COST ACCOUNTING
UNIT -1

Define of costing

The costing terminology of C.I.M.A., London defines costing as the "the techniques and processes of ascertaining costs". These techniques consist of principles and rules which govern the procedure of ascertaining cost of products or services. The techniques to be followed for the analysis of expenses and the processes by which such an analysis should be related to different products or services differ from industry to industry. These techniques are also dynamic and they change with time.

Define of Cost Accounting

Cost Accounting may be defined as "Accounting for costs classification and analysis of expenditure as will enable the total cost of any particular unit of production to be ascertained with reasonable degree of accuracy and at the same time to disclose exactly how such total cost is constituted". Thus Cost Accounting is classifying, recording an appropriate allocation of expenditure for the determination of the costs of products or services, and for the presentation of suitably arranged data for the purpose of control and guidance of management.

Cost Accounting can be explained as follows:-

1. Cost Accounting is the process of accounting for cost which begins with recording of income and expenditure and ends with the preparation of statistical data.
2. It is the formal mechanism by means of which cost of products or services are ascertained and controlled.
3. Cost Accounting provides analysis and classification of expenditure as will enable the total cost of any particular unit of product / service to be ascertained with reasonable degree of accuracy and at the same time to disclose exactly how such total cost is constituted. For example it is not sufficient to know that the cost of one pen is RS.25/- but the management is also interested to know the cost of material used, the amount of labour and other expenses incurred so as to control and reduce its cost.
4. It establishes budgets and standard costs and actual cost of operations, processes, departments or products and the analysis of variances, profitability and social use of funds.
5. Thus Cost Accounting is a quantitative method that collects, classifies, summarises and interprets information for product costing, operation planning and control and decision making.

Objectives of cost accounting:

There is a relationship among information needs of management, cost accounting objectives, and techniques and tools used for analysis in cost accounting. Cost accounting has the following main objectives to serve:

1. Determining selling price
2. Controlling cost
3. Providing information for decision-making
4. Ascertaining costing profit
5. Facilitating preparation of financial and other statements.

1. Determining selling price

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The objective of determining the cost of products is of main importance in cost accounting. The total product cost and cost per unit of product are important in deciding selling price of product.

Cost accounting provides information regarding the cost to make and sell product or services. Other factors such as the quality of product, the condition of the market, the area of distribution, the quantity which can be supplied etc., are also to be given consideration by the management before deciding the selling price, but the cost of product plays a major role.

2. Controlling cost

Cost accounting helps in attaining aim of controlling cost by using various techniques such as Budgetary Control, Standard costing, and inventory control. Each item of cost [viz. material, labour, and expense] is budgeted at the beginning of the period and actual expenses incurred are compared with the budget. This increases the efficiency of the enterprise.

3. Providing information for decision-making

Cost accounting helps the management in providing information for managerial decisions for formulating operative policies. These policies relate to the following matters:

(i) Determination of cost-volume-profit relationship.

(ii) Make or buy a component

(iii) Shut down or continue operation at a loss

(iv)Continuing with the existing machinery or replacing them by improved and economical machines.

4. Ascertaining costing profit

Cost accounting helps in ascertaining the costing profit or loss of any activity on an objective basis by matching cost with the revenue of the activity.

5. Facilitating preparation of financial and other statements

Cost accounting helps to produce statements at short intervals as the management may require. The financial statements are prepared generally once a year or half year to meet the needs of the management. In order to operate the business at high efficiency, it is essential for management to have a review of production, sales and operating results.

Cost accounting provides daily, weekly or monthly statements of units produced, accumulated cost with analysis. Cost accounting system provides immediate information regarding stock of raw material, semi-finished and finished goods. This helps in preparation of financial statements.

Scope of Cost Accounting

The terms ‘costing’ and ‘cost accounting’ are many times used interchangeably. However, the scope of cost accounting is broader than that of costing. Following functional activities are included in the scope of cost accounting:

1. Cost book-keeping:

It involves maintaining complete record of all costs incurred from their incurrence to their charge to departments, products and services. Such recording is preferably done on the basis of double entry system.

2. Cost system:

Systems and procedures are devised for proper accounting for costs.

3. Cost ascertainment:

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Ascertaining cost of products, processes, jobs, services, etc., is the important function of cost accounting. Cost ascertainment becomes the basis of managerial decision making such as pricing, planning and control.

4. Cost Analysis:

It involves the process of finding out the causal factors of actual costs varying from the budgeted costs and fixation of responsibility for cost increases.

5. Cost comparisons:

Cost accounting also includes comparisons between cost from alternative courses of action such as use of technology for production, cost of making different products and activities, and cost of same product/ service over a period of time.

6. Cost Control:

Cost accounting is the utilisation of cost information for exercising control. It involves a detailed examination of each cost in the light of benefit derived from the incurrence of the cost. Thus, we can state that cost is analysed to know whether the current level of costs is satisfactory in the light of standards set in advance.

7. Cost Reports:

Presentation of cost is the ultimate function of cost accounting. These reports are primarily for use by the management at different levels. Cost Reports form the basis for planning and control, performance appraisal and managerial decision making.

Nature of Cost Accounting

1. Cost accounting is a branch of knowledge:

Though considered as a branch of financial accounting, cost accounting is one of the important branch of knowledge, that is a discipline by itself. It is an organised body of knowledge consisting of its own principles, concepts and conventions. These principles and rules vary from industry to industry.

2. Cost accounting is a science:

Cost accounting is a science as it is a body of systematic knowledge relating to not only cost accounting but relating to a wide variety of subjects such as law, office practice and procedure, data processing, production and material control, etc.

It is necessary for a cost accountant to have intimate knowledge of all these field of study in order to carry on his day-to-day activities. But it is to be admitted that it is not a perfect science as in the case of natural science.

3. Cost accounting is an art:

Cost accounting is an art in the sense it requires the ability and skill on the part of cost accountant in applying the principles, methods and techniques of cost accountancy to various management problems. These problems include the ascertainment of cost, control of costs, ascertainment of profitability, etc.

4. Cost accounting is a profession:

In recent years cost accounting has become one of the important professions which has become more challenging. This view is evident from two facts. First, the setting up of various professional bodies such as National Association of Accountants (NAA) in USA.

The Institute of Cost and Management Accountants in UK, the Institute of Cost and Works Accountants in India and such other professional bodies both in developed and developing

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countries have increased the growing awareness of costing profession among the people. Secondly, a large number of students have enrolled in these institutes to obtain costing certificates and memberships for earning their livelihood.

Advantages of Cost Accounting

1. Advantages of Cost Accounting to Management

1. Fixation of responsibility: Whenever a cost centre is established, it implies establishing a kind of relationship between superior and subordinates. Thus, responsibilities are fixed on every individual who is concerned with incurrence of cost.

2. Measures economic performance: By applying cost control techniques such as budgetary control and standard costing it helps in knowing the performance of business.

3. Fixation of price: By providing cost data it helps management to fix the selling price in advance. Hence, quotations can be supplied to prospective customers to secure orders.

4. Aids in decision-making: It helps management in making suitable decisions such as make or buy, replace manual labour by machines, shut down or continue operations based on cost reports.

5. Helps in the preparation of interim final accounts: By the process of continuous stock taking it enables to know the value of closing stock of materials at any time. This facilitates preparation of final accounts wherever desired.

6. Helps in minimising wastages and losses: Cost accounting system enables to locate the losses relating to materials, idle time and under utilisation of plant and machinery.

7. Facilitates comparison: It facilitates cost comparison in respect of jobs, process, departments and also between two periods. This reveals the efficiency or otherwise of each job, process or department.

8. Assists in increasing profitability: Costing reports provide information about profitable or unprofitable areas of operation. The management can discontinue that product line or that department which are responsible for incurring losses and only profitable line of activities alone are retained.

9. Reconciliation with financial accounts: A well maintained cost accounting system facilitates reconciliation with financial accounts to check the arithmetical accuracy of both the systems.

10. It guides future production policy: Cost data help management in determining future production policy. Any expansion or contraction of production for the future is based on past cost data.

2. Advantages to Employees

1. Cost accounting system enables employees to earn better wages through overtime wages and incentive systems of wage payment.

2. By providing better facilities it ensures job security to employees.

3. Employees benefit by merit rating techniques which is conducted by scientific process.

3. Advantages to Creditors

1. It increases the confidence of creditors in the capital employed in the business.

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2. The frequent preparation of reports and statements help in knowing solvency position of the business.

4. Advantages to Government

1. It helps government in formulating policies regarding export, import, taxation, price control measures, wage fixation, etc.

2. It helps in assessing excise duty, sales tax and income tax of the business.

3. Costing information helps in preparing national plans.

5. Advantages to Society

1. Cost reduction and cost control programmes go to minimise cost of production of goods and services. A portion of the reduced cost of production is shared bycustomers by paying less price for goods and services.

2. It offers employment opportunities in the cost accounting department in the capacity of cost accountants and cost clerks.

Disadvantages of Cost Accounting

Cost accounting like other branches of accountancy is not an exact science but is art which has developed through theories and accounting practice based on reasoning and common sense. Many theories can be proved or disproved in the light of conventions and basic principles of cost accounting. These Principles are not static but changing with the change of time and circumstances. The following are the main limitations of cost accounting:

1. Cost accounting lacks a uniform procedure: It is possible that two equally competent cost accountants may arrive at different results from the same information. Keeping in view this limitation, all cost accounting results can be taken as mere estimates.

2. There are a large number of conventions, estimates and flexible factors such as classification of costs into its elements, issue of materials on average or standard price, apportionment of overhead expenses, arbitrary allocation of joint costs, division of overheads into fixed and variable costs, division of costs into normal and abnormal and controllable and non-controllable and adoption of marginal costs and standard costs due to which it becomes difficult to have exact costs.

Moreover, no one cost is suitable for all purposes and under all circumstances. Virtually its calculation depends on the use to which the data are required to be put to. Because of inclusion of some items of cost on estimated basis it is difficult to have actual true cost. On this basis when the valuation of stock is done, that will not be based on true facts and naturally the profit calculated from the cost records will not be true.

3. For getting the benefits of cost accounting **many formalities are to be observed** by a small and medium size concern due to which the establishment and running costs are so much that it becomes difficult for these concerns to afford its cost. Thus, cost accounting can be used only by big concerns.

4. The contribution of cost accounting for handling **futuristic situations has not been much.** For example, it has not evolved so far any tool for handling inflationary situation.

Cost classification

Costs can be classified or grouped according to their common characteristics. Proper classification of costs is very important for identifying the costs with the cost centers or cost units.

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The same costs are classified according to different ways of costing depending upon the purpose to be achieved and requirements of a particular concern. The important ways of classification are:

1. By Nature or Elements:

According to this classification the costs are classified into three categories i.e., Materials, Labour and Expenses. Materials can further be sub-classified as raw materials components, spare parts, consumable stores, packing materials etc.

This helps in finding the total cost of production and the percentage of materials (labour or other expenses) constituted in the total cost. It also helps in valuation of work-in-progress.

2. By Functions:

This classification is on the basis of costs incurred in various functions of an organization ie. Production, administration, selling and distribution.

According to this classification, costs are divided into Manufacturing and Production Costs and Commercial costs.

Manufacturing and Production Costs are costs involved in manufacture, construction and Fabrication of products.

Commercial Costs are (a) administration costs (b) selling and distribution costs.

3. By Degree of Traceability to the Product:

According to this, costs are divided indirect costs and indirect costs. **Direct Costs** are those costs which are incurred for a particular product and can be identified with a particular cost centre or cost unit. Eg:- Materials, Labour.

Indirect Costs are those costs which are incurred for the benefit of a number of cost centre or cost units and cannot be conveniently identified with a particular cost centre or cost unit. Eg:- Rent of Building, electricity charges, salary of staff etc.

4. By Changes in Activity or Volume:

According to this costs are classified according to their behavior in relation to changes in the level of activity or volume of production. They are fixed, variable and semi-variable.

Fixed Costs are those costs which remain fixed in total amount with increase or decrease in the volume of the output or productive activity for a given period of time. Fixed Costs per unit decreases as production increases and vice versa. Eg:- rent, insurance of factory building, factory manager's salary etc.

Variable Costs are those costs which vary indirect proportion to the volume of output. These costs fluctuate in total but remain constant per unit as production activity changes. Eg:- direct material costs, direct labour costs, power, repairs etc.

Semi-variable Costs are those which are partly fixed and partly variable. For example; Depreciation, for two shifts working the total depreciation may be only 50% more than that for single shift working. They may change with comparatively small changes in output but not in the same proportion.

5. Association with the Product:

Cost can be classified as product costs and period costs. Product costs are those which are traceable to the product and included in inventory cost, thus product cost is full factory cost.

Period costs are incurred on the basis of time such as rent, salaries etc. thus it includes all selling and administration costs. These costs are incurred for a period and are treated as expenses.

6. By Controllability:

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The CIMA defines controllable cost as "a cost which can be influenced by the action of a specified member of an undertaking" and a non-controllable cost as "a cost which cannot be influenced by the action of a specified member of an undertaking".

7. By Normality:

There are normal costs and abnormal costs. Normal costs are the costs which are normally incurred at a given level of output under normal conditions. Abnormal costs are costs incurred under abnormal conditions which are not normally incurred in the normal course of production. Eg:-damaged goods due to machine break down, extra expenses due to disruption of electricity, inefficiency of workers etc.

8. By Relationship with Accounting Period:

There are capital and revenue expenses depending on the length of the period for which it is incurred. The cost which is incurred in purchasing an asset either to earn income or increasing the earning capacity of the business is called capital cost, for example, the cost of a machine in a factory.

Such cost is incurred at one point of time but the benefits accruing from it are spread over a number of accounting years. The cost which is incurred for maintaining an asset or running a business is revenue expenditure. Eg:- cost of materials, salary and wages paid, depreciation, repairs and maintenance, selling and distribution.

9. By Time: Costs can be classified as 1) Historical cost and 2) Predetermined Costs.

The costs which are ascertained and recorded after it has been incurred is called historical costs. They are based on recorded facts hence they can be verified and are always supported by evidences.

Predetermined costs are also known as estimated costs as they are computed in advance of production taking into consideration the previous periods' costs and the factors affecting such costs. Predetermined costs when calculated scientifically become standard costs. Standard costs are used to prepare budgets and then the actual cost incurred is later-on compared with such predetermined cost and the variance is studied for future correction.

Types, Methods and Techniques of Costing

The general fundamental principles of ascertaining costs are the same in every system of cost accounting, but the methods of analysis and presenting the costs vary from industry to industry. Different methods are used because business enterprises vary in their nature and in the type of products or services they produce or render. Basically, there are two principal methods of costing, namely (i) Job Costing, and (ii) Process costing.

1. Job costing:

It refers to a system of costing in which costs are ascertained in terms of specific jobs or orders which are not comparable with each other. Industries where this method of costing is generally applied are Printing Process, Automobile Garages, Repair Shops, Ship-building, House building, Engine and Machine construction, etc. Job Costing includes the following methods of costing:

(a) Contract Costing: Although contract costing does not differ in principle from job costing, it is convenient to treat contract cost accounts separately. The term is usually applied to the costing method adopted where large scale contracts at different sites are carried out, as in the case of building construction.

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(b)Bach Costing: This method is also a type of job costing. A batch of similar products is regarded as one job and the cost of this complete batch is ascertained. It is then used to determine the unit cost of the articles produced. It should, however, be noted that the articles produced should not lose their identity in manufacturing operations.

(c)Terminal Costing: This method is also a type of job costing. This method emphasizes the essential nature of job costing, ie, the cost can be properly terminated at some point and related to a particular job.

(d)Operation Costing: This method is adopted when it is desired to ascertain the cost of carrying out an operation in a department, for example, welding. For large undertaking, it is frequently necessary to ascertain the cost of various operations.

2. Process Costing:

Where a product passes through distinct stages or processes, the output of one Process being the input of the subsequent process, it is frequently desired to ascertain the cost of each stage or process of production. This is known as process costing.

This method is used where it is difficult to trace the item of prime cost to a particular order because its identity is lost in volume of continuous production. Process costing is generally adopted in textile industries, chemical industries, oil refineries, soap manufacturing, paper manufacturing, tanneries, etc.

3. Unit or single or output or single output costing:

This method is used where a single article is produced or service is rendered by continuous manufacturing activity. The cost of the whole production cycle is ascertained as a process or series of processes and the cost per unit is arrived at by dividing the total cost by the number of units produced. The unit of costing is chosen according to the nature of the product.

Cost statements or cost sheets are prepared under which various items of expenses are classified and the total expenditure is divided by total quantity produced in order to arrive at unit cost of production. This method is suitable in industries like brick-making, collieries, flour mills, cement manufacturing, etc. this method is useful for the assembly department in a factory producing a mechanical article eg. Bicycle.

4. Operating Costing:

This method is applicable where services are rendered rather than goods produced. The procedure is same as in the case of single output costing. The total expenses of the operation are divided by the units and cost per unit of services is arrived at. This method is employed in Railways, Road Transport, Water supply undertakings, Telephone services, Electricity companies, Hospital services, Municipal services, etc.

5. Multiple or Complete Costing:

Some products are so complex that no single system of costing is applicable. It is used where there are a variety of components separately produced and subsequently assembled in a complex production. Total cost is ascertained by computing component costs which are collected by job or process costing and then aggregating the costs through use of the single or output costing system. This method is applicable to manufacturing concerns producing Motor Cars, Aeroplanes, Machine tools, Type-writers, Radios, Cycles, Sewing Machines, etc.

6. Uniform Costing:

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It is not a distinct method of costing by itself. It is the name given to a common system of costing followed by a number of firms in the same industry. This helps in comparing performance of one firm with that of another.

7. Departmental Costing:

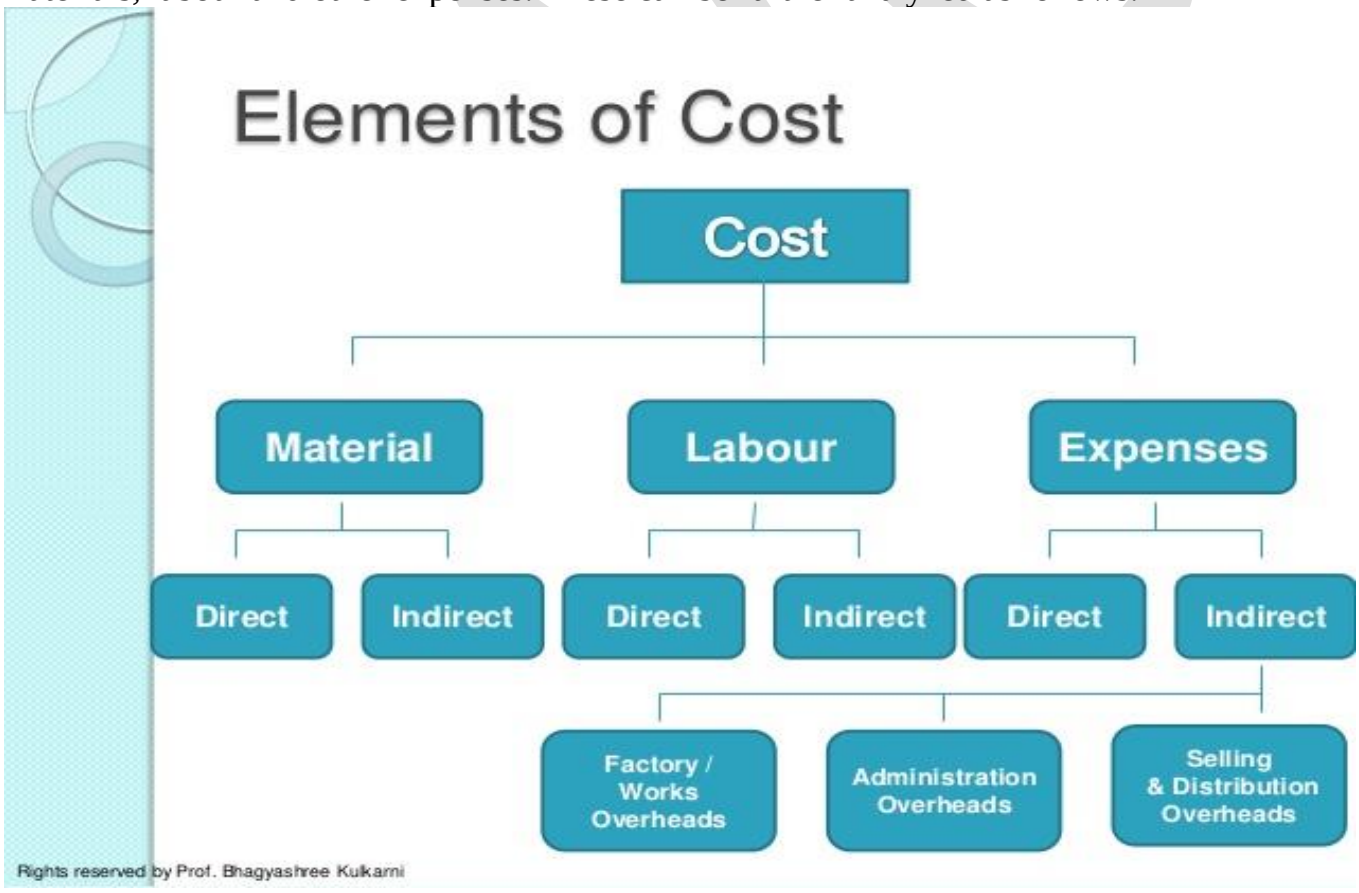
When costs are ascertained department by department, the method is called "Departmental Costing". Usually, for ascertaining the cost of various goods or services produced by the department, the total costs will have to be analysed, say, by the use of job costing or unit costing. In addition to the above methods of costing, mention can be made of the following techniques of costing which can be applied to any one of the above method of costing for special purposes of cost control and policy making:

a) Standard or Predetermined Costs.

b) Marginal Costs

Elements of Cost

The management of an organization needs necessary data to analyze and classify costs for proper control and for taking decisions for future course of action. Hence the total cost is analyzed by elements of costs that is by the nature of expenses. The elements of costs are three and they are materials, labour and other expenses. These can be further analyzed as follows.



By grouping the above elements of cost, the following divisions of cost are obtained.

Formula

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1. Prime cost	=Direct Materials + Direct Labour+ Direct Expenses
2. Works or Factory Cost	=Prime Cost + Works or Factory Overheads
3. Cost of Production	=Works Cost + Administration Overheads
4. Total Cost or Cost of Sales	=Cost of Production + Selling and Distribution overheads

1. Direct Materials are those materials which can be identified in the product and can be conveniently measured and directly charged to the product. For example, bricks in houses, wood in furniture etc.

Hence all raw materials, materials purchased specifically for a job or process like glue for book making, parts or components purchased or produced like batteries for radios and tyres for cycles, and primary packing materials are direct materials.

2. Indirect Materials are those materials which cannot be classified as direct materials. Examples are consumables like cotton waste, lubricants, brooms, rags, cleaning materials, materials for repairs and maintenance of fixed assets, high speed diesel used in power generators etc.

3. Direct Labour is all labour expended in altering the construction, composition, confirmation or condition of the product. Thus direct wages means the wages of labour which can be conveniently identified or attributed wholly to a particular job, product or process or expended in converting raw materials into finished goods.

