken to arrange necessary resources and equipment's. The management may opt for giving sub contracts to others.
- Weekly overtime reports must be made out to the management or work manager, which will enable him to initiate necessary action to cut down overtime.

Idle Time: Idle time is unproductive time on the part of employees or machines caused by management or as a result of factors beyond their control. Idle time is the time associated with waiting, or when a piece of machinery is not being used but could be. It could also be associated with computing, and in that case, refers to processing time.

Types:

- 1) Normal Idle Time, and
- 2) Abnormal Idle Time.

Normal Idle Time: It is inherent in any work situation and cannot be eliminated. This represents the time, the wastage of which cannot be avoided and, therefore, the employer must bear the labour cost of this time. But every effort should be made to reduce it to the lowest possible level.

Following are some of the examples of normal idle time:

- (i) The time taken in going from the factory gate to the department in which the worker is to work, and then again the time taken in coming from the department to the factory gate at the end of the day.
- (ii) The time taken in picking up the work for the day.
- (iii) The time which elapses between the completion of one job and the commencement of the next job.
- (iv) The time taken for personal needs and tea breaks.
- (v) The time lost when production is interrupted for machine maintenance.
- (vi) The time lost due to waiting for job, instructions, drawings, the prints, material etc. or due to machine set-up time which are normal to production.

Treatment of the Cost of Normal Idle Time: It is unavoidable cost and as such should be included in cost of production.

The cost of normal idle time can be dealt with in one of the following ways:

- The labour cost of normal idle time may be treated as an item of factory expenses and recovered as an indirect charge in case of indirect workers. For example, if a worker is engaged for 8 hours in a factory @ ₹ 10 per hour, he will receive ₹ 80 as wages for the day. From job card it is found that he utilises 7 hours for production. Then in such a case, ₹ 10 the labour cost of one hour of normal idle time may be debited to factory expenses and ₹ 70 the labour cost of 7 hours utilised for production may be recovered as a direct expenditure and charged as wages to the production.
- It may be charged direct to case of production at a grossed up rate to include normal idle time in case of direct workers. In the above example, ₹ 80 (total wages) will be charged to the production as a direct charge under the heading of direct wages. The grossed up rate will be ₹ 11.43 per hour ($₹ 80 \div 7$ hours).

The second method of treatment of the cost of normal idle time is preferable because of the following reasons:

- The actual cost of engaging the worker is ₹ 80 (in the above example) and, therefore, the jobs upon which he has spent his time should bear the entire amount of wages proportionately. No portion of the labour cost should be treated as factory expenditure.
- It will lead to approximation of cost if the labour cost of the normal idle time is treated as a factory expenditure because greater accuracy is achieved in costing if as much expenditure as possible can be treated as direct expenditure.

Abnormal Idle Time: It is that time the wastage of which can be avoided if proper precautions are taken. Examples of abnormal idle time can be cited as below:

- a) The time wasted due to breakdown of machinery on account of the inefficiency of the works engineer.
- b) The time wasted on account of the failure of the power supply.
- c) The time wasted due to shortage of materials on account of the inefficiency of the store-keeper or the purchasing department.
- d) The time wasted due to unnecessary waiting for instructions.
- e) The time wasted due to unnecessary waiting for tools and raw materials, and
- f) The time wasted due to strikes or lock-outs in the factory.

Treatment of the Cost of Abnormal Idle Time:

It is a principle of costing that all abnormal expenses and losses should not be included in costs and as such wages paid for abnormal idle time should not form part of the cost of production. The wages paid for abnormal idle time should be debited to Costing Profit and Loss Account. The objective of transferring wages of abnormal idle time to Costing Profit and Loss Account is to have meaningful comparison of cost of production at different times by keeping away abnormal wages from cost of production. It will be recognised that idle time can be isolated only in case of direct workers. In case of indirect or non-productive workers i.e., fitter and watch and ward staff, the whole of their wages will be shown as indirect expenses, so wages for idle time will be absorbed automatically.

Control of Idle Time: Production should be planned and supervised so that idle time is reduced to a minimum. All the jobs in hand should be properly planned so that workers may complete them in sequence and may not have to wait for getting the work. The instructions and drawings should be clearly laid down for all jobs so that workers may not have to wait unnecessarily for getting the instructions. Idle time due to internal power failure should be reduced by keeping a proper inspection and maintenance of the power plant. Idle time cards should be prepared to know the reasons which are responsible for such a time. Timely provisioning of materials and regular maintenance of plant and machinery will also go a long way in reducing the idle time. Tendency to conceal idle time should be discouraged so that preventive steps may be taken in time. Thus, management should

aim at eliminating controllable (i.e. abnormal) idle time and on a long-term basis reduce even the normal idle time.

Idle Time vs. Idle Capacity or Facility:

Idle time should not be confused with idle capacity or idle facility. Idle capacity is the unused capacity of a plant, equipment or department which cannot be utilised profitably. Idle capacity is related to the unused production potentiality whereas idle time is related to the time not utilised on production. Idle facility refers to that part of the production facilities available which remains unutilised. Thus, idle capacity or idle facility is entirely different from idle time except to the extent that in both the cases there is an increase in costs due to less production or no production.

Idle capacity or facility may arise because of the following factors:

- Loss of production due to plant remaining idle.
- Imbalance and interruption in other operating departments as a result of some plant remaining idle leading to loss in output.
- Labour and other facilities remaining idle because of a plant or equipment remaining idle.
- Fixed expenses continued to be incurred without any matching output.

If the idle capacity is beyond control, the cost of the same may be debited to the Costing Profit and Loss Account and if it is due to operational difficulties which can be controlled, the cost of such idle capacity can be taken as overheads.

Methods of Remuneration and Incentive Schemes

There are two basic methods of labour remuneration, i.e., time rate and piece rate system of wage payment. In modern days a number of incentive plans to induce workers to work hard so as to produce more and earn more are being used.

A. Time Rate System: Under this system of wage payment, workers are paid according to the time for which they work. Payment may be on hourly basis, daily basis, weekly basis, or monthly basis. In this system, no consideration is given to the quantity and quality of work done.

When payment is made on hourly basis, total wages payable is calculated as follows:

$$\text{Wages} = \text{No. of hours worked} \times \text{Rate per hour}$$

- Suitability: This method of wage payment is suitable under the following type of situations:
- Where quality of work is more important than quantity of work (i.e., high class tailoring)
- Where output cannot be measured in quantitative terms, e.g., in the case of indirect workers like watch man, cleaners and sweepers, etc.
- Where output is beyond the control of the worker, e.g., in process industries, where the work of a worker is dependent on the work of other workers.
- Where work is being done on a small scale so that close supervision is possible.
- Where the worker is a learner or an apprentice.

Advantages	Disadvantages
• Simplicity: The system is simple and calculation of wages is easily understood by the workers. • Security to Workers: Under this method, workers are assured of a certain amount of wages payable even if there is stoppage of work due to power failure, machine break-down etc. This gives a sense of security to workers. • Quality of Work: As this method does not give weight to the quantity of work done, workers can concentrate on the quality of goods produced. Thus, the quality of work under this method is better. • Economical: Under this method, no detailed records are required to be maintained regarding the work done by workers. This results in saving of clerical costs. Moreover, workers avoid over-speeding and causeless damage to Plant and Machinery and also materials. This also results in economy. • Accepted by Trade Unions: This method is favoured by trade unions because it treats all workers alike and no distinction is made between efficient and inefficient workers.	• Lack of Incentive: This method of wage payment offers no positive inducement to workers to improve performance as it does not distinguish between an efficient and inefficient worker. • Lower Production: As workers are paid on time basis, they tend to be slow in work. This results in lower production quantity. • More Supervision: Under this method, more supervision is required, so that workers may not waste time. Appointment of additional supervisors' increases supervision costs. • Idle Time: Under this method of wage payment, workers waste a lot of time resulting in increasing in idle time. • Costing Difficulties: From costing point of view, it creates difficulties in the calculation of labour cost per unit because the output is quite fluctuating.

• Unity in Labour: No hard line of distinction is drawn between an efficient and inefficient worker on the basis of production. This promotes a feeling of unity among the workers.	• It Makes Workers Lazy and Dull: Due to the adoption of this method, workers become lazy and dull and try to avoid work, and thus production suffers.
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B. Piece Wage System:

Under this method, workers are paid in proportion to the work done by them. The rate is fixed per unit of output, per article, per commodity, etc. The worker is paid for the total units manufactured. The system is thus being result oriented. For example, if the rate per unit is ₹ 5 and the worker manufactures 100 units in a week, his week's wages shall be ₹ 500 (i.e., 100×5).

It may be expressed in the form of the following formula:

$$\text{Total earnings} = \text{Units Manufactured} \times \text{Rate per unit}$$

Suitability:

Conditions under which piece rate method of wage payment may be usefully employed are:

- Where the output of workers can be measured.
- Where production is standardised and repetitive in nature.
- When the aim is continuous maximum production.
- Where workers continue at the same job for a long period.
- Where the standard time required to complete a job can be measured accurately.

Advantages	Disadvantages
a) Incentive to Efficient Workers: Under this method, as remuneration is paid in proportion to the worker's effort, the method provides a strong incentive to work more. b) Increase in Production: Under this method, each worker tries his best to produce more to earn higher wages. This results in increase in production. c) Decrease in Supervision: Under this method of wage payment, strict supervision is not required because the workers are themselves interested in maximising their earnings through the maximisation of output. d) Equitable Wages: This system is more equitable in comparison to time rate system because wages are paid according to the efficiency of each worker. e) Simple and Easy: This method is simple and easily understood by the workers. f) Simplifies Costing: As, under this method, wages are paid at a rate per unit, it simplifies cost ascertainment because labour cost per unit is known in advance. g) Decreased Cost: On account of increase in production, fixed cost per unit is reduced resulting in higher profit.	1) Lack of Secured Wages: This system does not guarantee of minimum wage to a worker. If a worker is not able to complete his allotted work in a day, due to any reason, he is paid less amount of wages. Thus, under this method, earnings of workers are uncertain. 2) Inferior Quality of the Product: Under this method, much emphasis is given on quantity of production and ignores quality of the product. In order to maximise their wages, workers try to produce more and more without caring for the quality of production. 3) Injurious to Health of Workers: In an effort to earn more wages, workers try to work excessively with greater speed. This proves to be injurious to health of workers. 4) Misuse of Equipment and Materials: In the greed to produce more, workers cause extra wastage of material and damage plant and machinery. 5) Unsuitable in Certain Cases: This method does not suit where work is of artistic and refined nature. 6) Difficulties in Fixing Piece Rate: Fixing equitable piece rate is quite a difficult task and may require considerable amount of work in the form of time studies. 7) Opposed by Trade Unions: Piece rate system is generally opposed by trade unions because it creates inequality in the wages of workers. Slow and inefficient workers feel jealous of the higher of their fellow workers.

Incentive Plans:

Both time rate system and piece rate system discussed above have their merits and demerits. Incentive plans attempt to combine the good points of both the systems. The primary purpose of an incentive plan is to induce a worker to produce more to earn a higher wage. Naturally, producing more in the same period of time should result in higher wages for the workers. Because of greater number of units produced, it should also result in a lower cost per unit for fixed factory cost and also for labour cost.

Objectives of Incentive Plans:

- To induce the workers to increase their productivity.
- To provide additional remuneration to the workers to their efforts and efficiency.
- To have a contented labour force, and to reduce the labour turnover.
- To keep the morale of the workers high.
- To have increased production from the improved productivity of the workers.

