



**SATHYABAMA**

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

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## SCHOOL OF MANAGEMENT

### UNIT I - COST ACCOUNTING - SBAX1018

## **UNIT 1 INTRODUCTION**

Nature and scope of cost accounting - Cost analysis, concepts and classifications. - Installation of costing systems - cost centers and profit centers

### **1.Introduction**

Cost Accounting is a branch of accounting and has been developed due to limitations of financial accounting. Financial accounting is primarily concerned with record keeping directed towards the preparation of Profit and Loss Account and Balance Sheet. It provides information regarding the profit and loss that the business enterprise is making and also its financial position on a particular date. The financial accounting reports help the management to control in a general way the various functions of the business but it fails to give detailed reports on the efficiency of various divisions. The limitations of Financial Accounting which led to the development of cost accounting are as follows.

#### **1.1 Limitations of Financial Accounting**

1. No clear idea of operating efficiency: Sometimes profits in an organization may be less or more because of inflation or trade depression and not due to efficiency or inefficiency. But financial accounting does not give a clear reason for profit or loss.
2. Weakness not spotted out by collective results: Financial Accounting shows the net result of an organization. When the profit and loss account of an organization, shows less profit or a loss, it does not give the reason for it or it does not show where the weakness lies.
3. Does not help in fixing the price: In Financial Accounting, we get the total cost of production but it does not aid in determining prices of the products, services, production order and lines of products.
4. No classification of expenses and accounts: In Financial Accounting, we don't get data relating to costs incurred by departments, processes separately or per unit cost of product lines, or cost incurred in various sales territories. Further expenses are not classified as direct or indirect, controllable and uncontrollable overheads and the value added in each process is not reported.

5. No data for comparison and decision making: It does not supply useful data to management for comparison with previous period and for taking various financial decisions as introduction of new products, replacement of labour by machines, price in normal or special circumstances, producing a part in the factory or buying it from outside market, production of a product to be continued or given up, priority accorded to different products, investment to be made in new products or not etc.
6. No control on cost: Financial Accounting does not help to control materials, supplies, wages, labour and overhead costs.
7. Does not provide standards to assess the performance: Financial Accounting does not help in developing standards to assess the performance of various persons or departments. It also does not help in checking that costs do not exceed a reasonable limit for a given quantum of work of the requisite quality.
8. Provides only historical information: Financial Accounting records only the historical costs incurred. It does not provide day-to-day cost information to the management for making effective plans for the future.

## **1.2 Features and Need of Accounting.**

It is the Practice and body of knowledge concerned primarily with

1. methods for recording transactions,
2. Keeping financial records,
3. Performing internal audits,
4. reporting and analyzing financial information to the management, and
5. Advising on taxation matters.

It is a systematic process of identifying, recording, measuring, classifying, verifying, summarizing, interpreting and communicating financial information. It reveals profit or loss for a given period, and the value and nature of a firm's assets, liabilities and owners' equity.

Accounting provides information on the

1. resources available to a firm,
2. The means employed to finance those resources, and
3. The results achieved through their use.

### **1.3 Types of accounting**

1. Financial Accounting
2. Management Accounting
3. Cost Accounting

### **1.4 Cost Accounting**

It is the recording of all the costs incurred in a business in a way that can be used to improve its management.

Cost accounting is a type of accounting process that aims to capture a company's costs of production by assessing the input costs of each step of production as well as fixed costs such as depreciation of capital equipment. Cost accounting will first measure and record these costs individually, then compare input results to output or actual results to aid company management in measuring financial performance.

#### **1.4 Definition:**

Cost Accounting: Cost accounting is the method of accounting for cost. The I C W A defines Cost Accounting as the technique and process of ascertainment of costs. Cost accounting begins with the recording of all income and expenditure, and ends with the presentation of statistical data.

#### **Costing and Cost Accounting**

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.

The main object of traditional cost accounts is the analysis of financial records, so as to subdivide expenditure and to allocate it carefully to selected cost centers, and hence to build up a total cost for the departments, processes or jobs or contracts of the undertaking. The extent to which the analysis of expenditure should be carried will depend upon the nature of business and degree of accuracy desired. The other important objective of costing are cost control and cost reduction.

Cost Accounting may be regarded as “a specialized branch of accounting which involves classification, accumulation, assignment and control of costs.” The costing terminology of C.I.M.A, London defines cost accounting as “the process of accounting for costs from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centers and cost units. In its widest usage, it embraces the preparation of statistical data, the application of cost control methods and the ascertainment of profitability of activities carried out or planned”.

Wheldon defines cost accounting as “classifying, recording and appropriate allocation of expenditure for determination of costs of products or services and for the presentation of suitably arranged data purposes of control and guidance of management”. It is thus a formal mechanism by means of which costs of products or services are ascertained and controlled.

### **1.5 Objectives of Cost Accounting**

Cost accounting aims at systematic recording of expenses and analysis of the same so as to ascertain the cost of each product manufactured or service rendered by an organization. Information regarding cost of each product or service would enable the management to know where to economize on costs, how to fix prices, how to maximize profits and so on. Thus, the main objectives of cost accounting are the following.

1. To analyse and classify all expenditure with reference to the cost of products and operations.
2. To arrive at the cost of production of every unit, job, operation, process, department or service and to develop cost standard.
3. To indicate to the management any inefficiencies and the extent of various forms of waste, whether of materials, time, expenses or in the use of machinery, equipment and tools. Analysis of the causes of unsatisfactory results may indicate remedial measures.
4. To provide data for periodical profit and loss accounts and balance sheets at such intervals, e.g. weekly, monthly or quarterly as may be desired by the management during the financial [School of Distance Education] Cost Accounting Page 8 year, not only for the whole business but also by departments or individual products. Also, to explain in detail the exact reasons for profit or loss revealed in total in the profit and loss accounts.
5. To reveal sources of economies in production having regard to methods, types of equipment, design, output and layout. Daily, Weekly, Monthly or Quarterly information may be necessary to ensure prompt constructive action.

6. To provide actual figures of costs for comparison with estimates and to serve as a guide for future estimates or quotations and to assist the management in their price fixing policy.
7. To show, where Standard Costs are prepared, what the cost of production ought to be and with which the actual costs which are eventually recorded may be compared.
8. To present comparative cost data for different periods and various volume of output and to provide guidance in the development of business. This is also helpful in budgetary control.
9. To record the relative production results of each unit of plant and machinery in use as a basis for examining its efficiency. A comparison with the performance of other types of machines may suggest the necessity for replacement.
10. To provide a perpetual inventory of stores and other materials so that interim Profit and Loss Account and Balance Sheet can be prepared without stock taking and checks on stores and adjustments are made at frequent intervals.

Also to provide the basis for production planning and for avoiding unnecessary wastages or losses of materials and stores. Last but not the least, to provide information to enable management to make short term decisions of various types, such as quotation of price to special customers or during a slump, make or buy decision, assigning priorities to various products, etc.

### **1.6 Difference between Cost Accounting and Financial Accounting-**

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

1. Financial accounting aims at safeguarding the interests of the business and its proprietors and others connected with it. This is done by providing suitable information to various parties, such as shareholders or partners, present or prospective creditors etc. Cost accounting on the other hand, renders information for the guidance of the management for proper planning, operation, control and decision making.
2. Financial accounts are kept in such a way as to meet the requirements of the Companies Act, Income Tax Act and other statutes. On the other hand cost accounts are generally kept voluntarily to meet the requirements of the management. But now the Companies Act has made it obligatory to keep cost records in some manufacturing industries.
3. Financial accounting emphasizes the measurement of profitability, while cost accounting aims

at ascertainment of costs and accumulates data for this very purpose.

4. Financial accounts disclose the net profit and loss of the business as a whole, whereas cost accounts disclose profit or loss of each product, job or service. This enables the management to eliminate less profitable product lines and maximize the profits by concentrating on more profitable ones.

5. Financial accounting provides operating results and financial position usually gives information through cost reports to the management as and when desired.

6. Financial accounts deal mainly with actual facts and figures, but cost accounts deal partly with facts and figures, but cost accounts deal with facts and figures and partly with estimates.

7. In case of financial accounts stress is on the ascertainment and exhibition of profits earned or losses incurred in the business. On account of this reason in financial accounts, the transactions are recorded, classified and analyzed in a subjective manner i.e. according to the nature of expenditure. In cost accounts the emphasis is more on aspects of planning and control and therefore transactions are recorded in an objective manner.

8. Financial accounts are concerned with external transactions i.e. transactions between the business concern on one side and third parties on the other. These transactions form the basis for payment or receipt of cash. While cost accounts are concerned with internal transactions which do not form the basis of payment or receipt of cash.

9. The costs are reported in aggregate in financial accounts but costs are broken into unit basis in cost accounts.

10. Financial accounts do not provide information on the relative efficiencies of various workers, plants and machinery while cost accounts provide valuable information on the relative efficiencies of various plants and machinery.

11. In financial accounts stocks are valued at cost or market price whichever is less, whereas stocks are valued at cost price in cost accounts.

## **1.7 Difference between Management Accounting and Cost Accounting.**

### Objective:

The objective of cost accounting is the ascertainment and control of costs of products or services. But the objective of management accounting is to help the management in the decision-making.

### Scope:

Cost accounting deals with cost data. But management accounting deals with both cost and

revenue. It includes financial accounting, cost accounting, budgeting, reporting to management and interpretation of financial data. Thus, the scope of management accounting is wider than that of cost accounting,

Data used:

In cost accounting only those transactions, which can be expressed in figures are taken. But management accounting uses both quantitative and qualitative information.

Nature:

Cost accounting uses both Past and recent figures. But management accounting is concerned with the projection of figures as guidelines.

Parties:

The facts and data, provided by cost accounting, are Preferred by both internal as well as external parties whereas the furnished by management accounting is useful only the management .

Cost Analysis

## **1.8 Importance of Cost Accounting**

The limitations of financial accounting have made the management to realize the importance of cost accounting. Whatever may be the type of business, it involves expenditure on labour, materials and other items required for manufacturing and disposing of the product. The management has to avoid the possibility of waste at each stage. It has to ensure that no machine remains idle, efficient labour gets due incentive, by-products are properly utilized and costs are properly ascertained. Besides the management, the creditors and employees are also benefited in numerous ways by installation of a good costing system. Cost accounting increases the overall productivity of an organization and serves as an important tool, in bringing prosperity to the nation, thus, the importance of cost accounting can be discussed under the following headings:

**a) Costing as an aid to management:-** Cost accounting provides invaluable aid to management. It provides detailed costing information to the management to enable them to maintain effective control over stores and inventory, to increase efficiency of the organization and to check wastage and losses. It facilitates delegation of responsibility for important tasks and rating of employees. For all these the management should be capable of using the information provided by cost accounts in a proper way. The various advantages derived by the management from a good system of costing are as follows:

1. Cost accounting helps in periods of trade depression and trade competition. In periods of trade



depression, the organization cannot afford to have wastages which pass unchecked. The management must know areas where economies may be sought, waste eliminated and efficiency increased. The organization must wage a war not only for its survival but also continued growth. The management should know the actual cost of their products before embarking on any scheme of price reduction. Adequate system of costing facilitates this.

2. Cost accounting aids price fixation. Although the law of supply and demand determines the price of the product, cost to the producer does play an important role. The producer can take necessary guidance from his costing records in case he is in a position to fix or change the price charged.

3. Cost accounting helps in making estimates. Adequate costing records provide a reliable basis for making estimates and quoting tenders.

4. Cost accounting helps in channelizing production on right lines. Proper costing information makes it possible for the management to distinguish between profitable and non-profitable activities; profits can be maximized by concentrating on profitable operations and eliminating non-profitable ones.

5. Cost accounting eliminates wastages. As cost accounting is concerned with detailed breakup of costs, it is possible to check various forms of wastages or losses.

6. Cost accounting makes comparisons possible. Proper maintenance of costing records provides various costing data for comparisons which in turn helps the management in formulating future lines of action.

7. Cost accounting provides data for periodical Profit and Loss Account. Adequate costing records provide the management with such data as may be necessary for preparation of Profit and Loss Account and Balance Sheet at such intervals as may be desired by the management.

8. Cost accounting helps in determining and enhancing efficiency. Losses due to wastage of materials, idle time of workers, poor supervision etc will be disclosed if the various operations involved in the production are studied carefully. Efficiency can be measured, cost controlled and various steps can be taken to increase the efficiency.

9. Cost accounting helps in inventory control. Cost accounting furnishes control which management requires, in respect of stock of materials, work in progress and finished goods.

**b) Costing as an aid to Creditors.** Investors, banks and other money lending institutions have a stake in the success of the business concern are therefore benefitted immensely by the installation of an efficient system of costing. They can base their judgment about the profitability

and future prospects of the enterprise on the costing records.

**c) Costing as an aid to employees.** Employees have a vital interest in their employer's enterprise **in which they are employed.** They are benefited by a number of ways by the installation of an efficient system of costing. They are benefited, through continuous employment and higher remuneration by way of incentives, bonus plans, etc

**d) Costing as an aid to National Economy** An efficient system of costing brings prosperity to the business enterprise which in turn brings prosperity to the business enterprise which in turn results in stepping up of the government revenue. The overall economic development of a country takes place as a consequence of increase in efficiency of production. Control of costs, elimination of wastages and inefficiencies led to the progress of the industry and, in consequence of the nation as a whole.

### **1.9 Classification of Cost**

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

**1. By Nature or Elements.** According to this classification the costs are classified into three categories i.e., Materials, Labour and Expenses. Materials can further be sub-classified as raw materials components, spare parts, consumable stores, packing materials etc. This helps in finding the total cost of production and the percentage of materials (labour or other expenses) constituted in the total cost. It also helps in valuation of work-in-progress.

**2 By Functions:** This classification is on the basis of costs incurred in various functions of an organization 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 in direct 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:** 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.

### **1.10 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.

(b) **Batch 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**: 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

### **1.11 Installation of Costing System**

While installing a cost system, the cost accountant should consider the following factors :

(1) **Objectives of Costing System**: While installing a cost accounting system, it should be ensured that it will aid in ascertainment of cost, determination of selling price, cost control and cost reduction etc.