Thus payment made to groups of labourers engaged in actual production, or carrying out of an operation or process, or supervision, maintenance, tools setting, transportation of materials, inspection, analysis etc is direct labour.

4. Direct Expenses are expenses directly identified to a particular cost centre. Hence expenses incurred for a particular product, job, department etc are direct expenses.

Example royalty, excise duty, hire charges of a specific plant and equipment, cost of any experimental Work carried out especially for a particular job, travelling expenses incurred in connection with a particular contract or job etc.

5. Overheads may be defined as the aggregate of the cost of indirect materials, indirect labour and such other expenses including services as cannot conveniently be charged direct to specific cost units.

Overheads may be sub-divided into (i) Manufacturing Overheads; (ii) Administration Overheads; (iii) Selling Overheads; (iv) Distribution Overheads; (v) Research and Development Overheads.

Explain the Terms

1. Cost units **2. Cost centre** **3.Profit centre**

1. Cost units

The Chartered Institute of Management Accountants, London, defines a unit of cost as "a unit of quantity of product, service or time in relation to which costs may be ascertained or expressed".

The forms of measurement used as cost units are usually the units of physical measurements like number, weight, area, length, value, time etc.

Following are some examples of cost unit.

Industry/product	Cost unit basis
Automobile	Numbers

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Brick works	per 1000 bricks
Cement	per Tonne
Chemicals	Litre, gallon, kilogram, ton
Steel	Tonne
Sugar	Tonne
Transport	Passenger-kilometre, tonne kilometer

2. Cost centre

According to Chartered Institute of Management Accountants, London, cost centre means "a location, person or item of equipment (or group of these) for which costs may be ascertained and used for the purpose of cost control". Cost centre is the smallest organizational sub-unit for which separate cost collection is attempted. Thus cost centre refers to one of the convenient unit into which the whole factory organization has been appropriately divided for costing purposes. Each such unit consists of a department or a sub-department or item of equipment or, machinery or a person or a group of persons.

For example, although an assembly department may be supervised by one foreman, it may contain several assembly lines. Some times each assembly line is regarded as a separate cost centre with its own assistant foreman.

The selection of suitable cost centres or cost units for which costs are to be ascertained in an undertaking depends upon a number of factors which are listed as follows.

1. Organization of the factory
2. Conditions of incidence of cost
3. Requirements of the costing system ie. Suitability of the units or centres for cost purposes.
4. Availability of information
5. Management policy regarding making a particular choice from several alternatives.

3. Profit centre

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

Illustration 1:

Find the Prime Cost, Works Cost, Cost of production, total Cost and profit from the following:-

Direct Materials Rs.20000; Direct Labour Rs. 10000; Factory Expenses Rs. 7000;Administration Expenses Rs. 5000; Selling Expenses Rs. 7000 and Sales Rs.60,000.

Answer:

Prime Cost = Direct Materials + Direct Labour = Rs.20,000 + Rs.10,000 = Rs.30,000.

Works Cost = Prime Cost + Factory Expenses = Rs.30,000 + Rs.7,000 = Rs.37,000.

Cost of Production = Works Cost + Administration Expenses=Rs.37000+Rs.5, 000 = Rs.42, 000.

Total Cost or Cost of sales= Cost of Production + Selling Expenses = Rs.42, 000+ Rs.7, 000 = Rs.49, 000.

Profit = Sales-Total Cost = Rs.60,000-Rs.49,000=Rs.11, 000.

Cost sheet or Statement of Cost:

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When costing information is set out in the form of a statement, it is called "Cost Sheet". It is usually adopted when there is only one main product and all costs almost are incurred for that product only. The information incorporated in a cost sheet would depend upon the requirement of management for the purpose of control.

Specimen of Cost Sheet or Statement of Cost

Particulars	Total Cost Rs.	Cost per Unit Rs.
Direct Materials	×××	×××
Direct Labour	×××	×××
Direct or Chargeable Expenses	×××	×××
Prime cost	×××	×××
Add: Works Overheads	×××	×××
Works Cost	×××	×××
Add: Administration Overheads	×××	×××
Cost of Production	×××	×××
Add: Selling and Distribution Overheads	×××	×××
Total Cost or Cost of sales	×××	×××

Illustration 2:

Calculate Prime Cost, Factory Cost, Cost of Production, Cost of Sales and profit from the following particulars:

Particulars	**Rs.**	**Particulars**	**Rs.**
Direct Materials	**1,00,000**	**Consumable stores**	**2,500**
Direct Wages	**30,000**	**Manager's Salary**	**5,000**
Wages of Foreman	**2,500**	**Directors' fees**	**1,250**
Electric power	**500**	**Office Stationery**	**500**
Lighting: Factory	**1,500**	**Telephone Charges**	**125**
Office	**500**	**Postage and Telegrams**	**250**
Storekeeper's wages	**1,000**	**Salesmen's salary**	**1,250**
Oil and water	**500**	**Travelling expenses**	**500**
Rent: Factory	**5,000**	**Advertising**	**1,250**
Office	**2,500**	**Warehouse charge**	**500**
Repairs and Renewals: Factory plant	**3,500**	**Sales**	**1,89,500**
Transfer to Reserves	**1,000**	**Carriage outward**	**375**
Discount on shares written off	**500**	**Dividend**	**2,000**
Depreciation: Factory Plant	**500**		
Office Premises	**1,250**		

Answers:

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Statement of Cost and Profit

Particulars	Rs.	Rs.
Direct Materials	1,00,000	
Direct Wages	30,000	
Prime Cost	**1,30,000**	**1,30,000**
Add: Factory Overheads:		
Wages of foreman	2,500	
Electric power	500	
Storekeeper's Wage	1,000	
Oil and Water	500	
Factory rent	5,000	
Repairs and renewals-Factory Plant	3,500	
Factory lighting	1,500	
Depreciation-Factory Plant	500	
Consumable stores	2,500	**17,500**
Factory Cost (1,30,000+17,500)		**1,47,500**
Add: Administration Overheads:		
Office Rent	2,500	
Repairs and Renewals -Office Premises	500	
Office lighting	500	
Depreciation : Office Premises	1,250	
Manager's Salary	5,000	
Director's fees	1,250	
Office Stationery	500	
Telephone charges	125	
Postage and telegrams	250	**11,875**
Cost of production (1,47,500+11,875)		**1,59,375**
Add: Selling and Distribution Overheads:		
Carriage Outward	375	
Salesmen's Salaries	1,250	
Travelling Expenses	500	
Advertising	1,250	
Warehouse charges	500	**3,875**
Cost of Sales (1,59,375+3,875)		**1,63,250**
Profit		26,250
Sales		**1,89,500**

Meaning of cost

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The term 'cost' means the amount of expenses [actual or notional] incurred on or attributable to specified thing or activity.

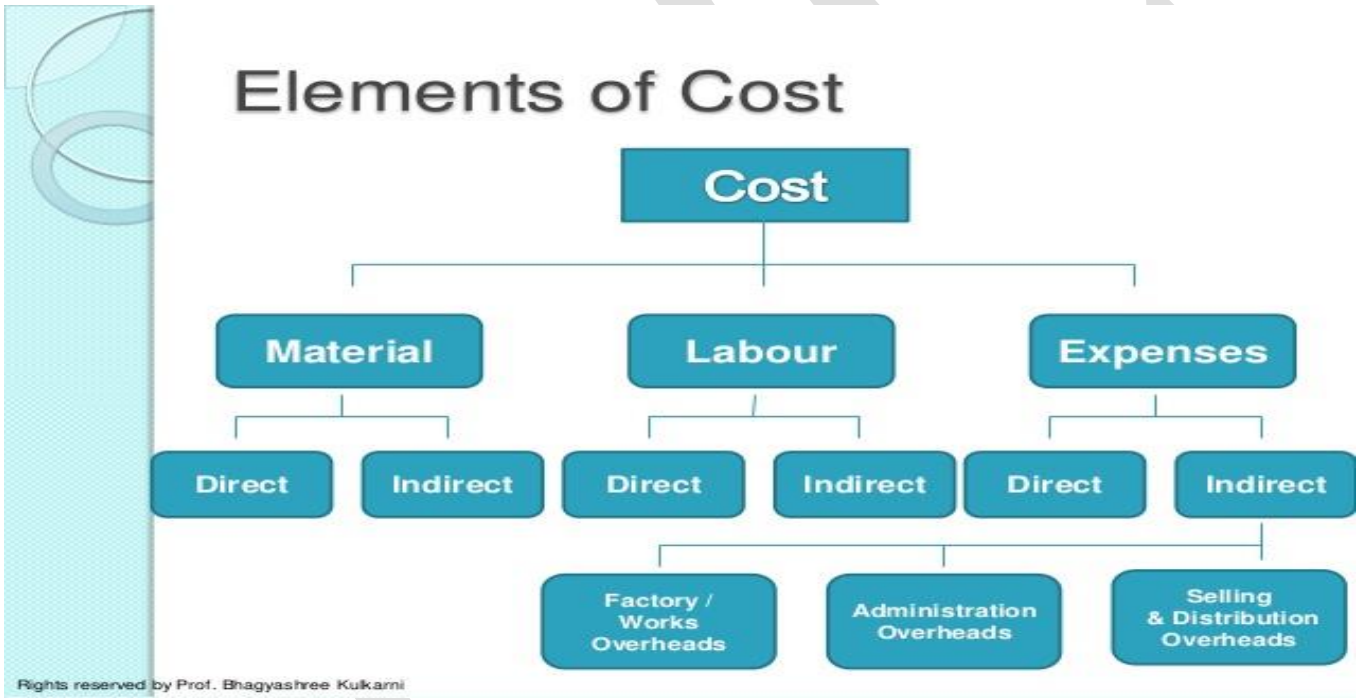
As per Institute of cost and work accounts (ICWA) India, Cost is 'measurement in monetary terms of the amount of resources used for the purpose of production of goods or rendering services.

To get the results we make efforts. Efforts constitute cost of getting the results. It can be expressed in terms of money; it means the amount of expenses incurred on or attributable to some specific thing or activity.

The term cost is used in this very form. In reference to production/manufacturing of goods and services cost refers to sum total of the value of resources used like raw material and labour and expenses incurred in producing or manufacturing of given quantity.

Elements of cost

Cost of production/manufacturing consists of various expenses incurred on production/manufacturing of goods or services. These are the elements of cost which can be divided into three groups : **Material, Labour and Expenses.**



1. Material

To produce or manufacture material is required. For example to manufacture shirts cloth is required and to produce flour wheat is required. All material which becomes an integral part of finished product and which can be conveniently assigned to specific physical unit is termed as "Direct Material".

It is also described as raw material, process material, prime material, production material, stores material, etc. The substance from which the product is made is known as material. It may be in a raw or manufactured state. Material is classified into two categories:

1. Direct Material
2. Indirect Material

1. Direct Material

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Direct Material is that material which can be easily identified and related with specific product, job, and process. Timber is a raw material for making furniture, cloth for making garments, sugarcane for making sugar, and Gold/silver for making jewellery, etc are some examples of direct material.

2. Indirect Material

Indirect Material is that material which cannot be easily and conveniently identified and related with a particular product, job, process, and activity. Consumable stores, oil and waste, printing and stationery etc, are some examples of indirect material. Indirect materials are used in the factory, the office, or the selling and distribution department.

2. Labour

Labour is the main factor of production. For conversion of raw material into finished goods, human resource is needed, and such human resource is termed as labour. Labour cost is the main element of cost in a product or service. Labour can be classified into two categories:

1. Direct Labour
2. Indirect labour

1. Direct Labour

Labour which takes active and direct part in the production of a commodity. Direct labour is that labour which can be easily identified and related with specific product, job, process, and activity. Direct labour cost is easily traceable to specific products. Direct labour costs are specially and conveniently traceable to specific products. Direct labour varies directly with the volume of output.

Direct labour is also known as process labour, productive labour, operating labour, direct wages, manufacturing wages, etc. Cost of wages paid to carpenter for making furniture, cost of a tailor in producing readymade garments, cost of washer in dry cleaning unit are some examples of direct labour.

2. Indirect labour

Indirect labour is that labour which can not be easily identified and related with specific product, job, process, and activity. It includes all labour not directly engaged in converting raw material into finished product. It may or may not vary directly with the volume of output.

Labour employed for the purpose of carrying out tasks incidental to goods or services provided is indirect labour. Indirect labour is used in the factory, the office, or the selling and distribution department. Wages of store-keepers, time-keepers, salary of works manager, salary of salesmen, etc, are all examples of indirect labour cost.

3. Expenses

All cost incurred in the production of finished goods other than material cost and labour cost are termed as expenses. Expenses are classified into two categories:

1. Direct expenses, and
2. Indirect expenses (An item of overheads)

1. Direct expenses

These are expenses which are directly, easily, and wholly allocated to specific cost center or cost units. All direct cost other than direct material and direct labour are termed as direct expenses.

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Direct expenses are also termed as chargeable expenses. Some examples of the direct expenses are hire of special machinery, cost of special designs, moulds or patterns, feed paid to architects, surveyors and other consultants, inward carriage and freight charges on special material, Cost of patents and royalties.

2. Indirect expenses (An item of overheads)

These expenses cannot be directly, easily, and wholly allocated to specific cost center or cost units. All indirect costs other than indirect material and indirect labour are termed as indirect expenses. Thus,

Indirect Expenses = Indirect cost – Indirect material – Indirect labour.

Indirect expenses are treated as part of overheads. Rent, rates and taxes of building, repair, insurance and depreciation on fixed assets, etc, are some examples of indirect expenses.

Overhead: Meaning

The term overhead has a wider meaning than the term indirect expenses.Overheads include the cost of indirect material, indirect labour and indirect expenses. This is the aggregate sum of indirect material, indirect labour and indirect expenses.

Overhead = Indirect material + Indirect labour + Indirect expenses

Overheads are classified into following **three categories:**

1. Factory/works/ production overheads
2. Office and administrative overheads
3. Selling and distribution overheads

1. Factory/works/ production overheads

All indirect costs incurred in the factory for production of goods is termed as factory/works overheads. Such costs are concerned with the running of the factory or plant. These include indirect material, indirect labour and indirect expenses incurred in the factory. Some examples are as follows:

Indirect materials:

(i) Grease, oil, lubricants, cotton waste etc.
(ii) Small tools, brushes for sweeping, sundry supplies etc.
(iii) Cost of threads, gum, nails, etc.
(iv) Consumable stores
(v) Factory printing and stationery

Indirect wages:

(i) Salary of factory manager, foremen, supervisors, clerks etc.
(ii) Salary of storekeeper
(iii) Salary and fee of factory directors and technical directors
(iv) Contribution to ESI, PF., Leave pay etc. of factory employee.

Indirect expenses:

(i) Rent of factory buildings and land
(ii) Insurance of factory building, plant, and machinery
(iii) Municipal taxes of factory building
(iv) Depreciation of factory building, plant and machinery, and their repairs and maintenance charges

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(v) Power and fuel used in factory
(vi) Factory telephone expenses.

2. Office and administrative overheads

These expenses are related to the management and administration of the business. They are incurred for the direction and control of an undertaking. These represent the aggregate of the cost of indirect material, indirect labour, and indirect expenses incurred by the office and administration department of an organisation. Some examples are as follows:

Office printing and stationery, Cost of brushes, dusters etc. for cleaning office building and equipments, Postage and stamps. Salary of office manager, clerks, and other employees, Salary of administrative directors, Salaries of legal adviser, Salaries of cost accountants and financial accountants, Salary of computer operator. Rent, insurance, rates and taxes of office building, Office lighting, heating and cleaning, Depreciation and repair of office building, furniture, and Equipment etc., Legal charges, Bank charges, Trade subscriptions, Telephone charges, Audit fee etc.

3. Selling and distribution overheads

Selling and distribution overheads are incurred for the marketing of a commodity, for securing order for the articles, dispatching goods sold or for making efforts to find and retain customers.

These expenses represent the aggregate of indirect material, indirect labour, and indirect expenses incurred by the selling and distribution department of the organisation. These overheads have two aspects (i) procuring orders (ii) executing the order. Based upon this concept the selling and distributions are studied separately.

I. Selling overheads

Indirect costs incurred in relation to the procurement of sale orders are termed as selling overheads. Some of the examples of selling overheads are as follows:

<u>Indirect material</u>
(i) Catalogues, price list
(ii) Printing and stationery
(iii) Postage and stamps
(iv) cost of sample

<u>Indirect wages</u>
(i) Salaries of sales managers, clerks and other employees
(ii) Salaries and commission of salesmen and technical representatives
(iii) Fees of sales directors

<u>Indirect expenses</u>
(i) Advertising
(ii) Bad debts
(iii) Rent and insurance of showroom
(iv) Legal charges incurred for recovery of debts
(v) Travelling and entertainment expenses
(vi) Expenses of sending samples
(vii) Market research expenses.

II. Distribution overheads

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Indirect costs incurred in relation to the execution of the sales order is termed as distribution overheads. Some of the examples of distribution
overheads are as follows:

Indirect material

(i) Cost of packing material
(ii) oil, grease, spare parts etc. for maintaining delivery vans

Indirect wages

(i) Salaries of godown employees
(ii) Wages of drivers of delivery vans
(iii) Wages of packers and dispatch staff.

Indirect expenses

(i) Packing expenses
(ii) Godown rent, insurance, depreciation, and repair etc.
(iii) Freight carriage outwards and other transport charges .
(iv) Running expenses of delivery vans, repair, and depreciation.
(v) Insurance in transit etc.

Classification of Cost

Costs are classified into following categories:

1.Cost behavior basis
(a) Fixed Cost
(b) Variable cost
(c) Semi-variable cost
2.Cost inventory basis
(a) Product cost and
(b) Period cost
3.Cost Relation to Cost Centre basis
(a) Direct and
(b) Indirect costs

1. Cost behavior basis

(a) Fixed Cost

A cost that remains constant within a given period of time and range of activity in spite of fluctuations in production. Per unit fixed cost varies with the change in the volume of production. If the production increases, fixed cost per unit decreases and as there is decrease in production, the fixed cost per unit increases. Rent and insurance of building, depreciation on plant and machinery, salary of employees etc., are some examples of fixed costs.

(b) Variable cost

Variable costs are those cost which vary directly in proportion to change in volume of production/output. The cost which increases or decreases in the same proportion in which the units

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produced is termed as variable cost. Direct material, direct labour, direct expenses, variable overheads are some examples of variable cost.

(c) Semi-variable cost

A cost contains both fixed and variable component and which is thus partly affected by fluctuations in the level of activity. Semi-variable costs is that cost of which some part remains fixed at the given level of production and other part varies with the change in the volume of production but not in the same proportion of change in production.

For example, expenses may not change if output is upto50% capacity but may increase by 5% for every 20% increase in output over 50% but up to 70%. For example, Telephone expenses of which rent portion is fixed and call charges are variable.

Segregation of semi-variable cost

Semi-variable costs are segregated into fixed and variable cost by using the following formula :

Semi-variable cost= Fixed cost + variable cost
Variable cost per unit = change in cost/change in output

2. Costs by inventory : Product cost and period cost

Product costs are those cost which are charged and identified with the product and included in stock value. In other words, the costs that are the cost of manufacturing a product are called product cost. Product cost includes direct material, direct labour, direct expenses, and manufacturing overheads. Period costs are those costs which are not charged to products but are written off as expenses against revenue of the period during which these are incurred.

They are not transferred as a part of value of stock to the next accounting year. They are charged against the revenue of the relevant period. Period costs include all fixed costs and total administration, selling and distribution costs.

3. Cost Relation to Cost Centre : Direct and Indirect costs

All costs are subdivided into direct and indirect costs. The concept of direct and indirect cost is of basic importance in costing. Costs which are easily and directly allocated to products or units are termed as direct cost. Direct costs include all traceable costs. In the process of manufacturing of a product, materials are purchased, wages are paid to labour, and certain other expenses are also incurred directly.

All these expenses are called as direct costs. The expenses incurred on those items which are not directly charged to a single product because they are incurred for many products are termed as indirect Costs. The example of indirect costs are Oil and scrap materials, [indirect materials], salary of factory supervisors [indirect labour], rent rates and depreciation [indirect expenses]. Indirect costs, often referred to as overheads have to be apportioned to different products on suitable criterion/criteria.

Meaning of Cost Sheet:

Cost sheet is a statement, which shows various components of total cost of a product. It classifies and analyses the components of cost of a product. Previous periods data is given in the cost sheet for comparative study.

It is a statement which shows per unit cost in addition to Total Cost. Selling price is ascertained with the help of cost sheet. The details of total cost

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presented in the form of a statement is termed as Cost sheet. Cost sheet is prepared on the basis of:
1. Historical Cost 2.Estimated Cost

1. Historical Cost

Historical Cost sheet is prepared on the basis of actual cost incurred. A statement of cost prepared after incurring the actual cost is called Historical Cost Sheet.

2. Estimated Cost

Estimated cost sheet is prepared on the basis of estimated cost. The statement prepared before the commencement of production is called estimated cost sheet. Such cost sheet is useful in quoting the tender price of a job or a contract.

Importance of Cost Sheet

The importance of cost sheet is as follows:

1. Cost ascertainment

The main objective of the cost sheet is to ascertain the cost of a product. Cost sheet helps in ascertainment of cost for the purpose of determining cost after they are incurred. It also helps to ascertain the actual cost or estimated cost of a Job.

2. Fixation of selling price

To fix the selling price of a product or service, it is essential to prepare the cost sheet. It helps in fixing selling price of a product or service by providing detailed information of the cost.

3. Help in cost control

For controlling the cost of a product it is necessary for every manufacturing unit to prepare a cost sheet. Estimated cost sheet helps in the control of material cost, labour cost and overheads cost at every point of production.

4. Facilitates managerial decisions

It helps in taking important decisions by the management such as: whether to produce or buy a component, what prices of goods are to be quoted in the tender, whether to retain or replace an existing machine etc.

Components of Total Cost

The Components of cost are shown in the classified and analytical form in the cost sheet. Components of total cost are as follows:

1. Prime Cost

It consists of direct material, direct wages and direct expenses. In other words "Prime cost represents the aggregate of cost of material consumed, productive wages, and direct expenses". It is also known as basic, first, flat or direct cost of a product.

Prime Cost = Direct material + Direct Wages + Direct expenses

Direct material means cost of raw material used or consumed in production. It is not necessary that all the material purchased in a particular period is used in production. There is some stock of raw material in balance at opening and closing of the period.

Hence, it is necessary that the cost of opening and closing stock of material is adjusted in the material purchased. Opening stock of material is added and closing stock of raw material is deducted in the material purchased and we get material consumed or used in production of a product. It is calculated as:

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Material Consumed = Material purchased + Opening stock of material– Closing stock of material.

Illustration 3:

Calculate prime cost from the following particulars for production unit:

Particulars	**Rs.**
Cost of material purchased	**30,000**
Opening stock of material	**6,000**
Closing stock of material	**4,000**
Wages paid	**3,000**
Rent of hire of a special machine for production	**5,000**

Answer: Statement showing Prime Cost

Particulars	Amount (Rs.)	Amount (Rs.)
Direct Material: Material Consumed		-
Opening stock of material	6,000	
Add : Material Purchased	30,000	
Material available for consumption	**36,000**	
Less : Closing stock of material	4,000	
Material consumed		32,000
Direct Labour : Wages		3,000
Direct Expenses: Rent of hire a special machine		5,000
Prime cost		**40,000**

2. Factory Cost

In addition to prime cost it includes works or factory overheads. Factory Overheads consist of cost of indirect material, indirect wages, and indirect expenses incurred in the factory. Factory cost is also known as works cost, production or manufacturing cost.