- f) To have reduction in the fixed overhead cost per unit through increased production.

Suitability of the Plan: Incentive wage plans are suitable in the following cases:

- Those industries where proper time and motion studies can be undertaken and proper standards of time and output can be fixed.
- Those industries where overhead charges are considerable and which can be reduced through increased production resulting from incentive schemes.

Essentials of a Good Incentive Plan:

1. For the successful implementation of an incentive plan, proper and accurate time and motion studies should be conducted and proper standards should be fixed.
2. The standard set for production should be such that any worker of normal efficiency can attain them.
3. The standards, on set, should not be changed unless there is a change in the method of production.
4. Job analysis and standardisation must be made on scientific and equitable basis.
5. Tools, equipment and machines must be maintained in efficient working condition.
6. Proper and comfortable working conditions should be provided to workers.
7. Uniform working conditions should be provided to all the workers.
8. Regular flow of materials and other supplies should be ensured.
9. Every worker should be given equal opportunity to earn.
10. The workers should be taught the proper way of doing the work.
11. The workers should not suffer on account of factors beyond their control, such as – break-down of machines, power failure, etc.
12. The incentive plan should be permanent and not temporary.
13. The plant should be flexible enough to permit changes to suit the changes in the method of work.
14. The plan should be easy for the workers to understand.
15. The workers should be properly educated about the scheme and motivated to improve their efficiency and earn more.
16. It should be economical to operate.
17. The plan should be acceptable to both employer and the employees.
18. The incentive provided should be sufficiently attractive.
19. There should be no maximum limit on the amount of earnings of the workers.
20. Indirect workers should also be included under the incentive scheme.
21. The scheme should have the approval of workers and the union.

Advantages of Incentive Plan	Disadvantages of Incentive Plan
a. The workers are assured of their time rates or day rates of wages, whether they attain the standard or not. b. In-efficiency is not penalised, as the workers are assured of their day rates of wages, whether they attain the standard or not. c. Efficiency is rewarded, as the workers of higher efficiency are given bonus in addition to their time wages. d. Incentive is given to workers to increase their productivity. e. Opportunity is given to workers to increase their earnings by efficient work. f. It keeps the labour force contented, and thereby, helps to reduce labour turnover. g. The increase in production leads to reduction in cost per unit. h. The gain or losses arising from the efficiency of the workers are shared by both the employer and the employees.	1. The incentive schemes cannot be gain-fully employed in concerns where the overheads are less. 2. These schemes cannot be adopted in undertakings where proper standards cannot be fixed. 3. It is difficult to calculate indirect labour under the common incentive schemes. 4. These schemes require careful determination of standard time and standard output which involves additional work and expenditure. 5. The bonus paid to workers under these schemes may not be proportionate to the improved efforts or productivity of the workers. 6. The quality of the product may suffer, because of their eagerness to save time and earn more. 7. Once an incentive scheme is introduced, it will be very difficult to withdraw that scheme later, it becomes uneconomical.

Labour Turnover: Ration between numbers of workers leaving an organisation during a given period and the average number of workers working in that organisation during the same period is known as labour turnover. Higher the labour turnover, workers will be more unstable due to any reasons and such a situation is not favourable for any organisation.

Different ways of measuring labour turnover ratio

$$1) \text{ Labour Turnover Ratio} = \frac{\text{Number of workers left during a period}}{\text{Average number of workers on roll during the period}} \times 100$$

$$\text{Average number of workers} = \frac{(\text{Number at the Beginning} + \text{Number at the end})}{2}$$

In an organisation where there are surplus workers, the number of workers leaving will likely to be high. In such cases, the above mentioned formula will not give true picture, as workers may be very willing to continue in the organisation but because they are surplus they had to go. This method is known as **Replacement Method** as “worker left” means “workers separated from the organisation”.

$$2) \text{ Labour Turnover Ratio} = \frac{\text{Number of workers replaced during a period}}{\text{Average number of workers on roll during the period}} \times 100$$

The question of replacement does not arise when surplus workers are retrenched. The new appointments replaced the workers whose services are required by the organizations, if they leave. So, if separations that need replacement could be properly replaced, then labour turnover ratio measured by this method will reflect the true state of affairs. Problem arises regarding the replacement, when skilled labours leave the organization because skilled labours are not available in sufficient numbers. Thus this method is known as Replacement method, & can measure reliably, if the required replacement can be properly done.

$$3) \text{ Labour Turnover Ratio} = \frac{\text{Number of Workers left} + \text{Number of workers replaced during a period}}{\text{Average number of workers on roll during that period}} \times 100$$

This method is known as flux method & is a combination of 1st & 2nd method.

$$4) \text{ Labour Turnover Ratio} = \frac{\text{Number of Workers Required to be replaced during a period}}{\text{Average number of workers on roll during that period}} \times 100$$

This method substitutes "number of workers replaced" by "number of workers required to be replaced", & so this is an improvement of the 2nd method. Where non-availability of the desired type of workers does not affect replacement, labour turnover ratio can be accurately measured by this method.

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Causes of Labour Turnover:

The main causes of labour turnover come under 2 heads:

- 1) Avoidable causes:
 - Lack of job satisfaction.
 - Lack of scope for training & promotion.
 - Bad working conditions.
 - Long hours of work.
 - Lack of facilities for recreation, children's education etc.
 - Inadequacy of welfare measures.
 - Inhumane attitude of management.
 - Lack of understanding amongst the workers etc.
- 2) Unavoidable causes
 - Unhealthy atmosphere of the locality.
 - Retirement & death.
 - Leaving for a better chance.
 - In case of seasonal industries, retrenchment during off-season;
 - Social unrest.
 - Marriage of female workers.
 - Disablement due to accident inside or outside or disease.
 - Due to political reasons or on the ground of health, change of place.

Effect of Labour Turnover: High labour turnover indicates high cost. The workers who are efficient find their places elsewhere. So, if the efficient workers become dissatisfied with the organization, & leave the job, new set of workers will replace them, but they cannot be expected to give the same output as given by the outgoing efficient workers, from the beginning of the employment. Thus the output will fall & will result in higher cost. On the other hand, if labour turnover is low, it cannot be said that cost of production shall also be low. If average workers in the organization do not have the standard efficiency, they will not be able to find jobs elsewhere. As a result, they will not move & labour turnover ratio will become low. But these workers cannot give standard output as they themselves are below standard. More scraps are created by them resulting in higher cost. Output is normally effected by frequent changes in staff & as a result cost increased.

Cost of Labour Turnover:

Cost of labour turnover may be classified into:

- A. Preventive Costs: These represent those costs which if incurred; then the leaving of the workers can be prevented. For example:
 - 1) Cost of providing better medical, housing, educational facilities, better recreation etc.
 - 2) Cost of providing retirement benefits, incentives, accident compensation etc.
 - 3) Cost of providing better working conditions & better safety measures
 - 4) Cost of providing for promotion & training etc.
 - 5) Cost of maintaining better industrial relations & peace.
- B. Replacement Costs: These are those costs which have to be incurred in connection with the replacement of workers who left. For example:
 1. Cost of advertisement, selection & recruitment
 2. Cost of training new workers
 3. Loss of working hours & materials in course of training
 4. Cost of scraps, defectives etc. created by the new workers
 5. Cost of repairs etc. of machinery in course of training
 6. If workers on training meet accident, compensation payable to them.

Piece rate system of labour calculation

Amount of Wages (normal wages) = Actual Quantity Produced $\times$ Standard labour rate per unit.

Taylor Approach	
Level of efficiency	Remuneration
Less than 100%	83% of Std piece rate.
$\geq 100\%$	175% of Std piece rate.
Note: in the institute study material it is given 125% which is not correct.	
Merrick Approach	
Level of efficiency	Remuneration
Up to 83.33% or 831/3%	Std piece rate
Above 831/3% but up to 100%	10% above Std piece rate
Above 100%	20% above Std piece rate

Time rate system of labour calculation

Amount of wages = Actual Hours worked $\times$ Standard Labour rate per hours.

Following thinking are available.

1. HALSEY'S 50% premium approach:

Workers Remuneration

$$= (\text{Actual hours worked} \times \text{Std rate per hours}) + \left(\frac{50}{100}\right) \times (\text{Std time} - \text{Actual time}) \times \text{Std Rate}$$

Std time: It means time allowed or standard time for actual production.

Actual time: it means actual time take for actual production or actual hours worked by the worker.

2. Rowan Approach

Amount of Wages

$$= (\text{Actual hours worked} \times \text{Standard labour rate per hours}) + \frac{\text{Standard time} - \text{Actual time}}{\text{Std time}} \times \text{Actual time}$$

3. Mixed Approach:

Level of efficiency	Remuneration
< 100%	Actual hrs works $\times$ Std rate per hour
100%	Actual hrs works $\times$ (Std rate per hour + 20%)
> 100 %	Actual quantity produced $\times$ High piece rate (Or) Actual hrs work $\times$ Std rate per hours + 1/3

Labour Turnover on the Basis of Hours

$$= \frac{\text{Number of Hours Lost due to Turnover}}{\text{Total productive Hours}} \times 100$$

Methods of Remuneration and Incentive Schemes

Remuneration is an expense to the company that has to pay on the basis of time rate or piece rate basis. So it is treated as a fixed cost hence it is constant for every employee even if they don't work as per standards.

Incentive is considered as a performance appraisal to the employee if he/she performs better than standard work in a way that benefits to the organization. Amount of incentives might differ from time to time & work to work.

Time Rate System:

Under this system of wage payment, workers are paid according to the time for which they work. Payment may be on hourly basis, daily basis, weekly basis, or monthly basis. In this system, no consideration is given to the quantity and quality of work done.

$$\text{Wages} = \text{No. of hours worked} \times \text{Rate per hour}$$

This method of wage payment is suitable under the following type of situations:

- Where quality of work is more important than quantity of work (i.e., high class tailoring)
- Where output cannot be measured in quantitative terms, e.g., in the case of indirect workers like watch man, cleaners and sweepers, etc.
- Where output is beyond the control of the worker, e.g., in process industries, where the work of a worker is dependent on the work of other workers.
- Where work is being done on a small scale so that close supervision is possible.
- Where the worker is a learner or an apprentice.

Advantages	Disadvantages
a) Simplicity: The system is simple and calculation of wages is easily understood by the workers.	1. lack of Incentive: This method of wage payment offers no positive inducement to workers to improve performance as it does not distinguish between an efficient and inefficient worker.
b) Security to Workers: Under this method, workers are assured of a certain amount of wages payable even if there is stoppage of work due to power failure, machine break-down etc. This gives a sense of security to workers.	2. Lower Production: As workers are paid on time basis, they tend to be slow in work. This results in lower production quantity.
c) Quality of Work: As this method does not give weight to the quantity of work done, workers can concentrate on the quality of goods produced. Thus, the quality of work under this method is better.	3. More Supervision: Under this method, more supervision is required, so that workers may not waste time. Appointment of additional supervisor's increases supervision costs.
d) Economical: Under this method, no detailed records are required to be maintained regarding the work done by workers. This results in saving of clerical costs. Moreover, workers avoid over-speeding and causeless damage to Plant and Machinery and also materials. This also results in economy.	4. Idle Time: Under this method of wage payment, workers waste a lot of time resulting in increasing in idle time.
e) Accepted by Trade Unions: This method is favoured by trade unions because it treats all workers alike and no distinction is made between efficient and inefficient workers.	5. Costing Difficulties: From costing point of view, it creates difficulties in the calculation of labour cost per unit because the output is quite fluctuating.
f) Unity in Labour: No hard line of distinction is drawn between an efficient and inefficient worker on the basis of production. This promotes a feeling of unity among the workers.	6. It Makes Workers Lazy and Dull: Due to the adoption of this method, workers become lazy and dull and try to avoid work, and thus production suffers.