(2) **Nature of Business**: Cost Accounting system should be suited to the nature of products and business. The nature of product and business is essential to determine proper method of costing on the basis of types of product, methods and product life cycle, quantity, quality etc.

(3) **Nature of Organization**: It is essential to examine existing organization structure of the company before introducing the costing system. Since the system is to be designed to suit the organization it is necessary to ascertain the layout, nature and size of the organization, scope of authority and responsibility.

(4) **Methods and Procedures**: Before introducing the costing system, the Cost

Accountant should carefully study the existing manufacturing procedures, processes, methods, system of wage payments, receipts and issue of materials. This will help him to select the proper method of costing.

(5) Communication: A good system of cost accounting will provide information which helps in decision making. Cost information should be made available promptly and regularly. It is necessary to examine the prompt reporting system.

(6) Standardization: The system should be introduced after a detailed study of the standardization. Standard Forms should be used in order to reduce clerical work to the minimum.

(7) Simplicity: The system to be adopted should be simple and easy to adopt to the changing requirement. The costing system should be capable of being understood by the operating personnel.

(8) Co-operation: There is need for co-operation and support of the various departments involved in the cost accounting process for being successfully implemented.

(9) Reconciliation: Emphasis should be on whether separate set of cost and financial books are required or an integrated system has to be followed. This depends upon the nature and size of the industry. Where cost books are maintained independently of financial records there must be provision for reconciliation between the cost and financial records.

### **Practical Difficulties in Installing Costing System**

The following are the practical difficulties confronted in installing a costing system : (1) Lack of top management support.

(2) Resistance from accounting departmental staff. (3) Non co-operation from user departments.

(4) Shortage of trained staff in costing department.

(5) Heavy cost of installing the system.

### **Steps to Overcome Practical Difficulties**

To overcome these difficulties, the steps required are given below:

(1) To sell the idea to top management to convince them of the utility of the system.

(2) Resistance and non co-operation can be overcome by behavioural approach to deal with the staff concerned effectively.

(3) Proper training should be given to the staff at each level.

(4) Regular meetings should be held with the cost accounting staff, user departments staff and top management to clarify points.

### **1.12 Characteristics of an Ideal Costing System (or) Requisites' of good costing system**

An ideal system of costing is that which achieves the objectives of a costing system and brings all advantages of costing to the business. Following are the main characteristics which an ideal system of costing should possess or the points which should be taken into consideration before installing a costing system.

#### **(i) Suitability to the Business:**

A costing system should be tailor-made, practical and must be devised according to the nature, conditions, requirements and size of the business. Any system which serves the purposes of the business and supplies necessary information for running the business efficiently is an ideal system.

#### **(ii) Simplicity:**

The system of costing should be simple and plain so that it may be easily understood even by a person of average intelligence. The facts, figures and other information's provided by cost accounting must be presented in the right form at the right time to the right person in order to make it more meaningful.

#### **(iii) Flexibility:**

The system of costing must be flexible so that it may be changed according to changed conditions and circumstances. The system without such flexibility will be outmoded because of fast changes in business and industry. Thus, the system must have the capacity of expansion or contraction without much change.

#### **(iv) Economical:**

A costing system is like other economic goods. It costs money just like economic goods. If the system is too expensive, management may be unwilling to pay as buyers are not willing to pay for the goods if these are expensive as compared to their utility. A costing system should not be expensive and must be adapted according to the financial capacity of the business.



The benefits to be derived from the system must be more than its costs as management will be willing to install the system when its perceived expected benefits exceed its perceived expected costs. In short, the system must be economical taking into consideration the requirements of the business. The cost of installing and operating the system should justify the results.

**(v) Comparability:**

The costing system must be such so that it may provide facts and figures necessary to management for evaluating the performance by comparing it with the past figures, or figures of other concerns or against the industry as a whole or other department of the same concern.

**(vi) Capability of Presenting Information at the Desired Time:**

The system must provide accurate and timely information so that it may be helpful to management for taking decisions and suitable action for the purpose of cost control.

**(vii) Necessary cooperation and participation** of executives from various departments of the concern is essential for development of a good system of cost accounting. Moreover, management should have faith in the costing system and should also provide a helping hand for its development and success.

**(viii)** The system of costing should not **sacrifice** the utility by introducing meticulous and unnecessary details.

**(ix)** A **carefully phased programme** should be prepared by using network analysis for the introduction of the system.

**(x) Minimum Changes in the Existing Set Up:**

The existing system of delegation and division of authority and responsibility must not be disturbed with the costing system. As far as possible the system must be such so that it may least disturb the existing organisational set up.

**(xi) Uniformity of Forms:**

All forms and proformas etc necessary to the system should be uniform in size and quality of paper. Higher efficiency can be obtained by using colour of the paper to distinguish different forms. Printed forms should contain instructions as to their use and disposal. Forms should be suitably designed for collection and dissemination of cost data.

**(xii) Minimum Clerical Work:**

The filling of the forms by foremen and workers should involve as little clerical work as possible as most of workers are not well educated. To ensure reliable statistics, every original entry should be supported by an examiner's signatures.

**(xiii) Efficient System of Material Control:**

There should be an efficient system of stores and stock control as materials usually account for a greater proportion of the total cost. A good method of pricing material issued to production should be followed.

**(xiv) Adequate Wage Procedure:**

There should be a well defined wage procedure for recording the time spent by workers on different jobs, for preparing the wage sheets and for the payment of wages. Thus the introduction of well defined wage system will help to control the cost of labour.

**(xv) Departmentalization of Expenses:**

A sound plan should be devised for the collection, allocation, apportionment and absorption of overheads in order to ascertain the cost accurately.

**(xvi) Reconciliation of Cost Accounts and Financial Accounts:**

If possible the Cost accounts and financial accounts should be interlocked into one integral accounting scheme. If this is not possible the systems should be so devised that the two sets of accounts are capable of easy reconciliation.

**(xvii) External Factors:**

The installation of a costing system mainly depends on internal factors of a firm, but external factors may also affect the structure of the system. For example, cost accounting rules applicable to certain industries as notified by the Central Government require certain cost information to be developed and included in the books of accounts. Therefore, an ideal system of costing should take care of internal as well as external factors.

**(xviii) Duties and Responsibilities of the Cost Accountant:**

Under a good system of cost accounting the duties and responsibilities of the cost accountant should be clearly defined. The cost accountant should have access to all works and departments

**1.13 Cost analysis** (CA), sometimes called **benefit–cost analysis** (BCA), is a systematic approach to estimating the strengths and weaknesses of alternatives that satisfy transactions, activities or functional requirements for a business.

### **Importance of Cost analysis**

#### Evaluate Projects

A cost-benefit analysis is used to evaluate the risks and rewards of projects under consideration. It can be used to project the potential benefits of investing in marketing ideas, product development, infrastructure enhancements and operational changes. If all potential costs are tallied accurately and the benefits outweigh the costs, the considered investment may be a good choice.

#### Prepare Budgets and Sales Projections

The information obtained during a cost-benefit analysis makes budgeting easier. If you have all the possible costs listed, you can project the budget needed to undertake the project. The anticipated benefits can also be used to project sales if they can be quantified into financial goals. Both of these considerations are useful when preparing budgets and sales projections.

#### Prioritize Investments

Cost-benefit analysis is useful for business owners who must choose among several potential projects. After examining profitable projects for potential benefits, you can prioritize investments, choosing the projects with the greatest benefit and lowest cost to invest in first. In this way, you can achieve the fastest return on your investment and use remaining capital to fuel additional projects.

#### Establish Goals

Once the benefits of possible projects are understood, they can be used to set benchmarks and goals for the project itself. Quantifiable benefits can be used to set concrete revenue goals. Other benefits can be used to set productivity, time or other management goals. Goals can be set for various types of projects, including marketing, finance, management and human resources.

### 1.14 Cost center

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 centers 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 centers for cost purposes.
4. Availability of information
5. Management policy regarding making a particular choice from several alternatives

**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.

<b><u>Industry/product</u></b>	<b><u>Cost unit basis</u></b>
Automobile	Numbers
Brick works	per 1000 bricks
Cement	per Tonne
Chemicals	Litre, gallon, kilogram, ton
Steel	Tonne
Sugar	Tonne
Transport	Passenger-kilometre, tonne kilometer

### **1.15 Profit center**

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 centers are created to delegate responsibility to individuals and measure their performance.

Difference between Profit centre and Cost centre

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

(i) Cost centers are created for accounting conveniences of costs and their control whereas as a profit centre is created because of decentralization of operations i.e., to delegate responsibility to individuals who have greater knowledge of local conditions etc.

(ii) Cost centers are not autonomous whereas profit centers are autonomous.

(iii) A cost centre does not have target cost but efforts are made to minimize costs, but each profit centre has a profit target and enjoys authority to adopt such policies as are necessary to achieve its targets.

(iv) There may be a number of cost centers in a profit centre in a profit centre as production or service cost centers or personal or impersonal but a profit centre may be a subsidiary company within a group or division in a company.

## **Question Bank**

### **Unit -1**

### **Part-A**

1. Define the term „costing“
2. What is cost accounting?
3. What is fixed cost and variable cost?
4. State the functions of cost accounting
5. State the objectives of cost accounting
6. What are the advantages of cost accounting?
7. List the limitations of cost accounting
8. Write short notes on profit centers?
9. What is controllable cost and uncontrollable cost?
10. Write a short note on cost centers.

### **Unit-I**

### **Part B**

1. Briefly discuss the requisites of a good costing system.
2. Explain the nature and scope of cost accounting.
3. Discuss the necessary steps to install the costing system.
4. Discuss the advantages of cost accounting.
5. Explain the difficulties in installing a costing system.
6. Broadly discuss the classification of cost.
7. Differentiate financial accounting and cost accounting.
8. How to overcome the practical difficulties in installing a costing system?
9. Explain the objection to cost accounting.
10. Discuss the methods of costing.



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## SCHOOL OF MANAGEMENT

### UNIT II - COST ACCOUNTING - SBAX1018

## **UNIT 2 COST SHEET**

Cost sheets, tenders and quotations. - Reconciliation of cost and financial accounts.

### **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 period's 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 detail of total cost 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.

### **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.

### **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.

### **2.1 Importance of Cost Sheet**

The importance of cost sheet is as follows:

#### **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.

#### **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.

#### **Help in cost control**

For controlling the cost of a product it is necessary for every manufacturing unit to prepare a cost



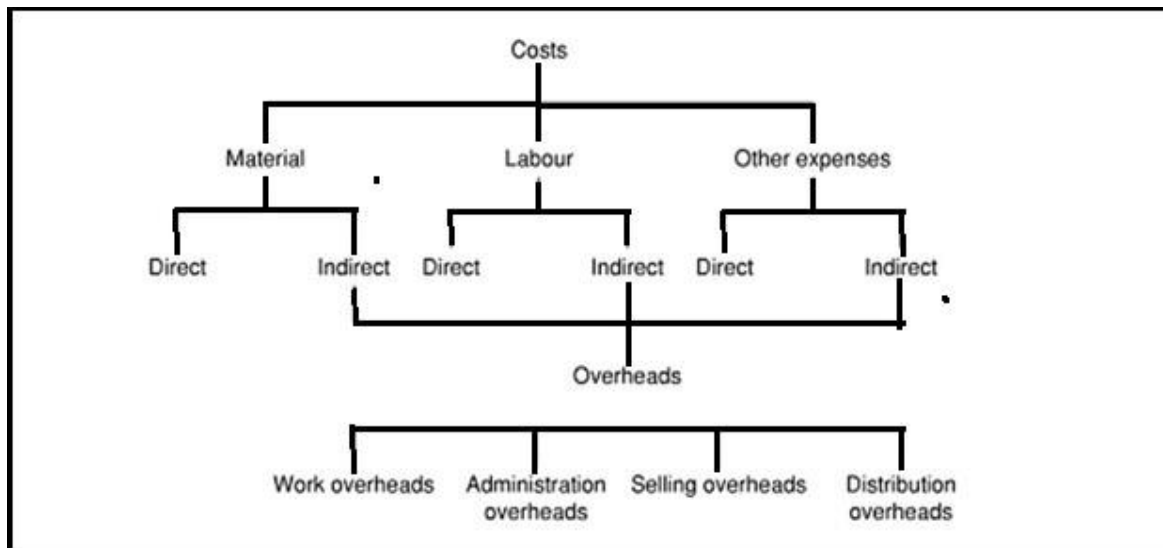
sheet. Estimated cost sheet helps in the control of material cost, labour cost and overheads cost at every point of production.

### **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.

## **2.2 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 ie by the nature of expenses. The elements of costs are three and they are



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

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
- The difference between the cost of sales and selling price represents profit or loss.

**Working Problem 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.

**Solution:**

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.37,000 + 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.

These terms can be explained as follows

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 tires 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.

## **2.3 Types of Overheads**

According to functions, classification of overhead expenses may be done as follows:

### **(i) Factory or Works Overhead**

Factory or works overhead refers to all indirect expenses of a factory. It includes the following:

- Wages of all factory staff excluding those of direct workers
- Indirect material
- Rent for factory
- Rates for factory
- Taxes of factory
- Depreciation of factory assets
- Excise duty
- Canteen expenses
- Labor welfare expenses

### **(ii) Administration Overhead**

It refers to all the expenses incurred in connection with general administration. In administrative building, following things are included:

- Salary of administrative staff
- Rent for office
- Rates for office
- Taxes of administrative accommodation
- Postage
- Telegram and telephone
- Stationery
- Lighting of administrative building
- Depreciation of office appliances

### **(iii) Selling Overhead**

Selling overhead refers to all expenses incurred in connection with sales. In selling overhead, following things are included:

- Salary of sales staff
- Traveler's commission
- Advertisement
- Rent for showroom
- Rates for showroom or sales shop
- Taxes of sales office
- Depreciation of sales office appliances
- Cost of participation in industrial fares and exhibitions
- Cost of free gifts
- Cost of free after sales service
- Normal bad debt

**(iv) Distribution Overhead**

Distribution overhead refers to all the expenses incurred in connection with the delivery of a product after the sale is affected. In distribution overhead, following things are included:

- Delivery van expenses
- Fright and insurance
- Packing for delivery loading and unloading
- Salary of the deliverymen
- Customs duty

According to behavior, classification of overhead expenses may be done as follows:

**a. Variable Overhead**

The overhead expenses that vary proportionately with the output are variable overhead.