Factory Cost = Prime cost + Factory overheads

Illustration 4: Calculate factory cost from the following particulars:

Material consumed	**Rs.60,000**
Productive wages	**20,000**
Direct Expenses	**5,000**
Consumable stores	**2,000**
Oil grease/Lubricating	**500**
Salary of a factory manager	**6,000**
Unproductive wages	**1,000**
Factory rent	**2,000**
Repair and Depreciation on Machine	**600**

Answer: Statement showing Factory cost

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Particulars	Amount (Rs.)	Amount (Rs.)
Direct Material: Material Consumed	60,000	
Direct Labour: Productive wages	20,000	
Direct Expenses	5,000	
Prime cost		**85,000**
Add:Factory overheads		
Indirect Material:		
Consumable stores	2,000	
Oil grease/lubricants	500	2,500
Indirect Labour:		
Unproductive wages	1,000	
Salary of a factory Manager	6,000	7,000
Indirect Expenses:		
Factory rent	2,000	
Repair and Depreciation on Machine	600	2,600
Factory cost		97,100

Adjustment for stock of work-in-progress

In the process of production, some units remain to be completed at the end of a period. These incomplete units are known as work-in-progress. Normally, the cost of incomplete units include direct material, direct Labour, direct expenses, and average factory overheads. Hence, at the time of computing factory cost, it is necessary to make adjustment of opening and closing stock of work in progress to arrive at the net Factory cost/works cost.

Illustration 3: From the following information calculate the works cost.

Particulars Rs.
Direct material 80,000
Direct Labour 22,000
Direct Expenses 5,000
Factory overheads 12,000
Work-in-progress: Opening stock 13,000 Closing stock 7,000

Answer: Statement showing Factory cost

Particulars	Amount (Rs.)	Amount (Rs.)
Direct Material: Material Consumed		80,000
Direct Labour: Productive wages		22,000

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Direct Expenses		5,000
Prime cost		**1,07,000**
Factory overheads		12,000
Factory Cost (Gross)		**1,19,000**
Add: Opening stock of work-in-progress		13,000
		1,32,000
Less: Closing stock of work-in-progress		7,000
Works or Factory cost (Net)		**1,25,000**

Total Cost and Cost Sheet

If office and administrative overheads are added to factory or works cost, total cost of production is arrived at. Hence the total cost of production is calculated as:

Total Cost of production = Factory Cost + office and administration overheads

Illustration 4: From the following information calculate the total cost of production.

Particulars	**Rs.**
Direct material	**90,000**
Direct Labour	**32,000**
Direct Expenses	**9,000**
Factory overheads	**25,000**
Office and administration overheads	**18,000**

Answer: Statement showing total cost of production

Particulars	**Amount (Rs.)**
Direct Material: Material Consumed	90,000
Direct Labour: Productive wages	32,000
Direct Expenses	9,000
Prime cost	**1,31,000**
Factory overheads	25,000
Factory Cost	**1,56,000**
Office and administration overheads	18,000
Total Cost Of Production	**1,74,000**

Cost of goods sold

It is not necessary, that all the goods produced in a period are sold in the same period. There is stock of finished goods in the opening and at the end of the period. The cost of opening stock of finished goods is added in the total cost of production in the current period and cost of closing stock of finished goods is deducted. The cost of goods sold is calculated as:

Cost of goods sold = Total cost of production + Opening stock of Finished goods – Closing stock of finished goods

Illustration 5: From the following information calculate the cost of goods sold.

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Particulars	Rs.
Total Cost of Production	**1,22,000**
Opening stock of finished goods	**12,000**
Closing stock of finished goods	**16,000**

Solution:

Cost of goods sold = Cost of Production + Opening stock of Finished goods - closing stock of Finished goods

Cost of goods sold = Rs.1,22,000 + 12,000 – 16,000 = Rs.1,18,000

Total Cost that is Cost of Sales

If selling and distribution overheads are added to the total cost of production, total cost is arrived at. This cost is also termed as cost of Sales. Hence the total cost is calculated as:

Total Cost = Cost of Goods sold + Selling and distribution overheads

Illustration 6:From the following information calculate the total cost.

Particulars	Rs.
Direct material	**1,60,000**
Direct Labour	**52,000**
Direct Expenses	**19,000**
Factory overheads	**45,000**
Office and administration overheads	**28,000**
Selling and distribution overheads	**33,000**

Answer:

Particulars	Amount (Rs.)
Direct material	1,60,000
Direct Labour	52,000
Direct Expenses	19,000
Prime cost	**2,31,000**
Factory overheads	45,000
Factory Cost	**2,76,000**
Office and administration overheads	28,000
Total Cost Of Production	**3,04,000**
Selling and distribution overheads	33,000
Total cost = cost of sales	**3,37,000**

Sales

If the profit margin is added to the total cost, sales are arrived at. Excess of sales over total cost is termed as profit. When total cost exceeds sales, it is termed as Loss.

Sales = Total Cost + Profit

Sometimes profit is calculated on the basis of given information in percentage of cost or sales. In such a situation, the amount is assumed 100 in which the percentage is calculated. Then the Profit is calculated in the following ways:

Case 1

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If Cost is Rs.10,000 and profit on cost 10%. Assume the cost is Rs.100 and profit on cost is Rs.10. Hence Profit on cost of Rs.10,000 is

$$10,000 \times 10/100 = Rs.1,000$$

Thus the sales value is Rs 11000 (10,000 + 1000)

Case 2

If Cost is Rs.10,800 and profit on sales price is 10%. Assume sales price is Rs.100. cost price is Rs.90 [i.e. Rs.100 – Rs.10]. When profit on cost of Rs.90 is Rs.10. Hence profit on cost of Rs.10,800 is

$$10,800 \times 10/90 = Rs.1,200$$

$$10,800 + 1200 = 12,000 \text{ sales value}$$

Case 3

If sales price is Rs.12,100 and profit on cost is 10%. Assume Cost price is Rs.100. Sales price is Rs.110 [i.e.100 + 10]. If sales price is Rs.110, profit is Rs.10. Profit on sales price of Rs.12,100 is

$$12,100 \times 10/110 = Rs.1,100 \text{ profit}$$

Illustration 7: From the following information, calculate the value of goods sold.

Particulars	**Rs.**
Total Cost of Production	**1,45,000**
Opening stock of finished goods	**22,000**
Closing stock of finished goods	**6,000**
Selling and distribution overheads	**25,000**
Profit	**22,000**

Answer: Statement showiniz Sales

Particulars	Amount (Rs.)
Total Cost of Production	1,45,000
Add: Opening stock of finished goods	22,000
	1,67,000
Less: Closing stock of finished goods	6,000
Cost of Goods sold	**1,61,000**
Selling and distribution overheads	25,000
Total Cost	**1,86,000**
Profit	22,000
Sales	**2,08,000**

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UNIT-2

Material cost

Material is any substance (Physics term) that forms part of or composed of a finished product. i.e material refers to the commodities supplied to an undertaking for the purpose of consumption in the process of manufacturing or of rendering service or for transformation into products. The term 'Stores' is often used synonymously with materials, however, stores has a wider meaning and it covers not only raw materials consumed or utilized in production but also such other items as sundry supplies, maintenance stores, fabricated parts, components, tools, jigs, other items, consumables, lubricants.....etc.

Finished and partly finished products are also often included under the term 'Stores'. Materials are also known as Inventory. The term Materials / Inventory covers not only raw materials but also components, work-in-progress and finished goods and scrap also.

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Material cost is the significant constituent of the total cost of any product. It constitutes 40% to 80% of the total cost. The percentages may differ from industry to industry. But for manufacturing sector the material costs are of greatest significance. Inventory also constitutes a vital element in the Working Capital. So it is treated as equivalent to cash. Therefore the analysis and control on Material Cost is very important.

Materials:-

The materials are a major part of the total cost of producing a product and are one of the most important assets in majority of the business enterprises. Hence the total cost of a product can be controlled and reduced by efficiently using materials.

The materials are of two types, namely:

(i) Direct materials: The materials which can be easily identified and attributable to the individual units being manufactured are known as direct materials. These materials also form part of finished products. All costs which are incurred to obtain direct materials are known as direct material costs.

(ii)Indirect materials: Indirect materials, on the other hand, are those materials which are of small value such as nuts, pins, screws, etc. and do not physically form part of the finished product. Costs associated with indirect materials are known as indirect material costs.

Purchasing Control and Procedure:

Purchasing is an art. Wrong purchases increase the cost of materials, store equipments and the finished goods. Hence it is imperative that purchases should be effectively, efficiently and economically performed.

Dr. Walters defines scientific purchasing as the "Procurement by purchase of the proper materials, machinery, equipment and supplies of stores used in the manufacture of a product, adapted to marketing in the proper quantity and quality at the proper time and the lowest price consistent with the quality desired".

According to Alford and Beatty, "Purchasing is the procuring of materials, supplies, machines tools and services required for the equipment, maintenance and operation of a manufacturing plant".

The major objectives of scientific purchasing it to purchase the right quantity at the best price, materials purchased should suit the objective, production should not be held up, unnecessarily capital should not be locked up in stores, best quality of materials should be purchased and company's competitive position and its reputation for fairness and integrity should be safeguarded.

Only scientific purchasing will help in achieving the above objectives. With proper plans, materials can be purchased at a lower price than competitors, turnover of investment in inventories can be high, purchasing department can advise regarding substitute materials, new products, change in trends, creating goodwill etc.

Methods of Purchasing

Purchasing can be broadly classified as centralized and localized purchasing.

(a) Centralized Purchasing: In a large organization, manufacturing units are many. In such cases centralized purchasing is beneficial. The advantages of centralized purchasing are:

1. Specialized and expert knowledge is available.
2. Advantages arise due to bulk purchases.

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3. The cost of purchasing can be reduced and selling price can be lowered.
4. As there is good knowledge of market conditions, greater control can be exercised.
5. When materials have to be imported, it is advantageous to centralize the buying.
6. Economy and ease in compilation and consultation of results.
7. It can take advantage of market changes.
8. Investment in inventories can be reduced.
9. Other advantages include undivided responsibility, consistent buying policies.

Factors to be considered when decision regarding centralization has to be taken are geographical separation of plants, homogeneity of products, type of material bought, location of supplies etc.

(b)Decentralization of Purchases: The advantages of localized purchasing or decentralization of purchases are:-

1. Each plant may have its own particular need. This can be given special attention.
2. Direct contact can be established with suppliers.
3. The time lag between indenting and receiving materials can be reduced.
4. Technical requirements of each plant can be ascertained.

Purchase Procedure:

The steps usually followed for purchase of materials may be enumerated as follows:-

1. Indenting for materials:

The stores department prepares indents for the purchase of materials for replenishment of stocks (regular indents) or for a special job (special indents) and sends it to the purchase department. Regular indents are prepared periodically and placed when the ordering level for different items of stocks are reached. The quantity indented is equal to the ordering quantity fixed for each item. The special indents are based on the demands received either from the planning or production department.

XYZ Co. Ltd.
MATERIAL PURCHASE INDENT
Date: For the Period:
Indent No: Demand Note No:
Regular/Special

Serial Number	Description	Stores Code No.	Quantity	Last Pur. Order No.	Special remarks

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Store Keeper	For Purchase Dept. Use Tender Nos. Issued on.				

2. Issue of tenders to suppliers:

The purchase department issue tenders to suppliers or publish them in papers. The suppliers quote their terms of price and delivery/payment. After the last date for receipt of quotations is over, the tenders are opened and a comparative statement is prepared. Tenders are prepared in triplicate. Of them, two are sent to the suppliers and one is retained with the purchase department. The supplier mentions his terms in the original.

While considering the tenders, the reliability of the supplier has to be taken into account. The quality of goods and time taken to deliver the goods on previous occasions should be checked. The financial stability and capacity to deliver goods should be ensured.

Sometimes purchases may be made without inviting quotations. The circumstances are when prices are controlled, or purchases are made under long term contracts, or catalogue prices are available or when there is a cost plus contract. If purchase is made under cost plus profit basis, the cost composition and reasonableness of price should be checke.

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INVITATION TO TENDER

Indent No: Tender No:

Date: Date:

To

XYZ Co.Ltd.

.....

.....

Dear Sirs,

The stores mentioned below are required to be delivered at our works godown. The terms and conditions of supply are mentioned overleaf. The first copy of this tender should be returned to us duly filled in before.....

A security deposit of Rs.....should also accompany your reply which will be returned if we do not place an order with you.

Yours faithfully,
For ABC Co.Ltd.

Particulars Of stores/ Supplies	Quantity required	Place of Delivery	Date of delivery required	Quantity which can be supplied	Rate	
					Per Unit	Price

We agree to supply the above on terms mentioned below.

Special conditions:

Place: For XYZ Co. Ltd.

3. Placing of purchase orders:

Normally six copies of purchase order are made. The supplier, stores, inspection department, store accounting section, purchase department and progress department are sent one copy each.

The purchase order has legal and accounting significance. From legal point of view, it binds both the parties to the terms of the contract. Form the accounting point of view; it signifies the amount which has to be spent. It signifies the stores department to accept the goods and the accounts department to accept the bill.

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A.B.C. CO. LTD.
MATERIALS PURCHASE ORDER

Order No: Indent No: Store Receipt No:
Date: Quotation No: Inspection Note No:

To
.....
.....

This is in response to your quotation against our Tender No:..... The terms and conditions mentioned overleaf will be applicable. Please supply the following items at the prices indicated below:

Sl. No.	Description	Stores Code No.	Specification	Quantity	Unit	Price

Terms of Delivery: Please send bill to:
Terms of Payment:
Special Conditions: For A.B.C. Co. Ltd.

4. Inspection:

The supplier delivers goods at the place specified. Two delivery challans are prepared by the supplier one of which is returned. It is a proof of delivery. After receiving the goods, the inspection department or production department or maintenance department (as the case may be) is intimated.

The inspector checks that the materials are in accordance with the quality required, standard expected, tolerances allowed etc. After inspection an inspection note is prepared in triplicate, one copy is sent to the supplier, one to the stores, and one to the inspection department.

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5. Receiving Stores:

The stores department prepares a Stores Receipt Note for the quantity of stock accepted in inspection. After issuing of the Stores Receipt, the Storekeeper is responsible for the stocks. The stores receipt is the document for the posting of receipts in Bin Card and the Stores Ledger. It is prepared in quadruplicate and sent to the supplier; stores accounting section and purchase department and one copy are retained with the stores. The supplier encloses this copy along with his bill. The stores accounting section compares the note with the purchase order.

ABC CO. Ltd.
STORES RECEIPT NOTE
S.R. No: P.O.No: Inspection Note No:
Date: Date: Date:
Received form M/s _____under their delivery challan no:_____ dated_____ the following items of stores against the above purchase order:

Stores Code No:	Description	Unit	Quantity	Price	Value

Posted in:-
Bin Card..... Stores Ledger..... Signature of Storekeeper.....

6. Checking and passing of bills for payment:

Bills received by the purchase department are forwarded to the stores accounting section to check the authenticity regarding quantity and price and the arithmetical accuracy. Special items included in the bills eg:- freight, packing charges are verified with the purchase order. The bill is later passed for payment. **Storekeeping:** Store keeping is a service function. The storekeeper is a custodian of all the items kept in the store. The stores should be maintained properly and cost minimized.

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The main **objectives of store keeping** are:-
i)To protect stores against losses
ii) To keep goods ready for delivery/issue
iii) To provide maximum service at minimum cost.
The duties and functions of Store-keeper can be summarized as follows:
i) Materials should be received, unloaded, inspected and then moved to stores. The materials have to be stored in appropriate places and records the receipts in proper books.
ii) The stores records should be maintained in an efficient and orderly manner so that materials can be easily located and information can be obtained for various departments.
iii) The stores should provide maximum protection and safety and accessibility and utilize minimum space. Suitable storage devices should be installed.
iv)The materials should be given special covering to prevent damage due to atmospheric conditions.
v) All issues should be properly recorded, efficiently, promptly and accurately. All issues should be duly authorized and procedures laid down should be duly followed.
vi)The storekeeper is responsible for co-ordination with materials control according to the type of production, size of the company, the organization structure etc.
vii) Ensure that all transactions are posted in the Bin Card see that the Bin Card is up-to-date.
viii) All items should be in its proper place.
ix)Maintenance of stores at required levels.
x) Neatness in stores to facilitate physical verification.
xi) Co-ordination and supervision of staff in the stores department.
xii) Periodical review of various scales, measuring instruments, conversion ratios etc.
xiii) Protect stores from fires, rust, erosion, dust, theft, weather, heat, cold, moisture and deterioration etc.

Requisitioning for Stores

One of the duties of the storekeeper is to send requisitions for materials for replenishment in time so that the production is not held up due to shortage of materials. The storekeeper should also see that there is no unnecessary blocking of capital due to overstocking of materials. For this he keeps a check on the re-order level, economic ordering quantity, and the maximum and minimum quantity which he is authorized to store in respect of each kind of material.

(A)Re-ordering Level

Re-ordering level is that point of level of stock of a material where the storekeeper starts the process of initiating purchase requisition for fresh supplies of that material.

This level is fixed somewhere between the maximum and minimum levels in such a way that the difference of quantity of the material between the re-ordering level and minimum level will be sufficient to meet the requirements of production until the fresh supply of the materials is received.

FORMULA

Re-ordering Level= Minimum Level + Consumption during the time required to get the fresh delivery

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According to Wheldon,
Re-ordering Level= Maximum Level x Minimum re-order period.

Here, maximum re-order period means the maximum period taken to get the material once the order for new material is placed. Wheldon has taken the maximum period and maximum consumption during that period so that factory may not stop production due to shortage of materials.

Illustration: 1 Calculate the ordering level of material A from the following particulars:
Minimum Limit 1,000 units.
Maximum Limit 5,000 units.
Daily requirement of material 200 units.
Time required for fresh delivery 10 days.

Solution:

Formula

Ordering Level=Minimum limit + Consumption during the time required for fresh delivery
=1000units+ 200 units x 10 days
= 3000 units

Order for the purchase of material should be placed when the material in stock reaches 3,000 units.

Illustration: 2 Calculate the re-ordering level from the following information:
Maximum consumption = 500 units per day
Minimum consumption = 400 units per day
Re-order period = 10 to 12 days

Solution

Re-order Level = Maximum consumption x maximum re-order period
= 500 units x 12 days = 6000 units.

(B)Economic Ordering Quantity

The quantity of material to be ordered at one time is known as economic ordering quantity. This quantity is fixed in such a manner as to minimize the cost of ordering and carrying the stock. The total costs of a material usually consist of:

Total acquisition cost + total ordering cost + total carrying cost.

Since the acquisition cost per unit of material is same whatever is the quantity purchased, it is usually excluded when deciding the quantity of a material to be ordered at one time. The only costs to be taken care of are the ordering costs and carrying costs which vary with the quantity ordered.

Carrying Cost: It is the cost of holding the materials in the store and includes:

1. Cost of storage space which could have been utilized for some other purpose.
2. Cost of bins and racks
3. Cost of maintaining the materials to avoid deterioration.
4. Amount of interest payable on the amount of money locked up in the materials.
5. Cost of spoilage in stores and handling.
6. Transportation cost in relation to stock.
7. Cost of obsolescence of materials due to change in the process or product.

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8. Insurance cost
9. Clerical cost etc.

In India all these costs amount to 20 to 25 % of the cost of materials per year. Hence it becomes necessary to reduce such carrying cost for efficient operations.

Ordering Cost: It is the cost of placing orders for the purchase of materials and includes:

1. Cost of staff posted in the purchasing department, inspection section and stores accounts department.
2. Cost of stationary postage and telephone charges.

Thus, this type of costs includes cost of floating tenders, cost of comparative evaluation of quotations, cost of paper work, and postage involved in placing the order, cost of inspection and cost of accounting and making payments. In other words, the cost varies with the number of orders.

When the quantity of materials ordered is less, the cost of carrying will decrease but ordering cost will increase and vice versa.

Formula:

$$EOQ = \frac{2CO}{I}$$

Q = Quantity to be ordered
C = Consumption of the material concerned in units during a year.
O = Cost of placing one order including the cost of receiving the goods i.e. the cost of getting an item into the firms inventory
I = Interest payment including variable cost of storing per unit per year that is holding costs of inventory.

Illustration 3: Find out the economic ordering quantity (EOQ) from the following particulars.
Annual usage: 6000 units
Cost of material per unit: Rs. 20
Cost of Placing and receiving one order: Rs.60
Annual carrying cost of one unit: 10% of inventory value.

Solution:

$$EOQ = \frac{2CO}{I}$$

Where

C = Annual usage of material that is 6,000 units

O = Cost of placing one order that is Rs.60

I = Annual carrying cost of one unit that is Rs.$\frac{20x10}{100}$ =Rs. 2

$$EOQ = \frac{2x6{,}000\text{units x } 60}{\text{Rs. } 2}$$

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$$EOQ = \frac{7{,}20{,}000}{\text{Rs. } 2}$$

$$= 3{,}60{,}000$$

$$= 600 \text{ Units}$$

C) Minimum Level or Safety Stock level

The minimum level is the minimum quantity of the material which must be maintained in hand at all times. The quantity is fixed so that the production is not held up due to shortage of the materials. In fixing this level, the following factors should be considered:

1. Lead time i.e. time lag between indenting and receiving of the material. It is the time required to replenish the supply.
2. Rate of consumption of the material during the lead time.
3. Nature of the material. Minimum level is not required in case of a special material which is required against customer's specific order.

Formula for calculating minimum level or safety stock level given by Wheldon is as follows:

Minimum Stock Level = Re-ordering level–(Normal consumption x Normal Re-order period)

D) Maximum Level

It is the maximum of stock which should be held in stock at any time during the year. The quantity is fixed so as to avoid overstocking as it leads to the following disadvantages.

1. Overstocking leads to increase in working capital requirement which could be profitable used somewhere else.
2. Overstocking will need more godown space, so more rent will have to be paid.
3. It may also lead to obsolescence on account of overstocking.
4. There are chances that the quality of materials will deteriorate because large stock will require more time before they are consumed.
5. There may be fear of depreciation in market values of the overstocked materials.

Formula According to Wheldon,

Maximum Stock level = Reordering level + Re-ordering Quantity–(Minimum consumption x Minimum re-ordering period)

E) Danger Level

This level means that level of stock at which normal issues of the material are stopped and issues are made only under specific instructions. The purchase officer will make special

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arrangements to get the materials which reach at their danger levels so that the production may not stop due to shortage of materials.

Formula

Danger Level = Average consumption x Max.re-order period for emergency purchases.