Piece Wage System:

Under this method, workers are paid in proportion to the work done by them. The rate is fixed per unit of output, per article, per commodity, etc. The worker is paid for the total units manufactured. The system is thus being result oriented. It may be expressed in the form of the following formula:

$$\text{Total earnings} = \text{Units Manufactured} \times \text{Rate per unit}$$

Suitability: Conditions under which piece rate method of wage payment may be usefully employed are:

- Where the output of workers can be measured.
- Where production is standardised and repetitive in nature.
- When the aim is continuous maximum production.
- Where workers continue at the same job for a long period.

- Where the standard time required to complete a job can be measured accurately.

Advantages	Disadvantages
1) Incentive to Efficient Workers: Under this method, as remuneration is paid in proportion to the worker's effort, the method provides a strong incentive to work more. 2) Increase in Production: Under this method, each worker tries his best to produce more to earn higher wages. This results in increase in production. 3) Decrease in Supervision: Under this method of wage payment, strict supervision is not required because the workers are themselves interested in maximising their earnings through the maximisation of output. 4) Equitable Wages: This system is more equitable in comparison to time rate system because wages are paid according to the efficiency of each worker. 5) Simple and Easy: This method is simple and easily understood by the workers. 6) Simplifies Costing: As, under this method, wages are paid at a rate per unit, it simplifies cost ascertainment because labour cost per unit is known in advance. 7) Decreased Cost: On account of increase in production, fixed cost per unit is reduced resulting in higher profit.	i. Lack of Secured Wages: This system does not guarantee of minimum wage to a worker. If a worker is not able to complete his allotted work in a day, due to any reason, he is paid less amount of wages. Thus, under this method, earnings of workers are uncertain. ii. Inferior Quality of the Product: Under this method, much emphasis is given on quantity of production and ignores quality of the product. In order to maximise their wages, workers try to produce more and more without caring for the quality of production. iii. Injurious to Health of Workers: In an effort to earn more wages, workers try to work excessively with greater speed. This proves to be injurious to health of workers. iv. Misuse of Equipment and Materials: In the greed to produce more, workers cause extra wastage of material and damage plant and machinery. v. Unsuitable in Certain Cases: This method does not suit where work is of artistic and refined nature. vi. Difficulties in Fixing Piece Rate: Fixing equitable piece rate is quite a difficult task and may require considerable amount of work in the form of time studies. vii. Opposed by Trade Unions: Piece rate system is generally opposed by trade unions because it creates inequality in the wages of workers. Slow and inefficient workers feel jealous of the higher of their fellow workers.

Incentive Plans:

Both time rate system and piece rate system discussed above have their merits and demerits. Incentive plans attempt to combine the good points of both the systems. The primary purpose of an incentive plan is to induce a worker to produce more to earn a higher wage. Naturally, producing more in the same period of time should result in higher wages for the workers. Because of greater number of units produced, it should also result in a lower cost per unit for fixed factory cost and also for labour cost.

Objectives of Incentive Plans: The main objectives of incentive wage plans are:

- 1) To induce the workers to increase their productivity.
- 2) To provide additional remuneration to the workers to their efforts and efficiency.
- 3) To have a contented labour force, and to reduce the labour turnover.
- 4) To keep the morale of the workers high.
- 5) To have increased production from the improved productivity of the workers.
- 6) To have reduction in the fixed overhead cost per unit through increased production.

Suitability of the Plan: Incentive wage plans are suitable in the following cases:

- Those industries where proper time and motion studies can be undertaken and proper standards of time and output can be fixed.
- Those industries where overhead charges are considerable and which can be reduced through increased production resulting from incentive schemes.

Essentials of a Good Incentive Plan:

- 1) For the successful implementation of an incentive plan, proper and accurate time and motion studies should be conducted and proper standards should be fixed.
- 2) The standard set for production should be such that any worker of normal efficiency can attain them.
- 3) The standards, once set, should not be changed unless there is a change in the method of production.
- 4) Job analysis and standardisation must be made on scientific and equitable basis.
- 5) Tools, equipment and machines must be maintained in efficient working condition.
- 6) Proper and comfortable working conditions should be provided to workers.
- 7) Uniform working conditions should be provided to all the workers.
- 8) Regular flow of materials and other supplies should be ensured.
- 9) Every worker should be given equal opportunity to earn.
- 10) The workers should be taught the proper way of doing the work.

- 11) The workers should not suffer on account of factors beyond their control, such as – break-down of machines, power failure, etc.
- 12) The incentive plan should be permanent and not temporary.
- 13) The plant should be flexible enough to permit changes to suit the changes in the method of work.
- 14) The plan should be easy for the workers to understand.
- 15) The workers should be properly educated about the scheme and motivated to improve their efficiency and earn more.
- 16) It should be economical to operate.
- 17) The plan should be acceptable to both employer and the employees.
- 18) The incentive provided should be sufficiently attractive.
- 19) There should be no maximum limit on the amount of earnings of the workers.
- 20) Indirect workers should also be included under the incentive scheme.
- 21) The scheme should have the approval of workers and the union.

Advantages of Incentive Plan	Disadvantages of Incentive Plan
1) The workers are assured of their time rates or day rates of wages, whether they attain the standard or not. 2) In-efficiency is not penalised, as the workers are assured of their day rates of wages, whether they attain the standard or not. 3) Efficiency is rewarded, as the workers of higher efficiency are given bonus in addition to their time wages. 4) Incentive is given to workers to increase their productivity. 5) Opportunity is given to workers to increase their earnings by efficient work. 6) It keeps the labour force contented, and thereby, helps to reduce labour turnover. 7) The increase in production leads to reduction in cost per unit. 8) The gain or losses arising from the efficiency of the workers are shared by both the employer and the employees.	1. The incentive schemes cannot be gain-fully employed in concerns where the overheads are less. 2. These schemes cannot be adopted in undertakings where proper standards cannot be fixed. 3. It is difficult to calculate indirect labour under the common incentive schemes. 4. These schemes require careful determination of standard time and standard output which involves additional work and expenditure. 5. The bonus paid to workers under these schemes may not be proportionate to the improved efforts or productivity of the workers. 6. The quality of the product may suffer, because of their eagerness to save time and earn more. 7. Once an incentive scheme is introduced, it will be very difficult to withdraw that scheme later, it becomes uneconomical.

Overheads: Overhead is those costs required to run a business, but which cannot be directly attributed to any specific business activity, product, or service. Thus, overhead costs do not directly lead to the generation of profits. Overhead is still necessary, since it provides critical support for the generation of profit-making activities.

Overheads comprise of indirect materials, indirect employee costs and indirect expenses which are not directly identifiable or allocable to a cost object in an economically feasible way.

Overheads are to be classified on the basis of functions to which the overheads are

- Production overheads
- Administrative overheads
- Selling overheads
- Distribution overheads
- Overheads may also be classified on the basis of behaviour such as variable overheads, semi-variable overheads and fixed overheads.
- Variable overheads comprise of expenses which vary in proportion to the change of volume of production. For example, cost of utilities etc.
- Fixed overheads comprise of expenses whose value do not change with the change in volume of production such as salaries, rent etc.
- Semi-variable overheads are partly affected by change in the production volume. They are further segregated into variable overheads and fixed overheads.

Steps in Overhead Accounting.

The following points highlight the five main steps in overhead accounting. The steps are:

- 1) Classifications of Overheads Costs.
- 2) Codification of Overheads.
- 3) Collection of Overheads.
- 4) Departmentalisation of Overheads.
- 5) Absorption of Overheads.

Classifications of Overheads Costs: Overheads can be classified on the basis of number of characteristics.

The following are the important basis of overhead classification:

1. Function wise Classification.
2. Element wise Classification.
3. Behaviour wise Classification.
4. On the Basis of Normality.
5. Controllability Basis.

Function wise Classification: Under this method of classification, the various functions performed by the factory constitute the basis. Accordingly, overheads are classified as follows:

- **Production Overhead:** Production overhead is also termed as factory overhead, works overhead, or manufacturing overhead. It is the aggregate of factory indirect material cost, indirect wages and indirect expenses. Some examples of indirect material cost used in the manufacturing process are consumable stores, tiny part of materials such as thread and button in readymade garment industry, nails and polish in furniture making industry and so on. Example of indirect labour cost incurred in production process are wages and salaries of repair and maintenance staff, salary of foreman, supervisor, inspector, watchman's salary, work's manager's salary, etc. Example of indirect expenses incurred in production process are depreciation, repair and maintenance, rent, rates, taxes of factory building, drawing office expenses and so on.
- **Administration Overhead:** These overheads are of general nature and consist of all costs incurred in the direction, control and administration of an undertaking which is not related directly to production or selling and distribution function. Some examples of indirect material cost are office stationery such as paper, pen, ink, carbon papers, stapler, etc. Some examples of indirect labour cost incurred in the administration department of a factory are salaries of managing director, accountant, secretary clerks and attenders. Some examples of indirect expenses incurred in office are lighting and heating, rent and taxes repairs and maintenance, bank charges, legal charges, telephone charges, etc.
- **Selling Overheads:** The overheads which are incurred in promoting sales and retaining customers is known as selling overheads. Selling overheads include indirect material cost, indirect labour cost and indirect expenses. Some examples of indirect material cost are catalogues, price lists, free gifts and samples, etc. Some examples of indirect labour cost incurred in the sales department are salaries of sales manager, salaries and commission of salesmen. Some examples of indirect expenses incurred in the sales department are expenses incurred in training salesman, advertisement, market research expenses, rent, insurance, heating and lighting of sales show room.
- **Distribution Overheads:** These are expenses which are incurred from the time finished products are packed until they reach their destination. Distribution overhead includes indirect material cost, indirect labour cost and indirect expenses. Some examples of indirect materials cost incurred in the distribution department of a factory are packing materials such as cardboard boxes, hammers, nails, etc. Some examples of indirect labour cost incurred in the distribution department are salaries of warehouse staff, salaries of drivers of delivery vans, etc. Some examples of indirect expenses are rent, heating, lighting, repairs of warehouse, freight, maintenance of delivery vans, etc.

Elementwise Classification: Under this method, expenditures are classified into three heads:

- **Indirect Materials:** These are the materials which cannot be conveniently identified with individual cost units. These are small and relatively inexpensive items which may become the part of the finished product. Examples of such materials are – lubricating oil, sand paper, nuts and bolts, tools for general use, gum, etc.
- **Indirect Labour:** Indirect Labour pertains to the wages of indirect workers and cannot be conveniently identified with a particular cost unit. Examples of indirect labour are – contribution to provident fund, gratuity, holiday pay, supervisor's salary, overtime wages, etc.
- **Indirect Expenses:** All indirect costs, other than indirect material and indirect labour costs are termed as indirect expenses. These costs cannot be directly identified with a particular job, process or work rather these are common to cost centres. Examples of indirect expenses are – rent and rates, depreciation, lighting and power, insurance, etc.