**b. Semi-Variable or Semi-Fixed Overhead**

The overhead expenses that vary with the output but not proportionately are semi- variable or semi-fixed overhead.

It should be always kept in mind that in this connection direct materials, direct wages and direct expenses are variable items of direct cost. Therefore, if we classify cost according to behavior, we get the following classification:

**a. Fixed Costs**

Fixed costs include only those overhead expenses which remain fixed irrespective of the level of output. Some of the items of fixed costs are as follows:

- ☐ Rent and rate of building
- ☐ Salary of work mangers, administrative manager, sales managers
- ☐ Depreciation of buildings
- ☐ Insurance

**b. Variable costs**

Variable costs include prime cost and variable overheads. These costs vary proportionately with the output. Some of the items of variable costs are as follows:

- Direct material
- Direct wages
- Direct expenses
- Consumable stores
- Power
- Fuel

**c. Semi-Variable Costs**

Semi-variable costs include overhead expenses that vary according to output but not proportionately, so these costs are partly fixed and partly variable. Some of the items of semi-variable costs are as follows:

- Normal repairs and maintenance of building and plant
- Salary of supervisors
- Charge men
- Foremen
- Service department expenses
- Depreciation of plant and machinery

Consider the element repairs. Normal repair is mostly fixed in nature because within a certain degree of capacity, utilization is beyond that degree. More frequent repairs will be necessary involving further cost. But still, such an increase in cost will not be proportionate to an increase in output. This is why the element is semi-fixed or semi- variable.

**Preparation of Cost sheet or Statement of Cost:** 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.

Raw materials are converted into finished products by a manufacturing concern with the help of labor, plants etc. The elements that constitute the cost of manufacturing are known as

Direct material, direct labor and direct expenses are those which can be traced in relationship with a particular process, job, operation or product. Indirect material, indirect labor and indirect expenses are those which are of general nature and cannot be traced in relationship with a particular process, operation, job or product.

## 2.4 Specimen of Cost Sheet

	Total Cost Rs.	Cost per Unit Rs.
Direct Materials	xxx	xxx
Direct Labour	xxx	xxx
Prime cost	xxx	xxx
Add: Works Overheads	xxx	xxx
Works Cost	xxx	xxx
Add: Administrative Overheads	xxx	xxx
Cost of Production	xxx	xxx
Add: Selling and Distribution Overheads	xxx	xxx
Total Cost or Cost of Sales	xxx	xxx

### Working Problem : 2

A manufacturer has shown an amount of Rs. 16190 in his books as “establishment” which includes the following expenses:

- Agents commission-- Rs. 5750
- Warehouse wages-- Rs. 1800
- Warehouse repairs-- Rs. 510
- Lighting of office-- Rs. 70
- Office salaries-- Rs. 1130
- Director's remuneration-- Rs. 1400
- Traveling expenses-- Rs. 760
- Rent, rates and insurance of warehouse-- Rs. 310
- Rent, rates and insurance of office-- Rs. 230
- Lighting of warehouse-- Rs. 270
- Printing and stationery-- Rs. 1500
- Trade magazines-- Rs. 70
- Donations-- Rs. 150
- Bank charges-- Rs. 100
- Discount allowed-- Rs. 1970
- Bad debts-- Rs. 170

From the above information, prepare a statement showing the following (in separate totals):

- Selling expenses
- Distribution expenses
- Administration expenses
- Expenses which you will exclude from total cost

**Solution:**

Statement of Cost		
	Rs.	Rs.
<b>Selling expenses:</b>		
Agents' commission	5,750	
Traveling expenses	760	
Bad debts	170	
		6,680
<b>Distribution expenses:</b>		
Warehouse wages	1,800	
Warehouse repairs	510	
Rent, rates and insurance of warehouse	310	
Lighting of warehouse	270	
		2,890
<b>Administration expenses:</b>		
Lighting of office	70	
Office salaries	1,130	
Directors' remuneration	1,400	
Rent, rates and insurance of office	230	
Printing and stationery	1,500	
Trade magazines	70	
Bank charges	100	
		4,500
Total expenses to be considered in estimation costs		1,4,070
<b>Expenses to be excluded form costs:</b>		
Donations	150	
Discount allowed	1,970	2,120
Total		1,6,190

**Working Problem: 3**

ABC Ltd., a manufacturing company, incurred the following expenses during a certain period. You are required to prepare a statement showing the subdivision of total cost.



	Rs.		Rs.
Materials used on jobs	1,20,540	Depreciation of plant	3,800
Wages traceable to jobs	86,650	Depreciation of delivery vans	1,600
Wages paid to men for maintenance work	1,26,00	Insurance on finished goods	2,500
Salaries of sales men	15,100	Lubrication oil	250
Directors' fees	10,000	Bad debts	300
Carriage inwards on raw materials	860	Commission to salesmen	2,850
Carriage outwards	2,800	Cost of idle time in factory	510
Factory rent and rates	8,300	Auditors fees	3,800
Works salaries	20,400	Dividends paid	6,800
Hire of crane for work	1,300	Lighting of showroom	1,500
Consumable stores	340	Office salaries and expenses	7,000
		Income tax	8,600

**Solution:**

**Statement of Cost**

	Rs.	Rs.
Direct materials	120540	
Add: carriage inwards	860	121400
Direct wages		86650
Direct expenses (hire of crane for work )		1300
<b>Prime Cost</b>		<b>209350</b>
<u>Works overhead</u>		
Wages paid to men on maintenance work	12600	
Factory rent and rates	8300	
Works salaries	20400	
Consumable stores	340	
Depreciation of plant	3800	
Lubricating oil	250	
Cost of idle time in factory	510	46200
<b>Works cost</b>		<b>255550</b>
<u>Administration overhead</u>		
Directory fees	10000	
Auditors fees	3800	
Office salaries and expenses	7000	20800
<b>Cost of production</b>		<b>276350</b>
<u>Selling and distribution overhead</u>		
Salaries of salesmen	15100	

Carriage outwards	2800	
Depreciation of delivery vans	1600	
Insurance of finished goods	2500	
Commission to sales men	2850	
Lighting of showroom	1500	
Bad debts	300	26650
<b>Total Cost</b>		<b>303000</b>

## 2.5 Tender and Quotation

It usually refers to the process whereby governments and financial institutions invite bids for large projects that must be submitted within a finite deadline. The term also refers to the process whereby shareholders submit their shares or securities to a takeover offer.

### Definition:

A **quotation** is a document that offers to sell goods or services at a stated price, under specified conditions. **Quotations** are used to let a potential buyer know how many your goods or services will cost before committing to purchase them.

To invite bids for a project, or to accept a formal offer such as a takeover bid. **Tender** usually refers to the process whereby governments and financial institutions invite bids for large projects that must be submitted within a finite deadline.

In order to prepare the tender the following items to be analyzed

- 1.Raw materials,
- 2.Direct Labour
- 3.Chargable expenses
- 4.Work overheads
- 5.Office overheads
- 6.Selling overheads
- 7.Estimated profit

### PREPARATION OF A PRICE LIST

Most businesses will need to draw up a price list at some stage. If you sell a fixed range of products, this may be the only form of pricing you need. This type of standard price list can also be used as the basis for pricing your non-standard orders.

It's a good idea to **date your price lists** - particularly if your customer is likely to keep it for a long time. You should make it clear when any special offers expire. It can also be useful to include a clause at the end of the price list stating that prices are subject to change.

We should make clear whether any **delivery, packing or postage** costs are included in your prices. Additionally, although you don't have to indicate discounts for bulk purchases on your price list, it might attract more business.

We may be able to use **software** packages such as Sage Simply Accounting to help you draw up complex price lists.

### **THE DIFFERENCE BETWEEN A QUOTATION AND AN ESTIMATE**

It's impossible for some businesses to give standard prices for goods and services. This may be because the skills, time and materials required for each job vary depending on different customers' needs.

This situation is more common in some trades than others - decorators or builders, for example, rarely do exactly the same job twice. When it's not possible to work from a standard price list, you have to give a quotation or an estimate instead.

A **quotation** is a fixed price offer that can't be changed once accepted by the customer. This holds true even if you have to carry out much more work than you expected.

An **estimate** is an educated guess at what a job may cost - but it isn't binding. To take account of possible unforeseen developments, you should provide several estimates based on various circumstances, including the worst-case scenario. This will prevent your customer from being surprised by the costs.

### **PREPARATION OF A WRITTEN ESTIMATE**

When you prepare an estimate it's good practice to give the customer a **written copy**, including a full **breakdown** of costs.

Our estimate should include the:

- Overall price
- Breakdown, listing the components of the price, schedule, detailing when work will be done or products delivered
- Terms and conditions
- Time period the estimate is valid for

- Payment terms or schedule

We must include our full business contact details in our estimates. If we have letterhead, it's a good idea to put our estimates on this.

Include a disclaimer stating clearly that the estimate's price is **subject to change**. Agree in advance how any variations will be costed. These can arise if the client changes their requirements or if a job turns out to be more complicated than expected.

## **PREPARATION OF A WRITTEN QUOTATION**

Quotations commit you to the price you specify, so they are usually used when:

- The work you're quoting for has clear requirements - in terms of time, labour, materials, etc. our costs are stable and our confident in the work won't turn out to be more complicated than expected.

It's good practice to give your customers a **written quotation**. This should include the:

- Overall price
- Breakdown of the components of the price, indicating what is covered and what is not
- Period the quotation is valid for
- Schedule for when the work will be done or products delivered
- Full contact details of your business
- Payment terms or schedule

It's also advisable to get your customer's **written confirmation** that they're happy with the price you have quoted and the work that this includes. This should be done before you carry out the work, or provide the goods or services.

Computer **software** can be used to help you determine the costs involved in any work for which you're drawing up a quotation. Many accounting and spreadsheet packages can be used for this.

## **2.6 Process of Inviting or preparing a Tender**

Invitations to tender should normally consist of the following sections; it will however depend upon the complexity of the requirement.

Part 1 - Defines the contract, giving details of timescales for commencement and completion

Part 2 - Contains the “Conditions of Contract” wherein the commercial details are explained in simple language; where appropriate the draft contract can be included.

Part 3 - Should be a pricing schedule

Part 4 - Will give details of the scope of the work or services or the quantity and frequency of requirements of goods or services to be supplied.

Part 5 - Depending on the size of the contract, should highlight all procedural requirements, such as third party inspection, variations if any, the communication route and names of people involved in discharging contractual requirements and so on.

Part 6 - The specification; if a “Technical” specification this should give full details of the work, supply or service to be undertaken; current preference is for this to be a “performance” or “functional” specification, which allows freedom of choice to the bidder as to how best to meet the requirement.

Part 7 - Any drawings and/or plans required to allow bidders to ensure their offered goods or service comply, not only to the specification, but also to those drawings originally issued as part of the Technical Specification.

Part 8 - Should contain details of free issue goods, if any, and the arrangement for such free issue.

Part 9 - Gives details of submission of bids, such as time and precise location, that late bids will not be accepted, the date of bid opening and whether it will be open or closed. Open bidding is where all bidders have the option of being present to view and note total prices submitted by all bidders. Often used overseas as a means of avoiding accusations of corrupt practices as only those bids opened, registered, and with their total cost announced, will be considered in the evaluation process. Where appropriate, information should be included on the tender evaluation methods that should be adopted.

Part 10 - Will detail the terms and conditions anticipated in any resultant contract, so that bidders may take any “special” conditions into consideration when compiling their tender. All invitations to tender for a specific product or service must be identical on issue.

## **2.7 Tender opening**

The Tender Board can be a standing group. It might consist of a board member as chairman, the purchasing director, probably a technical expert, and a non-aligned person to act as secretary.

To ensure equality of treatment of all tenders, the Tender Board meets on the nominated day, at the nominated time, in a location suitable to accommodate all interested parties, if a public opening. If not, in a closed office. All bids are date and time stamped and recorded, with total costs noted.

Late tenders or bids should preferably not be opened but should be date and time stamped and returned to the bidder with a letter of explanation. It may be that in some companies ALL tenders

are opened and those which were late, annotated as such, and kept separate from valid bids, submitted within the timescale stipulated.

## **2.8 Tender evaluation**

The bid analysis team, as identified in the introduction to this guide (as the Procurement Project Team), have now to assess all components of all bids. Firstly to ensure the bid is compliant, and that all parts are complete, then to compare and assess all parts, to identify the best value for money bid overall. It is most important to ensure that the necessary skills are included in the team. For example, a financial expert, a technical expert, a purchasing expert and, if necessary, a commercial or legal expert.

The process must follow a defined pattern to which all participants subscribe, to ensure all bids are dealt with in exactly the same way. The methods for comparison have to be fair, thorough and demonstrably so, should inspection take place.

## **2.9 Components of a tender**

The following is a check list of some of the aspects which, depending on the nature of the requirement, might need to be considered for inclusion in an invitation to tender:

- The scope and/or functions of the work or service required
- The output required
- The quality expected
- Estimated maintenance requirements when appropriate
- The number or amount
- Any standards required to be achieved, or applied
- Timescales • start date required
- Finish date if “time is of the essence”
- A schedule of deliveries
- Any inspection required and at what stages
- Details of free issue materials
- Accommodation details for installation
- Insurance cover required for contractors
- Costs in use of components or complete product where appropriate
- Response times
- Details of measurement of the work

## 2.10 Reconciliation of Cost and Financial Accounts

### Meaning

In business concern where Non-integrated Accounting System is followed, cost and financial accounts are maintained separately, the difference between the end result of these two are required to be reconciled. Reconciliation of cost and financial accounts mean tallying the profit or loss revealed by both set of accounts. The chief aim is to find out the reasons for the difference between the results shown by Cost Accounts and Financial Accounts.