F) Average Stock Level

The average stock level is calculated by the following **formula:**

Average Stock Level = Minimum Stock Level + ½ of Re-order Quantity. Or =½ (Minimum Stock Level + Maximum Stock Level)

Illustration 4: Calculate the minimum stock level, maximum stock level, re-ordering level and average stock level from the following information:

(i)Minimum consumption = 100 units per day
(ii)Maximum consumption = 150 units per day
(iii)Normal consumption = 120 units per day
(iv)Re-order period = 10-15 days
(v)Re-order quantity = 1,500 units
(vi)Normal re-order period = 12 days

Solution:

1. Re-ordering Level = Maximum Consumption x Maximum re-order period
= 150 units x 15 days = 2,250 units

2. Minimum Stock Level = Re-ordering Level-(Normal consumption x Normal re -order period)
=2,250–(120 x12) = 810 units

3. Maximum Stock Level = Re-ordering Level + Re-order Quantity–(Minimum Consumption x Minimum Re-Order Period)
= 2,250 + 1500–(100 x 10) = 2,750 units

4. Average stock Level = Minimum Stock Level + ½ Re-order Quantity
= 810units + ½ x 1500 units = 1,560 units

Stores (or Materials) records

In the stores the most important **two records kept are bin cards and stores ledger.**

(a)Bin Card.

A bin card is a record of the receipt and issue of material and is prepared by the store keeper for each item of stores. A bin card is also known as bin tag or stock card and is usually kept in the rack where the material is kept. In a bin card not only the receipt and issue of material is recorded, minimum quantity, maximum quantity and ordering quantity are stated on the card. This helps the store keeper to send the material requisition for the purchase of material in time.

(b)Stores Ledger:

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This ledger is kept in the costing department and is identical with the bin card except that receipts, issues and balances are shown along with their money values. This provides the information for the pricing of materials issued and the money value at any time of each item of stores.

Perpetual Inventory System

The Chartered Institute of Management Accountants, London, defines the perpetual inventory as "a system of records maintained by the controlling department, which reflects the physical movements of stocks and their current balance". Thus this is a system in which, with the help of Bin Cards and Stores Ledger, the balance of stock is ascertained after every receipt and issue of materials. This is helps in avoiding closing down of firm for physical verification.

Advantages of the Perpetual Inventory System

The following are the advantages of the perpetual inventory system:

1. It avoids the disruption of production for physical checking of all items of stores at the end of the year.
2. The preparation of Profit and Loss Account and Balance Sheet is possible without physical verification of stock.
3. A detailed and more reliable control on the materials in store is obtained.
4. As the work of recording and continuous stocktaking is carried out systematically and without undue haste, the figures are more reliable.
5. Continuous stocktaking will make the storekeeper and the stores accountant more vigilant in their work and they will try to keep the records accurate and up-to-date.
6. Planning of production can be done without any fear of shortage as the management is constantly informed of the stores position.
7. An inbuilt system of internal check will be in operation as bin cards and the stores ledger keep a check on each other.
8. Errors and shortage of stock are readily discovered and efforts are made to avoid the shortage of stock in future.
9. The capital invested in the stores can be kept under control and efficiently used as stock can be compared with the minimum and maximum levels.
10. It makes available correct stock figures for claim to be lodged with the insurance company for loss on account of stock destroyed by fire.

ABC Analysis

Under ABC Analysis, the materials in stock are divided into three categories for the purpose of control. Generally it is seen that the materials which constitute the least percentage of items in stock may contribute to a large percentage of value and a large percentage of items may represent a smaller percentage of value of items consumed. Between these two items are those items, the percentage of which is more or less equal to their value in consumption.

Items falling in the first category are treated as 'A' items, of the second category as 'B' items and items of the third category are taken as 'C' items. Such an analysis of material is known as ABC analysis. This technique of stock control is also known as stock control according to value method or Always Better Control method or Proportional Parts Value Analysis method. Thus, under this technique of material control, materials are listed in 'A', 'B' and 'C' categories in descending order based on money value of consumption.

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ABC analysis measures the cost significance of each item of material. It concentrates on important items, so it is also known as 'Control by Importance and Exception" (CIE).

The report of the Indian Productivity Team on "Stores and Inventory Control in U.S.A., Japan and West Germany" gives the following example of ABC Analysis:

Group	Percentage of Items	Percentage of Costs
A	8%	75%
B	25%	20%
C	67%	5%

The significance of this analysis is that a very close control is exercised over the items of 'A' group which account for a high percentage of costs while less stringent control is adequate for category 'B' and very little control would suffice for category 'C' items.

Issue of materials

Materials issued from stores are debited to the jobs or work orders which received them and credited to the materials account. These jobs are debited with the value of materials issued to them.

But what is the value of materials? Theoretically the value includes the invoice price less trade discount, the freight, cartage, octroi and insurance on incoming materials, expenses of purchase, receiving, storing and record keeping and carriage from the stores up to the process plant. However, in practice, it involves minute calculations for including all these expenses and is a big task compared to the benefit derived from it.

Moreover the price changes according to the market conditions and at any given time there will be stock of materials purchased at different times at different prices. Hence the problem as to at what price the materials should be issued?

There are many methods of pricing material issues. The most important being: FIFO, LIFO, simple and weighed average methods.

1) First in First Out (FIFO)

Under this method material is first issued from the earliest consignment on hand and priced at the cost at which that consignment was placed in the stores. In other words, materials received first are issued first. The units in the opening stock of materials are treated as if they are issued first, the units from the first purchase issued next, and so on until the units left in the closing stock of materials are valued at the latest cost of purchases.

This method is most suitable in times of falling prices because the issue price of materials to jobs or work order will be high while the cost of replacement of materials will be low. But in case of rising prices this method is not suitable because the issue price of materials to production will be low while the cost of replacement of materials will be high. The following example will illustrate how issues of materials are valued under this method.

Illustration 5: The received side of the Stores Ledger Account shows the following particulars:

Jan. 1	**Opening Balance:**	**500 units @ Rs.4**
Jan. 5	**Received from vendor:**	**200 units @ Rs.4.25**
Jan.12	**Received from vendor:**	**150 units @ Rs.4.10**
Jan.20	**Received from vendor:**	**300 units @ Rs.4.50**
Jan.25	**Received from vendor:**	**400 units @Rs.4**

Issues of material were as follows:

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Jan. 4-200 units; Jan.10-400 units; Jan. 15-100 units; Jan 19-100 units; Jan.26-200 units; Jan.30-250 units.

Issues are to be priced on the principle of "first in first out". Write the Stores Ledger Account in respect of the materials for the month of January.

Answer 5: FIFO Stores Ledger Account

Date	Particulars	Receipts			Issues			Balance		
		Quantity (Units)	Total Cost(Rs)	Unit cost(Rs)	Quantity(Units)	Total Cost(Rs)	Unit cost(Rs)	Quantity(Units)	Amount (Rs)	Per unit(Rs)
Jan 1	Balance b/d	-	-	-	-	-	-	500	2000	4
Jan 4	Requisition slip no.	-	-	-	200	800	4	300	1200	4
Jan 5	Goods received note no.	200	850	4.25	-	-	-	300	1200	4
		-	-	-	-	-	-	200	850	4.25
Jan 10	Requisition slip no.	-	-	-	300	1200	4	-	-	-
		-	-	-	100	425	4.25	100	425	4.25
Jan 12	Goods received note no.	150	615	4.10	-	-	-	100	425	4.25
		-	-	-	-	-	-	150	615	4.10
Jan 15	Requisition slip no.	-	-	-	100	425	4.25	150	615	4.10
Jan 19	Requisition slip no.	-	-	-	100	410	4.10	50	205	4.10
Jan 20	Goods received note no.	300	1350	4.50	-	-	-	50	205	4.10

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		-	-	-	-	-	-	300	1350	4.50
Jan 25	Goods received note no.	400	1600	4.00	-	-	-	50	205	4.10
		-	-	-	-	-	-	300	1350	4.50
		-	-	-	-	-	-	400	1600	4.00
Jan 26	Requisition slip no.	-	-	-	50	205	4.10	150	675	4.50
		-	-	-	150	675	4.50	400	1600	4.00
Jan 30	Requisition slip no.	-	-	-	150	675	4.50	300	1200	4.00
					100	400	4.00	-	-	-

2) Last in First Out (LIFO)

Under this method, issues are priced in the reverse order of purchase i.e., the prices of the latest available consignment is taken. This method is suitable in times of rising prices because material will be issued from the latest consignment at a price which is closely related to the current price levels. Valuing material issues at the price of the latest available consignment will help the management in fixing the competitive selling prices of the products.

Answer 6: LIFO Stores Ledger Account

Date	Particulars	Receipts			Issues			Balance		
		Quantity (Units)	Total Cost(Rs)	Unit cost(Rs)	Quantity(Units)	Total Cost(Rs)	Unit cost(Rs)	Quantity(Units)	Amount (Rs)	Per unit(Rs)
Jan 1	Balance b/d	-	-	-	-	-	-	500	2000	4
Jan 4	Requisition slip no.	-	-	-	200	800	4	300	1200	4
Jan 5	Goods received note no.	200	850	4.25	-	-	-	300	1200	4
		-	-	-	-	-	-	200	850	4.25
Jan 10	Requisition slip no.	-	-	-	200	850	4.25	-	-	-
		-	-	-	200	850	4.00	100	400	4.00

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Jan 12	Goods received note no.	150	615	4.10	-	-	-	100	400	4.00
		-	-	-	-	-	-	150	615	4.10
Jan 15	Requisition slip no.	-	-	-	100	410	4.10	100	400	4.00
		-	-	-	-	-	-	50	205	4.10
Jan 19	Requisition slip no.	-	-	-	50	205	4.10	-	-	-
					50	200	4.00	50	200	4.00
Jan 20	Goods received note no.	300	1350	4.50	-	-	-	50	200	4.00
		-	-	-	-	-	-	300	1350	4.50
Jan 25	Goods received note no.	400	1600	4.00	-	-	-	50	200	4.00
		-	-	-	-	-	-	300	1350	4.50
		-	-	-	-	-	-	400	1600	4.00
Jan 26	Requisition slip no.	-	-	-	200	800	4.00	50	200	4.00
		-	-	-	-	-	-	300	1350	4.50
		-	-	-	-	-	-	200	800	4.00
Jan 30	Requisition slip no.	-	-	-	200	800	4.00	50	200	4.00
					50	225	4.50	250	1125	4.50

3) Simple Average Method

In this method, price is calculated by dividing the total of the prices of the materials in the stock from which the material to be priced could be drawn by the number of the prices used in that total. This method may lead to over-recovery or under-recovery of cost of materials from production because quantity purchased in each lot is ignored.

Eg:-

1000 units purchased @ Rs.10

2000 units purchased @ Rs.11

3000 units purchased @ Rs.12

In this example, simple average price will be Rs.11 calculated as below:

$$= \frac{\text{Rs. } 10 \ + \ \text{Rs. } 11 \ + \ \text{Rs. } 12}{3}$$

= Rs. 11

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4) Weighted Average Methods

In this method, price is calculated by dividing the total cost of materials in the stock from which the materials to be priced could be drawn by the total quantity of materials in that stock.

In the above example, the weighted average price is Rs.11.33 per unit calculated as follows:

$$= \frac{1000 \text{ x Rs.10} + 2000 \text{ x Rs.11} + 3000 \text{ x Rs.12}}{1000+2000+3000}$$

= Rs. 11.33

In the periods of heavy fluctuations in the prices of materials, the average cost method gives better results because it tends to smooth out the fluctuations in prices by taking the average of prices of various lots in stock.

Illustration 7

Prepare a statement showing the pricing of issues, on the basis of

(A) Simple Average and

(B) Weighted Average methods from the following information pertaining to Material-D

2016 March 1 Purchased 100 units @ Rs.10 each

2 Purchased 200 units @ Rs.10.2 each.

5 Issued 250 units to Job X vide M.R.No.12

7 Purchased 200 units @ Rs.10.50 each

10 Purchased 300 units @ Rs.10.80 each

13 Issued 200 units to Job Y vide M.R.No.15

18 Issued 200 units to Job Z vide M.R.No.17

20 Purchased 100 units @ Rs.11 each

25 Issued 150 units to Job K vide M.R.No.2

Solution:

(a) Simple Average Method:

Stores Ledger Account

Date	Receipts			Issue			Balance	
	Qty.	Price Rs.	Value Rs.	Qty.	Price Rs.	Value Rs.	Qty.	Value Rs.
2016 March 1	100	10	1000	-	-	-	100	1000
March 2	200	10.2	2040	-	-	-	300	3040
March 5	-	-	-	250	10.10 (1)	2525	50	515
March 7	200	10.50	2100	-	-	-	250	2615
March 10	300	10.80	3240	-	-	-	550	5855
March 13	-	-	-	200	10.50 (2)	2100	350	3755
March 18	-	-	-	200	10.65 (3)	2130	150	1625
March 20	100	11	1100	-	-	-	250	2725
March 25	-	-	-	150	10.90 (4)	1635	100	1090

Working Notes:

1. Calculation of Price for Issue on March 5th

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= 10 + 10.2 / 2 = Rs.10.10

2. Calculation of Price for Issue on March 13th

= 10.2 + 10.5 + 10.8 / 3 = Rs .10.5

3. Calculation of Price for Issue on March 18th

= 10.5 + 10.8 / 2 = Rs .10.65

4. Calculation of Price for Issue on March 25th

= 10.8 + 11 / 2 = Rs .10.90

(b) Weighted Average methods

Stores Ledger Account

Date	Receipts			Issue			Balance	
	Qty.	Price Rs.	Value Rs.	Qty.	Price Rs.	Value Rs.	Qty.	Value Rs.
2016 March 1	100	10	1000	-	-	-	100	1000
March 2	200	10.2	2040	-	-	-	300	3040
March 5	-	-	-	250	10.13 (1)	2533	50	507
March 7	200	10.50	2100	-	-	-	250	2607
March 10	300	10.80	3240	-	-	-	550	5847
March 13	-	-	-	200	10.63 (2)	2126	350	3721
March 18	-	-	-	200	10.63 (3)	2126	150	1595
March 20	100	11	1100	-	-	-	250	2695
March 25	-	-	-	150	10.78(4)	1617	100	1078

Working Notes:

1. Calculation of price for Issue on March 5th

= 3040/300 = Rs.10.13

2. Calculation of price for Issue on March 13th

= 5847/550 = Rs.10.63

3. Calculation of price for Issue on March 18th

= 3721/350 = Rs.10.63

4. Calculation of price for Issue on March 25th

= 2695/250 = Rs.10.78

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UNIT-3

Labour Cost

Labour is an important element of cost and for overall cost control and cost reduction, Labour Cost is of paramount importance. **Labour Cost is also called as Employee Cost.** However, for control and reduction of Labour Cost, it is essential to compute the Labour Cost in a scientific manner and hence there should be proper systems and processes and documentation, which will help computation of Labour Cost in a scientific manner. It should be remembered that Labour is not like material as there is a human aspect involved in it. Therefore, there should be a comprehensive study of all related aspects of Labour Cost and then only computation and control over the same will be possible. Attention should also be paid to the productivity aspect. Low productivity results in higher Labour Cost per unit while higher productivity will reduce the Labour Cost per unit. All these aspects of Labour Cost are discussed in detail in this chapter. Study of Labour or Employee Cost can better be explained as follows:

Various aspects of Labour Cost Control

In the modern competitive environment, it is essential to make efforts for controlling and reducing the Labour Cost. Systematic efforts are required in order to achieve this target. The following steps will be useful in controlling and reducing the Labour Cost.

A. Classification of Labour cost:

The first step in the direction of controlling and reducing the Labour Cost is proper classification of the same. The Labour Cost is classified into Direct Cost and Indirect Cost.

Direct Labour Cost is the cost that can be identified with a product unit. It can also be described as cost of all Labour incurred for altering the construction, composition orcondition of the product.

Indirect Labour Cost is the cost, which cannot be identified with a product unit. It represents the amount of wages which is paid to the workers who are not directly engaged on the production but it includes wages paid to the workers and assistants working in departments like purchasing, store keeping, time office, maintenance, and other service and production departments.

In other words, indirect wages are the wages paid to the workers who facilitate the production rather than actually engaged in production. The Direct Labour Cost can be charged directly to the job or product units and is included in the prime cost. Indirect Labour Cost is included in the overhead cost. Direct Labour Cost is variable in nature and can be controlled by strictly adhering to the norms and standards set by the management. Indirect Labour Cost can be controlled by establishing Labour budgets and comparing the actual Indirect Labour Cost with the

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budgeted Labour Cost. Any difference between the two is analysed carefully and suitable corrective action is taken.

B. Production Planning:

Effective control over the Labour Cost Can be achieved through proper production planning. Production planning includes activities like planning, scheduling, routing, machine loading, product and process engineering, work study etc. With the help of work study, time and motion study can be conducted which will help in fixation of standard time for a particular job. A comparison between the standard time and actual time is constantly made to find out the difference between the two. Suitable corrective action can be taken if it is noted that the actual time taken is constantly more than the standard time allowed for the job.

C. Labour Budget:

Budget and budgetary control are effective tools for cost control and cost reduction. A Labour budget can be prepared which will set the target for the Labour Cost which will again facilitate comparison between the Budgeted Labour Cost and the Actual Labour Cost.

D. Labour Standards:

Standards can be set for Labour Cost against which the Actual Labour Cost can be compared. Standard Labour Cost is the cost, which should have been incurred for producing a particular quantity of production. While fixing the Standard Labour Cost, use of time and motion study is made to fix up the standard time that should be taken for the actual production.

E. Labour Performance Report:

There should be a system of periodic Labour efficiency and utilisation reports. These reports will give an idea about the efficiency and productivity of the Labour.

F. Incentive Schemes:

Improving the Labour productivity is one of the important ways to reduce the Labour Cost per unit. Productivity can be improved by motivating the workers. Offering monetary and non monetary incentives can help to improve the productivity substantially. However, there should be a periodic review of the incentive schemes and therefore incentive schemes report should be prepared at periodic intervals.

G. Labour Cost Accounting:

There should be a proper cost accounting system, which will identify the Direct and Indirect Labour Cost. Similarly the cost accounting department should be able to generate and maintain records for time keeping, time booking, idle and overtime, impact of incentive schemes, per unit of Labour, cost due to Labour Turnover and other relevant records. Thus from the above mentioned points, it will be clear that there is a need to control the Labour Cost and it can be done by the combined efforts of various departments.

Principles of measurement of Labour Cost

The guide lines for ascertaining the Labour Cost / Employee Cost are as follows :-

(a) Employee Cost shall be ascertained taking into account the gross pay including all allowances payable along with the cost to the employer of all the benefits

(b) Bonus whether payable as a statutory minimum or on a sharing of surplus shall be treated as part of Employee Cost. Ex-gratia payable in lieu of or in addition to bonus shall also be treated as part of the Employee Cost.

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(c) Remuneration payable to managerial personnel including executive directors on board and other officers of a corporate body under a statute will be considered as part of the Employee Cost of the year under reference, whether the whole or part of the remuneration is considered as a percentage of profits.
(d) Separation costs related to voluntary retirement, retrenchment, termination...etc shall be amortized over the period of benefitting from such costs.
(e) Employee Cost shall not be included any Imputed Costs.
(f) Any subsidy, grant, incentive or any such received or receivable with respect to any employee cost shall be reduced from ascertainment of Cost of the cost project to which such amounts are related.
(g) Any abnormal cost where it is material and quantifiable shall not form part of the Employee Cost.
(h) Penalties, damages paid to statutory authorities or other third parties shall not form part of the Employee Cost.
(i) The cost of free housing, free conveyance and any other similar benefits provided to an employee shall be determined at the total cost of all resources consumed in providing such benefits. Any recovery from employees towards the facilities provided shall be reduced from the Employee Cost.
(j) Cost of idle time is ascertained by the idle hours multiplied by the hourly rate applicable to idle employee or employee group.
(k) Where Employee Cost is accounted at standard cost, variances due to normal reasons related to employee cost shall be treated as part of Employee Cost. Variances due to abnormal reasons shall be treated as part of abnormal cost.
(l) Any change in the cost accounting principles applied for the determination of the Employee Cost should be made only if it is required by law or for compliance with Cost Accounting Standard or change would result in a more appropriate way of presentation of Cost Statement.

Control of Labour Cost

Labour cost consists of the total amount of wages paid to the workers and other expenses related thereto. It includes hourly or piece-rates payable to the workers. It may be excessive due to inefficiency of labour force, high idle time and overtime payments, increase in spoilage, waste and defective production due to lack of supervision and inspection, high labour turnover and other matters. Therefore it is clearly seen that the control of labour cost is essential in every organization to cut down the cost of production and to improve the labour productivity/efficiency. The following departments play a vital role in Labour Cost Control :-

(a) Human Resources Department

This department is responsible for the execution of policies regarding appointment, discharge, transfer, promotion, classi fication of labour, wage and incentive systems, etc, which have been formulated by the board of directors or executive committee. It normally maintain detailed records of attendance, leave records, overtime and shift records from which various calculations of wages, allowances, overtime, incentives are made. Reports concerning labour turnover, recruitment, productivity, utilization, absenteeism as well as reports on labour cost, idle time, various cost ratios etc., are prepared here for submission to higher authorities for necessary action.

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(b) Engineering, Industrial Engineering Department

This department helps to maintain control over working conditions, production methods, job performances by preparing plans and specification for each job scheduled for production, maintaining safety and efficient working conditions, initiating and supervising research and development activities, making method study, motion study, and time study, setting piece-rates, making job evaluation, merit rating and job analysis, measuring labour productivity and in general suggesting ways and means to improve labour efficiency/productivity thereby cutting down the effective labour cost.

(c) Time Keeping Department

The function of this department is mainly to keep, maintain the time for which each and every worker has worked including the check-in and check-out time. The records are kept separately for different shift and irregular working periods like overtime period. The records are such kept that the departments wise/product wise/process wise/ batch wise/job wise/operation wise allocation of labour cost is possible. The entire correctness of calculation of payroll, overtime payments, incentive payments, overhead allocation depend on the records maintained by this department and as such the importance of the functions rendered by this department cannot be over emphasised.

(d) Payroll Department

This departments is responsible for preparation of payroll and also basically to maintain records of job classification, department wage rates to prepare each man's earnings, to allocate those earnings to various cost centres to summarise various deductions and employers' share of provident fund, state insurance and other items, and also to summarise overtime payments and incentive payments wherever applicable.

(e) Cost-Accounting Department

This department is responsible for the accumulation and compilation of all cost data relating to the element Labour. It analyses the payroll cost to effectively render routine and special labour, cost reports thereby disclosing the amount of normal, and abnormal idle time, direct labour, indirect labour, overtime and departmental labour costs and variances between actual and standard labour costs. These reports are used by the top management to effectively control the labour cost and also to improve the labour productivity/efficiency.

Time Keeping:

Like Personnel Department, this department also plays an important role in labour cost control through maintaining record of each worker's time in and time out during regular working period and reporting the time of each worker for each department, operation or production order. Thus this department is responsible for recording the attendance time of each worker accurately. This will ensure punctuality and discipline in the company and will have a positive impact on the morale of each worker. Time keeping is a statutory requirement also and therefore accurate recording of time should be ensured. The important role of time keeping from the point of view of labour costing and control can be summarized as given below :

(a) It shows the total number of hours worked by each workman and so the calculation of his wage becomes possible. This is applicable where the workers are paid wages as per the time rate.