Behaviour wise Classification: Under this method expenditure are classified into three heads:

- **Fixed Overheads:** Subject to certain limitations, the amount of fixed overheads tends to remain constant for all volume of production within a certain limit. Fixed costs are relatively unaffected by the change in the level of production or sales. The amount of such costs does not depend upon the volume of production during a period. These costs accrue over a period of time. Hence they are also known as 'time costs' or

'period costs'. However, it should not be implied that fixed costs do not change at all. They do increase with the increase in the output beyond a certain level of capacity. Examples of fixed costs are – factory rent, office staff salaries, license fees, legal expenses, depreciation of building, insurance charges, etc.

- **Variable Overheads:** Variable items of overheads are those which vary with production. Thus, there is a linear relationship between variable cost and output. However, the variable cost per unit of output remains the same. Examples of variable costs are fuel, power, lighting delivery expenses, salesman commission, etc.
- **Semi-Variable Overheads:** These types of overheads are partly fixed and partly variable. These expenses stand mid-way between fixed and variable expenses. Examples of variable expenses are – telephone and fax charges, repairs and maintenance of plant and machinery, electricity charges, material handling and storage charges, etc.

Importance of Behaviour wise Classification of Overheads:

The advantages of this classification are:

- a) **Cost Control:** Fixed overheads are not controllable at all points and levels of management. At the most fixed overheads can be controlled only by the top level management, whereas, variable costs are capable of controlling at all levels of management. Thus a proper classification of overheads into fixed and variables help in controlling overheads.
- b) **Preparation of Flexible Budgets:** A flexible budget is prepared for various levels of production capacity. In its preparation classification of overheads into fixed and variable is very important. Fixed overheads remain constant for all levels of activity, whereas variable overheads vary with every change in the level of activity.
- c) **Marginal Costing:** Under marginal costing technique only variable overheads are taken into cost of production, whereas fixed overheads are charged to costing profit and loss account. So for the application of marginal costing technique it becomes inevitable to classify overheads into fixed and variable overheads.
- d) **Break-Even Analysis:** For preparation of breakeven chart it is also very essential to classify overheads into fixed and variable. Only then it is possible to know the point of no profit no loss in a business.
- e) **Marginal Decision-Making:** Management is very often confronted with number of problems and alternate proposals. To take decision among various proposals it is necessary to classify overheads into fixed and variables. This is so because some decisions such as make or buy, fixation of price, etc., are affected by variable overheads but not by fixed overhead.
- f) **Cost Analysis:** Analysis of overheads into fixed and variable is important because though fixed overheads remains fixed in respect of its amount, it decreases per unit when the volume of output is increased. Similarly, though variable overheads per unit remain the same it increases when production volume is increased. When it is necessary to know the cost per unit, it is also necessary to classify overheads into fixed and variable components.
- g) **Overheads Absorption:** In order to charge overheads to various products or jobs it is essential to calculate two separate overheads rate, viz., fixed overhead rate and variable overhead rates. In order to calculate these rates overheads are to be classified into fixed and variable.

On the Basis of Normality: According to this basis, overheads are classified into two categories. They are:

- **Normal Overheads:** Normal overheads are those overheads, which are expected to be incurred in attaining a given level of output. They are unavoidable. They have to be included in production cost.
- **Abnormal Overheads:** Normal overheads are those overheads which are not expected to be incurred in attaining a given level of output. Cost of abnormal idle time, abnormal wastage of materials, etc. are examples of abnormal overheads. Abnormal overheads are transferred to costing Profit and Loss Account.

Controllability Basis: On this basis, overheads may be classified into two categories. They are:

- **Controllable Overheads:** Controllable overheads are those overheads which can be controlled by efficient management. Costs of idle time, wastage, etc. are examples of controllable overheads.
- **Uncontrollable Overheads:** Uncontrollable overheads are those overheads, which cannot be controlled. Fixed costs are example of uncontrollable overheads.

Codification of Overheads: Codifications of overheads are useful in accumulating and control of overheads. After classification of overheads, the next step involved in overhead accounting is to codify them. This is so because there are number of overheads which are incurred in factories and unless proper attention is given, the chances of accounting of all overheads may not be possible. Thus, all overheads falling under the category of depreciation relating to plant and machinery, factory building, factory furniture may be given a separate number. So that depreciation related to all the assets can be properly accounted for codification of overheads refers to assignment of a number or symbol for each time of overheads with a view to accumulate them easily. To facilitate

easy identification of different types of overheads, different code numbers are given. The code numbers given for factory overheads is known as standing number order and that to administration, selling and distribution overheads is known as cost accounting number.

Objects of Codification of Overheads:

1. To accumulate overheads systematically.
2. To facilitate control over them.
3. To distinguish between different types of overheads.
4. To account for all types of overheads.
5. To facilitate convenience of identifying the overheads.

Methods of Codification of Overheads: The following are the important methods of codifying the overheads:

- **Numerical Method:** Under this method, numerical numbers are used to codify the overheads. In big factories, first of all the various expenses are first identified and a separate number is given to each expense. Subsequently a sub-number is given for various overheads incurred under each category of expense. For example – depreciation is given a code number as 1. Then depreciation relating to factory building will be given a code number of 1.1, depreciation relating to plant and machinery 1.2 and that relating to furniture 1.3 and so on. Similarly, repairs may be given a code number as 2. Then repairs relating to factory building are given a code number as 2.1 repairs relating to plant and machinery as 2.2 and repairs relating to furniture as 2.3 and so on.
- **Alphabetic Method:** Under this method, alphabets are used to codify the overheads. Each item of overhead is given a code letter which happens to be the first letter of the overhead expenditure. However, items of overheads beginning with same letter will pose a problem. To avoid confusion, the next letter of the overhead can be used along with the first letter.
- **Alpha Numerical Method:** This method combines both the alphabetic and numerical methods. The alphabetic letter denotes the main expenditure while the numerical number denotes its sub-division. For example – Depreciation of plant is coded as D1, Depreciation of plant and machinery is coded as D2 and depreciation of assets as D3.
- **Decimal Method:** Under this method the various departments are first identified and a separate number is given to them. Then each and every overhead incurred in the respective departments are given a sub-number. For example – salary of clerk belonging to office department is given a code number as 1.1. The salary of clerk belonging to selling department is given a code number as 2.1 and so on.

Collection of Overheads: The process of ascertaining the amount of overheads incurred for a period is called collection of overhead. The classified and coded overheads are collected and recorded under the standing over number and cost accounting number. To facilitate recording of overhead as separate ledger known 'overhead ledger' is maintained. Separate accounts are opened for standing order number and cost accounting number in this ledger. Generally, overheads are collected at the end of every month and after totalling them, they are recorded in the overhead ledger.

Sources from Which Various Overheads Are Collected:

- a) **Material Requisition Slips:** Indirect materials such as oil, grease, cotton waste, etc. are drawn by various departments on the basis of material requisition slips. At the time of issue, the particulars of issue of indirect materials and the departments to which they are issued are recorded in the material requisition slip. At the end of the month, the various material requisition slips are summarised in a sheet known as 'Material abstract'. From the material abstract the total of indirect material cost is posted to the debit of factory overhead control account and credited to store ledger control account.
- b) **Invoices:** Those indirect materials which are directly requisitioned by departmental heads, such as stationery by the office superintendent does not pass through a material requisition note. Such types of indirect materials are collected from invoices. The various invoices supporting the purchase of indirect materials by various departmental heads are entered in purchase journal meant for the purpose of collection of overheads. At the end of the month, the totals from the purchase journal is posted to the debit of factory overhead account and credited to cost control account.
- c) **Wages Abstract:** The indirect wages paid to various employees are recorded in the wage abstract on the basis of time cards. From wages abstract, the total indirect labour cost is posted to the debit of factory overhead account and credited to wages control account.
- d) **Subsidiary Records:** Certain items of expenses or indirect expenses are recorded separately in subsidiary or special records. For example – depreciation on machinery is recorded in a plant register. Similarly, scraps can be recorded in a 'scrap report' and postal expenses in a postage book. So overheads of this nature are collected from subsidiary register meant for this purpose.

- e) **Cash Book:** Sundry items of expenses or indirect expenses are recorded in an analytical petty cash book. The total of indirect expenses is collected from the petty cash book on the basis of standing order number and cost accounting number. They are then posted to the debit of factory overhead control account and credited to cost control ledger account.
- f) **Journal:** All notional expenses and transactions regarding adjustments, such as accrued expenses, prepaid expenses are posted into the journal. The total of these expenses are posted to the debit of factory overhead control account and credited to cost control ledger account.

Departmentalisation of Overheads:

Departmentalisation of overhead is the process of allocation and apportionment of overhead to different departments or cost centres. For smooth and efficient working a factory is sub-divided into a number of departments, each of which denotes a particular activity of the factory e.g. purchase department, stores department, time keeping department, personnel department, crushing department, melting shop, etc. In a large sized factory there exists number of departments. Some departments are concerned with production process, while other departments render useful services to production department. The former type of department is known as production department and latter is known as service department. Whenever overheads are incurred in a factory, they have to be charged to these two departments. Thus, the process of allocation and apportionment of overheads to various departments is known as departmentalisation of overheads.

Objectives of Departmentalisation of Overheads:

Departmentalisation of overheads serves the following purposes:

- 1) **Control of Overhead Costs:** Effective control of overhead cost is possible because departmentalisation makes the incurrence of costs in a department or cost centre the responsibility of someone who heads the department or the cost centre. Thus, with the help of departmentalisation, responsibility accounting can be effectively introduced for control purposes.
- 2) **Ensures Greater Accuracy in Cost Ascertainment:** Departmentalisation helps in achieving greater accuracy by proper allocation and apportionment of overheads. For accurate costing of each function or operation, overhead absorption rates should be determined separately for each cost centre. This is possible only with the help of departmentalisation.
- 3) **Valuation of Work-in-Progress:** Correct cost of work-in-progress cannot be ascertained unless overheads are departmentalised.
- 4) **Cost of Service Departments:** Departmentalisation helps in ascertaining the cost of various departments which is useful for making estimates and submitting quotations for those items which make use of the services of various cost centres.
- 5) **Forecasting and Estimating:** Because of greater accurate in cost ascertainment and cost control, departmentalisation ensures more accurate forecasting and estimating and decision-making.

Allocation of Overheads: The term 'allocation of overheads' refers to identifying an item of overhead and the allotment of the whole amount to one department or cost centre. In other words, charging the entire amount of overhead to a particular department or cost centre, is called allocation of overhead. A point to be clearly understood is that allocation can be made only when exact amount of overhead incurred in a cost centre is definitely known. For example – rent cannot normally be allocated, since rent is payable for the factory as a whole and the exact amount of rent for each department cannot be known. Some examples of allocation are – salary of a foreman, wages of a machine operator, power expenses if separate meter is installed for each production department.

Apportionment of Overheads: Those overheads which cannot be allocated to a specific department or cost centre need to be apportioned to various departments or cost centres the process of charging proportionate amount of overheads to various departments is known as apportionment of overheads. As overheads are to be charged proportionately to various departments it has to be done on some equitable basis. For example, salary of general manager is to be apportioned to various departments on the basis of time devoted by him on different departments.