### Reasons for the Difference

The various reasons which create difference between cost and financial profit or loss shown by the two set of books may be listed under the following heads :

- (1) Items shown only in Financial Accounts
- (2) Items shown only in Cost Accounts
- (3) Absorption of Overheads
- (4) Methods of Stock Valuation
- (5) Abnormal Loss and Gains

**(1) Items shown only in Financial Accounts:** Some items of income and expenses which are included only in financial accounts but are not shown in cost accounts and vice versa. The following items are shown in financial accounts but not in cost accounts:

#### **(A) Income:**

- (1) Profit on sale of fixed assets
- (2) Interest received on investment
- (3) Dividend received on investment
- (4) Rent, brokerage and commission received
- (5) Premium on issue of shares
- (6) Transfer fees received.

#### **(B). Expenditure:**

- (1) Loss on sale of fixed assets, e.g., Plant, Machinery, Building
- (2) Interest paid
- (3) Discount paid
- (4) Dividend paid
- (5) Losses due to scrapping of plant and machinery

- (6) Penalties and fines
- (7) Expenses of shares' transfer fees
- (8) Preliminary expenses written off
- (9) Damages payable at law.

**(2) Items shown only in Cost Accounts:** There are some items which are recorded only in Cost Accounts but are not included in financial accounts, notional interest on capital, notional rent of premises owned, salary to proprietor etc. are not recorded in financial account because the amount is not actually spent or paid. These expenses reduced the profit in cost account while in financial account it may be the reverse effect.

**(3) Absorption of Overheads :** In financial accounts actual amount of expenses paid are recorded while in cost accounts overheads are charged at predetermined rates. If overhead charged are not equal to the amount of overhead incurred the under or over absorption of overhead leads to difference in profits of two accounts.

**(4) Methods of Stock Valuation:** The term stock refers to opening or closing stock of raw materials, work in progress and finished goods. In financial accounts stocks are valued at cost price or market price whichever is lower. In Cost Account; stock of raw materials can be valued on the basis of FIFO, LIFO and Simple Average Method etc., and work in progress may be valued at Prime Cost or Work Cost. Finished stocks are generally valued on the basis of cost of production. Thus, the adoption of different method of valuation of stock leads to difference in profits of two sets of accounts.

**(5) Abnormal Losses and Gains:** Different items of abnormal wastages, losses or gains which are included in financial accounts but are not recorded in cost accounts. Thus, the figures of abnormal losses and gains may affect the results in financial accounts alone.

## Importance of Reconciliation

Reconciliation of cost and financial account is necessary for the following reasons:

- (1) To ensure arithmetical accuracy of both set of accounts for effective cost ascertainment and cost control.
- (2) To identify the reasons for different results.
- (3) To evaluate the reasons for variations
- (4) To enable the smooth co-operation and co-ordination between the activities of cost and financial accounting departments.
- (5) To ensure the standardization of policies relating to stock valuation, depreciation and absorption of overheads.



### Format of Reconciliation Statement

Particulars	Amt.Rs.	Amt.
Profit/Loss as per Cost Sheet (A)		xxxx
<b>ADD: (I) Financial Income which are ignored in Cost Account</b>		
Interest received	xxxx	
Dividend received	xxxx	
Share transfer fee	xxxx	
Rent received	xxxx	
Profit of asset sold	xxxx	
<b>(II) Over valuation of Overhead Expenses in Cost Account</b>		
Factory overheads	xxxx	
Administrative overheads	xxxx	
Selling & Distribution overheads	xxxx	
<b>(III) Over valuation of closing stock in Cost Account(B)</b>	xxxx	xxxx
<b>Grand Total (A+B)=C</b>		<b>xxxxx</b>
<b>LESS : (I) Financial expenditure which are ignored in Cost Acc.</b>		
Income Tax	xxxx	
Penalty	xxxx	
Donation	xxxx	
Goodwill written off	xxxx	
Preliminary expenses written off	xxxx	
Debenture discount written off	xxxx	
Bad debt reserve	xxxx	
Loss of Assets sold	xxxx	
<b>(II) Under valuation of overhead expenses in Cost Account</b>		
Factory overheads	xxxx	
Administrative overheads	xxxx	
Selling & Distribution overheads	xxxx	
<b>(III) Under valuation of closing stock in Cost Account (D)</b>	xxxx	xxxx
<b>Profit/Loss as per Financial Account(C-D)</b>		<b>xxxxx</b>

#### Working problem: 4

From the following particulars, prepare a Cost Sheet showing (1) Cost of Materials Consumed (2) Prime Cost (3) Factory Cost (4) Cost of Production and (5) Profit

Opening stock of raw materials	20,000
Opening stock of work in progress	10,000
Opening stock of finished goods	50,000
Raw materials purchased	5,00,000
Direct wages	3,80,000
Sales for the year	12,00,000
Closing stock of raw materials	75,000
Closing stock of work in progress	15,000
Factory overhead	80,000
Direct expenses	50,000
Office and Administrative overhead	60,000
Selling and Distribution expenses	30,000

Solution:

Opening Stock of Raw Materials	20,000	
Purchases	5,00,000	
	<b>5,20,000</b>	
Less : Closing Stock of Raw Materials	75,000	
<b>Cost of Raw Materials Consumed (1)</b>		<b>4,45,000</b>
Add : Direct Wages	3,80,000	
Direct Expenses	50,000	<b>4,30,000</b>
<b>Prime Cost (2)</b>		<b>8,75,000</b>
Add : Factory overheads	80,000	
Add: Opening stock of work in progress	10,000	
	<b>90,000</b>	
Less: Closing stock of Work in Progress	15,000	<b>75,000</b>
<b>Works Cost (or) Factory Cost (3)</b>		<b>9,50,000</b>
Add: Office & Administrative Overhead		60,000
<b>Cost of Production (4)</b>		<b>10,10,000</b>
Add: Opening Stock of Finished Goods		50,000
		<b>10,60,000</b>
Less: Closing Stock of Finished Goods		50,000
<b>Cost of Goods Sold (5)</b>		<b>10,10,000</b>
Add : Selling and Distribution Overhead		30,000
<b>Cost of Sales (6)</b>		<b>10,40,000</b>
<b>Profit (7)</b>		<b>1,60,000</b>
Sales for the year		12,00,000

## **Methods of Reconciliation**

For reconciling the profit or loss as disclosed by the financial accounting with that shown by the cost accounting, a Reconciliation Statement or Memorandum of Reconciliation Account is prepared.

The following steps have to be taken for preparation of Reconciliation Statement :

- (I) Ascertain the extent of difference between the profit or loss disclosed by two set of book of accounts.
- (2) Take the base profit or loss as per any set of books (either cost or financial) of accounts as the starting point.
- (3) Prepare a statement by making suitable adjustment of items either added or subtracted included in one set of accounts but not in the other set.
- (4) In other words, balances as per cost account has been taken as the starting point, then balance as per financial account is to be adjusted according to the transaction recorded in the financial accounts and vice versa.

## **Question Bank**

### **Unit –II**

#### **Part-A**

1. What are the elements of cost?
2. What is overhead and classify it?
3. List the need for reconciliation
4. Draw the specimen of cost sheet
5. What do you mean by tender?
6. What do you mean by quotations?
7. Differentiate between direct material and indirect material
8. What is prime cost?
9. Differentiate between direct expenses and indirect expenses
10. Differentiate between direct labor and indirect labor.

### **Unit-II**

#### **Part-B**

1. Define cost sheet .Explain the purpose of cost sheet and give the proforma of cost sheet.
2. Explain the various elements of cost.
3. What is reconciliation statement and why it is prepared?

4. You are required to compile a statement showing cost and profit from the information given, showing clearly: (a) Material consumed, (b) Prime cost, (c) Work cost, (d) Cost of production, (e) Cost of sales, (f) Profit and (g) sales.

Material Consumed	Rs.200000
Wages	Rs.100000
Direct Expenses	Rs.20000
Opening stock of materials	Rs.40000
Closing stock of materials	Rs.60000

Factory overheads are absorbed at 20% on wages, Administration overheads are 25% on the work cost. Selling and distribution overheads are 20% on the cost of production. Profit is 20% on sales.

5. During the year 2008, X Ltd., produced 50000 units of product. The following were the expenses:

Particulars	Amount in Rs
Stock of raw materials on 1-1-2008	10000
Stock of raw materials on 31-12-2008	20000
Purchases	160000
Direct wages	75000
Direct expenses	25000
Factory expenses	37500
Office expenses	62500
Selling expenses	25000

You are required to prepare a cost sheet showing cost per unit and total cost at each stage.

6. The following details have been obtained from the cost records of TCS Ltd

Particulars	Amount in Rs
Stock of raw materials on 1-1-2009	75000
Stock of raw materials on 31-12-2009	91500
Direct wages	52500
Indirect wages	2750
Sales	211000
Work in progress on 1-1-2009	28000
Work in progress on 31-12-2009	35000
Purchases of raw materials	66000
Factory rent, rates and power	15000
Depreciation of plant and machinery	3500
Expenses on purchases	1500
Carriage outwards	2500
Advertising	3500
Office rent and taxes	2500
Traveller's wages and commission	6500
Stock of finished goods 1-1-2009	54000
Stock of finished goods 31-12-2009	31000

Prepare a cost sheet giving the maximum possible break up of costs and profit.

7. Mr.X Company Ltd, are the manufactures of mobile batteries. The following data relate to manufacture of batteries during the month of March 2005.

Raw material consumed	Rs.20000
Direct wages	Rs.12000
Machine Hours worked	9500 Hours
Machine Hour rate	Rs.2
Office Overheads	20% of work cost
Selling overheads	50 paise per unit
Units produced	20000 units
Units Sold	18000@Rs.5 per Unit

Prepare cost sheet showing the cost and the profit per unit and the total profit earned.

8. The following particulars have been extracted from the books of a manufacturing company

Particulars	Amount in Rs
Stock on materials on 1 <sup>st</sup> Jan 2014	47000
Stock on Material on 31 <sup>st</sup> Dec 2014	50000
Materials purchased	208000
Office salaries (factory)	9600
Counting house salaries	14000
Carriage In wards	8200
Carriage Outwards	5100
Cash discount allowed	3400
Bad dets written off	4700
Repairs to plant and machinery	10600
Rent –factory	3000
Rent-office	1600
Travelling expenses	3100
Travelling commission	8400
Production wages	140000
Depreciation –machinery	7100
Depreciation – office	600
Directors fees	6000
Water-factory	1500
Water –office	300
General charges	5000
Managers salary	12000

Out of 48 hours in a week, the time devoted by the managers to the factory and to the office was on average 40 hours and 8 hours respectively, throughout the accounting year .prepare a statement giving the following information (a) prime cost,(b) Factory on cost as a percentages

of production wages,(c) Factory cost ,(d) General on cost as a percentage of factory cost and (e)Total cost.

9. From the following information prepare a cost sheet for the month of Dec 2012

Particulars	Amount in Rs
Opening stock – Raw materials	25000
Opening stock – Finished goods	17300
Closing stock - Raw materials	26200
Closing stock - Finished goods	15700
Purchase of raw materials	21900
Carriage on purchases	1100
Working in progress on 1-1-2012	8200
Working in progress- 31-12-2012	910 0
Sale of finished goods	72300
Direct wages	17200
Non productive wages	800
Direct expenses	1200
Factory overheads	8300
Administrative overheads	3200
Selling and distribution overheads	4200

10. The cost accounts department of a company has supplied the following data for the supply of 2000 units of product.

Particulars	Amount in Rs
Direct materials	4000 tons at Rs.5 per ton
Direct wages	8000 labour hours at Rs50 per hour
Overheads : Variable	Factory Rs.10 per labour hour Selling Rs.20 per unit
Overheads : Fixed	Factory Rs.100000 Office Rs.200000

Prepare a statement showing the price to e fixed which will fetch a profit of 25% on cost.



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## SCHOOL OF MANAGEMENT

### UNIT III - COST ACCOUNTING - SBAX1018

## UNIT 3 MATERIALS

Material purchase control, need and essentials of material control - EOQ, ABC analysis, VED analysis. Material costing – Issue of materials – FIFO, LIFO, HIFO, SAM, WAM, Market price, Base stock method and standard price method.

### Meaning of Materials

Materials cost is one of the important elements of cost of product or unit. It constitutes a substantial proportion of the total cost of production. For material cost control purposes, it is very essential to know the important aspects of material, material control and material purchase control.

**Materials:** The term ‘materials’ refers to all commodities or components which are consumed in the process of manufacture. The materials may be classified into Direct Materials and Indirect Materials.

**Direct Materials:** Direct Materials form part of the finished products. They can be easily identified with a particular cost unit. For example, cotton used in textile mills, timber used in furniture industries.

**Indirect Materials :** Indirect materials indirectly used for conversion from raw materials into finished products. They cannot be easily identified with a particular cost unit. For example, spare parts, tools, nails, lubrications etc.

Materials are further classified on the basis of the nature which have to be used such as:

- (a) Raw Materials, e.g., rubber, timber, steel etc.
- (b) Components, e.g., instruments
- (c) Consumable stores, e.g., cotton waste, brushes
- (d) Maintenance Materials, e.g., spare parts
- (e) Tools, e.g., jigs and fixtures



## **Materials Control**

Materials control may be defined as the systematic control over the procurement, storage and usage of materials so as to maintain an even flow of materials and at the same time avoiding excessive investment in inventories.

From the above definition we can derive the following important **Objectives:**

- (1) To ensure the smooth flow of production without interruptions.
- (2) Prevention of excessive investments in materials stock.

## **Functions of Materials Control**

1. Purchasing of Materials
2. Receiving of Materials
3. Inspection of Materials
4. Storage of Materials
5. Issue of Materials
6. Maintenance of Stores Records
7. Stock Audit.

## **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
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

### **Advantages of Materials Control**

- (1) It ensures continuous flow of production.
- (2) There is maximum utilization of stores resources.
- (3) It facilitates economy of buying.
- (4) It ensures optimum investments in inventories.
- (5) There is possibility of reduction of loss of theft, leakage, obsolescence etc.
- (6) It minimizes cost of materials during purchase, storage and issue of materials.
- (7) It facilitates effective information system to management.