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(b) Time keeping promotes punctuality and discipline amongst the workers. In the absence of the time keeping system, there will be not only indiscipline amongst them but the workers who are otherwise punctual and disciplined will be frustrated.
(c) Certain benefits like pension, gratuity and leave with pay, provident fund, promotion, and salary scale are linked with the continuity of service. Attendance records in this regard, can be helpful in computation of these benefits.
(d) Computation of Labour hours becomes possible through time keeping records. This will be useful in overhead apportionment and absorption, which may be made on the basis of Labour hours.
(e) Time keeping is a statutory requirement under Labour laws.
(f) The time keeping records can be used for further analysis like for fixation of standard time and finding out idle time as well as the efficiency of Labour. It can be used by researchers as well as by Government Authorities for various purposes.

Methods of Time Keeping

The above-mentioned points highlight the importance of the time keeping. The question that we have to answer now is that what are the methods of time keeping? The answer to this is given in the following paragraphs. The methods of time keeping are explained below.

(1)Time Recording Clocks or Clock Cards:

This is mechanized method of time recording. Each worker punches the card given to him when he comes in and goes out. The time and date is automatically recorded in the card. Each week a new card is prepared and given to the worker so that weekly calculation of wages will be possible. If wages are paid on monthly basis, a new card may be given in each month. Due to advancement of technology, giving a new card each month is also not required as the same card continued till the worker either leaves the service or retires from the service. The only limitation of this method, [in fact it is the limitation of all the methods of time keeping] is that though the time in and time out are recorded, the records do not show the productive time of the worker, i.e. how he has spent the time in the factory. Thus if a worker comes in at 8 am and leaves at 5 pm, he has spent 9 hours in the company, which can be ascertained from the time keeping records. However, how he has spent time, is not be shown by these records. For showing the productive time, separate records showing time booking are to be prepared. The time booking records can also be combined with time keeping records so that there is no need to keep dual records.

(2) Disc Method:

This is one of the older methods of recording time. A disc, which bears the identification number of each worker, is given to each one. When the worker comes in, he picks up his disc from the tray kept near the gate of the factory and drops in the box or hooks it on a board against his number. Same procedure is followed at the time of leaving the factory. The box is removed at starting time, and the time keeper becomes aware of late arrivals by requiring the workers concerned to report him before starting. The time keeper will record in an Attendance Register any late arrivals and workers leaving early. He will also enter about the absentees in the register on daily basis. The main limitation of this method is that there is a possibility of marking the

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attendance of a worker by his friend i.e. by a proxy. Secondly if the number of workers is large, there will be a delay in recording time due to manual operation of this system.

(3) Attendance Records:

This is the simplest and the oldest method of marking attendance of workers. In this method, every worker signs in an attendance register against his name. Leaves taken by workers as well as late reporting is marked on the attendance register itself. The main limitation of this system is that in case there is large number of workers, there may be large queues for signing the muster. Similarly there is little control over marking the attendance time and hence there may be irregularities in time recording.

Time Booking:

In time keeping we have seen that the basic objective of time keeping is to mark the attendance time, i.e. time in and time out. Time keeping aims at keeping a check on the number of hours spent by a worker in the factory. However, it does not record the productive time of the workers. It means the time keeping methods do not provide information about how the time is spent by the workers in the factory.

For example, the time keeping record will show that the worker has reported for duty at 8 am and left at 6 pm, thus, he has spent 10 hours in the company. But the analysis of these 10 hours is not provided by the time keeping. In view of this there is a need to have a system, which will tell about the productive time spent by the workers in the factory. The method, which supplies this information, is known as 'Time Booking Methods' and the recording the time spent by a worker in each job, process or operation is known as 'Time Booking'.

The objects of time booking are as follows:-

(i) To determine the productive time spent by the worker on the job or operation. This helps in finding out the idle time and controls the same.

(ii) To determine the quantity and value of work done.

(iii) To determine earnings like wages and bonus.

(iv) To determine the efficiency of workers.

Time Booking Methods:

The following methods are used for time booking:-

(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. However, the main limitation of this method is lot of paper work is involved as daily sheets are maintained on daily basis by each worker.

(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 helps in reducing the paper work to a great extent. The only care to be taken is that since the information is filled up on daily basis, there may be

Inaccuracies and hence filling the information should be done on daily basis only.

(3) Job Ticket:

Job tickets are given to all workers where time for commencing the job is recorded as

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well as the time when the job is completed. The job tickets are given for each job and the recording of the time as mentioned above helps to ascertain the time taken for each job. After completing one job, the worker is given another job.

(4) Labour Cost Card:

This card is meant for a job, which involves several operations or stages of completion. Instead of giving one card to each worker, only one card is passed on to all workers and time taken on the job is recorded by each one of them. This card shows the aggregate labour cost of the job or the product.

(5) Time and Job Card:

This card is a combined record, which shows both, the time taken for completion of the job as well as the attendance time. Therefore there is no need to keep separate record of both, time taken and attendance time.

Thus we may distinguish time keeping and time booking, that the time keeping is simply maintaining attendance of the workers i.e the time of arrival and the time of departure and there by the time spent by the worker in the organization is measured, where as time booking is not only maintaining the time spent by the workers in the organization, but also the time spent on each & every job including the idle time with reasons are recorded.

Work Study

In order to motivate workers, it is necessary to design a proper incentive system of payment of wages. Money is the strongest motivating factor and hence monetary incentive system become essential. In any incentive system, the bonus is paid by comparing the standard performance/production with the actual performance, i.e. actual production. Bonus is paid if the actual performance is higher than the standard one. However, for deciding the standard performance, standard time, i.e. time that is allowed doing a particular job should be fixed against which the actual time taken should be compared. The Work Study which includes, the Job Study, and the Method Study ensures the fixation of standard time to do a particular job and thus has become extremely important in the designing of the incentive system. Work Study components are discussed below.

Method Study

Method Study is done to improve the methods of production and to achieve the most efficient use of the resources like, manpower, machines and materials. Method Study has the following stages:-

(a) Method Study is generally conducted for the jobs, which involve complex operations as well as costly operations. Hence the first step is to select jobs, which are having complexity of operations.

(b) There should be a detailed study of related aspect of the selected job. Information about the job like, purpose, location, sequence, relationship with other work, methods of working, operators, requirement of skilled workers, facilities required etc. should be collected.

(c) The crucial step is that after studying the relevant aspects of the job, there should be development of the improved method of doing the job. An improved method of job might change the location and sequence of the work, methods of production and the layout for the job. The improved method will result in more efficiency, more simplicity and effectiveness and job will be done in a better manner.

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(d) The developed method should be applied in doing the job.
(e) For any new method, a follow up is always required. For method study also a constant follow up is necessary to ensure that the method selected is implemented properly. Thus method study ensures efficient use of resources by reducing unnecessary work and helps to achieve highest production.

Work Measurement

The Work Measurement aims at determining the effective time required to perform a job. The ineffective, wasteful or avoidable time is separated from required time to complete the work. The effective time so established in work measurement can be used for the following purposes:-
(a) Incentive wage schemes which require data about the time allowed and time taken for a particular job.
(b) Improving utilization of men, machines and materials.
(c) Assisting in production control.
(d) Assisting in setting labour standards.
(e) Cost control and reduction.
The following stages are involved in work measurement:-
(i) Selection of work.
(ii) Measuring the actual time taken in the work done.
(iii) Making comparison between the standard time and the actual time.

Job Evaluation

It is necessary for the management of any organization to establish proper wage and salary structure for various jobs. For doing this in a scientific manner, it is necessary to determine the relative value of jobs and hence a job evaluation is done. Job Evaluation is a technique of analysis and assessment of jobs to determine their relative value within the firm. It aims at providing a rational and equitable basis for differential salaries and wages for different classes of workers.
Job Evaluation has the following objectives:-
(a) It helps in developing a systematic and rational wage structure as well as job structure.
(b) Job Evaluation aims at removing the controversies and disputes relating to salary between the employers and employees. Thus the employees and also the employer remain satisfied.
(c) Another important objective of Job Evaluation is to bring fairness and stability in the wage and salary structure so as to ensure full cooperation of workers in implementing various policies of the employers.
(d) Job Evaluation discloses characteristics and conditions relating to different jobs. This is very useful at the time of recruiting of workers as only suitable workers can be recruited. This avoids square pegs in round holes.

Methods of Job Evaluation

Methods of job evaluation are as follows:-
(1) Point Ranking Method:

In this method each job is analyzed in terms of various job factors or characteristics. The characteristics are skills required, efforts involved, working conditions, hazards, responsibility and so on. In other words the job factors are the requirements needed for performing the job effectively. Each job factor is given weightage or points depending upon its value for the job. For example, for certain jobs, maximum value is assigned to experience while for some jobs, education may be

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the most crucial factor. Finally each job is ranked in the order of points or weights secured by them. The wage structure can be suitably designed according to the points assigned to each job. The method is quite sound in principle but difficulties may be faced assigning the weights to each job.

(2) Ranking Method:

In this method, jobs are ranked in order of importance on the basis of skills required, experience requirements, working conditions etc. Jobs are rearranged in an order, which can be either from the lowest to the highest or in the reverse. Wage scales are determined in terms of ranks. Though this method is quite simple to operate and less costly as well as easy for understanding, it is suitable when the size of the organization is small and jobs are few and well defined. In a large organization, where jobs are quite complex, this method is not beneficial.

(3) Grading Method:

This method is an improvement over the ranking method. Under this method, each job is analyzed in terms of a predetermined grade and then assigned a grade or class. Grades are established after making an investigation of job factors, such as complexity in the job, supervision, responsibility, education etc.

Merit Rating

Job Evaluation is the rating of the job in order to bring rationality in the wage and salary structure in the organization. On the other hand Merit Rating is the comparative evaluation and analysis of individual merits of the employees. The Merit Rating aims at evaluation and ranking the individual employees in order to plan and implement rational promotional policies in the organization. Merit Rating has the following objectives:-

(a) To evaluate the merit of an employee for the purpose of promotion, increment, reward and other benefits.

(b) To establish and develop a wage system and incentive scheme.

(c) To determine the suitability of an employee for a particular job.

(d)To analyze the merits or limitations of a worker and help him to develop his capability and competence for a job.

(e) To examine characteristics like cooperation, quality of work done, attendance and regularity, education, skill, experience, character and integrity and initiative.

Thus it can be understood that Merit Rating is extremely useful for organizations for evaluating the employees. However the main limitations are that the rating can be subjective which will give rise to the disputes and there is a possibility that past performance of an employee may be given too much importance.

Difference between Merit Rating and Job Evaluation

The difference between the Merit Rating and Job Evaluation are as follows:-

(a) Job Evaluation is the assessment of the relative worth of jobs within a business enterprise and Merit Rating is the assessment of the employees with respect to a job.

(b) Job Evaluation helps in establishing a rational wage and salary structure. On the other hand, Merit Rating helps in fixing fair wages for each worker in terms of his competence and performance.

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(c) Job Evaluation brings uniformity in wages and salaries while Merit Rating aims at providing a fair rate of pay for different workers on the basis of their performance.

Time And Motion Study

The study of time and motion is essential for designing an incentive system. Time Study determines the time to be spent on the job. Standard time is the time that should be taken for completing a particular job under standard or normal working conditions. For fixation of standard time, Motion Study is necessary. Thus, the Motion Study precedes the Time Study. Motion Study means dividing the job into fundamental elements or basic operations of the job or process and studying them in detail to eliminate the unnecessary elements or motions. After investigation all movements in a job, process or operation, the Motion Study aims at finding out the most scientific and systematic way of performing the job. After eliminating unnecessary motions, the time that should be taken to perform these motions is decided with the help of a stop-watch. In the time so fixed, some allowance is added in the same for normal idle time, which is due to fatigue, change of job, change of tools, and preventive maintenance of machines and so on. Thus standard time for a job or process is arrived at.

The Time and Motion Study aims at :-

(a) Eliminating unnecessary motions, thereby reducing inefficiency.
(b) Improving methods, procedures, techniques, and processes relating to a job.
(c) Effective utilization of men, material, machines and time.
(d) Improving working environment, layout and design of plant and equipment.

The following are the benefits of Time and Motion Study:-

(a) Effective utilization of resources like men, material, machine and time.
(b) Helps in assessment of labour.
(c) Helps in designing incentive system as many of the incentive systems are based on standard time.
(d) Preparation of labour budget.
(e) Proper planning of production for preparation of production budget.
(f) Helps in improving labour productivity by designing best method for performing a job or process.
(g) Improvement of work methods.

Payroll Department

Roll of Payroll Department is of crucial importance in overall Labour Cost computation and control. The main responsibilities of this department are preparation of payroll from clock cards, job or time tickets, or time sheet. The payroll shows the amount of wages payable to each worker showing the gross wages payable, the deductions and the net wages payable. For doing this calculation, they have to work in collaboration with the time office, personnel department, Cost Accounting department and with the concerned department in which the worker is working. The functions of this department are given below:-

(a) To compute the wages of the employees
(b) To prepare a detailed wages sheet showing the gross wages payable, various deductions and other payroll liabilities.
(c) To maintain individual employee payroll records.
(d) To prepare department wise summaries of wages.

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(e) Compilation of Labour statistics for management.
(f) To install and implement an effective internal check system for preventing frauds and irregularities in payment of wages.
(g) To detect and prevent ghost workers.

Cost Accounting Department

The Cost Accounting department is responsible for analyzing the Labour Cost for the purpose of computation and control of the same. It is responsible for the accumulation and classification of all cost data of which Labour Cost is one of the important components. The Cost Accounting department classifies the Labour Cost into direct and indirect, compares the actual Labour Cost with the budgeted cost, compute unit Labour Cost and compiles the data for further analysis of the Labour Cost. The data generated can be useful for the management in taking decisions.

Labour Turnover

Labour Turnover of an organisation is change in the labour force during a specified period measured against a suitable index. The rate of Labour Turnover in an industry depends upon several factors such as, nature of the industry, its size, location and composition of the labour force. A controlled level of Labour Turnover is considered desirable because it helps the firm to adjust the size of its labour force in response to needs such as for seasonal changes or changes in technology.

Causes of Labour Turnovers:

The causes giving rise to high labour turn over may be broadly classified under the following the heads:

(i) Personnel Causes: Workers may leave employment purely on personal grounds, e.g.,
(a) Dislike for the job, locality or environments.
(b) Domestic troubles and family responsibilities.
(c) Change of line for betterment.
(d) Retirement due to old age and ill health.
(e) Death.

In all such cases, personal factors count the most and employer can practically do nothing to help the situation.

(ii) Unavoidable Causes: In certain circumstances it becomes obligatory on the part of the management to ask some of the workers to leave. These circumstances are:
(a) Retrenchment due to seasonal trade, shortage of any material and other resources, slack market for the product, etc.
(b) Discharge on disciplinary grounds.
(c) Discharge due to continued or long absence.

(iii) Avoidable Causes: Under this head, may be grouped the causes which need the attention of the management most so that the turnover may be kept low by taking remedial measures. The main reasons for which workers leave are:
(a) Unsuitability of job.
(b) Low pay and allowance.
(c) Unsatisfactory working conditions.

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(d) Unhappy relations with co-workers and unsatisfactory behaviour of superiors.
(e) Dispute between rival trade unions.
(f) Lack of transport, accommodation, medical and other factors.
(g) Lack of amenities like recreational centres, schools, etc.
The above causes may also be classified in a different manner under three heads, viz., Financial Causes, Social and Economic Causes and Psychological Causes relating to human relationship.

Measurement of Labour Turnover:

It is essential for any organisation to measure the Labour Turnover. This is necessary for having an idea about the turnover in the organisation and also to compare the Labour Turnover of the previous period with the current one. The following methods are available for measurement of the Labour Turnover:-

(a) Additions Method:

Under this method, number of employees added during a particular period is taken into consideration for computing the Labour Turnover. The method of computing is as follows.

Labour Turnover = (Number of additions/Average number of workers during the period)×100

(b) Separation Method:

In this method, instead of taking the number of employees added, number ofemployees left during the period is taken into consideration. The method of computation is as follows.

Labour Turnover = Number of separations/Average number of workers during the period)×100

(c) Replacement Method:

In this method neither the additions nor the separations are taken into consideration. The number of employees replaced is taken into consideration for computing the Labour turnover.

Labour Turnover = (Number of replacements/Average number of workers during the period)×100

(d)Flux Method:

Under this method Labour Turnover is computed by taking into consideration the additions as well as separations. The turnover can also be computed by taking replacements and separations also. Computation is done as per the following methods.

Labour Turnover = ½ [Number of additions + Number of separations] /Average number of workers during the period ×100

Labour Turnover = ½ [Number of replacements + Number of separations] /Average number of workers during the period × 100

Cost of Labour Turnover

Increasing Labour Turnover is a double edged malady. It reduces the productivity of labour and resulting in high costs. The cost of Labour Turnover may be analyzed under two broad headings, Preventive Cost and Replacement Costs. Preventive Costs refer to all those items of expenditure which are incurred in order to keep the workers satisfied and thus to act as discouragement against leaving employment. Replacement Costs are those costs which are incurred for the recruitment and training of new hands and the resulting losses, wastages and lowering of productivity due to the inexperience and inefficiency of the new labour force.

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Preventive Costs may be further grouped under the following heads:

1. Personnel administration

Most concerns would have a Personnel Department which is entrusted with recruitment, training, and other problems arising out of the employment of the labour force. Obviously, the entire expenditure of the department cannot be treated as labour turnover costs but a portion of the costs which related to the efforts of the Personnel Manager in maintaining good relationship between the management and the staff should be treated as Preventive Labour Turnover Cost. The labour force remains satisfied if properly looked after and if grievances are sympathetically considered.

2. Medical Service (Preventive and Curative)

Care for own health and that of family members gets prior consideration with the workers who prefer those concerns where medical services are available. Further, a healthy worker is an asset of the firm as he is able to make substantial contribution towards higher efficiency and productivity.

3. Welfare activities and Schemes

These include facilities like subsidised canteens, co-operative store, laundry and washing services, sports, housing schemes, transport, and educational facilities. These facilities are as good as higher wages offering incentive to the worker to stay with the firm.

4. Miscellaneous Schemes such as Pension or Provident Fund Schemes, Bonus, High Wage and Other Incentive Schemes

Greater the advantage these prerequisites offer, the lower will be the rate of Labour Turnover.

Replacement Costs consist of the following:

1. Loss of output due to delay in obtaining new workers

As suitable workers may not be available readily, there is a time gap before a new worker can replace the old one. During this period, some output may be maintained by retaining surplus labour force to meet such contingencies or by working overtime. All such extra cost should be taken as labour turnover cost.

2. Employment Department Expenses

With the increase in the tempo of recruitment, additional work is thrown on the Employment or Personnel Department. Administrative expenditure is incurred for the selection, test and medical examination of the new hands for writing initial document like service records, fund accounts, etc.

3. Induction Training for new workers

Unless skilled workers are recruited (more likely on higher rates of pay) who can be at right way put on jobs, the average worker has to be given some induction training before he is fit to be put on his assigned work. For certain categories of skilled and highly skilled jobs, intensive training for some period may be essential.

4. Inefficiency of new workers

The efficiency of new hands be generally low, productivity is reduced and cost increases.

5. Cost of tool and machine breakage

While on training and the initial stages of work after completion of training, the worker is likely to break tools more frequently on account of his inexperience.

6. Cost of Scrap and Defective Work

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A new worker is likely to spoil work and although in most cases responsibility can be fixed on him and no wages paid for the scrapped work, the expenditure incurred on material and wages for the earlier operations done on the job becomes waste.

7. Cost of Accidents

On account of his inexperience, the new worker is apt to disregard safety rules and he is thus more prone to accidents. It may be noted that the increases in labour costs due to high Labour Turnover contribute to create an inflationary trend in the industry.

Measures to reduce Labour Turnover:

Labour Turnover may be reduced by removing its avoidable causes and taking preventive remedial measures. The various measures may be summarised as follows:

(i) Efficient, sympathetic and impartial personal administration.
(ii) Effective communication system to keep the workers informed on matters that affect them.
(iii) Improving working conditions and placing the right man on the right jobs.
(iv) Job enrichment to reduce boredom and monotony and to provide job satisfaction.
(v) Introducing fair rates of pay and allowance and incentives, pensions, gratuity, etc.
(vi) Strengthening welfare measures.
(vii) Augmenting recreational activities and schemes.

Illustration 1

During October 2015, the following information is obtained from the Personnel Department of a manufacturing company. Labour force at the beginning of the month 1900 and at the end of the month 2100. During the month, 25 people left while 40 persons were discharged. 280 workers were engaged out of which only 30 were appointed in the vacancy created by the number of workers separated and the rest on account of expansion scheme. Calculate the Labour Turnover by different methods.

Solution:

Computation of Labour Turnover

1.Additions Method:

Number of Additions/Number of average workers during the period
= 280 / 2000 X 100 = 14%

2.Separation Method:

Number of Separations/Number of average workers during the period
= (25+40)/2000 × 100 = 3.25%

3.Replacement Method:

Number of Replacements / Number of average workers during the period
=30/2000 X 100 = 1.5%

4.Flux Method:

½ [Number of Additions + Number of Separations] / Number of average workers during the period
= [½(280 + 65) / 2000]×100 = 173/2000 X 100 = 8.63%

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Note:

Average number of workers in all the above methods is computed by taking Opening number of workers + Closing number of workers / 2 = 1900 + 2100/2 =2000

Overtime Wages / Overtime Premium

The Factories Act provides for payment of overtime wages at double usual rates of wages. Even where the Act is not applicable, the practice is to pay for overtime work at higher rates usually in accordance with a standing agreement between the employer and the workers. Hence, payment of overtime consists of two elements, viz., the normal (i.e., usual) amount and the extra payment, i.e., the premium. Overtime premium is defined as 'Overtime is the time spent beyond the normal working hours which is usually paid at a higher rate than the normal time rate. The extra amount beyond the normal wages & salaries paid is called Overtime Premium'.

Treatment of Overtime in Cost Records

Overtime Premium shall be assigned directly to the cost object or treated as overheads depending on the economic feasibility and specific circumstances requiring such overtime.

When overtime is worked due to exigencies or urgencies of the work, the basic / normal payment is treated as Direct Labour Cost and charged to Production or cost unit on which the worker is employed. Whereas the amount of premium (extra amount) is treated as overhead.

If overtime is spent at the request of the customer, then the entire amount (including overtime premium) is treated as direct wages and should be charged to the job.

When the overtime is worked due to lack of capacity as general policy of the company, then the total amount paid is treated as direct wages which is computed at the estimated rate based on the figures of the previous years.

Overtime worked on account of the abnormal conditions such as flood, earth quake, etc., should not be charged to cost, but to costing Profit and Loss Account if integrated accounts are maintained.

It will thus be seen that overtime involves payment of increased wages and should be resorted to only when extremely essential. The disadvantages attached to overtime working are as follows :

(a) It involves excess labour cost.
(b) There is decrease in productivity. Output is usually proportionate to the excess time worked as efficiency during late hours is diminished.
(c) Work in the evenings increases lighting cost.
(d) Continuous work for long periods leads to fatigue and defective work.
(e) It fells upon the health of the workers.
(f) Overtime work if not properly distributed among the workers may lead to discontentment.
(g) There is an unusual strain on plant and machinery.
(h) Once overtime is resorted to for some time, the workers take the over time wages as part of their normal earnings and resist future attempts to discontinue overtime work.
(i) There is a tendency to keep the work pending to be done during overtime period or to intentionally slow down in order to compel the management to sanction overtime.

It may, however, be said in favour of overtime work that it increases the productive capacity of the concern as more work is done with the existing resources.