Difference between Allocation and Apportionment of Overheads:

Under allocation of overheads the entire amount of expenses is charged to a particular department, but under apportionment of overhead only a proportionate amount is charged to a department. Allocation is the first step in the departmentalisation of overheads, whereas apportionment comes next. Allocation is a simple process, whereas apportionment is a complicated process. In case of allocation, overheads can be conveniently identified with a department, whereas it is not possible to identify overheads to a department under apportionment process.

Basis of Apportionment of Overheads: Items of overhead expenses which are incurred as a common expense is to be apportioned among all the departments. Though different basis is available for apportionment, it is essential to satisfy that the overheads are closely related to the basis selected. In other words, the overheads

should involve a direct impact on the basis selected. The basis should also ensure accuracy under the prevailing situations. Some of the bases used for apportionment are as follows:

- a. Direct Wages: The following overheads are apportioned on the basis of direct wages:
 - Worker's compensation
 - Contribution to Provident Fund
 - Contribution to E.S.I.
- b. Number of Labour Hours: The following overheads are apportioned on this basis:
 - Salaries of inspector
 - Salaries of supervisors
 - Other administrative expenses
- c. Number of Employees: The following overheads are apportioned on this basis:
 - Canteen expenses
 - Welfare expenses
 - Salaries of time keeping staff
 - Medical expenses
 - Fringe benefits
- d. Floor Area: The following overheads are apportioned on the basis of floor areas:
 - Rent and rates
 - Taxes
 - Heating and Lighting
 - Repairs and maintenance of building
 - Accident prevention cost
- e. Capital Value of Assets: The following overheads are apportioned on this basis:
 - Depreciation
 - Repairs and maintenance
 - Insurance
- f. Machine Hours: The following overheads are apportioned on this basis:
 - Consumable stores
 - Supervision charges
 - Repairs and maintenance
- g. Number of Watts, Kilowatt, hours and light point: The following overheads are apportioned on this basis:
 - Electricity charges for lighting, heating, and air-conditioning.
 - Electricity charges for productive purposes.
- h. Technical Estimates: The following overheads are apportioned on the following basis:
 - Sundry Overheads
 - Internal Transport cost
 - Director's salaries

Principles of Apportionment: Overheads which are incurred for various departments should be apportioned to different departments on the basis of a suitable method or principle. The following are the important principles for the apportionment of overheads:

- 1) Service Criterion: It is based on the assumption that the services rendered to different departments can be easily measured. In other words, department which derives of maximum services should share more amount of overheads, when compared to other departments.
- 2) Ability to Pay Principle: This principle is applied where overheads are to be apportioned to different departments or products of which one of them happens to be a new line. According to this principle, the overheads are charged on what is termed as 'ability to pay'. That means those departments which earn more profit should bear a higher share of overheads as compared to new department or product.
- 3) Incentive Principle: Under this principle, production target is fixed for each department and overheads are apportioned according to the target set. In order to encourage the departmental managers to attain the targets they are also given incentives. When the targets are attained, the unit cost of production decreases, which reveals the efficiency of the department. On the other hand, if the targets are not attained the unit cost of the production will be high and thereby proves inefficiency of the department.
- 4) Analysis Principle: This principle is adopted where it is not possible to measure the services rendered directly because of its variation from time to time. In such a situation an analysis is made to know the impact of overheads on different departments and accordingly a fair share of overheads is apportioned to

all the departments. The best examples are apportionment of salary of general manager to various departments based on the assessment of his time spent on different departments. Similarly, the salary of sales manager can be apportioned to different products based upon the time spent on promoting the sales of all products.

- 5) Absorption of Overheads: This is the last step in the accounting procedure of overheads. After all the overheads are apportioned from the service departments to production departments, it involves charging of production department overheads to the number of units produced in those departments. The process of charging the overheads from cost centre to cost unit is known as absorption of overheads. In other words, the recovery of overheads by the finished goods from various production departments is known as absorption of overheads. The finished products absorb the factory overhead through overhead absorption rates. The overhead absorption rates are obtained by dividing the overheads to be absorbed by a basis to be decided by the management.
 - a. Actual Rate: An actual rate is obtained by dividing the actual overhead to be absorbed by actual base selected. Actual overrate can be calculated only historically. Actual overhead rates are not popularly used because they suffer from the following limitation:
 - Since actual overheads are available at the end of financial year so ascertainment of cost will be delayed.
 - It is not possible to prepare tender statement for quotation. Thus, prospective orders are lost if actual overhead rates are used.
 - Actual overhead rates cannot be controlled.
 - Cost comparison is not facilitated when actual overhead rates are used. This is so because certain overheads like overtime wages, leave and holiday pay, repairs and maintenance are not uniformly spread over the entire accounting year. So overhead rate fluctuates making difficult cost comparison.
 - b. Pre-Determined Overhead Rates: Due to the limitations of actual overhead rate, in most of the cases pre-determined overhead rate is used. This rate is calculated in advance. It is calculated by dividing pre-determined overhead by a pre-determined base. Budgeted overhead and budgeted base could be used to calculate this overhead rate.
 - c. Single Rate/Blanket Rate: When a single overhead rate of absorption is set up for the entire factory, it is known as single rate or blanket rate. This rate is calculated by adding up the overheads of all the production departments and dividing by the base which is the total of the quantity or amount. The use of blanket rate may not give accurate result when the amount of overheads differs from department to department.
 - d. Multiple Rates: When a separate overhead rate is set up for each department for absorption of overheads it is known as multiple rate. This is calculated by dividing departmental overheads by the departmental base. Multiple absorption rates are popularly used because they give accurate results.

Calculation of Overhead Absorption Rate

Basis (Methods) for Calculating Overhead Absorption Rate:

The production overheads calculated for each production department after going through apportionment and allotment are used to calculate overhead absorption rate. There are six basis (methods) to calculate an overhead cost absorption rate.

Formula: General formula for calculating overhead absorption rate is as follows:

$$\text{Overhead Absorption rate} = \frac{\text{Total Budgeted Production Cost Center Overheads}}{\text{Budgeted Activity Level of Production Cost Center}}$$

Raw Material Cost Basis: When the historical records of a company reveal that in the past, there was a correlation between raw material costs and factory overheads then they may use a rate as a percentage of raw material cost to absorb production overhead costs into the product or cost unit. Overhead absorption rate and total overheads to be absorbed for the job may be calculated as:

$$\text{Overhead Absorption Rate} = \frac{\text{Estimated Factory Over Head}}{\text{Estimated Material Cost}} \times 100$$

Absorption of overheads based on direct material cost:

$$\text{Total Absorbed Overheads} = \text{Overhead Absorption Rate} \times \text{Actual Material cost of job}$$

The material cost base normally has a limited use as fluctuations in price of materials are not accompanied by similar fluctuation in overheads; moreover, cheap quality material has a low material cost but has more overheads and opposite is true for better quality material. There are instances that one product using high priced material and another is made from low priced material but go through the same manufacturing process and as a result incur approximately same amount of factory overheads. In this case by using direct material cost base the product using expensive material will be charged more overheads than its share.

Direct Labour Cost Basis: This is frequently used rate in practice and is easy to apply as amount of direct wages is readily available. This is recommended as unlike material prices; labour rates are relatively stable moreover there is direct relationship between direct labour cost and factory overheads on the basis that both are related to time.

$$\text{Overhead absorption rate} = \frac{\text{Estimated Factory Overhead}}{\text{Estimated Labour Cost}} \times 100$$

Absorption of Overheads based on direct labour cost

Total absorbed overheads = actual labour cost of job $\times$ overhead absorption rate.

Certain objections are raised for using this method as no distinction is made between skilled and non-skilled workers and differences of their pay scale. It may also ignore time factor as when workers are paid on piece rate basis or when business makes higher overtime payments whereas overheads do not increase at the same rate.

Prime Cost Basis: This is applied by using both direct material and direct labour cost in the calculation, which is given below:

$$\text{Overhead absorption rate} = \frac{\text{Estimated Factory Overhead}}{\text{Estimated Prime Cost}} \times 100$$

Absorption of Overheads based on Prime Cost

Total Absorbed Overheads = Actual Prime Cost of job $\times$ Overhead absorption rate

This method is usually recommended as it combines the weaknesses of both direct material cost and direct labour cost base.

Units of Production Basis: This method is simple and easy to use when company manufactures only one type of product and all units produced are similar in terms of size, time spent being worked on by the cost center etc. This is calculated as follows:

$$\text{Overhead absorption rate} = \frac{\text{Estimated Factory Overhead}}{\text{Estimated Units of output}} \times 100$$

Absorption of overheads based on units of production

Total Absorbed Overheads = Actual Units of Output $\times$ Overhead absorption rate

Direct Labour Hours Basis: This method is more appropriate in a labour intensive cost center where there is insignificant role of machines involving low machine related expenses and relatively high labour costs. This is considered as a better method for overhead absorption than direct labour cost method as is only based on time factor and is not distorted by factors like varying wage rates, overtime or bonus payments.

$$\text{Overhead absorption rate} = \frac{\text{Estimated Factory Overhead}}{\text{Estimated Labour Hours}} \times 100$$

Absorption of overheads based on Direct labour hours

Total Absorbed Overheads = Actual Labour Hours for the job $\times$ Overhead absorption rate

The use of this method requires a record of the direct labour hours expended on each job, product or cost unit in order to determine the share of overhead, it should bear.

Machine Hour Basis: This method is more appropriate in a capital intensive cost center where use of machines is the most significant factor in production. In such a cost center most of the production overheads are related to the machinery (power, repairs, depreciation, etc.), so a machine hour rate should reflect fairly the incidence of overheads. This is used as follows:

$$\text{Overhead absorption rate} = \frac{\text{Estimated Factory Overhead}}{\text{Estimated Machine Hours}} \times 100$$

Absorption of overheads based on Machine hours

Total Absorbed Overheads = Actual Machine for the job $\times$ Overhead absorption rate

This method is in frequent use as it gives consideration to time factor, moreover in contrast to different efficiency and skill levels of workers the machines normally give equal output. However, this method has a drawback as it is quite difficult to estimate machine hours in advance.

Which Method is better for Calculating Overhead Absorption Rate?

There is general acceptance that the time based methods (direct labour hours, machine hours and to some extent direct labour cost) are more likely to reflect the load on a cost center as production overheads also tend to be incurred on a time basis so even in exams students should use these methods unless questions requires to use some other methods. In respect of capital intensive operations or machine related departments, machine hours' base is more appropriate since most of the overheads in these departments would be closely related to machine hours. However, for labour intensive operations direct labour hours base is the most appropriate method.

Overhead Absorption Rate (OAR's) or Overhead Recovery: Actual amount of overheads cannot be accurately determined at the time of producing goods. In order to charge the total costs of the production cost center to the cost units, we need to calculate an overhead absorption rate or overhead recovery for each cost center.

Actual and Predetermined Overhead Absorption Rates: In most cases overhead absorption rate is calculated prior to accounting period using estimated or budgeted overheads figures for an estimated activity level. This is so as the actual overheads and actual activity level cannot be determined in advance before the end of the period. As a result, the actual overhead absorption rate could not be calculated until the end of the period. This implies that product costs in this case could not be calculated until the end of a period and clearly this would produce unacceptable delays into such procedures as invoicing and estimating. This is such a major advantage that virtually all absorption rates used are predetermined. **Actual VS Predetermined Overhead Absorption Rates:** Because the actual overheads are not known until all cost information have been collected, there may be practical problems in estimating cost of an activity. Many businesses will, therefore, use predetermined overhead absorption rate, estimated at the start of an accounting period. At the end of the period an adjustment is made to bring the predetermined overheads to match with the actual overhead cost. The use of predetermined overhead absorption rate can cause particular problems where; there is a fixed cost, because the volume of activity for the period ahead has to be estimated as well as the amount of overheads.