### **Materials Purchase Control**

Materials Purchase is one of the important functions of stores department. The basic objectives of the material purchasing is to ensure continuous supply of raw materials to production and maximum reduction of cost product. In other words, the chief aim of purchasing is to ensure, not only to procure the raw materials at the lowest price but to reduce the cost of the finished product. In order to achieve the above said objectives the following aspects and procedure should be adapted:

### **Organization of Purchasing**

Materials may be purchased based on the size of the concern, nature of materials to be used, nature of operations and management policies etc. A large company will have a separate purchase department while a small firm on the other hand may have all functions including purchasing, carried out by the owner himself. Materials may be purchased through Centralized Organization or Decentralized Organization.

## **Qualities of the Purchasing Manager**

- (1) **Integrity:** Personal integrity is the important quality of the purchase manager because purchasing involves huge sums of company money.
- (2) **Dependability:** He must have this personality trait because continuous operations depend on the reliability of the supplies.
- (3) **Initiative:** He must have the ability of initiative to continuous search for alternative sources of supply or alternative materials.
- (4) **Co-operation:** Purchasing Manager must possess an unusual ability to co-operate.
- (5) **Tact:** To maintain a sound and friendly relationship with suppliers, tact is considered to be an important characteristic of the purchasing manager.
- (6) **Ability to Learn:** A Purchasing personnel must have an inquiring mind. He must always be seeking information about company's products, materials and process.
- (7) **Ability to Work on Details:** He must have ability to work on details even though it is routine in nature.
- (8) He must have the technical knowledge of materials and sources acquired.

## **Need and essentials of material control**

1. Proper co-ordination of all departments involved viz., finance, purchasing, receiving, inspection, storage, accounting and payment.
2. Determining purchase procedure to see that purchases are made, after making suitable enquiries, at the most favorable terms to the firm.
3. Use of standard forms for placing the order, noting receipt of goods, authorizing issue of the materials etc.
4. Preparation of budgets concerning materials, supplies and equipment to ensure economy in purchasing and use of materials.

5. Operation of a system of internal check so that all transactions involving materials, supplies and equipment purchases are properly approved and automatically checked.
6. Storage of all materials and supplies in a well designated location with proper safeguards.
7. Operation of a system of perpetual inventory together with continuous stock checking so that it is possible to determine at any time the amount and value of each kind of material in stock.
8. Operation of a system of stores control and issue so that there will be delivery of materials upon requisition to departments in the right amount at the time they are needed.
9. Development of system of controlling accounts and subsidiary records which exhibit summary and detailed material costs at the stage of material receipt and consumption.

#### **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 materials. 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.

Re-ordering level = minimum level + consumption during the time required to get the fresh delivery

#### **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.

### **(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.

**Formula :  $EOQ = \sqrt{2AB/CS}$**

Whereas EOQ	=	Economic order quantity,
A	=	Annual Consumption usage of materials in units
B	=	Buying cost per order
C	=	Cost per unit
S	=	Storage cost and carrying cost percentage per annum.

***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.
8. Insurance cost
9. Clerical cost etc.

***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.

**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.

According to Wheldon,

$$\text{Maximum Stock level} = \text{Reordering level} + \text{Re-ordering Quantity} - (\text{Minimum consumption} \times \text{Minimum re-ordering period})$$

**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

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

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 +  $\frac{1}{2}$  of Re-order Quantity. Or  $\frac{1}{2}$  (Minimum Stock Level + Maximum Stock Level)

Inventory Control and its technique

- Economic order quantity
- ABC analysis
- VED analysis
- Perpetual inventory system
- Just in time (JIT)
- FNSD analysis
- Automatic ordering system
- Ordering cycle method
- Min-max method
- Inventory turnover ratio
- Input-Output ratio analysis
- Inventory cost reports

#### **The 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.

### **The VED Analysis**

The VED criticality analysis of all the listed items was performed by classifying the items into vital (V), essential (E) and desirable (D) categories. The items critically needed for the survival of the patients and those that must be available at all times were included in the V category. The items with a lower criticality need and those that may be available in the hospital were included in the E group. The remaining items with lowest criticality, the shortage of which would not be detrimental to the health of the patients, were included in the D group. The VED status of each item was discussed with justification by a group comprising of physician, surgeon, pediatrician and pharmacist.

### **Material costing**

Material costing is the process of determining the costs at which inventory items are recorded into stock, as well as their subsequent valuation in the accounting records. We deal with these concepts separately.

### **JUST IN TIME (JIT)**

Just-in-time (JIT) is an inventory strategy companies employ to increase efficiency and decrease waste by receiving goods only as they are needed in the production process, thereby reducing inventory costs.

### **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.

### **The value of materials**

Theoretically the value includes the invoice price less trade discount, the freight, cartage, 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.



## **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.

### **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.

### **3) Highest In, First Out(HIFO)**

**HIFO** is an acronym of the words Highest In, First Out. Requirements / material are serviced in order, from the most expensive items regardless of date of entry or acquisition. **HIFO** is an acronym of the words Highest In, First Out.

### **4).SAM (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.

### **5)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.

## **Market price**

The current price at which an asset or service can be bought or sold. Economic theory contends that the market price converges at a point where the forces of supply and demand meet. Shocks to either the supply side and/or

demand side can cause the market price for a good or service to be re-evaluated.

In cost accounting, *market-based pricing* sets the product price based on customer expectations and demand. You take a look at the customer's perceived value of the product. Based on the customer view, you estimate how much he or she would be willing to pay.

### **Base stock method**

An **accounting method** of valuing inventories by carrying on the books a minimum quantity of a commodity at the same low fixed **price** from year to year and valuing the quantity in excess of the minimum at a separate **price** which is usually the lower of **cost** or market value

### **Standard price method**

Under this method, all factors by which price may be effected are considered & before the actual price, standard material price for the materials is generally fixed. At that standard price materials issued are valued. For establishing standard price, the factors usually considered are-

- (a) Due to possible changes in market conditions, apprehended changes in price.
- (b) Depending upon the quantity to be ordered, the amount of discount that may be available from the suppliers.
- (c) Expenses which are related to purchases i.e. freights & carriage, customs duty, godown expenses, packing, handling etc.

Difference, if any, between the standard price & the actual purchase price, is known as material variance. However, the variance which arises due to the difference between standard rate of purchase & the actual rate of purchase is known as rate variance. On the other hand, variance due to difference between total actual material cost & total standard material cost, there being no difference in rates, the variance is called usage variance. Either at the time of actual purchase or at the end of accounting period, the variance may be worked out. The variance is analyzed into causative reasons & by taking suitable measures its recurrence is prevented.

### **Advantages:**

- (a) Efficiency of the purchase department can be revealed.
- (b) As all the issues are charged at a standard price, the method is easy to apply.
- (c) Even if standard costing method is not applied in any industry, the method can be used there.
- (d) By setting the standard price, control on material cost may be exercised by the method, which may be called the price that should be.

***Disadvantages:***

- (a) At actual cost, the issues are not charged.
- (b) Profit or loss on materials may be there.
- (c) The purpose for which it is set may be spoiled by a very low or high standard price.
- (d) Fixing a reliable standard price is difficult, since upon a number of unknown variable factors, the price depends.

**Working Problems**

**MATERIALS**

**EOQ-Economic Ordering Quantity:**

1. Calculate economic ordering quantity from the following particulars:  
Annual requirement = 1,600 units  
Cost of materials per unit = Rs. 40  
Cost of placing and receiving one order = Rs. 50  
Annual carrying cost of inventory.10% of inventory value.
2. Calculate economic order quantity:  
Annual Consumption = 600 units  
Order cost = Rs.12 per order  
Cost price per unit = Rs.20  
Storage & carrying cost= 20%
3. Calculate the economic ordering quantity from the following particulars:  
Annual usage = 20,000 units  
Buying per order= Rs.10  
Cost per unit = Rs.100
4. From the following information, determine the EOQ :  
Annual Consumption = 90,000 units  
Cost per unit = Rs. 50

Buying Cost per order = Rs. 10

Cost of carrying inventory = 10% of cost.

**EOQ- Where material usage is given in rupees:**

5. Find out the economic ordering quantity from the following particulars:

Annual usage = Rs. 1, 20,000

Cost of placing and receiving one order = Rs. 60

Annual carrying Cost: 10% of inventory value.

6. You are required to compute the economic ordering quantity with the help of the details given below:

Materials usage per month = Rs. 1,600.

Buying Cost per order = Rs. 40.

Storage & carrying cost. 15% of Inventory value.

7. Calculate the economic ordering quantity. Also state the number of orders to be placed in a year.

Consumption of materials per annum = 10,000 Kg.

Cost of materials per Kg = Rs. 2

Order placing costs per order = Rs. 50

Storage costs 8% on Average Inventory.

### **COMPUTATION OF STOCK LEVELS**

**Stock levels for one material:**

8. From the following information, calculate:

(a) Maximum Stock level

(b) Minimum Stock level

(c) Reorder level

(d) Average stock level

Minimum Consumption = 240 units per day

Maximum Consumption = 420 units per day

Normal Consumption = 300 units per day

Reorder quantity = 3,600 units

Reorder period = 10-15 days

Normal Reorder period = 12 days.

9. Calculate Maximum Stock level, Minimum Stock level and Re-ordering level

- (1) Minimum Consumption = 100 units per day
- (2) Maximum Consumption = 150 units per day
- (3) Normal Consumption = 120 units per day
- (4) Reorder period = 10-15 days
- (5) Reorder quantity = 1,500 units
- (6) Normal Reorder period = 12 days.

10. Calculate Reorder level, Minimum Stock level, Maximum Stock level and Average Stock level from the following information:

Normal usage = 300 units per week  
Maximum usage = 450 units per week  
Minimum usage = 150 units per week  
Reorder period = 4-6 weeks  
Reorder quantity = 2,400 units.

### **STOCKS LEVELS FOR TWO OR MORE MATERIALS:**

11. Two components X and Y are used as follows:

Normal usage = 600 units per week each  
Maximum usage = 900 units per week each  
Minimum usage = 350 units per week each  
Reorder quantity:  
X = 4,800 units,  
Y = 7,200 units  
Reorder period:  
X = 4-6 weeks  
Y = 2-4 weeks

Calculate for each component: Reorder level (b) Maximum level (c) Minimum level (d)  
Average stock level

12. Two materials A and B are used as follows:

Normal Consumption = 50 units per week each

Minimum Consumption = 25units per week each

Maximum Consumption = 75units per week each

Reorder quantity:

A= 300 units

B= 500 units

Reorder period:

A= 4-6 weeks

B= 2-4 weeks

Calculate for each component:

(a) Reorder level (b) Maximum level (c) Minimum level (d) Average stock level

13. Two materials A and B are used as follows:

Normal usage = 3,000 units per week each

Minimum usage = 1,500 units per week each

Maximum usage = 4,500 units per week each

Reorder quantity:

A= 13,000 units

B= 14,000 units

Reorder period: A= 4-6 weeks

B= 2-4 weeks

Calculate for each component:

(a) Reorder level (b) Maximum level (c) Minimum level (d) Average stock level

## **PRICING OF MATERIALS ISSUES**

### **A) FIRST IN FIRST OUT (FIFO) METHOD**

14. Prepare a store ledger on FIFO METHOD

DATE	RECEIPTS	ISSUES
2001-March 1	600 units at Rs.5 per unit	
16	400 units at Rs.6 per unit	
20		500 units
22	400 units at Rs.7 per unit	
23		600 units
25	200 units at Rs.8 per units	200 units

### **(Material Return)**

15. Prepare a store ledger on FIFO Method of pricing issues.

2002-January 1	Opening balance	50 units at Rs.30 per unit
5	Issued	20 units
7	Purchased	48 units at Rs.40 per unit
9	Issued	20 units
19	Purchased	36 units at Rs.35 per unit
24	Received back	10 units out of the units issued on 9 <sup>th</sup> January
27	Issued	15 units

### **B) LOST IN FIRST OUT (LIFO) METHOD**

16. Prepare a store ledger on LIFO METHOD

DATE	RECEIPTS	ISSUES
2001-March 1	600 units at Rs.5 per unit	
16	400 units at Rs.6 per unit	
20		500 units
22	400 units at Rs.7 per unit	
23		600 units
25	200 units at Rs.8 per units	200 units

**(Material Return)**

17. Prepare a store ledger on LIFO Method of pricing issues.

2012-January 1	Opening balance	50 units at Rs.30 per unit
5	Issued	20 units
7	Purchased	48 units at Rs.40 per unit
9	Issued	20 units
19	Purchased	36 units at Rs.35 per unit
24	Received back	10 units out of the units issued on 9 <sup>th</sup> January
27	Issued	15 units

**Question Bank**

**Unit –III**

**Part-A**

1. What is material control?
2. What is centralized purchasing?
3. What do you mean by stores ledger?
4. Write a note on EOQ
5. Write a note on ABC analysis
6. Write a note on VED analysis
7. What is JIT purchasing?
8. Write a short note on wastage.
9. What is inventory turnover ratio?
10. What is scrap?

**Part-B**

1. Briefly discuss the advantages and dis-advantages of FIFO, LIFO, and HIFO.
2. Briefly differentiate the methods of SAM and WAM along with its merits and demerits.
3. Broadly discuss the importance's of EOQ, ABC analysis and VED analysis.



4. Two components A and B are used as follows

Particulars	Amount in Rs
Reordering quantity	A -1200 units B-1000 units
Reordering period	A- 2 to 4 weeks B- 3 to 6 weeks
Normal usage	300 units per week each
Minimum usage	150units per week each
Maximum usage	450 units per week each

You are required to calculate the following for each of the components.(a) Reordering level, (b) Maximum level, (c) Minimum level, (d) Average stock.

5. From the particulars given below write up the stores ledger card on 2002

Month	Particulars	Units
January	1 Opening stock	1000 units at Rs.26 each
	5 Purchased	500 units at Rs.24.50 each
	7 Issued	750 units
	10 Purchased	1500 units at Rs.24 each
	12 Issued	1100 units
	15 Purchased	1000 units
	17 Issued	500 units
	18 Issued	300 units
	25 Purchased	1500 units at Rs.26 each
	29 Issued	1500 units

Adopt the FIFO and LIFO method of issue and find the value of closing stock.