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Overtime work is particularly useful in pulling up backlog in production arising due to shutdown, breakdown, power failure and such other contingencies.

Though overtime work cannot be completely eliminated, it is essential that proper control should be exercised to keep it to the minimum. The following steps should be taken to control the Overtime:

(a) All overtime work should be duly authorised after investigating the necessity thereof.

(b) Overtime cost should be recorded separately and shown against the department incurring it. This will enable proper investigation and planning of production in future.

(c) If overtime tends to be a permanent feature, the necessity of recruiting more men and shifting working should be considered.

(d) If overtime is due to lack of plant or machinery or other resources, steps may be taken to install more machines, or to give subcontracts alternatively, to restrict production so as to complete it within the normal time.

Idle Time

Idle Time Cost represents the wages paid for the time lost during which the worker does not work, i.e time for which wages are paid, but no work is done. Idle Time is 'The difference between the time for which the employees are paid and the employees time booked against the cost object'. This happens because due to various causes for which he is not responsible, the worker remains idle but full wages are paid to him. Even for workers who are paid on the basis of output, idle time payment may be required to be made.

The causes leading to idle time may be broadly classified into four categories, viz. :-

(i) Normal, inherent or unavoidable idle time: Time lost between the gate and place of work, break for tea, time interval between one job and another, time for tool setting, adjustment of machine, etc.

(ii)Normal idletime such as waits for jobs, tools, materials or instructions, small power failures, small breakdown of machines and tools, and atmospheric conditions.

(iii) Abnormal idle time such as those arising due to breakdown for considerable period, non-availability of raw materials, slack supervision, strikes or lock-outs, fire flood, storm, etc.

(iv)Concealed idle time such as manipulation of job breaking, wastage of time due to under-employment, i.e., unnecessary work like cleaning, grass cutting and gardening to employ idle men, and employment of skilled workers on unskilled jobs.

Idle time should not be booked directly to jobs or production orders because such a practice not only increases the cost of direct labour, but also vitiates comparison of idle time costs from time to time. In booking of time, idle or waiting time should not normally record in the job card but on separate idle time cards. Separate cards or registers may be provided for recording idle time according to the causes which give rise to it.

Treatment of Idle Time

Idle Time Cost shall be assigned direct to the cost object or treated as overheads depending on the economic feasibility and specific circumstances causing such idle time.

Treatment of different categories of Idle Time are as below:-

(a) Unavoidable idle time above would be for insignificant periods. In Cost Accounts, this is allowed to remain merged in the Production Order or Standing Order Number on which the worker was otherwise employed.

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(b) Normal Idle Time is booked to factory or works overhead. For the purpose of effective control, each type of idle time, i.e., idle time classified according to the causes is allocated to a separate Standing Order Number.

(c)Abnormal Idle Time would usually be heavy in amount involves longer periods and would mostly be beyond the control of the management. Payment for such idle time is not included in cost and is adjusted through the Costing Profit and Loss Account or included in Profit and Loss Account, when the accounts are integrated.

(d) Tendency to conceal Idle Time should be discouraged. It is a non-effective time and the resultant loss of profit due to reduced production activity but also increases the cost per unit of production as the fixed costs continue to be incurred, irrespective of the reduced quantum of production due to loss of labour time. Idle Time should, therefore, be highlighted prominently so that action can be taken to remove the causes thereof. Although for obvious reasons, it is not possible to record minor details, vigilance is necessary for finding out long-term idleness among the workers.

Idle Time Preventive Measures

Idle Time may be eliminated or reduced to a large extent by taking suit able preventive measures such as (a) proper planning of production in advance, thus reducing imbalances in production facilities, (b) timely provisioning of materials, (c) regular maintenance of machines so as to avoid breakdown, and (d) careful watch over the labour utilization statement. The remedial measure to be taken will, no doubt, depend upon the particular factor or situation which caused the Idle Time.

General principles in designing the system of remuneration to Employee

Remuneration is the reward for labour under normal circumstances and is generally based on either time spent or on the result produced. The former is called "time-related" remuneration and the latter is known as "Piece-related" remuneration. The fixation of method of remuneration in a proper manner is vitally important for any organisation because it deals with the most sensitive item of the input, i.e., Labour.

The general principles which should be considered in designing a proper method of labour remuneration is summarized below:-

(a) The basis should be simple to understand and the various segments of the system, should clearly mention in detail.

(b) The employees should be able to accept the method without any doubts or hesitation in their mind.

(c) The method should be flexible enough to adopt any changes or variation which may become inevitable at a later stage.

(d) The method should be able to cut down/stabilize the labour turnover which is often causes due to unsatisfactory or unacceptable method of remuneration.

(e)The method should assure fair wages to the employees so that both the employers and the employees can gain by such methods, the former by way of higher productivity and the latter by way of higher earnings.

(f) Incentive payments should be a part of the method of remuneration with a view to increase the labour productivity.

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(g)The method should be able to minimise the level of absentees so that avoidable wastages in labour cost can be reduced.
(h) The method should ultimately result into higher production and improved quality of the output.

Methods of Wage Payment

One of the important components of Labour Cost Control is the wages system. A system of wage payment, which takes care of both, i.e. providing guarantee of minimum wages as well as offering incentive to efficient workers helps to motivate the workers to a great extent. It should also be remembered that high wages do not necessarily mean high labour cost because it may be observed that due to high wages the productivity of workers is also high and hence the per unit cost of production is actually decreased. On the other hand, if low wages are paid, it may result in lower productivity and hence higher wages do not necessarily mean high cost.

The following are the various methods of payment of wages.

A. Time Rate System
(a) At ordinary levels.
(b) At high wage levels and
(c) Graduated Time Rate.
B.Piece Rate
(a) Straight Piece Rate.
(b) Piece Rate with Guaranteed Day Rates and
(c) Differential Piece Rates.
C.Bonus Systems
(a) Individual Bonus for Direct Workers.
(b) Group Bonus for Direct Workers and
(c) Bonus for Indirect Workers.
D.Indirect Monetary Incentives
(a) Profit Sharing and
(b) Co-partnerships.
E.Non monetary incentives like job security, social and general welfare, sports, medical facilities etc.

These methods are discussed in the following paragraphs:-

A. Time Rate Method

Time Rate at Ordinary Levels

Under this method, rate of payment of wages per hour is fixed and payment is made accordingly on the basis of time worked irrespective of the output produced. However, overtime is paid as per the statutory provisions. The main benefit of this method for the workers is that they get guarantee of minimum income irrespective of the output produced by them. If a worker is not able to work due to genuine reasons like
illness or physical disability, he will continue to get the wages on the basis of time taken for a particular job.

This method is used in the following situation:-
(a) Where the work requires high skill and quality is more important than the quantity.
(b) Where the output/services is not quantifiable, i.e. where the output/services cannot be measured.

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(c) Where the work done by one person is dependent upon other person, in other words where a individual worker has no control over the work.
(d) Where the speed of production is governed by time in process or speed of a machine.
(e) Where the workers are learners or inexperienced.
(f) Where continuous supervision is not possible.

The main advantage of this method is that the worker is assured of minimum income irrespective of the output produced. He can focus on quality as there is no monetary incentive for producing more output. However, the main limitation of this method is that it does not offer any incentive to the efficient workers. Efficient and inefficient workers are paid at the same rate of wages and hence there is a possibility that even an efficient worker may become inefficient due to lack of incentive.

Time Rate at High Wage Levels

This system is a variation of time rate at ordinary levels in the sense that in this system, workers are paid at time rate but the rate is much higher than that is normally paid in the industry or area. In this method, the workers are paid according to the time taken andovertime is not normally allowed. This method offers a very strong incentive to workers and it can attract talented workers in the industry. However, care should be taken that productivity also increases; otherwise the cost will go on increasing.

Graduated Time Rate

Under this method payment is made at time rate, which varies according to personal qualities of the workers. The rate also changes with the official cost of living index.
Thus this method is suitable for both employer and employees.

B)Piece Rate System (payment by result)

Under this system of wage payment, a fixed rate is paid for each unit produced, job completed or an operation performed. Thus, payment is made according to the quantity of work done no consideration is given to the time taken by the workers to perform the work.
There are four variants of this system.
a)Straight piece rate system
b)Taylor's differential piece rate system
c)Merrick's multiple piece rate system
d)Gant's task and bonusplan

(a)Straight piece rate system

Payment is made as per the number of units produced at a fixed rate per unit. Another method ispiece rate with guaranteed time rate in which the worker is given time rate wages if his piece ratewages is less than the time rate.

Advantages

1.Wages are linked to output so workers are paid according to their merits.
2.Workers are motivated to increase production to earn more wages.
3.Increased production leads to decreased cost per unit of production and hence profit per unit increases.
4.Idle time is not paid for and is minimized.
5.The employer knows his exact labour cost and hence can make quotations confidently.

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6.Workers use their tools and machinery with a greater care so that the production may not be held up on account of their defective tools and machinery.
7.Less supervision is required because workers get wages for only the units produced.
8.Inefficient workers are motivated to become efficient and earn more wages by producing more.

Disadvantages

1.Fixing of piece work rate is difficult as low piece rate will not induce workers to increase production.
2.Quality of output will suffer because workers will try to produce more quickly to earn More wages.
3.There may not be an effective use of material, because of the efforts of workers to increase the production. Haste makes waste. Thus there will be more wastage of material.
4.When there is increased production, there may be increased wastage of materials, high cost of supervision and inspection and high tools cost and hence cost of production might increase.
5.Increased production will not reduce the labour cost per unit because the same rate will be paid for all units. On the other hand, increased production will reduce the labour cost per unit under the time wage system.
6.Workers have the fear of losing wages if they are not able to work due to some reason.
7.Workers may work for long hours to earn more wages, and thus, may spoil their health.
8.Workers may work at a very high speed for a few days, earn good wages and then absent themselves for a few days, upsetting the uniform flow of production.
9.Workers in the habit of producing quality goods will suffer because they will not get any extra remuneration for good quality.
10.The system will cause discontentment among the slower workers because they are not able to earn more wages.

<u>This method can be successfully applied when:</u>

1.The work is of a repetitive type.
2.Quantity of output can be measured.
3.Quality of goods can be controlled.
4.It is possible to fix an equitable and acceptable piece rate
5.The system is flexible and rates can be adjusted to changes in price level.
6.Materials, tools and machines are sufficiently available to cope with the possible increase in production.
7.Time cards are maintained so that workers are punctual and regular so that production may not slow down.

(b)Taylor's Differential Piece Rate system

This system was introduced by Taylor, the father of scientific management to encourage the workers to complete the work within or less than the standard time. Taylor advocated two piece rates, so that if a worker performs the work within or less than the standard time, he is paid a higher piece rate and if he does not complete the work within the standard time, he is given a lower piece rate.

Illustration2:

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Calculate the earnings of workers A and B under Straight Piece-rate System and Taylor's Differential Piece-rate System form the following particulars.
Normal rate per hour = Rs.1.80
Standard time per unit = 20 seconds
Differentials to be applied:
80 % of piece rate below standard
120% of piece rate at or above standard.
Worker A produces 1,300 units per day and worker B produces 1,500 units per day.

c) Merrick's Multiple Piece Rate System

This method seeks to make an improvement in the Taylor's differential piece rate system. Under this method, three piece rates are applied for workers with different levels of performance. Wages are paid at ordinary piece rate to those workers whose performance is less than 83% of the standard output, 110% of the ordinary piece rate is given to workers whose level of performance is between83% and 100% of the standard and 120% of the ordinary piece rate is given to workers who produce more than 100% of the standard output.

This method is not as harsh as Taylor's piece rate becuse penalty for slow workers is relatively lower.

Illustration 3:

Calculate the earnings of workers A,B and C under straight piece rate system and Merrick's multiple piece rate system from the following particulars:
Normal rate per hour Rs.1.8
Standard time per unit1 minute
Output per day is as follows:
Worker A : 384 units
Worker B : 450units
Worker C : 552 units
Wording hours per day are 8

C) Premium and Bonus Plan

The object of a premium plan is to increase the production by giving an inducement to the workers in the form of higher wages for less time worked.

Under a premium plan, a standard time is fixed for the completion of a specific job or operation at an hourly rate plus wages for a certain fraction of the time saved by way of a bonus. The plan is also known as incentive plan because a worker has the incentive to earn more wages by completing the work in less time.

This system of wage payment is in between the time wage system and piece work system. In time wage system, worker does not get any reward for the time saved and in piece work system, the worker gets full payment for time saved whereas in a premium plan both the worker and the employer share the labour cost of the time saved.

<u>The following are some of the important premium plans.</u>

(i)Halsey Premium Plan:

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Under this method, the worker is given wages for the actual time taken and a bonus equal to half of wages for time saved. The standard time for doing each job or operation is fixed. In practice the bonus may vary from 33⅓ % to66⅔ % of the wages of the time saved.

Thus if S is the standard time, T the time taken, R the labour rate per hour, and % the percentage of the wages of time saved to be given as bonus, total earnings of the worker will be: **T x R + % (S-T) R**

Under Halsey-Weir plan, the premium is set at 30% of the time saved.

Illustration 4:

Rate per hour = Rs.1.50 per hour

Time allowed for job = 20 hours

Time taken = 15 hours

Calculate the total earnings of the worker under the Halsey Plan. Also find out effective rate of earnings.

The advantages of the Halsey Premium Plan are:

It is simple to understand and relatively simple to calculate.

1.It guarantees time wages to workers.

2.The wages of time saved are shared by both employers and workers, so it is helpful in reducing labour cost per unit.

3.It motivates efficient workers to work more as there is increasing incentive to efficient workers.

4.Fixed overhead cost per unit is reduced with increase in production.

5.The employer is able to reduce cost of production by having reduction in labour cost and fixedoverhead cost per unit. So, he is induced to provide the best possible equipment and working conditions.

Disadvantages

1.Quality of work suffers because workers are in a hurry to save more and more time to get more and more bonus.

2.Workers criticize thismethod on the ground that the employer gets a share of wages of the time saved.

(ii)Rowan Plan:

The difference between Halsey plan and Rowan Plan is the calculation of the bonus. Under this method also the workers are guaranteed the time wages but the bonus is that proportion of the wages of the time taken which the time saved bears to the standard time allowed.

$$\text{Total Earnings} = T \times R + S-T \times T \times R$$

Advantages

1.It guarantees time wages to workers

2.The quality of work does not suffer as they are not induced to rush through production as bonus increases at a decreasing rate at higher levels of efficiency.

3.Labour cost per unit is reduced because wages of time saved are shared by employer and employee.

4.Fixed overhead cost is reduced with increase in production.

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Disadvantages

1.The Rowan plan is criticized by workers on the ground that they do not get the full benefit of the time saved by them as they are paid bonus for a portion of the time saved.

2.The Rowan plan suffers from another drawback that two workers, one very efficient and the other not so efficient, may get the same bonus.

Unit-4 Overheads

Overheads: -

Cost related to a cost center or cost unit may be divided into two that is Direct and Indirect cost. The Indirect cost is the overhead cost and is the total of indirect material cost, indirect labour cost, indirect expenses. CIMA defines indirect cost as "expenditure on labour, materials or services which cannot be economically identified with a specific salable cost per unit". Indirect costs are those costs which are incurred for the benefit of a number of cost centers or cost units. So any expenditure over and above prime cost is known as overhead. It is also called 'burden', 'supplementary costs', 'on costs', 'indirect expenses'.

Classification of Overheads

Overheads can be classified on the following basis:

i) **Function-wise classification**: Overheads can be divided into the following categories on functional basis.

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(a) Manufacturing or production overheads eg:- indirect materials like lubricants, cotton wastes, indirect labour like salaries and wages of supervisors, inspectors, storekeepers, indirect expenses like rent, rates and insurance of factory, power, lighting of factory, welfare expenses like canteen, medical etc.

(b) Administration overheads eg:- indirect materials like office stationery and printing, indirect labour salaries of office clerks, secretaries, accountants, indirect expenses rent, rates and insurance of office, lighting heating and cleaning of office, etc.

(c) Selling and Distribution overheads eg:- indirect materials like catalogues, printing, stationery, price list, indirect salary of salesmen, agents, travellers, sales managers, indirect expenses like rent, rates and insurance of showroom, finished goods,godown etc., advertising expenses, after sales service, discounts, bad debts etc.

ii) **Behavior-wise classification**: Overheads can be classified into the following categories as per behavior pattern.

(a) Fixed overheads like managerial remuneration, rent of building, insurance of building, plant etc.

(b) Variable overheads like direct material and direct labour.

(c) Semi-variable overheads like depreciation, telephone charges, repair and maintenance of buildings, machines and equipment etc.

iii) **Element-wise classification**: Overheads can be classified into the following categories as per element.

(a) Indirect materials

(b) Indirect labour

(c) Indirect expenses

Allocation and Apportionment of Overhead to Cost Centres (Depart-mentalisation of Overhead)

When all the items are collected properly under suitable account headings, the next step is allocation and apportionment of such expenses to cost centres. This is also known as departmentalization or primary distribution of overhead.

A factory is administratively divided into different departments like Manufacturing or Producing department, Service department, partly producing departments.

Allocation of Overhead Expenses

Allocation is the process of identification of overheads with cost centres. An expense which is directly identifiable with a specific cost centre is allocated to that centre. Thus it is allotment of a whole item of cost to a cost centre or cost unit. For example the total overtime wages of workers of a department should be charged to that department. The electricity charges of a department if separate meters are there should be charged to that particular department only.

Apportionment of Overhead Expenses

Cost apportionment is the allotment of proportions of cost to cost centres or cost units. If a cost is incurred for two or more divisions or departments then it is to be apportioned to the different departments on the basis of benefit received by them. Common items of overheads are rent and rates, depreciation, repairs and maintenance, lighting, works manager's salary etc.

Basis of Apportionment

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Suitable bases have to be found out for apportioning the items of overhead cost to production and service departments and then for reapportionment of service departments costs to other service and production departments. The basis selected should be correlated to the expenses and the expense should be measurable by the basis. This process of distribution of common expenses over the departments on some equitable basis is known as 'Primary Distribution'. The following are the main bases of overhead apportionment utilized in manufacturing concerns:

Direct Allocation: Under direct allocation, overheads are directly allocated to the department for which it is incurred. Example overtime premium of workers engaged in a particular department, power, repairs of a particular department etc.

(i) **Direct Labour/Machine Hours.** Under this basis, overhead expenses are distributed to various departments in the ratio of total number of labour or machine hours worked in each department. Majority of general overhead items are apportioned on this basis.

(ii) **Value of materials passing through cost centres.** This basis is adopted for expenses associated with material such as material handling expenses.

(iii) Direct wages. Expenses which are booked with the amounts of wages eg:- worker's insurance, their contribution to provident fund, worker's compensation etc. are distributed amongst the departments in the ratio of wages.

Illustration1 :

The Modern Company is divided into four departments: A, B and C are producing departments, and D is a service departments. The actual costs for a period are as follows:

Rent Rs.1000 Repairs to Plant Rs.600
Supervision Rs.1500 Fire Insurance in respect of Stock Rs.500
Depreciation of Plant Rs.450 Power Rs.900
Light Rs.120 Employers' liability for insurance Rs.150

The following information is available in respect of the four departments;

	Dept.A	Dept.B	Dept.C	Dept.D
Area (sq.mtrs)	**1,500**	**1,100**	**900**	**500**
Number of Employees	**20**	**15**	**10**	**5**
Total Wages (Rs.)	**6,000**	**4,000**	**3,000**	**2,000**
Value of Plant (Rs.)	**24,000**	**18,000**	**12,000**	**6,000**
Value of stock (Rs.)	**15,000**	**9,000**	**6,000**	**-**
H.P. of Plant	**24**	**18**	**12**	**6**

Apportion the costs to the various departments on the most equitable basis.

Solution:

Overheads Distribution Summary

Items	Basis of apportionment	Total Amount Rs.	Product Departments			Service Department D Rs.
			A Rs.	B Rs.	C Rs.	
Rent	Floor Area	Rs.1000	375	275	225	125

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Supervision	No. of Employees	Rs.1500	600	450	300	150
Depreciation of Plant	Plant Value	Rs.450	180	135	90	45
Light	Floor Area	Rs.120	45	33	27	15
Repairs to Plant	Plant Value	Rs.600	240	180	120	60
Fire Insurance in respect of Stock	Stock Value	Rs.500	250	150	100	-
Power	HP. Of Plant	Rs.900	360	270	180	90
Employers' liability for insurance	No. of Employees	Rs.150	60	45	30	15
Total		5,220	2,110	1,538	1,072	500

Re-apportionment of Service Department Costs to Production Departments

Service department costs are to be reapportioned to the production departments or the cost centres where production is going on. This process of re-apportionment of overhead expenses is known as '**Service Distribution**'. The following is a list of the bases of apportionment which may be accepted for the service departments noted against

Service Department Cost	Basis of Apportionment
1. Maintenance Department 2. Payroll or time-keeping department 3. Store keeping department 4.Employment or Personnel epartment. 5. Purchase Department 6.Welfare, ambulance, canteen service, recreation room expenses. 7. Building service department 8. Internal transport service or overhead crane service 9. Transport Department 10. Power House (Electric power cost)	1.Hours worked for each department 2.Total labour or Machine hours or number of employees in each department 3.no. of requisitions or value of materials of each department. 4. Rate of labour turnover or number of employees in each department. 5.no. of purchase orders or value of materials 6. No. of employees in each department. 7. Relative are in each department 8. Weight, value graded product handled, weight and distance travelled. 9. crane hours, truck hours, truck mileage, truck tonnage, truck tonne-hours, tonnage handled, number of packages. 10. wattage, horse power, horse power machine hours, number of electric points etc.

The following are the various methods of re-distribution of service department costs to production departments.

1. Direct re-distribution method
2. Step distribution method
3. Reciprocal Services method
    a. Simultaneous Equation Method
    b. Repeated Distribution Method

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c. Trial and Error Method

1. Direct re-distribution method

Under this method, the costs of service departments are directly apportioned to production departments without taking into consideration any service from one service department to another service department. Thus, proper apportionment cannot be done on the assumption that service departments do not serve each other and as a result the production departments may either be overcharged or undercharged. The share of each service department cannot be ascertained accurately for control purposes. Budget for each department cannot be prepared thoroughly. Therefore, Department Overhead rates cannot be ascertained correctly.

Illustration 2:

In an Engineering factory, the following particulars have been collected for the three months' period ended on 31st March, 2007. You are required to prepare Production Overheads Distribution Summary showing clearly the basis of apportionment where necessary.

		Production Departments			Service Departments	
		A	B	C	D	E
Direct Wages	Rs.	2000	3000	4000	1000	2000
Direct Material	Rs.	1000	2000	2000	1500	1500
Staff	Nos.	100	150	150	50	50
Electricity	Kwh.	4000	3000	2000	1000	1000
LightPoints	No.	10	16	4	6	4
Asset Value	Rs.	60000	40000	30000	10000	10000
Area Occupied	Sq.m.	150	250	50	50	50

The expenses for the period were:

Motive power Rs.550; Lighting Power Rs.100; Stores Overheads Rs.400; Amenities to Staff Rs.1500; Depreciation Rs.15,000; Repairs and Maintenance Rs.3,000; General Overheads Rs.6000; and Rent and Taxes Rs. 275.