Absorption rates which use actual overheads costs and actual activity level are also possible but could suffer from two very serious limitations:

- Actual costs and volume may not be determined until the end of the relevant period.
- Actual costs and volume may fluctuate within a particular period.

However, these limitations do not make use of actual absorption rate impractical rather it depends on the specific circumstances. If there is no significant difference between estimated and actual costs (which is possible because most of overheads are fixed in nature) and activity levels and if costs and activity occur reasonably evenly throughout the period, then actual absorption rate is possible.

Advantages of using Predetermined Overhead Absorption Rate:

- They enable overheads to be absorbed immediately after production.
- They make it easier to estimate total and per unit product or job cost.
- They smooth out uncontrollable fluctuations that would otherwise occur in unit costs if product is uneven.

Allocation of Production Overheads: Allocation of production overhead is a process to charge those overheads to cost center which result solely from the existence of that cost center. Cost allocation is therefore carried out where a cost can easily be identified with, and charged to, a particular cost center and cost unit. Allocation of production overheads may be done where the costs are directly attributable to a cost center. Examples include the cost of repair work done in a particular production of a particular production department by an outside company, overheads relating to machines dedicated to the production of a particular product. Likewise, time tickets or daily time reports will serve as a basis for the identification of indirect labour cost to specific departments. Moreover, if separate meters are installed in each department for electricity or power then amounts for these expenses for each department are readily available. In all these cases there is no need to divide up the costs between products since the facility is used exclusively within a particular department.

Apportionment of Production Overheads: Apportionment of production overhead is a process in which overheads cannot be directly allocated to products but must go through a more roundabout system to charge them to the cost units. These indirect production overheads are incurred for the joint or common benefit of two or more than two departments. These costs are recorded jointly because of difficulty to keep them separately. Examples includes rent and rates, heating costs, building repairs and maintenance, depreciation, etc. Such costs therefore, do not lend themselves to accurate allocation and as such have to be prorated to the concerned departments on some fair and equitable basis so as to reflect the relative use of that cost item by each cost center.

Basis of apportionment to cost centers:

Overhead Cost Item	Basis of Apportionment to Cost Centers
Floor area occupied	Building related expenses like rent and rates, cleaning, heating and lighting, repairs, depreciation and insurance of buildings.
Number of workers or employees	All employees related costs like canteen, supervision, personnel, medical and welfare expenses.
Cost or book value of machines	Machine related expenses e.g.: depreciation repairs etc.,
Number of store requisitions	Cost of store keeping, store keeper wages, etc.,
Number of horse power	power

Recovery Rates: Overhead cost recovery methods depend on the costing method used. Businesses that use standard costing recover overhead by incorporating the cost-per-unit overhead estimate to the unit price of each

unit produced. An issue with this method is intangible costs such as vendor relationships that can be impossible to fully capture. With activity-based costing, overhead costs are incorporated into the per-unit price. This essentially builds overhead cost recovery into the unit price, eliminating a step and simplifying the overhead cost recovery process.

Once total production overheads (calculation of overhead absorption rate) of production cost centers are calculated through allocation and apportionment, they are transferred to, i.e., absorbed by, the cost units or products which are produced by those cost centers. The cost charged to production is known as the absorption of overheads or cost recovered, is determined for each cost center by using the formula:

Absorption of overheads

$$= \text{Actual activity of production cost center} \times \text{Cost center overhead and cost absorption rate}$$

In the above formula the actual production is expressed in the same terms as the absorption rate is calculated. Thus, if an absorption rate is expressed as a rate per unit, then actual activity is also expressed in units. If the rate is expressed as a percentage of direct material cost, then activity must also be expressed in material cost terms. The procedure of cost absorption is the transfer of the department or cost center production overheads to the product or cost unit by using cost absorption or recovery rates. A single rate is calculated for each cost center, but different methods may be used for each cost center of the business depending upon the characteristics of that cost center, for example, whether it is capital or labour intensive.

Over and Under Absorption: Usually overheads are absorbed on the basis of predetermined rates. Since predetermined overhead rates are based on budgeted overheads and budgeted production, invariably the overheads absorbed by this process do not agree with the actual overheads incurred for the period. If the absorbed overheads at predetermined rates are greater than actual overheads, this is known as Over-Absorption. Conversely, if absorbed overheads are less than the actual overheads, this is known as Under-Absorption.

Treatment of Over-Absorption or Under-Absorption: There are many factors that are responsible for the difference between absorbed overheads and actual overheads. But it is actual overhead that is to be absorbed to ascertain the actual cost which finally determines the profit. The total of actual costs must appear in the final income statement and not merely those calculated product costs which include actual prime cost plus overheads based on predetermined overhead rates. Accordingly, the amount of under-absorbed overheads should be added to total costs before the profit is calculated and, conversely, the amount of over-absorbed overheads should be subtracted from the total cost. This treatment can be made when under or over-absorption of overheads is caused by abnormal factors. In a seasonal business firm, the balance (being the difference between predetermined absorbed overheads and actuals) may be carried forward to a subsequent period expected to be counter balanced at the end of the accounting period. A supplementary rate can be used to adjust the amount of under or over-absorption. The supplementary rate is determined as follows:

$$= \frac{\text{Amount of Under or Over absorption}}{\text{Actual absorption base}}$$

Under-absorption is adjusted by using a plus supplementary rate while a minus supplementary rate is used to correct over absorption.

Methods for disposal of under- or over-absorption of factory overheads:

- Apportionment through supplementary rates.
- Transfer to Costing Profit and Loss Account
- Carry over to next year's Accounts.

Machine Hour Rate:

Machine hour rate is a rational method for absorption of factory overhead. The factory overhead costs are allocated to a machine or a group of machines doing the same type of job and the cost per hour of the machine is ascertained dividing the total allocated overhead costs to the machine by number of hours the machine worked during the same period of time for which the costs have been considered. In this method of overhead absorption each machine is considered as cost centre.

The machine-hour method is based on the principle that, in plants where production processes are primarily mechanical, machines constitute a more important and costly element than labour. Factory overhead costs are equitably apportioned to production on the basis of some rational and accepted principles. This method of overhead absorption can satisfactorily be used when all production overheads are departmentalized and the overheads of the service departments are apportioned to the production departments.

Treatment of Machine Setting Time and Idle Time: It is the usual practice to find out the total potential hours for the computation of machine hours. The cost of idle time may be calculated separately. Alternatively,

only effective machine hours may be ascertained by making allowance for idle time or setting time. By doing this, the machine hour rate is inflated by absorbing the machine hour cost for idle time.

$$= \frac{\text{Factory Overhead}}{\text{Machine Hours}}$$

Advantages of Machine Hour Rate	Disadvantages of Machine Hour Rate
1. It is perhaps the most realistic and accurate method of allocating expenses to each job from cost accounting point of view. 2. This is the best and logical method of charging overheads where one operator attends to several machines or several operators are engaged on one machine. 3. It is a scientific method of absorbing overheads since it takes into consideration the time factor completely. 4. From the management point of view, it is the best method of absorption of overheads since it is a scientific and logical method and it can be used easily. 5. Under-absorption will reveal the extent to which the machines remained idle.	1) This method involves increased costing work. 2) This method of absorption can be applied to job which is performed by machines only.

Method of Computation of Machine Hour Rate:

The following steps have to be taken for the computation of machine-hour rate: Expenses are apportioned on the basis of accepted principles.

Step I: All standing or fixed expenses for a particular period of time say for a year or for a month, are added up. The total standing expenses thus arrived at, is divided by number of hours the machine worked i.e. machine hours for that period of time. It is essential that standing charges for the machine or group of machines which has been considered as cost centre should be considered. The resultant figure will give us the fixed expenses per hour. Fixed expenses are rent, rates and taxes for the factory, insurance, lighting, supervision expenses, canteen and other welfare expenses.

Step II: Variable expenses pertaining to the cost centre, i.e. machine or group of machines are considered. Variable expenses comprise depreciation, power, fuel, repairs and renewals. An hourly rate is calculated by dividing each item of variable expenses by normal working hours of the machine.

Step III: Hourly rate of standing charges and hourly rates of each item of variable expenses are added up to derive the total machine hour rate. Basis of apportionment of standing and variable expenses pertaining to the machine.

$$= \frac{\text{Cost Machine-Scrap Value}}{\text{Estimated working hours-Idle Time}}$$

Comprehensive of Composite Machine Hour Rate: Generally, in the computation of Machine hour Rate only indirect expenses in connection with the factory are apportioned or allocated. Machine operator's wages are treated as direct wages and charged to the job directly. But, machine operator's wages are included, in certain cases, in the machine hour rate itself. The machine hour rate so arrived at is known as a comprehensive or composite machine hour rate. This rate is useful where not only the operator but a distinct group of workers can be identified directly with the machine or group of machines. It is to be noted that this method converts the elements of prime cost (direct labour) into factory overhead. It is, therefore, of advisable to compute comprehensive machine hour rate.

Setting Times and Idle Time: In a factory, machines do not work for the full working hours. Certain hours become unproductive because machines remain idle for some hours because of certain factors like setting of tools, waiting for raw materials. In estimating the total machine hours for the computation of the machine hour rate it is the general practice to consider the total potential hours including the possible idle hours. The positive aspect of this method is that the cost of idle time can be separately worked out which will help the management in controlling the idle expenses from period to period. Conversely, in computing machine hour rate, only the net effective or productive hours are considered. The object of this treatment is to absorb the idle time cost into cost of production. Similarly, certain machine hours are lost in tool setting. Logically, the tool setting time should form a part of the actual machine hours against the job and the setting hours are also charged to the jobs at the same machine hour rate.

$$\text{Effective hours} = \text{Machine Hours} - \text{Idle time} - \text{Setting time}$$

Job Costing: Job costing as a distinctive method costing is a form of specific order costing which is adopted to execute the work strictly according to customer's specification. The production process depends upon the member of orders received from customers. As such production is not standardised and intermittent in nature. The goods manufactured are not for stocking but for immediate delivery once it is complete in all respects. The cost is ascertained separately for each job as every work order differs from customers to customers. The purpose of job costing is to ascertain the profit or loss made on each job. Further cost of job is compared with the

estimated cost to indicate whether estimation was defective or the actual cost incurred is excessive. Such an analysis helps in taking remedial action to improve efficiency and also facilitate revision of estimates.

According to Eric Kohler, "Job costing is a method of cost accounting whereby cost is compiled for a specific quantity of product, equipment, repair or other service that moves through the production process as a continuously identifiable unit, applicable material, labour, direct expenses and usually a calculated portion of the overhead being charged to job order.

From the above definition, it is clear that job costing is a method of costing under which the cost of each job is ascertained separately. It is that form of specific order costing which applies where work is undertaken to customer's special requirements. As distinct from contract costing, each job is of comparatively short duration.