6. Draw the stores ledger card recording the following transactions under (a) FIFO and (b) LIFO method for the year of 2013.

Month	Particulars	Units
July	1 Opening stock	2000 units at Rs.10 each
	5 Purchased	1000 units at Rs.11 each
	6 Issued	500 units
	10 Purchased	5000 units at Rs.12 each
	12 Received back	50 units out of issue made on 6 <sup>th</sup> July
	14 Issued	600 units
	18 Returned to supplier	100 units out of the goods received on 5 <sup>th</sup> July
	19 Received back	100 units out of issue made on 14 <sup>th</sup> July
	20 Issued	150 units
	25 Purchased	500 units at Rs.14 each
	28 Issued	300 units

The stock verification report reveals that there was a shortage of 10 units on 18<sup>th</sup> July and another shortage of 15 units on 26<sup>th</sup> July.

7. Using information given, draft stores ledger account showing quantities and value of receipts, issues and balances in hand under LIFO method of pricing stores issues for the year of 2008.

Date	Particulars
Jan 1	Balance in hand 1000 units at Rs.1 each
Jan 4	Received 500 units to be issued on request from dept X, Rate Rs.2 each
Jan 15	Received 3000 units costing Rs.3300
Jan 30	Issued 2000 units
Feb 8	Issued 500 units (Received on Jan 4 <sup>th</sup> ) to Dept X
Feb 12	Received 2000 units costing Rs.2400
Feb 27	Issued 3400 units

8. From the following particulars prepare the stores ledger account showing the pricing of materials issue, by adopting the FIFO method, with base stock of 400 units, out of opening stock.

Date	Particulars
Dec 1 2001	Opening stock 1000 units at Rs.2 each
Dec 3 2001	Purchased 800 units at Rs.2.10 each
Dec 5 2001	Issued 800 units
Dec 12 2001	Purchased 1600 units at Rs.2.10 each
Dec 17 2001	Issued 1500 units
Dec 20 2001	Purchased 900 units at Rs.2.50 each
Dec 25 2001	Issued 600 units

9. Laxmi and Co, has purchased and issued material D as under 2011

Date	Particulars
May 1 2011	Opening stock 2000 units at Rs.5 per unit
May 3 2011	Purchased 500 units at Rs.6 per unit
May 5 2011	Purchased 700 units at Rs.6.5 per unit
May 10 2011	Issued 800 units
May 11 2011	Purchased 300 units at Rs.8 per unit
May 15 2011	Purchased 200 units at Rs.7 per unit
May 18 2011	Issued 400 units
May 25 2011	Purchased 200 units at Rs.9 per unit
May 28 2011	Purchased 150 units at Rs.8.5 per unit
May 30 2011	Issued 200 units

Ascertain the closing stock value under HIFO method of pricing of issues.

10. From the following particulars , prepare stores ledger by adopting (a) Simple average method and (b) Weighted average method of pricing of material issues.

Month	Particulars	Units
January 2006	1 Opening stock	300 units at Rs.10 per unit
	10 Purchased	200 units at Rs.12 per unit
	12 Purchased	400 units at Rs.11 per unit
	15 Issued	250 units
	16 Issued	150 units
	18 Purchased	200 units at Rs.14 per unit
	20 Issued	300 units
	22 Purchased	300 units at Rs.15 per unit
	25 Purchased	100 units at Rs.16 per unit
	27 Issued	200 units
	31 Issued	100 units



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## SCHOOL OF MANAGEMENT

### UNIT IV - COST ACCOUNTING - SBAX1018

## Unit – IV

Labour cost – computation and control - Methods of wage payment – Time rate and piece rate system - Idle time and over time. Labour turnover.

### **Labour cost**

The cost of labor is the sum of all wages paid to employees, as well as the cost of employee benefits and payroll taxes paid by an employer. The cost of labor is broken into direct and indirect (overhead) costs.

### **Meaning**

Labor cost covers one of the major portion of the total cost of a product or job. It may increase unnecessarily due to inefficiency of workers, wastage of materials by workers, idle time, unusual overtime work and high labor turnover. Hence, the management should devise effective techniques for controlling labor cost to ensure maximum outputs of better quality at low cost through proper utilization of the labor force.

Basically, management is concerned with controlling labor cost. Labor cost control involves such systems, procedures, techniques and tools used by the management in order to keep the labor cost of the product or job as minimum as possible. Labor cost control consists of a number of such regular activities which are carried on by various departments of the organization in a coordinated manner to ensure the availability of the best employees and their optimum utilization. It is the system followed by the management to maximize quality output at a minimum cost. Labor cost control includes the process of developing various forms, studying and recording the activities and performance of workers, calculating the correct amount of wages and making payment in time. It also includes the process of analyzing and reporting labor cost to the management for planning and decision making.

### **Importance or Needs of Labor Cost Control**

- i. Labor cost control is important to make economic utilization of labor force in production process.
- ii. Labor cost control is important to obtain maximum quantity of output with the least amount of materials and other resources.
- iii. Labor cost control helps to obtain better quality output with the least effort and time of workers.
- iv. Labor cost control reduces the cost of production of products manufactured or services rendered.
- v. Labor cost control ensures the satisfaction of the workers by creating a good working environment in the factory.

- vi. Labor cost control helps to adopt the fair system of wage payment and to minimize labor turnover.
- vii. Labor cost control is helpful in minimizing wastage of materials by workers , idle time and unusual overtime work.
- viii. Labor cost control is helpful to maintain safety working environment.
- ix. Labor cost control is important to keep complete records of the employees and to supply information to the management regarding availability, efficiency, utilization and absenteeism of the workers.
- x. Labor cost control is very useful to increase the profitability and competitiveness of the organization.

## **Types of Labour Cost**

The labour cost can be classified into

**(1) Direct Labour Cost:** Any labour cost that is specially incurred for or can be readily charged to or identified with a specific job, contract, work order or any other unit of cost is termed as direct labour cost. Wages for supervision, wages for foremen, wages for labours who are actually engaged in operation or process are the examples of direct labour cost.

**(2) Indirect Labour Cost:** Indirect labour is for work in general. The importance of the distinction lies in the fact that whereas direct labour can be identified with and charged to the job, indirect labour cannot be so charged and has, therefore to be treated as part of the factory overheads to be included in the cost of production. For example, salaries and wages of supervisors, storekeepers and maintenance labour etc.

## **Control of Labour Cost**

Control of labour cost is a significant influence on the growth, profitability and cost of production. Labour cost may become unduly high rate due to inefficiency of labour, ineffective supervision, idle time, unusual overtime work etc. The primary objectives of the management therefore is to efficiently utilize the labour as economically as possible.

## **Techniques of Labour Cost Control**

In order to achieve the effective utilization of manpower resources, the management has to apply proper system of labour cost control.

- (1) Scientific method of production planning.

- (2) Use of labour budgets.
- (3) Establishment of labour standards.
- (4) Proper system of labour performance report.
- (5) Effective system of job evaluation and job analysis.
- (6) Devise a proper system of control over ideal time
- (7) Establish a fair and equitable remuneration system.
- (8) Effective cost accounting system.

### **The Department that using Labour cost**

The objectives of proper control on labour cost is effectively achieved through the functions of various departments responsible for controlling labour cost in an organisation. The following are the important departments for control over labour costs:

- (1) Personnel Departments.
- (2) Engineering and Works Study Department.
- (3) Time Keeping Departments.
- (4) Pay Roll Department.
- (5) Cost Accounting Department.

#### **(1) Personnel Department**

Personnel department plays a very important role in control of labour costs. It is primarily concerned with the recruitment of labours on the basis of employee placement requisition and imparting training to them. And thereafter placing them to the job for which they are best suited. In order to achieve the efficient utilization of manpower resources, this department is responsible to execution of labour policies which have been laid down by top management.

#### **(2) Engineering and Works Study Department**

Engineering department is primarily concerned with maintaining control over working conditions and production methods for each job, process, operation or departments. It is performed by undertaking the following functions :

- (1) Preparation of plan and specification of each job.
- (2) Maintaining required safety and efficient working conditions.
- (3) Making time and motion studies.
- (4) Conducting job analysis, job evaluation and merit rating.



- (5) Setting fair and equitable piece rate or time wage system.
- (6) Conducting research and experimental work.

### **Methods to control the labor cost**

(a) **Method Study:** It is one of the important components of work study. The chief aim of this study is to find a scheme of least wastage. Method Study is defined as "a systematic and scientific evaluation of existing and proposed plans and performance of any work system and the evaluation of improvement, through analytical process of critical examination."

(b) **Motion Study:** Frank Gilbreth, who is the real founder of Motion Study. According to him motion study may be defined as the "science of eliminating wastefulness resulting from ill-directed and inefficient motions. The following are the important objectives of the motion study:

- (1) Effective utilisation of material, machine and labours.
- (2) Elimination of wastage of time and labours.
- (3) Maintaining higher standards of safety and health.
- (4) Reducing unnecessary movements in order to minimize wastages.
- (5) Better design of work place layout for effective production process.
- (6) Ensure fair remuneration with job satisfaction.

(c) **Time Study:** Time study is also called work measurement. Time study may be defined as "the art of observing and recording the time required to do each detailed element of an industrial operation."

(e) **Job Evaluation:** Job evaluation may be defined as "a process of analyzing and describing positions, grouping them and determining their relative value by comparing the duties of different positions in terms of their different responsibilities and other requirements." Job evaluation is determined on the basis of job description and job analysis. The primary purpose of job evaluation is developing appropriate wage and salary structure with internal pay equity between jobs.

(f) **Merit Rating:** Merit rating may be defined as "a systematic evaluation of an employee's performance on the job in terms of the requirement of the job." Merit rating is a system of measuring both qualitatively and quantitatively of an employee's capacity in relation to his job.

## **Computation of Labor Cost**

### **Step1**

Calculate an average wage rate per hour for your manufacturing workforce. To do so, add all the hourly wages together and average them. Then, add all the payroll tax you pay for these employees and average this figure. Next, average the benefits you pay for your manufacturing labors. Add these figures -- the hourly wage average, the payroll tax average and the benefits average -- together to determine your workforce's average wage rate per hour .

### **Step2**

Calculate average labor hours per unit. This is best done by observation. Find the average amount of time it takes a laborer to produce a unit. Add an allowance for breaks and personal needs. Add in some time for machine setup and machine downtime. The resulting figure is your average labor hours per unit.

### **Step3**

Multiply your average labor hours per unit by the average wage rate per hour. This is your average labor cost per unit. Note that it is an average, and actual unit labor costs may be above and below the average.

### **Step4**

To make a standard labor cost card for each unit, write down your calculations in detail. That way, if machine downtime increases, or average wages increase, you can make adjustments and recalculate.

## **Methods of wage payment**

Labour cost is one of the important elements of production. Wage, salaries and other incentives of employee remuneration constitute a very large component of operating costs. Remuneration of employees is a vital factor not only affecting the cost of production but also industrial relations of the organization. No organization can expect to attract and attain qualified and motivated employees unless it pays them fair remuneration. Employee remuneration, therefore, influences vitally the growth and profitability of the company.

### **Objectives of an Ideal Wage System**

An ideal wage system is required to achieve the following objectives:

- (1) The wage system should establish a fair and equitable remuneration.

- (2) A sound wage system helps to attract qualified and efficient worker by ensuring an adequate payment.
- (3) It assists to improve the motivation and moral of employees which in turn lead to higher productivity.
- (4) It enables effective control of labour cost.
- (5) An Ideal wage system helps to improve union-management relations. It should reduce grievances arising out of wage inequities.
- (6) It should facilitate job sequences and lines of promotion wherever applicable.
- (7) An ideal system seeks to project the image of a progressive employer and to comply with legal requirements relating to wages and salaries

### **Principles of an Ideal Wage System**

**The following principles should be adopted for an ideal wage system**

- (1) Differences in pay should be based on differences in job requirements.
- (2) Follow the principle of equal pay for equal work.
- (3) The scheme should be based on work study, and the work contents of various jobs should be stabilized.
- (4) Recognize individual differences in ability and contributions.
- (5) The scheme should not be very costly in operation.
- (6) The scheme should be flexible.
- (7) The scheme should encourage productivity.
- (8) The scheme should not undermine co-operation amongst the workers.
- (9) The scheme should be sufficient to ensure for the worker and his family reasonable standard of living.

### **Types of wags payment**

The following are the important methods of remuneration which may be grouped into

- :
- (1) Time Rate Systems
  - (2) Piece Rate Systems
  - (3) Bonus System (or) Incentives Schemes.

- (4) Indirect Monetary Incentives.
- (5) Non-Monetary Incentives

These may be further classified as under:

**(1) Time Rate Systems:**

- (a) At Ordinary Levels
- (b) At High Wage Levels
- (c) Guaranteed Time Rates.

**(2) Piece Rate Systems:**

- (a) Straight Piece Rate
- (b) Piece Rates with Guaranteed Time Rate
- (c) Differential Piece Rates:
  - (i) Taylor's Differential Piece Rate System
  - (ii) Merrick Differential Piece Rate System
  - (iii) Gantt Task and Bonus Plan

**(3) Bonus System or Incentive Schemes:**

- (1) Halsey Premium Plan
- (2) Halsey-Weir Premium Plan
- (3) Rowan Plan
- (4) Barth Variable Sharing Plan
- (5) Emerson Efficiency Plan
- (6) Bedaux Point Premium System
- (7) Accelerating Premium Plan
- (8) Group or Collective Bonus Plans.

**(4) Indirect Monetary Incentives**

**(5) Non-Monetary Incentives**

**(1)Time rate System**

**(a) Time Rate at Ordinary Levels:**

This is also termed as "Day Wage System" or "Flat Rate System." Under this system, wages are paid to the workers on the basis of time spent on the job irrespective of the quantity of work produced by the workers. Payment can be made at a rate per day or

a week, a fortnight or a month.