Apportion the expenses of service department E in proportion of 3:3:4 and those of service department D in the ratio of 3:1:1 to departments A, B and C respectively.

Solution:

Production Overhads Distribution Summary For The Quarter Ending 31st March, 2007

	Production Departments			Service Departments		Total
	A	B	C	D	E	
Direct Wages				1000	2000	3000
Direct Material				1500	1500	3000
Motive Power @ 5p.per Kwh	200	150	100	50	50	550
Lighting Power @ Rs.2.50per	25	40	10	15	10	100

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Point						
Stores Overhead @ 5% of Direct Material	50	100	100	75	75	400
Amenities to staff @ Rs.3 per employee	300	450	450	150	150	1500
Depreciation @ 10% of the value of asset.	6000	40000	3000	1000	1000	15000
Repairs and maintenance @ 2% of value	1200	800	600	200	200	3000
General Overheads @ 50% of Direct Wages	1000	1500	2000	500	1000	6000
Rent and Taxes @Re.0.50 per sq.meter	75	125	25	25	25	275
Total	8,850	7,165	6,285	4,515	6,010	32,825
Dept.E (3:3:4)	1,803	1,803	2,404		(6,010)	
Depy.D (3:1:1)	2,709	903	903	(4,515)		
Total	13,362	9,871	9,592			32,825

2. Step Distribution Method

Under this method, the cost of most serviceable department is first apportioned to other service departments and production departments. The next service department is taken up and its cost is apportioned and this process goes on till the cost of the last service department is apportioned. Thus, the cost of last service department is apportioned only to production departments.

Illustration 3:

A manufacturing company has two Production Departments, P1 and P2 and three Service Departments, Time-keeping, Stores and Maintenance. The Departmental Summary showed the following expenses for July, 2007.

Production Departments		Service Departments (in order of their importance)		
P1 Rs.	P2 Rs.	S1 (Time-keeping) Rs.	S2 (Stores) Rs.	S3 (Maintenance) Rs.
16,000	10,000	4,000	5,000	3,000

The other information relating to departments were:

	Service Departments			Production Departments	
	S1 (Time-keeping) Rs.	S2 (Stores) Rs.	S3 (Maintenance) Rs.	P1 Rs.	P2 Rs.

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No. of Employees	-	20	10	40	30
No. of Stores requisitions	-	-	6	24	20
Machine Hours	-	-	-	2400	1600

SOLUTION:

Department	As per Primary Distribution System				
S1 (Time-keeping)	4000	(-4000)			
S2 (Stores)	5000	800	(-5800)		
S3 (Maintenance)	3000	400	696	(-4096)	
P1 Rs.	16000	1600	2784	2458	22842
P2 Rs.	10000	1200	2320	1638	15158
	38,000				38,000

Note: basis of apportionment

(a) Time-keeping –No. of employees (ie. 2:1:4:3)

(b) Stores–No. of stores requisitions (ie. 3:12:10)

(c) Maintenance- Machine Hours (ie. 3:2)

The most important limitation of this method is that the cost of one service centre to other service cost centres is ignored and thus the cost of individual cost centres are not truly reflected.

3.Reciprocal Services Method

In order to avoid the limitation of Step Method, this method is adopted. This method recognizes the fact that if a given department receives service from another department, the department receiving such service should be charged. If two departments provide service to each other, each department should be charged for the cost of services rendered by the other. There are three methods available for dealing with inter-service departmental transfer:

a. Simultaneous Equation Method

b. Repeated Distribution Method

c. Trial and Error Method

(a) Simultaneous Equation method

Under this method, the true cost of the service departments are ascertained first with the help of simultaneous equations; these are then redistributed to production departments on the basis of given percentage.

Illustration 4: A company has three production departments and two service departments, and for a period the departmental distribution summary has the following totals.

Rs.

Production Departments:

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P1-Rs.800; P2-Rs.700 and P3-Rs.500	2,000
Service Departments:	
S1-Rs.234;S2-Rs.300	534
	2,534

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

	P1	P2	P3	S1	S2
Service Department S1	20%	40%	30%	-	10%
Service Department S2	40%	20%	20%	20%	-

Prepare a statement showing the apportionment of two service departments expenses to production departments by Simultaneous Equation Method.

Solution:

Let x = total overheads of department S1

y = total overheads of department S2

Then,

x=Rs.234+. 2y

y=Rs.300+. 1x

Rearranging and multiplying to eliminate decimals;

10x-2y=Rs.2,340 .....(1)

-x+10y=Rs.3,000 .....(2)

Multiplying equation (1) by 5 and add result to (2), we get

49x=Rs.14,700

x=Rs.300

Substituting this value in equation (1), we get

y=Rs.330

All that now remains to be done is to take these values x=Rs.300 and y=Rs.330 and apportion them on the basis of the agreed percentage to the three production departments; thus:

	Total	P1	P2	P3
	Rs.	Rs.	Rs.	Rs.
Per distribution summary	2000	800	700	500
Service department S1(90% of Rs. 300)	270	60	120	90
Service department S2 (80% of Rs. 330)	264	132	66	66

This method is recommended in more than two service departments if the data is processed with computers and in two service departments only where the data is processed manually.

(b) Repeated Distribution Method

Under this method, the totals are shown in the departmental distribution summary, are put out in a line, and then the service department totals are exhausted in turn repeatedly according to the agreed percentages until the figures become too small to matter.

(c) Trial and Error Method

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Under this method, the cost of one service department is apportioned to another centre. The cost of another centre plus the share received from the first centre is again apportioned to the first cost centre and this process is repeated till the balancing figure becomes negligible.

Absorption of overhead

Absorption means the distribution of the overhead expenses allotted to a particular department over the units produced in that department. Overhead absorption is accomplished by overhead rates.

Methods of Absorption of Manufacturing Overhead

The following are the main methods of absorption of manufacturing or factory overheads.

(A) Direct Material Cost Method. Under this method percentage of factory expenses to value of direct materials consumed in production is calculated to absorb manufacturing overheads.

FORMULA $$\text{Overhead Rate} = \frac{\text{Production Overhead Expenses (Budgeted)}}{\text{Anticipated Direct Material Cost}}$$

If in a factory the anticipated cost of direct material is Rs. 4,00,000 and the over Head budgeted expenses are Rs. 1,00,000, then the overhead rate will be 25% ie.(Rs.1,00,000 ÷Rs.4,00,000) of the materials used. It is assumed that relationship between materials and factory expenses will not change. This method is simple and can be adopted under the following circumstances:

(i)Where the proportion of overheads to the total cost is significant.

(ii)Where the prices of materials are stable.

(iii)Where the output is uniform ie. Only one kind of article is produced.

(B)Direct Labour Cost (or Direct Wages) Method. This is a simple and easy method and widely used in most of the concerns. The overhead rate is calculated as under:

FORMULA $$\text{Overhead Rate} = \frac{\text{Production Overhead Expenses}}{\text{Direct Labour Cost}}$$

If from past experience, the percentage of factory expenses to direct wages is 50%, then the factory expenses in the next year is taken as 50% of the direct wages. This method is suitable under the following situations:

(i)Where direct labour constitutes a major proportion of the total cost of production.

(ii)Where production is uniform.

(iii)Where labour employed and types of work performed are uniform.

(iv)Where the ratio of skilled and unskilled labour is constant.

(v)Where there are no variations in the rates of pay ie., the rates of pay and the methods are the same for the majority of the workers in the concern.

In some concerns a separate rate is calculated for the fringe benefits and applied on the basis of direct labour cost.

(c)Prime Cost Method.Under this method the recovery rate is calculated dividing the budgeted overhead expenses by the aggregate of direct materials and direct labour cost of all the products of a cost centre.

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FORMULA Overhead Recovery Rate = Production Overhead Expenses / Anticipated Direct Materials and Direct Labour Cost

Suppose if the budgeted overheads are Rs.50,000 and the estimated values of direct materials and direct labour are Rs.30,000 and Rs.20,000, then overhead recovery rate will be 100% that is $\frac{50000*100}{30000+20000}$

(d)Direct Labour (or Production) Hour Method. This rate is obtained by dividing the overhead expenses by the aggregate of the productive hours of direct workers.

FORMULA Overhead rate = Production Overhead Expenses / Direct Labour Hours

If in a particular period the overhead expenses are Rs.50,000 and direct labour hours are 1,00,000, then overhead labour rate will be Re.0.50 (i.e., Rs.50,000 ÷1,00,000). This rate is suitable where:

(i)The production is done using more of labour and less technology is used.
(ii)It is desired to taken into consideration the time factor.
(iii)The rate may not be affected by the method of wage payment or the grade or the rate of workers.

Illustration 5: From the following particulars find out "Direct Labour Rate".
(a) Total number of labourers working in the department. 400
(b) Total working days in a year 300
(c) Number of working hours per day 8
(d) Total departmental overheads per year Rs.1,82,400
(e) Normal idle time allowed. 5%

Solution:

Calculation of Direct labour rate for departmental overheads

Total working days in a year	300
Number of working hours per day	8
Total working hours available per worker per year	2,400 (300 x 8)
Less: normal idle time allowed (5% of 2,400hrs)	120
Effective working hours per worker per year (2400-120)	2,280
Number of workers working in the department	400
Total effective working hours in the department (2280 x 400)	9,12,000
Total departmental overheads per year	Rs.1,82,000

Direct Labour Rate for absorption of overheads per hour Re.0.20
(Rs.182,400÷9,12,000hrs=Rs.0.20)

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(e)Machine Hour Rate. Machine hour rate is the cost of running a machine per hour. It is one of the methods of absorbing factory expenses to production. There is a basic similarity between the machine hour and the direct labour hour rate methods, in so far as both are based on the time factor. The choice of one or the other method depends on the actual circumstances of the individual case. In respect of departments or operations, in which machines predominate and the operators perform a relatively a passive part, the machine hour rate is more appropriate. This is generally the case for operations or processes performed by costly machines which are automatic or semi-automatic and where operators are needed merely for feeding and tending them rather than for regulating the quality or quantity of their output. In such cases, the machine hour rate method alone can be depended on to correctly apportion the manufacturing overhead expenses to different items of production. What is needed for computing the machine hour rate is to divide overhead expenses for a specific machine or group of machines for a period by the operating hours of the machine or the group of machines for the period. It is calculated as follows:

$$\text{Machine hour rate} = \frac{\text{Amount of overheads}}{\text{Machine hours during a given period}}$$

The following steps are required to be taken for the calculation of machine hour rate:

1)Each machine or group of machine should be treated as a cost centre.

2) The estimated overhead expenses for the period should be determined for each machine or group of machines.

3) Overheads relating to a machine are divided into two parts i.e., fixed or standing charges and variable or machine expenses.

4) Standing charges are estimated for a period for every machine and the amount so estimated is divided by the total number of normal working hours of the machine during that period in order to calculate an hourly rate for fixed charges. For machine expenses, an hourly rate is calculated for each item of expenses separately by dividing the expenses by the normal working hours.

5) Total of standing charges and machines expenses rates will give the ordinary machine Hour rate. Some of the bases which may be adopted for apportioning the different expenses for the purpose of calculation of machine hour rate are given below.

Some of the expenses and the basis of apportionment are given below.

1.Rent and Rates-Floor area occupied by each machine including the surrounding space.

2.Heating and Lighting-The number of points used plus cost of special lighting or heating for any individual machine, alternatively according to floor area occupied by each machine.

3.Supervision–estimated time devoted by the supervisory staff to each machine.

4.Lubricating Oil and Consumable Stores–On the basis of past experience.

5.Insurance–Insurable value of each machine

6.Miscellaneous Expenses–Equitable basis depending upon facts.

Machine Expenses

1. Depreciation –cost of machine including cost of stand- by equipment such as spare motors, switchgears etc., less residual value spread over its working life.

2. Power– Actual consumption as shown by meter readings or estimated consumption ascertained from past experience.

3. Repairs–Cost of repairs spread over its working life.

Illustration 6:

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A machine is purchased for cash at Rs.9,200. Its working life is estimated to be 18,000 hours after which its scrap value is estimated at Rs.200. it is assumed from past experience that:
(i) The machine will work for 1,800 hours annually.
(ii)The repair charges will be Rs.1,800 during the whole period of life of the machine.
(iii)The power consumption will be 5 units per hour at 6 paisa per unit.
(iv)Other annual standing charges are estimated to be:

	Rs.
(a)Rent of department (machine occupies 1/5th of total space)	780
(b) Light (12 points in the department-2 points engage d in the machine)	288
(c)Foreman's salary (1/4th of his time is occupied in the machine)	6000
(d) Insurance premium (fire) for machinery	36
(e)Cotton waste	60

Find out the machine hour rate on the basis of above data for allocation of the works expenses to all jobs for which the machine is used.
Solution:

Calculation of machine hour rate

	Per Annum Rs.	Per Hour Rs.
Standing Charges:		
Rent[Rs.780 ÷Rs.5]	156	
Light [2/12 x Rs.288]	48	
Insurance Charges	36	
Cotton waste	60	
	1,500	
Total Standing Charges	1,800	
Hourly rate of standing charges Rs.1800/1800		1.00
Machine Expenses:		
Depreciation (Rs.9,200- Rs.200)÷18,000 = Rs.9000÷18,000		0.50
Repairs and Maintenance (Rs.1,080÷18,000)		0.06
Power (0.06 x 5)		0.30
Machine Hour Rate		1.86

(f) Rate Per Unit of Production. This method is simple, direct and easy. It is suitable for mining and other extractive industries, foundries and brick laying industries, where the output is measured in convenient physical units like number, weight, volume etc. the rate is calculated as under:

$$\text{Overhead Rate} = \frac{\text{Overhead expenses (budgeted)}}{\text{Budgeted production}}$$

For example, if the overhead expenses (budgeted) are Rs. 30,000 and the budgeted production is 10,000 tonnes, then overhead rate according to this method will be Rs. 3 per tonne.

The main limitation of this method is that it is restricted to those concerns which produce

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only one item of product or a few sizes, qualities or grades of the same product. If more than one item are produced, then it is essential to express dissimilar units against a common denominator on weightage or point basis.

(g)Sale Price Method: Under this method, budgeted overhead expenses are divided by the sale price of units of production in order to calculate the overhead recovery rate. The formula is sale price of units of production in order to calculate the overhead recovery rate, the formula is

$$\text{Overhead Recovery Rate} = \frac{\text{Budgeted overhead expenses}}{\text{Sale value of units of production}}$$

The method is more suitable for apportioning of administration, selling and distribution, research, development and design costs of products. It can also be used with advantage for the appropriation of joint products costs.

Unit-5

Introduction

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The term 'costing' refers to the techniques and processes of determining costs of a product manufactured or services rendered. The first stage in cost accounting is to ascertain the cost of the product offered or the services provided. In order to do the same, it is necessary to follow a particular method of ascertaining the cost. The methods of costing are applied in various business units to ascertain the cost of product or service offered. Different methods of costing are required to be used in different types of businesses.

For example, costing methods used in a manufacturing business will differ from the methods used in a business that is offering services. Even in a manufacturing business, some business units may have production in a continuous process, i.e. output of a process is an input of the Subsequent process and so on, while in some businesses production is done according to the requirements of customers and hence each job is different from the other one. Different methods of costing are used to suit these diverse requirements. These methods of costing are discussed in detail in this chapter.

Methods of Costing

As mentioned in the above paragraph, the methods of costing are used to ascertain the cost of product or service offered by a business organization. There are two principle methods of costing. These methods are as follows

I] Job Costing

II] Process Costing

Other methods of costing are the variations of these two principle methods. The variations of these methods of costing are as follows.

I] Job Costing: Batch Costing, Contract Costing, Multiple Costing.

II] Process Costing: Unit or Single Output Costing, Operating Costing, Operation Costing

The Job Costing and its variations

***1. Job Costing*:**

This method of costing is used in Job Order Industries where the production is as per the requirements of the customer. In Job Order industries, the production is not on continuous basis, rather it is only when order from customers is received and that too as per the specifications of the customers. Consequently, each job can be different from the other one. Method used in such type of business organizations is the Job Costing or Job Order Costing.

The objective of this method of costing is to work out the cost of each job by preparing the Job Cost Sheet. A job may be a product, unit, batch, sales order, project, contract, service, specific program or any other cost objective that is distinguishable clearly and unique in terms of materials and other services used. The cost of completed job will be the materials used for the job, the direct labor employed for the same and the production overheads and other overheads if any charged to the job.

The following are the features of job costing.

1. It is a specific order costing
2. A job is carried out or a product is produced is produced to meet the specific requirements of the order
3. Job costing enables a business to ascertain the cost of a job on the basis of which quotation for the job may be given.

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4. While computing the cost, direct costs are charged to the job directly as they are traceable to the job. Indirect expenses i.e. overheads are charged to the job on some suitable basis.

5. Each job completed may be different from other jobs and hence it is difficult to have standardization of controls and therefore more detailed supervision and control is necessary.

6. At the end of the accounting period, work in progress may or may not exist.

Advantages of Job Costing

1. Accurate information is available regarding the cost of the job completed and the profits generated from the same.

2. Proper records are maintained regarding the material, labor and overheads so that a costing system is built up

3. Useful cost data is generated from the point of view of management for proper control and analysis.

4. Performance analysis with other jobs is possible by comparing the data of various jobs. However it should be remembered that each job completed may be different from the other.

5. If standard costing system is in use, the actual cost of job can be compared with the standard to find out any deviation between the two.

6. Some jobs are priced on the basis of cost plus basis. In such cases, a profit margin is added in the cost of the job. In such situation, a customer will be willing to pay the price if the cost data is reliable. Job costing helps in maintaining this reliability and the data made available becomes credible.

Limitations of Job Costing

1. It is said that it is too time consuming and requires detailed record keeping. This makes the method more expensive.

2. Record keeping for different jobs may prove complicated.

3. Inefficiencies of the organization may be charged to a job though it may not be responsible for the same.

Methodology used in Job Costing

The objective of job costing is to ascertain the cost of a job that is produced as per the requirements of the customers. Hence it is necessary to identify the costs associated with the job and present it in the form of job cost sheet for showing various types of costs. Various costs are recorded in the following manner.

1. Direct Material Costs:

Material used during the production process of a job and identified with the job is the direct material. The cost of such material consumed is the direct material cost. Direct material cost is identifiable with the job and is charged directly.

The source document for ascertaining this cost is the material requisition slip from which the quantity of material consumed can be worked out. Cost of the same can be worked out according to any method of pricing of the issues like first in first out, last in first out or average method as per the policy of the organization.

The actual material cost can be compared with standard cost to find out any variations between the two. However, as each job may be different from the other, standardization is difficult but efforts can be made for the same.

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2. Direct Labor Cost:

This cost is also identifiable with a particular job and can be worked out with the help of 'Job Time Tickets' which is a record of time spent by a worker on a particular job. The 'job time ticket' has the record of starting time and completion time of the job and the time required for the job can be worked out easily from the same. Calculation of wages can be done by multiplying the time spent by the hourly rate. Here also standards can be set for the time as well as the rate so that comparison between the standard cost and actual cost can be very useful.

3. ***Direct Expenses:***

Direct expenses are chargeable directly to the concerned job. The invoices or any other document can be marked with the number of job and thus the amount of direct expenses can be ascertained.

4. ***Overheads:***

This is really a challenging task as the overheads are all indirect expenses incurred for the job. Because of their nature, overheads cannot be identified with the job and so they are apportioned to a particular job on some suitable basis. Pre determined rates of absorption of overheads are generally used for charging the overheads. This is done on the basis of the budgeted data. If the predetermined rates are used, under/over absorption of overheads is inevitable and hence rectification of the same becomes necessary.

5. **Work in Progress:**

On the completion of a job, the total cost is worked out by adding the overhead expenses in the direct cost. In other word, the overheads are added to the prime cost. The cost sheet is then marked as 'completed' and proper entries are made in the finished goods ledger. If a job remains incomplete at the end of an accounting period, the total cost incurred on the same becomes the cost of work in progress. The work in progress at the end of the accounting period becomes the closing work in progress and the same becomes the opening work in progress at the beginning of the next accounting period. A separate account for work in progress is maintained.

Format of Job Cost Sheet

The format of job cost sheet is given below.

XYZ LTD.

JOB ORDER COST SHEET

Customer Invoice No. Selling Price Per Unit: Cost Per Unit:

Date: Job Order No: Total Cost

Product Description

Particulars	**Dates and Ref. No.**	**Total Amount [Rs]**	**Per Unit [Rs]**
Direct Materials: Dept I Dept II Dept III Total			
Direct Labor			
Overheads			
Total Costs			

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Illustration :1

From the following particulars calculate the cost of Job No.505 and price for the job to give a profit of 25% on the selling price.

1. Material : Rs. 6820

2. Wage details:

Department X : 60 hrs @ Rs. 3 per hr

Y : 50 hrs @ Rs. 3 per hr

Z : 30 hrs @ Rs. 5 per hr

3. The variable Overheads are as follows:

Department X : Rs. 5000 for 5000 hrs

Y : Rs. 4000 for 2000 hrs

Z : Rs. 2000 for 500 hrs

The total fixed expenses amounted to Rs. 20,000 for 10,000 working hours. Calculate the cost of Job No. 505 and price for the job to give a profit of 25% on selling price

Solution:

Job Cost Sheet No. 505

particulars	Rs.
Material	6,820
Wage details: Department X : 60×3 =180 Y : 50×3 =150 Z : 30×5=150	480
Prime Cost	**7,300**
variable Overheads are as follows: Department X : 60×1=60 (5000 ÷5000)=1 Y :50×2=100 (4000÷ 2000)=2 Z :30×4=120 (2000÷500)=4	280
	7,580
Fixed OH 140 x 2 = 280(60+50+30 x 2)	280
Total cost	**7,800**
Profit 25% on selling price ie 1/3 of cost 7860 x1/3	2, 620
Selling price	**10,480**

CONTRACT COSTING

Meaning

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It is a special form of job costing and it is the most appropriate method to be adopted in such industries as building and construction work, civil engineering, mechanical fabrication and ship building. In other words, it is a form of specific order costing which applies where the work is undertaken to customer's requirements and each order of long duration as compared to job costing.

It is also known as terminal costing. The official CIMA terminology defines contract costing as " a form of specific order costing in which costs are attributed to individual contracts."

Basic features:

1. Each contract itself a cost unit.
2. Work is executed at customers site
3. The existence of sub contract
4. Most of the expenses incurred upon the contracts are direct.
5. Cost control is very difficult in contract costing.

Types of contracts

Generally there are three types of contracts:

1. Fixed price contracts: Under these contracts both parties agree to a fixed contract price.
2. Fixed price contract with Escalation clause
3. Cost plus contract: Under this contract no fixed price could be settled for a contract.

Contract Account

A contract account is a nominal account in nature. It is prepared to find out the cost of contract and to know profit or loss made on the contract. A contractor may undertake a number of contracts at a time. For each contract a separate account is opened. In the contract account all direct cost such as material, labour and other direct expenses incurred during an accounting period are debited and the indirect expenses are apportioned on an equitable basis. The differences between the two sides are known as Notional profit or notional loss.

SPECIAL TERMS IN CONTRACT ACCOUNT

1. **Work in Progress:**

It is the unfinished contract at the end of the accounting period and it includes amount of work certified and amount of work uncertified. Work in progress is an asset, shown in the balance sheet by deducting there from any advance received from the contractee.