Features of Job Costing: The characteristic features of job costing are:

- a) Job costing is adopted by manufacturing concerns as well as non-manufacturing concerns.
- b) Those concerns which follow job costing method produce goods not for stock but against specific orders from customers.
- c) Job costing is adopted in concern where the work done is analysed into different jobs, each job being considered a separate unit of cost.
- d) A separate account is opened for each job to which all expenses incurred on that job, from the date of commencement till the date of completion are debited. This will enable the concern to know the cost of each job.
- e) Under job costing, the cost of each job is ascertained after the completion of the job.
- f) As each job is different from other jobs, each job needs separate treatment under job costing.
- g) By comparing the actual cost of each job against the price charged for each job, the profit or loss made on each job is ascertained.
- h) Under this method, the cost of each job and the profit or loss made on each job undertaken is found out separately.
- i) Under this method, production is intermittent and not continuous.
- j) The industries need not incur selling and distribution expenses as the customers themselves come to place orders and collect the goods after production.

Objectives of Job Costing: The main objectives are of job costing are:

1. The main objective of job costing is to ascertain the cost as well as the profit or loss on each job.
2. Another objective of job costing is to find out those jobs which are more profitable and those which are not profitable or less profitable.
3. Control of costs, by comparing actual costs with estimated costs, is also one of the objectives of job costing.
4. Job costing is also intended to indicate, through the comparison of actual cost of a job with its estimated cost, whether the estimation is incorrect or the actual cost is excessive.
5. Another objective of job costing is to provide a basis for estimating or determining the cost of similar jobs undertaken in future.

Similarities between Job Costing and Contract Costing: There are many similarities between job costing and contract costing, which are:

- a) Both job costing and contract costing are specific order costing.
- b) In the case of both job costing and contract costing, each job or contract constitutes a cost unit.
- c) Both methods have the same object to find out cost and profit.
- d) Under both the methods a separate account is opened.
- e) Under both the methods customer come to them, so there is no demand creation in the case of both.
- f) Under both the methods works are executed as per the specifications of the customers.
- g) In both the cases work commences on the receipt of order from the customer.
- h) In both the cases quotation is called by the customer before placing the order.

Procedure of Job Costing: The procedure that is commonly applicable to a normal sale transaction equally applies in case of job costing.

This is explained under the following steps:

- (1) **Receiving an Enquiry:** Before placing an order with the manufacturer, usually the customer will enquire about the price, quality to be maintained, the duration within which the order is to be executed and other specifications of the job.
- (2) **Estimation of the Price of the Job:** The cost accountant estimates the cost of job after considering the various elements of cost and keeping in mind the specification of customer. This is based on the cost of execution of similar job in the previous year and considering the possible changes in the various elements of the cost. The estimated cost of the job is then informed to the prospective customer.

- (3) **Receiving of Order:** The customer will then place the order if he is satisfied with the quotation price and other terms of executing the job. The production control department receives the order and it will give a number for every order thus received which is known as job order number. The job is known by this number until it is completed.
- (4) **Preparation of Production Order:** A production order is prepared by the production control department is sent to the concerned persons such as the employees to enable them to carry out the job, to the store-keeper to facilitate him to stock all the required materials, to cost accountant to enable him to prepare job cost sheet in order to ascertain the profit on every job completed.
The production order consists of the following particulars:
- Date on which the order is prepared,
 - Job order number.
 - Description of the goods to be produced.
 - Number of goods to be produced.
 - Date of starting the work.
 - Date of completing the work.
 - Listing of materials to be used.
 - Sequence of production process.
 - Signature of production manager, etc.
- (5) **Preparation of Design:** When the job to be executed requires special treatment, a design to meet the customer's specifications is prepared by the production planning department. This is done by the engineering department with consultation with the production planning department.
- (6) **Execution of Job and its Inspection:** The job will be started as per the schedule of production. Necessary materials, employees, tools, etc. are used to complete the production. The production process is supervised by the production manager or supervisor from time to time to ensure that the job executed is in accordance with customer's specification and that it is completed as per the production schedule.
- (7) **Despatch of Goods:** The finished product is then packed and delivered to the customer as per the delivery schedule. Payment is settled as per the agreed mode of payment.

Accounting System under Job Costing:

There are four elements of cost (i.e. material, labour, chargeable expenses and overheads) which are also applicable to job costing. They are discussed as under:

- **Materials Cost:** Materials are classified into direct and indirect materials on the basis of traceability of materials to the job. Those materials which are traceable to the job are treated as prime cost element and those not traceable to the job are treated as manufacturing overhead.
- **Direct Labour Cost:** The direct labour cost is debited to the job on which work is directly performed. Clock card is used to record the hours worked by each employee. At the end of each week, the payroll department uses the information on the clock card to calculate each employee's pay. The clock card only records the total time worked by each employee. It is used by the employee to indicate how much time he worked in a period and by the employer to determine how much to pay the employee for that work. A clock card does not record the time spent by each employee on the jobs. This information is recorded by the employees on a time ticket. A time ticket shows the date on which the work was completed, the employee's name, name of the department, the time of starting and finishing the work. If the work is performed directly on a job, the employee would record the job number, indicating the labour as direct labour. The cost accounting department collects all the labour time tickets, records the pay rate of the employee on the ticket and calculate the labour cost of the operation.

Treatment of Overtime Wages in Job Costing: When overtime work is done on a job to speed up production with the view to expedite the delivery, the overtime wages is to be debited to that job on which overtime work is performed where overtime work is performed as a routine work it forms part of factory overhead.

- **Direct Expenses:** The direct expenses under job order industries usually include cost of designs, moulds, hiring of special tools and equipment's and maintenance cost of such tools.
- **Factory Overheads:** In most cases pre-determined overhead rates are used for the absorption of factory overheads. The pre-determined overhead rate is calculated at the beginning of the year by estimating the total overhead cost for the year and then dividing either by direct labour cost or direct labour hours. Throughout the year the overhead rate is applied to calculate the overheads and thus charged to job.

Preparation of Job Cost Sheet: Under job costing, a job cost sheet is prepared for every job. It presents the cost data relating to a job. It states the various elements of cost, such as, direct material, direct labour, direct expenses

and overheads under the various division of cost like prime cost, works cost, cost of production and total cost. It also states the sale price and profit or loss made on a job.

Advantages of Job Costing	Disadvantages of Job Costing
a) It is helpful to ascertain the cost as well as the profit or loss on each job separately. b) It helps the management to know about the profitability of the jobs. c) It is best suited for cost plus contract. d) It provides detailed analysis of the elements of cost which is quite useful for the preparation of cost estimates and quotations. e) Under this method of costing, spoilage and defective jobs can be easily identified and responsibility for the same can be fixed on specific departments or individuals. f) The data of the job costing are quite helpful in the preparation of future budgets. g) The cost data relating to completed jobs is helpful to the management to know the trend of material, labour and overhead costs and to control the future job costs.	• It involves more clerical work for cost collection. Further, it involves more supervision. These add to cost and make it costly. • Under this method of costing, costs are required to be collected for a large number of small jobs. So the chances of errors in cost collection are more in job costing. • Job costing, being historical in nature, cannot be of much help for cost control unless it is combined with estimated or standard costing.

Contract Costing: Contract costing is a specialized system of Job costing applies to long-term contracts as distinct from short-term jobs. Contract costing is mainly applied in civil construction and engineering projects, ship building, road and railway line contracts, construction of bridges etc.

Contract costing is a form of Specific order costing. It is applied to contracts where substantial time is taken to complete the contract and it falls into different accounting periods. However, a duration of exceeding one year is not an essential feature of a long-term contract. Some contracts with a shorter duration than one year should be accounted for as long-term contracts if they are sufficiently material to the activity of the period.

CIMA defines Contract cost and Contract costing as follows: "Contract cost is the aggregated costs relative to a single contract designated a cost unit".

"Contract costing is that form of specific order costing which applies where work is undertaken to customers' special requirements and each order is of long-term duration".

Features of Contract Costing

- Contracts are undertaken to special requirements of the customers.
- Duration of contracts are relatively for a long period.
- Contract work is done on the sites unlike manufacturing under a roof.
- Contract work mainly consists of construction activities.

Accounting Procedure for Contract Costing: If the numbers of contracts are more, a distinguishing number or name is given to each contract for accounting and administration convenience. A separate Contract Account is maintained for each contract. All costs relating to contracts are charged to the respective Contract Accounts. In the contract cost structure, majority of the expenditure is of direct nature in the form of materials, wages, use of plant and stores, direct expenses etc., and only a small portion will be charged as apportioned overheads.

Accounting Treatment of Costs: Accounting of each item of cost in contract accounts is discussed below:

(1) Materials:

- All the materials purchased for the contract or any material sent to site is charged to contract.
- If any material is returned to stores or lying at site unused or materials transfers to another contract site is credited to the Contract Account.
- If materials are not required immediately, the materials may be stored and its cost is debited to Stock Account.

(2) Labour: All the labour employed or worked at site is treated as direct labour and all costs relating to them is charged to the Contract Account. The salaries and incentives of the administrative and supervisory staff of a specific contract is also charged to that specific contract.

(3) Plant:

- When the plant is taken on hire, the hire charges are charged to Contract Account.
- If the plant is specifically purchased for the contract or plant was sent to site, the value of the plant is debited to Contract Account. The value of plant returned or remaining at site is credited to Contract Account. The balance between amounts debited and credited to contract represents the value of plant used at site.
- Sometimes the value of depreciation provided on the plant is debited to Contract Account instead of showing the value of plant issued to site and remaining at site.

- (4) **Sub-Contract Charges:** Sometimes part of the contract work is given on subcontract basis and payments made on subcontract work is debited to Contract Account.
- (5) **Overheads:** The general overheads and head office expenses are apportioned to different contracts on equitable basis, and the portion of overheads are charged to the Contract Account.
- (6) **Difficulties in Cost Control:** Generally, contracts are big in size and the contract work is to be carried out at sites. Due to this some problems will arise concerning usage of material, labour utilization, supervision of labour, damage to plant and work, pilferage of materials and tools etc. This site based work makes it difficult to control the costs of the contract.
- (7) **Surveyor's Certificate and Retention Money:** In contract works, a surveyor or an architect or civil engineer is appointed to periodically visit the site for inspection of the work completed. He will issue a certificate mentioning the stage of completion of work and the value of the work completed to the date of issue of certificate. The payments will be released to the contractor by the contractee based on the said certificate. Normally the payments will be released only to the certain percentage, say 80% of the work certified. The balance amount of work certified is retained by the contractee till the completion of the entire contract satisfactorily. The amount so retained is called 'retention money'. The contractee so retains to safeguard himself from the risks that may arise from the contractor. Usually the percentage of retention money is up to 20% of the amount of work certified.
- (8) **Work-in-Progress:** The amount of work-in-progress includes the value of work certified and uncertified appearing in the Contract Account. The work-in-progress is shown as Current Asset in the Balance Sheet as follows: Materials at site, Plant at site are shown separately in the Assets side of the Balance sheet.
- (9) **Costing of Running Contracts:** The long-term nature of contracts has necessitated to determine profit to be attributed to each accounting period. In the long-term contracts it is considered that their outcome can be assessed with reasonable certainty before their conclusion, the attributable profit should be calculated on a prudent basis and included in the accounts for the period under review. The profit taken up should be based on Standard Cost Accounting principles. In case of Completed Contracts, all the profit that arise from the contract can be transferred to Profit and Loss Account. But in case of Incomplete Contracts, only a portion of the profit is taken to the Profit and Loss Account depending on the extent of work completed on the contract because some provision is to be made for meeting contingencies and unforeseen loss. There are no hard and fast rules in calculation of profit to be taken to profit and loss account. But in general, the following principles are followed:
- If loss is arrived on incomplete contracts, the entire loss is debited to Profit and Loss Account.
 - Profit should be considered only in respect of work certified. The uncertified work should be valued at cost.
 - Completion of contract is less than 25% of the contract price – No profit should be taken to Profit and Loss Account and the entire amount is kept as reserve for meeting contingencies.
 - Completion of contract is upto 25% or more, but less than 50% of the contract price – In this case 1/3rd of profit, reduced in the ratio of cash received to work certified should be taken to the Profit and Loss Account. The balance will remain as reserve for meeting contingencies.
 - Completion of contract is upto 50% or more, but less than 90% – In this case 2/3rds of profit ascertained as reduced by proportion of cash received to work certified to be taken to Profit and Loss Account, keeping the remaining amount in Reserve

$$= \text{notional profit} \times \frac{2}{3} \times \frac{\text{Cash Received}}{\text{Work Certified}}$$