The formula for calculation of payment of time rate of ordinary levels is as follows:

$$\text{Remuneration or Earnings} = \text{Hours Worked} \times \text{Rate Per Hour}$$

Time rate system is suitable under the following conditions:

- (1) Where the units of output are difficult to measurable, e.g., watchman.
- (2) Where the quality of work is more important, e.g., furniture, fine jewellery.
- (3) Where machinery and materials used are very sophisticated and expensive.
- (4) Where supervision is effective and close supervision is possible.
- (5) Where the workers are new and learning the job.
- (6) Where the work is of a highly varied nature and standard of performance cannot be established.

#### ***Advantages***

- (1) It is simple and easy to calculate.
- (2) Earning of workers are regular and fixed.
- (3) Time rate system is accepted by trade unions.
- (4) Quality of the work is not affected.
- (5) This method also avoids inefficient handling of materials and tools.

#### ***Disadvantages***

- (1) No distinction between efficient and inefficient worker is made and hence they get the same remuneration.
- (2) Cost of supervision are high due to strict supervision used for high productivity of labour.
- (3) Labour cost is difficult to control due to more payment may be made for the lesser amount of work.
- (4) No incentive is given to efficient workers. It will depress the efficient workers.
- (5) There is no specific standards for evaluating the merit of different employees for promotions.

#### **(b) Time Rate at High Levels:**

Under this system, efficient workers are paid higher wages in order to increase

production. The main object of this method designed to remove the drawbacks of time rate at ordinary levels. This system is simple and easily understandable. When higher rate of wages are paid, it not only reduces labour turnover but also increases production and efficiency.

**(c) Guaranteed Time Rates:**

Under this method, the wage rate is calculated by considering to changes in cost of living index. Accordingly, the wage rate is varied for each worker according to the change in cost of living index. This system is suitable during the period of raising prices.

**(2) Piece Rate System**

This is also known as "Piece Wage System" or "Payment By Result." Under this system, wages of a worker are calculated on the basis of amount of work done or output of a worker. Accordingly, a worker is paid in direct proportion to his output.

Piece Rate System is suitable under the following conditions:

- (1) Quality and workmanship are not important.
- (2) Work can be measured accurately.
- (3) Quantity of output directly depends upon the efforts of the worker.
- (4) Production of standardized goods in a factory.
- (5) Job is of a repetitive nature.

***Advantages***

- (2) This encourages the efficient workers to increase
- (3) Under this system efficient workers are recognized and rewarded.
- (4) It helps to reduce the cost of supervision and idle time.
- (5) Tenders or quotations can be prepared confidently and accurately.

***Disadvantages***

- (1) Where a concern is producing large quantities, it is difficult to fix a piece rate.
- (2) In order to maximize their earnings, workers working with high speed may affect their health.

- (3) The quality of output cannot be maintained.
- (4) This system is not encouraging to the inefficient workers.
- (5) Temporary delays or difficulties may affect the earnings of the workers. There are three important methods of paying labour remuneration falling under this type:
  - (a) Straight Piece Rate
  - (2) Piece Rates with Guaranteed Time Rates and
  - (c) Differential Piece Rates.

**(a) Straight Piece Rate:** Under this system, workers are paid according to the number of units produced at a given rate per unit. Thus, total earnings of each worker is calculated on the basis of his output irrespective of the time taken by him. The following formula is used for measuring piece work earning:

$$\text{Straight Piece Work Earnings} = \text{Units Produced} \times \text{Rate Per Hour}$$

**(b) Piece Rates with Guaranteed Time Rates:** Under this method, the worker earning from piece work less than the guaranteed minimum wage, will get the fixed amount of guaranteed time rate. A guaranteed rate would be paid per hour rate or day rate or week rate.

**(c) Differential Piece Rates:** This system is designed to provide for variation of piece rates at different levels of output. Accordingly increase in wages is proportionate to increase in output. Under this system, efficient workers get ample reward and at the same time inefficient workers are motivated to earn more. The following are the three important types of differential piece rates :

- (a) Taylor's Differential Piece Rates System.
- (b) Merrick's Differential Piece Rates System.
- (c) Gantt Task Bonus Plan.

#### **(a) Taylor's Differential Piece Rates System**

FW. Taylor, who is the father of scientific management introduced this plan. Under this system, two piece rates are applicable on the basis of standard of

performance established. Accordingly one is high rate and the other one is lower rate. Thus high piece rate is applicable for standard and above the standard performance. Lower piece rate for those workers with below the standard performance.

#### **(b) Merrick Differential Piece Rate System**

This is also termed as Multiple Piece Rate system. This plan is 'designed to overcome the drawback of Taylor's Differential Piece Rate System. Under this method, three piece rates are applied with different levels of performance.

#### **(c) Gantt's Task Bonus Plan**

This system is designed by Henry L. Gantt. Under this system, standard time for every task is fixed through time and motion study. The main feature of this system is a good combination of time rate, differential piece rate and bonus. In this system day wages are guaranteed to all workers.

### **Differences Between Piece Rate System And Time Rate System Of Wage Payment**

#### ***1. Meaning***

Piece rate system is a method of wage payment to workers based on the quantity of output they have produced. Time rate system is a method of wage payment to workers based on time spent by them for the production of output.

#### ***2. Nature of Payment***

Piece rate system pays the workers according to the units of output produced. Time rate system pays the workers according to the time spent in the factory.

#### ***3. Emphasis***

Piece rate system gives emphasis on larger quantity of output. Time rate system emphasis on better quality of output.

#### ***4. Discrimination***

Piece rate system discriminates the workers and pays more wages



to efficient and skilled workers. Time rate system does not discriminate the workers and pays the same wages to efficient and inefficient workers.

### ***5. Supervision***

Piece rate system requires strict supervision to get the required quality output. Time rate system requires strict supervision to get required quantity of output.

### ***6. Determination Of Labor Cost***

Piece rate system helps to fix per unit labor cost in advance. Time rate system does not help to fix labor cost per unit in advance.

### ***7. Flow Of Production***

Piece rate system does not bring uniformity in the flow of production and causes an excessive wastage of inputs. Time rate system helps maintain a uniform flow of production and ensures an efficient use of materials, tools and equipments.

## **(3) Bonus or Incentives Schemes**

Incentive schemes of wage payment are also known as Premium Bonus Plans. introduced in order to increase production with ensuring proper industrial climate. Wage incentive plans may be of two types : (1) Individual Incentive Plans and (2) Group Incentive Plans. Under individual incentive plans, remuneration can be measured on the performance of the individual worker.

**(1) Halsey Premium Plan:** This Plan was developed by F. A. Halsey. This system also termed as Split Bonus Plan or Fifty-Fifty Plan. Under this plan, standard time is fixed for each job or operation on the basis of past performance. If a worker completes his job within or more than the standard time then the worker is paid a guaranteed time wage. If a worker completes his job within or less than the standard time, then he gets a bonus of 50% of the time saved plus normal earnings.

**(2) The Halsey- Weir Scheme:** Under this system, the worker gets the bonus of 30% of the time saved instead of 50% of time saved under Halsey Plan. Except for this, Halsey Plan and Halsey-Weir Systems are similar in all other respects

**(3) Rowan Plan:** This plan was introduced by James Rowan of England. It was similar to the

Halsey Plan in many respects except that it differs in calculation of bonus. Under this system, bonus is determined as the proportion of the time taken which the time saved bears to the standard time allowed.

**(4) Emerson's Efficiency Sharing Plan:** Under this plan, earning of a worker is by combining guaranteed day wages with a differential piece rate. Accordingly the level of efficiency is determined on the basis of establishment of standard task for a unit of time. If the level of worker's efficiency reaches 67% the bonus is paid to him at a normal rate. The rate of bonus increases in a given rate as the output increases from 67% to 100% efficiency. Above 100% efficiency, the bonus increases to 20% of the wage earned plus additional bonus of 1% is added for each increase of 1% in efficiency.

**(5) Barth Variable Sharing Plan:** This scheme introduced to attract newly recruited and skilled employees who are motivated to learn work, It provides sufficient incentives to inefficient workers who are motivated to increase productivity.

**6) Bedaux Point Premium System:** This plan was introduced by Charles E. Bedaux in 1911. Under this plan, standard time fixed for each operation or job is expressed in terms of Bedaux point or 'S.' For example, a standard time of 360 B means the operation or job should be completed within 360 minutes. The chief advantage of this plan is that it can be applied to any kind of a job. Under this system, worker is paid at the time for actual hours worked, and 75% of the wages for the time saved are paid as bonus to the worker and 25% to the foremen, supervisors etc

**(7) Accelerating Premium Bonus Plan:** Under this plan, bonus is determined on the basis of time saved unlike a fixed percentage under Halsey Plan and as a decreasing percentage under Rowan Plan. The bonus is paid to workers at an increased rate according to more and more time saved. This provides increasing incentives to efficient workers.

***Merits***

- (1) It is simple to understand.
- (2) Total earnings of each worker can be easy to calculate.
- (3) Both employer and employee get equal benefit of time saved.
- (4) This system not only benefits efficient worker but also provides average worker to get guaranteed minimum wages.
- (5) This system is based on time saved and it can reduce the labour cost.

***Demerits***

- (1) Lack of co-operation among the employees.
- (2) Under this system establishment of standard is very difficult.
- (3) Earning are reduced at high level of efficiency.

**Group or Collective Bonus Plan**

The incentive schemes explained so far are applicable to individual performance depending directly on production. However, it is not the individual worker who produce the goods or services (operation) alone but group of several other workers are required to jointly perform a single operation. It is, therefore, essential that a group incentive scheme be introduced. Bonus is calculated for a group incentive scheme.

The bonus is calculated for a group of workers and the total amount is distributed among the group of workers on anyone of the following basis :

- (a) Equally by all the workers of the group.
- (b) Pro rata on the time rate basis.
- (c) Pre determined percentage basis.

- (d) Specified proportion basis.

### **Types of Group Incentive Plans**

The following are the important types of group incentive bonus plans:

- (1) Budgeted Expenses Bonus Plan
- (2) Priest Man Bonus Plan
- (3) Towne's Gain-sharing Plan
- (4) Scanlon Plan

**(1) Budgeted Expenses Bonus Plan:** Under this method, bonus is determined on the basis of savings in actual expenditure compared with total budgeted expenditure.

**(2) Priest Man Bonus Plan:** Under this plan, standard performance is fixed by the management and committee of workers. The group of workers get bonus when actual performance exceeds the standard performance irrespective of individual's efficiency or inefficiency.

**(3) Towne's Gain-sharing Plan:** Under this plan, bonus is calculated on the basis of savings in labour cost. The group of workers get bonus when actual costs is less than the standard costs, one-half of the savings is distributed among workers including foremen in proportion with the wages earned.

**(4) Scanlon Plan:** Scanlon Plan is designed with the chief aim of reducing the cost of operations in order to increase the production efficiency. This plan is generally applicable in industries where the operation cost is high.

### **(4) Indirect Monetary Incentives**

Incentive schemes are regarded beneficial to both employers and workers. In this regard, under indirect monetary incentives by giving them a share of profit and introducing co-partnership schemes or as they have become partners in the business in order to make a very profitable enterprise.

**Profit Sharing:** Profit sharing and bonus is also known as Profit sharing bonus. Under this scheme, there is an agreement between the employer and employee by which employee receives a share, fixed in advance of the profits. Accordingly profit sharing bonus refers to the distribution of profit on the basis of a certain percentage of one's monthly earnings. The amount to be distributed depends on the profits earned by an enterprise. The proportion of the profits to be distributed among the employees is determined in advance.

**Co-partnership:** This system provides not only a worker to become partner in the business but also to share in the profits of the concern. There are different degrees of partnership and share of responsibilities allowed to the workers to take part in its control.

**Non-Monetary Incentive Schemes:** Under this system, employees are provided better facilities, instead of additional monetary payments. Some of the examples of non-monetary incentives are free education for children, rent free accommodation, medical facilities, canteen facilities, welfare facilities, and entertainment facilities etc.

## **Idle Time**

Idle Time is that time during which the workers spend their time without giving any production or benefit to the employer and concern. The idle time may arise due to non-availability of raw materials, shortage of power, machine breakdown etc.

### **Types of Idle Time:**

It refers that any loss of time is inherent in every situation which cannot be avoided. Any cost associated with the normal idle time are mostly fixed in nature.

The normal idle time arises due to the following reasons:

- (1) Time taken for personal affairs.
- (2) Time taken for lunch and tea break.
- (3) Time taken for obtaining work.
- (4) Time taken for changing from one job to another.
- (5) Waiting time for getting instructions, tools and or raw materials.

## **Abnormal Idle Time**

Abnormal idle time refers that any loss of time which may occur due to some abnormal reasons. Abnormal idle time can be prevented through effective planning and control. The abnormal idle time may arise due to the following avoidable reasons :

- (1) Faulty planning.
- (2) Lack of co-operation and co-ordination.
- (3) Power failure.
- (4) Time lost due to delayed instructions.
- (5) Time lost due to inefficiency of workers.
- (6) Time lost due to non-availability of raw materials, spare parts, tools etc.
- (7) Time lost due to strikes, lock outs and lay-off.

**Over Time:** The term "over time" refers to when a worker works beyond the normal working hours or scheduled time is known as 'overtime.' According to Factories Act, the wage rate of overtime work to be paid at double the normal rate of wages. The extra amount of remuneration is paid to the worker in addition to normal rate of wages is said to be overtime premium.

**Effect of Over Time Payment on Productivity:** The following are the effects of over time payment on productivity:

- (1) Overtime premium is an extra payment over normal wages and hence will increase the production cost.
- (2) The efficiency of workers during overtime work may fall and hence output may be reduced.
- (3) To earn more, workers may not concentrate on work during normal hours, and thus the output during normal hours may fall.
- (4) Reduced output and increased premium will increase the cost of production.

**Control of Overtime:** Control of overtime is essential to minimize the cost of production and increase the overall performance of the efficiency. Effective control of overtime can be possible through the following ways :

- (1) Effective sound planning of production
- (2) Adequate supervision
- (3) Ensuring availability of raw materials, spare parts
- (4) Encouraging productivity
- (5) Reducing labour turnover
- (6) Ensuring effective system of repairs and maintenance, material handling and smooth flow of production
- (7) Fair and equitable remuneration to efficient and inefficient workers.

**Casual Workers:** Casual workers are those who are engaged casually whenever there is extra load of work or due to planned maintenance during off season.