2. **Work certified:**

The sales value of work completed as certified by the architect is known as 'work certified'. In the case of contracts of long duration, the amount payable by the customer to the contractor is based on the sales value of work done as certified by the architect. At the end of the financial year, the total sales value of work done and certified by the architect is credited to the contract account.

3. **Work Uncertified:**

It means work which has been carried out by the contractor but has not been certified by the architect. Sometimes, work which is complete remains uncertified at the end of the financial year. The reasons for the same may be

a. Work not sufficient enough to be certified
b. Work has not reached the stipulated stage to qualify for certification

It is always valued at cost and credited to the contract account.

4. **Retention money:**

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Regardless of the amount of work certified, the contractor is paid a specified percentage of the same and the balance is held or retained by the contractee. This is because of the fact that the contractee has to safe guard himself against any contingency arising from the non fulfillment of the terms of the contract by the contractor. The unpaid balance of work certified or the amount held back or retained by the contractee is known as 'retention money'.

5. **Sub contract:**

Sometimes the contractor enters into contracts with another contractor to give a portion of work undertaken by him. In such cases the work performed by the subcontractor s forms a direct charge to the contract concerned. Sub contract cost will be shown on the debit side of the contract account.

6. **Escalation clause**:

This is clause which is provided in the contract to cover up any increase in the price of the contract due to increase in the prices of raw material or labour or in the utilization of any other factors of production. If material and labour utilization exceeds a particular limit, the customer agrees to bear the additional cost occasioned by excessive utilization. Here, the contractor has to satisfy the customer that excessive utilization is not the result of decreased efficiency.

SPECIMEN FORM OF CONTRACT ACCOUNT (Unfinished contract)

Contract A/C

To materials	×××	By work in progress: Work certified xxx Work uncertified xxx	×××
To Labour	×××	By material returned	×××
To Plant	×××	By plant xxx	
To Overheads	×××	Less: Depreciation xxx	×××
To cost of sub contracts	×××		×××
To Notional Profit c/d(B/F)	×××	By material lying at site	×××
	×××	By Notional profit B/d	×××
To Profit and Loss A/C	×××		
To WIP (B/F)	×××		
	×××		×××

Treatment of Plant and Machinery:

One of the distinguishing features of a contract is the use of special plant and machinery. The cost of these is capital expenditure, but yet, the usage of these should be reflected in the form of depreciation. There are two distinct methods of charging depreciation.

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1. At the time of issue of plant to contract the contract account is debited with the full value of the plant. At the end of the period contract account is credited with the depreciated value. This method is used when plant and machinery is used at the contract site for a long period.

2. In the second method, contract account is debited with an hourly rate of depreciation for the number of hours the plant is used on the contract. A cost centre is set up for each machine. An estimate is made is made of the cost such as maintenance, depreciation, driver's wage etc to be incurred. The total of this cost is divided by the number of hours that the machine is expected to be used.

Profit on Incomplete Contract:

In the case of a small contract extending over the financial period, profit or loss on the same may be ascertained by crediting it with the contract price due by the contractee. This procedure cannot be adopted in the case of contracts extending beyond the accounting period, and taking a long time for completion. If there is any profit upon the incomplete contract, it cannot be taken as actual profit. The profit upon the incomplete contract is called notional profit.

For the purpose of determining the amount of profit to be transferred to profit and loss account and making provision for future contingencies, the following guidelines may be kept in mind.

1. **When the work has not reasonably advanced (1/4 or less than ¼):** - No profit should be taken to the credit of p/L account in the case of contracts which have just commenced and a small portion of the work is complete.

2. **Where the work is complete more than ¼ but less than ½ of contract price:** In this case 1/3 of the notional profit as reduced by the percentage of cash received may be credited to profit and loss account. The usual formula is

$$\text{Notional profit x1/3 x } \frac{\text{Cash received}}{\text{Work certified}}$$

The balance of notional profit shall be kept as reserve till the completion

3. **If the contract completed is more than 1/2 but less than 90%**: Here 2/3rd of the notional profit should be taken to profit and loss account.

$$\text{Notional profit x2/3 x } \frac{\text{Cash received}}{\text{Work certified}}$$

The balance of notional profit shall be transferred to work in progress as reserve. It is to be noted that in order to find out how much portion of contract is completed, work certified should be compared with contract price.

4. **If the contract is nearing completion:** Here, estimated profit may be ascertained by deducting the total cost of contract to date plus estimated additional expenses to complete the contract , from the contract price. It is calculated by using the following formula

$$\text{Estimated profit x} \frac{\text{Cash received}}{\text{Contract price}}$$

Example 2

The following was the expenditure on a contract for Rs. 6,00,000.

Material 1,20,000
Wages 1,64,000
Plant 20,000
Overheads 8,600

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Cash received on account of the contract was Rs. 2,40,000 being 80% of the work certified. The Value of material in hand was Rs. 10,000. The plant has undergone 20% depreciation.

Solution:

Contract A/C

To material	1,20,000	By material in hand	10,000
To Wages	1,64,000	By plant on hand	16,000
To Plant	20,000	By work certified (2,40,000x100/80)	3,00,000
To Overheads	8,600		
To Notional Profit	13,400		
	3,26,000		**3,26,000**
To Profit and Loss A/C	7,147	By notional profit b/d	13,400
To Balance c/d	6,253		
	13, 400		**13, 400**

Example 3

XY Ltd undertook a contract, the following was the expenditure on a contract for Rs. 6,00,000.
Material issued to contract Rs. 1,02,000
Plant issued for contract Rs. 30000
Wages Rs.1,62,000
Other expenses Rs. 10,000

Cash received on account of contract up to 31st march 2011 amounted to Rs. 2,56,000 being 80% of work certified. Of the plant and material charged to the contract plant costing Rs. 3000 and material costing Rs. 4000/ were lost. On Ist March 2011, Plant which cost Rs. 2,000 was returned to the store, the cost of work done but not certified was Rs. 3000 and material costing Rs. 2,500 were in hand on site. Provide 10% depreciation on plant, reserve 1/3 of profit received and prepare contract account from the above particulars.

Solution:

Contract A/C

To material	1,02,000	By work in progress: Work certified 256000x100/80 =3,20,000	3,23,000

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		Work uncertified = 3,000	
To Wages	1,62,000	By P & L Account Plant lost 3,000 Material lost 4,000	7,000
To Plant	30,000	By plant returned: 2,000 Less: depreciation 200	1,800
To Overheads	10,000	By material in hand	2,500
To Notional profit c/d (B. F)	52,800	By plant at site(30000-3000-2000) 25,000 Less: depr 2,500	22,500
	3,56,800		**3,56,800**
To P/L Account 52800x2/3x80/100	28,160	By notional profit B/d	52,800
Reserve BF	24,640		
	52,800 ==========		**52,800** ==========

WORK IN PROGRESS ACCOUNT

To contract A/c	3,23,000	By Contract A/c (reserve)	24,640
		By Balance c/d	2,98,360
	3,23,000 =======		**3,23,000** ======

PROCESS COSTING

Process costing is the method of costing applied in the industries engaged in continuous or mass production. Process costing is a method of costing used to ascertain the cost of a product at each process or stage of manufacturing.

According to ICMA terminology, "Process Costing is that form of operation costing which applies where standardized goods are produced".

So it is a basic method to ascertain the cost at each stage of manufacturing. Separate accounts are maintained at each process to which expenditure incurred. At the end of each process the cost per unit is determined by dividing the total cost by the number of units produced at each stage. Hence, this costing is also called as "Average Costing" or "Continuous Costing". Process Costing is used in the industries like manufacturing industries, chemical industries, mining works and public utility undertakings.

Characteristics of Process Costing

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1. Production is continuous
2. Products pass through two or more distinct processes of completion.
3. Products are standardized and homogeneous.
4. Products are not distinguishable in processing stage.
5. The finished product of one process becomes the raw material of the subsequent process.
6. Cost of material, labour and overheads are collected for each process and charged accordingly.

Advantages of Process Costing

1. It is easy to compute average cot because the products are homogeneous in Process Costing.
2. It is possible to ascertain the process costs at short intervals.
3. Process Costing is simple and less expensive in relation o job costing.
4. By evaluating the performance of each process effective managerial control is possible.

Disadvantages of Process Costing

1. Valuation of work in progress is difficult.
2. It is not easy to value losses, wastes, scraps etc.
3. The apportionment of total cost among joint products and by-products is difficult.
4. Process cost are not accurate, they are only average costs
5. Process costs are only historical.

Principles of Process Costing

The following points are considered while determining the cost under Process Costing.

1. Production activity should be divided into different processes or departments.
2. A separate account is opened for each process.
3. Both direct and indirect costs are collected for each process.
4. The quantity of output and costs are recorded in the respective process accounts.
5. The cost per unit is determined by dividing the total cost at the end of each process by the number of output of each process.
6. Normal loss and abnormal loss are credited in the process account
7. The accumulated cost of each process is transferred to subsequent process along with output. The output of the last process along with cost is transferred to the finished goods account.
8. In case of by-products and joint products their share in joint cost should be estimated and credited to the min process.
9. When there is work in progress at the end of the period the computation of inventory is made I terms of complete units.

Difference between Process Costing and Job Costing

Process Costing Job Costing	Job Costing
1. Production is continuous	1. Production is according to customers' orders
2. Production is for stock	2. Production is not for stock
3. All units produced are identical or homogeneous	3. Each job is different from the other
4. There is regular transfer of cost of one process to subsequent processes	4. There is no regular transfer of cost from one job to another
5. Work in progress always exists	5. Work in progress may or may not

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	exist

Procedure for Process Costing

1. Each process is separately identified. Separate process account is opened for each process.
2. Along with 'Particulars Column', two columns are provided on both sides of the process account – units (quantity) and amount (Rupees).
3. All the expenses are debited in the respective process account.
4. Wastage, sale of scrap, by-products etc are reordered on the credit side 0f the process account.
5. The difference between debit and credit side shows the cost of production and output of that particular process which is transferred to the next process.
6. The cost per unit in every process is calculated by dividing the net cost by the output.
7. The output of last process is transferred to the Finished Stock Account.
8. Incomplete units at the end of the each period ion every process s converted in terms of completed units.

Specimen of Process Account

Process Account

	Units	Rs.		Units	Rs.
To Direct materials To Direct Wages To Direct Expenses To Indirect expenses			By Loss in weight (Normal Loss) By sale of Scrap		
To Other Expenses (if any)			By Next Process Account(Transfer)		

Preparation of Process Accounts

The preparation of Process Account depends upon the following situations

1. Simple Process Account
2. Process costing with normal process loss
3. Process costing with abnormal process loss
4. Process costing with abnormal process gains
5. Inter – process profits.

1. Simple Process Account

Under this case it is very easy to prepare process account. A separate account is opened for each process. All costs are debited to the process account. The total cost of the process is transferred to the next process. At the end of each process the cost per unit is obtained by dividing the total cost by the number of units.

Illustration 4:

Product A requires three distinct processes and after the third process the product is transferred to finished stock. Prepare various process accounts from the following information.

	Total	P1	P2	P3
Direct Materials	5000	4000	600	400

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Direct Labour	4000	1500	1600	900
Direct Expenses	800	500	300	
Production overheads	6000			

Production overheads to be allocated to different processes on the basis of 150% of direct wages. Production during the period was 200 units. Assume 5here is no opening or closing stock.

Solution:

Process I Account

	Units	Rs.		Units	Rs.
To Direct materials	200	4,000	By Process II Account(Transfer)	200	8,250
To Direct Wages		1,500	Cost per unit 8250 = 41.25		
To Direct Expenses		500	200		
To Production overheads (1500x150%)		2,250			
	200	8,250		200	8,250

Process II Account

	Units	Rs.		Units	Rs.
To Process I A/c	200	8,250	By Process III		
To Direct materials		600	Account(Transfer)	200	13,150
To Direct Wages		1,600	Cost per unit 13150 = 65.75		
To Direct Expenses		300	200		
To Production overheads (1600x150%)		2,400			
	200	13,150		200	13,150

Process III Account

	Units	Rs.		Units	Rs.
To Process II A/c	200	1,3150	By Finished stock A/c		
To Direct materials		400	(Output Transferred)	200	15,800
To Direct Wages		900	Cost per unit 15800 = 79		
To Production overheads (900x150%)		1,350	200		
	200	15,800		200	15,800

2. Process losses

The process loss is classified into two- normal process loss and abnormal process loss.

1.Normal process loss

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This is the loss which is unavoidable on account of inherent nature of production process. It arises under normal conditions. It is usually calculated as a certain percentage of input. Normal process loss includes either waste or scrap r both. Waste is unsalable and has no value. Loss in weight is an example of waste. Loss in weight should be credited to the concerned process account. It should be recorded only in terms of quantity.

Loss in weight = Opening Stock + output from the preceding process – (output of the Concerned process + closing stock)

Illustration 5:

From the following figures, show the cost of three processes of manufacture. The production of each process is passed on to the next process immediately on completion.

	Process A	Process B	Process C
Wages and Materials	30400	12000	29250
Works Overhead	5600	5250	6000
Production ion units	36000	37500	48000
Stock on 1 July 2012 (units from preceding process)		4000	16500
Stock on 31 July 2012 (units from preceding process)		1000	5500

Solution:

Process A Account

	Units	Rs.		Units	Rs.
To Wages and Materials	36000	30,400	By Process B A/c	36000	36,000
To Works Overhead		5,600	(Transfer)		
			Cost per unit 36000 = 1		
			36000		
	36000	36,000		36000	36,000

Process B Account

	Units	Rs.		Units	Rs.
To Opening Stock			By loss in weight(Bal. fig)	1500	
(Re.1p.u)	4000	4,000	By Closing stock @ Re.1p.u	1000	1,000
To Process A A/c	36000	36,000	By Process C A/c (Transfer)	37500	56,250
(transfer)			Cost per unit 56250 = 1.50		
To Wages and Materials		12,000	37500		
To Works Overhead		5,250			
	40000	57,250		40000	57,250

Process C Account

	Units	Rs.		Units	Rs.

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To Opening Stock (Rs.1.50 p.u)	16500	24,750	By loss in weight (Bal.fig)	500	
			By Closing	5500	8250
To Process B A/c (transfer)	37500	56,250	stock@Rs.1.5p.u		
			By Finished stock A/c	48000	108000
To Wages and Materials		29,250	(Transfer)		
			Cost per unit 108000 / 48000 =2.25		
To Works Overhead		6,000			
	54000	1,16,250		54000	1,16,250

2. Abnormal Process Loss

Any loss caused by unexpected or abnormal conditions such as plant break don, substandard materials, carelessness, accident etc. or loss in exceeds of the margin anticipated for normal process loss can be called as abnormal process loss. It is controllable and avoidable. When actual loss in the process is greater than the estimated normal loss, it is a case of abnormal loss. It may also be determined by comparing actual output with expected or normal output. If actual output is less than the normal output, the difference is abnormal loss.

Value of Abnormal loss = Normal cost of normal output / Normal output x Units of Abnormal loss

Normal cost of normal output = Total expenditure (i.e., total debit of process A/c) – Sale Proceeds of scrap (i.e. Value of normal loss)

Normal output = Input – Units of normal loss

Illustration 6:

In process A 100 units of raw materials were introduced at a cost of Rs.1000. the other expenditure incurred by the process was Rs. 602. Of the units introduced 10% are normally lost in the course of manufacture and them posses a scrap value of Rs.3 each. The output of process A was only 75 units. Prepare Process A A/c and Abnormal loss A/c.

Solution:

Process A Account

	Units	Rs.		Units	Rs.
To Raw Materials	100	1,000	By Normal loss-100x10% @Rs.3each	10	30
To Other expenses		602	By Abnormal loss (Bal.Fig)	15	262*
			By Process B A/c (transfer)	75	1310
	100	1,602		100	1,602

Working Note:

Normal cost of normal output = Total expenditure – Sale Proceeds of scrap

= 1602-30

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= 1572

Normal output = Input – Units of normal loss

= 100 – 10

= 90

Value of Abnormal loss = Normal cost of normal output x Units of Abnormal loss

Normal output

= 1572 x 15 = Rs. 262

90

Abnormal Loss A/c

	Units	Rs.		Units	Rs.
To Process A	15	262	By Cash (scrap value of loss @ Rs.3) By Costing P&L A/c	15	45 217
	15	262		15	262

Abnormal Gain (or Abnormal Effective)

Sometimes actual loss or wastage in a process is less than expected normal loss. In this case the difference between actual loss and expected loss is known as abnormal gain or abnormal effective. It is the excess of actual production over normal output. Abnormal gain is valued in the same manner as abnormal loss. The value of abnormal gain is debited to process A/c and credited to abnormal gain A/c. the value of scrap is debited to abnormal gain A/.c and credited to normal loss A/c. finally abnormal loss A/c is closed by transferring the credit balance to Costing P&L A/c.

Value of Abnormal Gain = Normal cost of normal output x Units of Abnormal gain

Normal output

Normal cost of normal output = Total expenditure– Sale Proceeds of scrap

Normal output = Input – Units of normal loss

Units of Abnormal gain = Normal loss- Actual loss

Or

= Actual output - Normal output

Illustration 7:

Product X is obtained after it passes through three distinct processes. 2000 kg of materials at Rs.5 per kg were issued to the first process. Direct wages amounted to Rs.900 and production overhead incurred was Rs.500. Normal loss is estimated at 10% of input. This wastage is sold at Rs.3 per kg. The actual output is 1850 kg. Prepare process I A/c and Abnormal Gain/Abnormal loss A/c as the case may be.

Solution:

Process I Account

	Units	Rs.		Units	Rs.
To Materials	2000	10000	By Normal loss (Sale of scrap)	200	600
To Direct wages		900	By Process II - transfer	1850	11,100
To Production OH		500			
	50	300			

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To Abnormal gain(Bal.)	2050	11700		2050	11700

Abnormal Gain A/c

	Units	Rs.		Units	Rs.
To Normal loss (loss of income)	50	150	By Process I A/c	50	300
To Costing P&L A/c (Bal.)		150			
	50	300		50	300

Working note:

1. (200+1850)-2000=50
2. (10000+900+500)-600 = Rs.6
   1850-50

1850x6=11100

3. 50x6=30

OPERATING COSTING (SERVICE COSTING)

It is the costing procedure used for determining the cost of per unit of service rendered. It is a method of costing applied to undertaking which provides service rather than production of commodities. The services may be in the form of transport, supply service, welfare service,etc. There is a difference between operating costing and operation costing. Operating costing is a method of costing designed to find out the cost of operating or rendering a service. On the other hand, operation costing is a method of costing applied to determine the total cost and unit cost of each operation. Though service undertakings are of different types, but here we discuss only transport operating costing.

Transport costing:

Transport industries include Air, Water, Rail and Road. They render services to the community at large. We have to give utmost care while selecting the cost unit. The cost unit of other forms operation costing is quite different from that of a service undertaking. The cost unit of a service organization is a composite unit. The important factors to be considered includes the number of passengers, tonnage carried, distance covered etc.

Classification of Costs:

Operating costs of a transport undertaking comprising different items, which are classified under the following three groups.

1. **Standing or fixed charges**:

These charges are incurred in spite of the kilometers run. It is fixed in nature. Eg. Insurance, Motor vehicle tax, license fee, rent, salary of operating manager etc.

2. **Maintenance charges**:

It includes semi variable expenses Eg. Tyres and tubes, repairs and paintings etc.

3. **Operating and running charges**:

These charges vary more or less in direct proportion to kilometers. All the variable charges of running vehicles are included in this group. Generally it includes, petrol, oil,, grease etc., wages

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of driver, attendant if payment is related to time or distance of trip etc. In the place of the above classification, all expenses can be divided into two – fixed cost and variable costs. Here, both maintenance charges and running charges are considered as
variable charges

Selection of Unit:

In transport costing, a composite unit such as passenger mile or passenger kilometer or tone kilometer is often selected. Such unit takes into account both the number of passengers or weight of goods carried and distance run.

Absolute passenger or commercial passenger/ tone km:

It is calculated by multiplying every part of distance travelled/covered with either weight carried or passenger carried.. After getting the product of each journey we add all the products. The total is absolute ton/quintal km

In the case of goods transport the equation is

Distance of each part of journey x weight carried

In the case of passenger transport, the following formula is used

Distance of each part of journey x No. of passengers taken for the same distance.

Commercial method:

The following steps are used to find out the commercial tone km

a. Find out average trip load
b. Find out total distance of journey
c. Multiply a and b, the resultant figure is commercial tone km

Example 8

A truck starts with a load of 10 tonnes of goods from station P. It unloads 4 tonnes at station Q and rest of the goods at station R. It reaches back directly to station P after getting reloaded with 8 tonnes of goods at station R. The distance between P to Q, Q to R and then from R to P are 40kms, 60 kms, and 80 kms respectively. Compute absolute tone kms and commercial tone-km .

Absolute ton/ km = Total distance x weight carried

= (40x10) + (60x6) + (80x8) =400+360+640= 1400

Commercial tone/km = Distance x average load

= [40+60+80] x{10+6+8/3}= 180x8=1440

Preparation of Operating Cost sheet:

An operating cost sheet is prepared periodically in order to ascertain the cost per unit. Here, the total fixed, maintenance and running costs are collected and allocated under respective heads and these are then divided by total units.

The Performa of a operating cost sheet is given below:

OPERATING COST SHEET

Particulars	Total cost	Cost per unit
A. Fixed or standing charges: Garage rent License fee Insurance		

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Motor vehicle tax		
Interest on capital		
Supervision		
Office establishment		
Administrative overheads		
Salary of foreman , manager etc		
Total		
B. Maintenance charges:		
Repairs and renewals		
Tyres and tubes		
Paintings		
Overhauling		
Cleaning		
Gas and electric charges		
Spare parts and accessories		
Total		
C. Operating charges:		
Petrol		
Engine oil		
Lubricating oil, grease etc		
Wages of operators		
Depreciation		
Salaries of running staff		
Water		
Total		

Calculation of Depreciation:

If the rate of depreciation is not given, depreciation is calculated as follows:

$$\text{Depreciation} = \frac{\text{Cost - scrap}}{\text{Life in years}}$$

$$\text{Depreciation per mile, or km} = \frac{\text{Depreciation p.a}}{\text{Kms/miles run p.a}}$$

Example 9

From the following data calculate the cost per mile of a vehicle:

Value of vehicle	Rs. 15,000
Road license for the year	500
Insurance charges per year	100
Garage rent per year	600
Drivers' wages per month	200
Cost of petrol per litre	0.80
Miles per litre	8
Proportional charge for tyre and maintenance per mile	0.20
Estimated life	1,50, 000 miles

Ignore interest on capital.

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Solution:

Operating cost statement

Particulars	Annual cost	Cost per unit
Fixed expenses:		
Road license fee	500	0.08
Insurance charge	100	0.02
Garage rent	600	0.10
Maintenance charges:		
Cost of tyre and maintenance of per mile	0.20	0.20
Operating /running charges:		
Cost of petrol per mile 80p/8		0.10
Drivers wage per mile 2400/6000		0.40
Depreciation of vehicle 15000X6000/1,50,000		0.10
		1.00

References Book

1. S.P. Jain &K. L. Narang: Cost Accounting
2. Cost Accounting – Dr. R. Ramachandran and Dr. R. Srinivasan

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