- (10) **Costing of Contracts Nearing Completion:** Completion of contract is upto 90% or more (nearing completion): In this case the profit to be taken to Profit and Loss Account is calculated by determining the estimated profit by using any one of the following formulas:

- Estimated Profit $\times \frac{\text{Work certified}}{\text{Contract Price}}$
- Estimated Profit $\times \frac{\text{Work Certified}}{\text{Contract Price}} \times \frac{\text{Cash Received}}{\text{Work Certified}}$ Or Estimated Profit $\times \frac{\text{Cash Received}}{\text{Contract Price}}$
- Estimated profit $\times \frac{\text{Cost of Work to date}}{\text{Estimated Total Cost}}$
- Estimated profit $\times \frac{\text{Cost of work to date}}{\text{Estimated total cost}} \times \frac{\text{Cash Received}}{\text{Work Certified}}$
- Notional profit $\times \frac{\text{Work Certified}}{\text{Contract Price}}$ => this formula is generally used when the estimated profit figure is not available.

The balance amount of profit not transferred to Profit and Loss Account but kept as reserve for meeting contingencies is shown in the balance sheet assets side by deducting it from the amount of work-in-progress. It

is carried down as a credit balance in the Contract Account itself, the work- in-progress being represented by the debit balance in the Contract Account.

Operating Costing: Operating costing is a process and technique of accumulating and ascertainment of cost for providing a standardized service to the public or to an undertaking.

“Operating costing is that form of operation costing which applies where standardized services are provided either by an undertaking or by a service cost center within an undertaking”.

The term ‘Operating Costing’ has now been replaced by ‘Service/Function Costing’ as per latest CIMA Terminology. It is defined as — The cost of providing a service or function. The cost of rendering the services for a particular period is related to quantum of services rendered during the period to arrive at cost per unit of service rendered.

Features of Operating Costing:

- 1) Uniform service is provided to all the customers.
- 2) The costs are classified into fixed and variable.
- 3) The fixed and variable cost classification is necessary to ascertain the cost of service and the unit cost of service.
- 4) There is no physical stock of article if an undertaking renders a service.
- 5) If a cost center is operating for an undertaking, there is no sale of service but render the service. In other words, if a cost center is operating for public, it sells its service to the public.
- 6) The cost unit may be simple in certain cases or composite or compound in other cases like transport undertakings.
- 7) Total costs are averaged over the total amount of service rendered.
- 8) The costs are collected from the authentic documents like daily log sheet, operating cost sheet, boiler house cost sheet, canteen cost sheets etc.
- 9) Operating cost is the cost of rendering service.
- 10) Operating costing is the method of ascertaining costs.
- 11) The productive enterprises can quote prices by ascertaining cost data.

Objectives of Operating Costing

- a) To supply the information through which the efficiency in rendering service is improved.
- b) To provide a basis for fixing accurate quotation and fare.
- c) To ensure that the services are provided in proper time.
- d) To control the fuel consumption and its expenses.
- e) To ensure that the service equipment's are properly maintained.
- f) To provide cost comparison between own service and alternative service i.e. hiring.
- g) To compare the cost of one service center with another.
- h) To determine the apportionment cost if the services are provided within an organization.
- i) To decide the price that can be charged for use of vehicle.
- j) To control the cost of maintenance and repairs.
- k) To select efficient and suitable routing of vehicles to reduce the costs to production departments that uses the service.
- l) To avoid the underutilization of capacity and idle time of the work force.
- m) To absorb the fixed costs proportionately and systematically that is allocated to the units of services.

Application of Operating Costing: Operating costing is applied by an organization, which provides service to the public as a whole instead of manufacturing an article, and sells the same. For example, Transport undertaking electricity, theatre, hospitals, schools and the like. Similarly, the same type of an organization or cost center renders service to production departments. For example, Electricity, powerhouse, canteen and the like. The service cost in operating cost should be find out to understand whether an organization or cost center render services to others or sell the services to the general public. If the services are sold, the operating expenses and the extent of services rendered are taken into consideration to find out the service cost. On the other hand, if the services are sold, the service expenses should be apportioned to the production department on a suitable basis.

Services classified under Operating Costing: The services may be classified into two categories under operating costing, namely

- Internal service refers to rendering service to the production departments within an organization.
- External service refers to providing services to the general public uniformly. The object of both internal service and external service is the same.

Selection of Cost under Operating Costing: Cost is expressed in terms of the unit of service rendered. Though, operating cost is relating to units of costing the cost unit is not as tangible as a job or a contract. Any person cannot easily select a cost unit. Thus, the selection of cost unit requires more skill, technical and statistical

talent on the part of the cost accountant. The cost unit may be simple cost unit or composite cost unit. There is only one variable in the simple cost unit. For example, per bed in case of hospitals, a cup of tea or coffee in case of canteen, per room or per bed in case of lodge and the like. Two or more variables have a close relationship in the composite cost unit. Costs are collected in terms of composite cost units. For example, per ton km in case of transport (truck), per man show in case of cinema theatres, per passenger km in case of transport (passenger) and the like. Hence, the selection of suitable cost unit depends upon the nature of service.

The following table gives a clear picture on the cost unit along with the nature of service of the undertaking.

Nature of Service Undertaking	Cost Unit
Goods Transport service (Lorry, goods train, air transport of goods, trucks etc.)	Per tone km.
Passenger Transport service (Bus, Train, Boat, Passenger train, air transit etc.)	Per Passenger km.
Hospitals	Per bed, per patient, per day
Electricity Supply	Kwh, Horse power
Canteen Service	Man-men/cup of tea or coffee
Boiler House	Cubic centimetres
Road Maintenance	Per Km
Private Transport (private car, private aeroplane etc)	Running Hour, Trip Km
Hotel	Per room, per bed
Street lighting	Per point, per lamp
Gas	Cubit meters, Kg
Water Supply	Gallons, Litres
Cinema theatres	Per man show

Classification of Cost:

Operating costs are classified and accumulated under the following three heads:

1. **Fixed or Standing Charges:** These are expenses which are more or less fixed in nature. For example, in case transport service garage charges, insurance, taxes, license and depreciation are standing cost. In case of Hospital the depreciation pertaining to the cost of building, equipment, beds, beds insurance etc. are fixed charges. These expenses are constant and are incurred irrespective of the extent of service.
2. **Maintenance Charges:** These are costs of semi-variable nature and include expenditure on repairs, maintenance, tyres, tubes, accessories and spares.
3. **Running or Operating Charges:** These are variable cost. For example, in case of hospital, the cost of medicine, diet, laundry etc. will represent the running charges. In case of transport service petrol or diesel, lubricating oil, wages of driver or cleaner are operating or running charges.

Process Costing: Process Costing is defined as a branch of operation costing, that determines the cost of a product at each stage, i.e. process of production. It is an accounting method which is adopted by the factories or industries where the standardized identical product is produced, as well as it passes through multiple processes for being transformed into the final product.

Types of Process Costing

- **Weighted average costs.** This version assumes that all costs, whether from a preceding period or the current one, are lumped together and assigned to produced units. It is the simplest version to calculate.
- **Standard costs.** This version is based on standard costs. Its calculation is similar to weighted average costing, but standard costs are assigned to production units, rather than actual costs; after total costs are accumulated based on standard costs, these totals are compared to actual accumulated costs, and the difference is charged to a variance account.
- **First-in first-out costing (FIFO).** FIFO is a more complex calculation that creates layers of costs, one for any units of production that were started in the previous production period but not completed, and another layer for any production that is started in the current period.

Features of Process Costing

- The plant has various divisions, and each division is a stage of production.
- The production is carried out continuously, by way of the simultaneous, standardized and sequential process.
- The output of a process is the input of another.
- The production from the last process is transferred to finished stock.
- The final product is homogeneous.
- Both direct and indirect costs are charged to the processes.
- The production may result in joint and by-products.
- Losses like normal and abnormal loss occur at different stages of production which are also taken into consideration while calculating the unit cost.

- The output of one process is transferred to another one at a price that includes the profit of the previous process and not at the cost.
- At the end of the period, if there remains the stock of finished goods, then it is also expressed in equivalent completed units. It can be calculated as:

Equivalent units of semi-finished goods or WIP = Actual number of units in process × Percentage of work completed

Process costing is employed by the industries whose production process is continuous and repetitive, as well as the output of one process is the input of another process. So, chemical industry, oil refineries, cement industries, textile industries, soap manufacturing industries, paper manufacturing industries use this method.

Process Losses and Gains:

It is usual that a certain amount of material introduced into the processes are lost, scrapped or wasted. There are many ways in which losses may arise e.g., evaporation, shrinkage, breakages, spoilage for various reasons.

The process loss can be categorized into:

1. Normal process loss, and
2. Abnormal process loss.

Normal Loss: The loss expected during the normal course of operations, for unavoidable reasons is called 'normal loss' and this is due to inherent result of the particular process and thus uncontrollable in the short-run. Management usually able to identify an average percentage of normal losses expected to arise from the production process. The cost of normal losses should be borne by the good production. If any value can be recouped from sale of scrap or wastage or spoilage etc., then this would be credited to the Process Account thus reducing the overall cost of the process.

Abnormal Loss: Abnormal losses are those losses above the level deemed to be the normal loss rate for the process. The abnormal loss is the amount by which the actual loss exceeds the normal loss and it is expected to arise under inefficient operating conditions. The abnormal losses are not included in the process costs but are removed from the appropriate Process Account and reported separately as an abnormal loss. The abnormal loss is treated as a period cost and written off to the Profit and Loss Account at the end of the period. Abnormal losses are credited out of the Process Account into an abnormal loss account at the full unit cost value. Abnormal losses will be costed on the same basis as good production and therefore, like good production, will carry a share of cost of normal losses.

= actual loss – normal loss

$$\text{Value of abnormal loss} = \frac{\text{normal cost of normal output}}{\text{normal output}} \times \text{units of abnormal loss}$$

Abnormal Gain: If the loss is less than the normal expected loss, the difference is considered as abnormal gain. Abnormal gain is accounted similar to that abnormal loss. Abnormal gains will be debited to the Process Account and credited to Abnormal Gain Account. The Abnormal Gain Account is debited with the figure of reduced normal loss in quantity and value. At the end of the accounting year the balance in the Abnormal Gain Account will be carried to Profit and Loss Account.

Value of Scrap: The value of scrap, treated as normal loss, received from its sale is credited to the Process A/c. But the value of scrap received from its sale under abnormal conditions should be credited to Abnormal Loss A/c.