**System of Control:** In order to achieve the effective control of casual workers the following system to be adopted:

- (1) Assess work load, for example, planned maintenance during off season.
- (2) Assess manpower requirement.
- (3) Obtain prior sanction for number of workers giving the period for which engagement is to be done.
- (4) Obtain periodical report on performance and compare with the plan to ensure that there is no lagging behind.
- (5) Provide for automatic termination after the period for which sanction is given expenses.

**Out Workers:** Out workers are those who are engaged in production operations outside the factory. For example, works carried on construction and electricity.

**Control of Out Workers :** The following are the important aspects to be considered for effective control of out workers :

- (1) Keep a log book at reception.
- (2) Record complaint specifying date and time of receipt of complaint.
- (3) Keep proper complaint slips and send the same to technical department.
- (4) Prepare duty sheets in duplicate to note down time on and time off.
- (5) Summarise time spent by each service man daily.
- (6) Summarise chargeable amount and non-chargeable amount.
- (7) Advise accounts department for billing.

**Labour Turnover:** Labour Turnover may be defined as "the rate of changes in labour force, i.e., the percentage of changes in the labour force of an organization during a specific period. Higher rate of labour turnover indicates that labour is not stable and there are frequent changes in the labour force in the organization. It will affect the efficiency of the workers and overall profitability of the firm. The determinant result of labour turnover is expressed in terms of percentage.

### Types of labor turn over

#### (1) Labour turnover according to separation method:

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

This definition does not take into consideration the fact of surplus labour. This definition will give incorrect result when the surplus workers are discharged because labour turnover calculated in this way will be high.

#### (2) Labour turnover according to flux method:

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

This definition will not be applicable when the organisation is expanding. In such a case, many new workers are engaged and there may be no separation; even then labour turnover calculated will be high.

$$(3) \text{ Labour Turnover} = \frac{\frac{\text{Number of additions + Separations during a period}}{2}}{\text{Average number of employees during a period}} \times 100$$



This definition will misguide when an organisation has reached its optimum size and does not require expansion at all. In such a case, labour turnover, as per this definition, will show half the actual percentage of labour turnover.

**(4) Labour turnover according to replacement method:**

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

This definition takes into account the surplus labour. This definition will also give correct labour turnover when the factory is expanding because all additions are not to be taken only workers replaced due to leavers are to be taken. Therefore, this definition can be taken to be the most reliable definition out of all the definitions given above.

Causes for Labour Turnover:

- (1) Avoidable Causes
- (2) Unavoidable Causes

***(1) Avoidable Causes***

- (1) Lack of job involvement
- (2) Lack of co-operation among the employees
- (3) Lack of smooth relationship between employer and employees
- (4) Dissatisfaction with wages and incentives
- (5) Bias attitude of Management
- (6) Poor working conditions
- (7) Dissatisfaction with promotion, recognition, transfer etc.
- (8) Lack of Co-ordination
- (9) Non-availability of adequate protection, proper instructions, accommodation etc.

***(2) Unavoidable Causes***

- (1) Retirement or Death of employer
- (2) Marriage in the case of female workers
- (3) Permanent disability due to accident or illness

- (4) Dismissal or discharged due to inefficiency or disciplinary ground
- (5) Dissatisfaction with job
- (6) Shortage of power, raw materials etc.
- (7) Personal responsibilities
- (8) Personal betterment with regard to new job
- (9) Change in nature of business and plant location.

#### **Effect of Labour Turnover:**

- (1) Increased cost of recruitment, training and placement
- (2) Increased cost of production
- (3) Decrease in output due to inefficient or newly recruited workers
- (4) Higher accident rate due to negligence or mishandling of machines
- (5) Low team spirit due to lack of co-operation and co-ordination between the workers and employers.

#### **Cost of Labour Turnover:**

The chief aim of the preventive costs which are incurred in order to keep the workers satisfied and reduce the labour turnover rate as much as possible. These preventive costs which include the following:

- (a) Cost of providing medical facilities, canteen and other welfare facilities
- (b) Cost of administration
- (c) Cost of providing better working conditions
- (d) Cost of pension, gratuity, provident fund and other retirement benefits.

#### **Problem 1**

Find out the value wages under Piece rate system and Time Rate System

- I) Mr X worked 8 hours in a day in Bricks Manufacturing Company and the Rate per Hour is Rs.50.
- II) Mr X Produced 120 Units of Product in Bricks Manufacturing Company and Rate per Unit is Rs.30.

Solution 1

Time Rate System :

$$\text{Wages} = \text{No of Hours Worked} * \text{Rate Per hour} = 8 * 50 = \text{Rs.400}$$

Piece Rate System:

Wages = No of Units Produced \* Rate Per Unit = 120 \* 30 = Rs.3600

Problem 2

Find out the value wages under Time rate system with OVER TIME

Day	No of Hours Worked
<b>Mon</b>	<b>4</b>
<b>Tue</b>	<b>4</b>
<b>Wed</b>	<b>4</b>
<b>Thu</b>	<b>7</b>
<b>Fri</b>	<b>6</b>
<b>Sat</b>	<b>4</b>

Actual Standard hour is 4 hours in a day

Rate per Hour is Rs.150 and Over Time Rate is Rs.200 if crossed more than 4 Hours in a day. (Standard hour).

Solution 2

Day	Total No of Hours Worked	Actual Hours	Over Time
<b>Mon</b>	<b>4</b>	<b>4</b>	<b>0</b>
<b>Tue</b>	<b>4</b>	<b>4</b>	<b>0</b>
<b>Wed</b>	<b>4</b>	<b>4</b>	<b>0</b>
<b>Thu</b>	<b>7</b>	<b>4</b>	<b>3</b>
<b>Fri</b>	<b>6</b>	<b>4</b>	<b>2</b>
<b>Sat</b>	<b>4</b>	<b>4</b>	<b>0</b>
<b>Total</b>	<b>29</b>	<b>24</b>	<b>5</b>

So Total of Normal Working Hours in a week is 24 Hours

Total of Overtime in a Week is 5 Hours

Wages for standard working Hours = 24 \* 150 = Rs.3600

Wages for Overtime Working Hours = 5 \* 200 = Rs.1000

So, The Total wages of the Worker is = Rs.4600 ( 3600+ 1000)

Problem 3

Calculate the normal and overtime wages payable to a workman from the following data.

Day	Total No of Hours Worked
<b>Mon</b>	<b>8</b>
<b>Tue</b>	<b>12</b>
<b>Wed</b>	<b>10</b>
<b>Thu</b>	<b>10</b>
<b>Fri</b>	<b>9</b>
<b>Sat</b>	<b>4</b>
<b>Total</b>	<b>53</b>

Normal Working Hours - 8 Hours per day ; on Saturday is 4 Hours.

Normal Rate Rs.2 per Hour.

Overtime rate – **Upto** 9 Hours in a day at single rate and **over** 9 hours in a day at double rate. Or Upto 48 Hours in a week at single rate and over 48 Hours at double rate, whichever is more beneficial to the workers.

Solution 3

Day	Total No of Hours Worked	Normal Working Hours	Over Time at Single Rate	Over Time at Double Rate
<b>Mon</b>	<b>8</b>	<b>8</b>	<b>0</b>	<b>0</b>
<b>Tue</b>	<b>12</b>	<b>8</b>	<b>1</b>	<b>3 (12-9)</b>
<b>Wed</b>	<b>10</b>	<b>8</b>	<b>1</b>	<b>1(10-9)</b>
<b>Thu</b>	<b>10</b>	<b>8</b>	<b>1</b>	<b>1 (10-9)</b>
<b>Fri</b>	<b>9</b>	<b>8</b>	<b>1</b>	<b>0</b>
<b>Sat</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>
<b>Total</b>	<b>53</b>	<b>44</b>	<b>4</b>	<b>5</b>

Day Basis

<b>Wages for normal working Hours</b>	<b>44 * 2</b>		<b>88</b>
<b>Wages for Overtime Hours:</b>			
<b>At Single rate for 4 Hours</b>	<b>4 * 2</b>	<b>8</b>	
<b>At Double rate for 5 Hours</b>	<b>5 * 4</b>	<b>20</b>	<b>28</b>
<b>Total Wages</b>			<b>116</b>

Week Basis

<b>Wages for normal Hourly rate for 48 Hours</b>	<b>(44+4) 48 *</b>		<b>96</b>
<b>Wages for Overtime Hours for 5 Hours</b>	<b>5 * 4</b>		<b>20</b>
<b>Total Wages</b>			<b>116</b>

#### Problem 4

Calculate the earning of workers X and Y under (A) **Straight piece rate system** and (B) **Taylor's Differential Piece rate system** from the following details:

Standard time per unit = 12 minute

Standard rate per hour = Rs.60

Differentials to be used 80% and 120%

In a particular day of 8 Hours, worker 'X' Produced 30 units and worker 'Y' Produced 50 Units.

#### Solution 4

##### i) Level of Performance of Workers

Standard production for 12 minutes = 1 unit

So standard production per hour = 60 minutes / 12 minutes = 5 units

Standard production per day of 8 Hours = 8 hours \* 5 Units = 40 units

SO, Worker **X** who produced 30 units is **below standard**

Worker **Y** who produced 50 units is **above standard**

##### ii) Calculation of piece rates

Standard rate per hour = Rs.60

Straight piece rate = Rs.60 / 5 units per hour = Rs.12 per unit

**Low piece rate for below standard production = Straight piece rate \* Lower differential**

= Rs. 12 \* 80% = Rs.9.60 per unit

**High piece rate for above standard production = Straight piece rate \* Higher differential**

= Rs.12 \* 120% = Rs.14.40 per unit.

##### A) Earning of workers under straight piece rate system

**Earnings = Production of worker \* Straight piece rate**

Worker X : 30 Units \* Rs.12 per Unit = Rs.360

Worker Y : 50 Units \* Rs.12 per Unit = Rs.600

##### (B) Earning of workers under Taylor's Differential Piece rate system

**Earnings = Production of worker \* Differential piece rate**

Worker X : 30 Units \* Rs.9.60 per Unit = Rs.288

Worker Y : 50 Units \* Rs.14.40 per Unit = Rs.720

#### Problem 5

From the following data given by the Personnel department, calculate the labour turnover rate by applying:

**a) Separation method b) Replacement Method c) Flux method**

##### No of workers in the payroll:

At the beginning of the month 900

At the end of the month 1,100

During the month 10 workers left; 40 workers were discharged and 150 workers were recruited. Of these, 25 workers are recruited in the vacancies of those leaving while rests were engaged for an expansion scheme.

Solution 5

Average No of workers during the year:

= (No of workers at the beginning of the Month+ No of workers at the end of the Month) / 2

$$900 (+) 1100 / 2 = 1000$$

(a) Labor Turnover rate in Separation Method:

$$= (\text{No of Separations} / \text{Average no of workers}) * 100$$

$$(10 + 40 / 1000) * 100 = 5\%$$

(b) Labor Turnover rate in Replacement Method:

$$= (\text{No of Workers replaced} / \text{Average no of workers}) * 100$$

$$(25 / 1000) * 100 = 2.5 \%$$

(C) Labor Turnover rate in Flux Method:

$$= (\text{No of Addition} + \text{No of Separations} / \text{Average no of workers}) * 100$$

$$(150 + 40 + 10) / 1000 = 20\%$$

### Working Problems

#### UNIT-4

#### LABOUR COST

1. From the following data given by the Personnel department, calculate the labour turnover rate by applying:

a) Separation method b) Replacement Method c) Flux method

No of workers in the payroll:

At the beginning of the month 900

At the end of the month 1,100

During the month 10 workers left; 40 workers were discharged and 150 workers were recruited. Of these, 25 workers are recruited in the vacancies of those leaving while rests were engaged for an expansion scheme.

2. Calculate the normal and overtime wages payable to a workman from the following data:

Days	Hours worked
Monday	8
Tuesday	12
Wednesday	10
Thursday	10
Friday	9

Saturday

4

---

53

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Normal working hours-8 hours per day: on Saturday-4 hours.

Normal rate Rs.2 per hour.

Overtime rate up to 9 hours in a day at single rate and over 9 hours in a day at double rate. Or up to 48 hours in a week at single rate and over 48 hours at double rate, whichever is more beneficial to the workers.

3.From the following data prepare statement showing the cost per day of 8 hours of engaging a particular type of labour:

- a) Monthly salary (Basic plus dearness allowance) Rs.400
- b) Leave salary payable to a workman 15% of basic and dearness allowance.
- c) Employee's contribution to provident fund 8% of salary (items a and b)
- d) Employer's contribution to E.S.I 5% of salary (items a and b)
- e) Pro rata expenditure on amenities to labour Rs25 per head per month.
- f) No. of working hours in a month 200

4.Mr. A, a worker in a factory is paid on time basis. During the month of October, 2009 he has worked for 200 hours. His hourly wage rate is Rs.10 per hour.

Mr. B, another employee of the company is paid on the basis of piece wages. During the month of January 99 his output was 1,000 units. Rate of wages per piece is Rs.3.

Calculate the wages of respective workers for the month of October, 2009.

5.Calculate the earnings of workers X and Y under (A) straight piece rate system and (B)

Taylor's differential piece rate system from the details:

Standard time per unit =12 minutes

Standard rate per hour =Rs.60

Differentials to be used 80% and 120%

In a particular day of 8 hours, workers 'X' produced 30 units and worker 'Y' produced 50 units.

6.Calculate the earnings of 3 workers A, B, and C under 'Merrick's multiple piece rate system',

given the following:

Standard production per day: 150 units

Normal piece rate: Rs.0.50 per unit

Production of workers on a particular day:

A-120 units

B-140units

C-160 units

7. The following are the particulars applicable to a work process:

Time Rate Rs.5 per hour

High task 40 units per week

Piece rate above the high task Rs.605 per unit

In a 40 hour week, the production of the workers was as follows:

A 35 units B 52 units

Calculate the wages of the workers under Gantt's task bonus plan.

8. A worker is paid at 25 paise per hour for completing a work within 8 hours. If he completes the work within 6 hours, calculate his wages under Halsey plan when the rate of premium is 50%.Also ascertain the effective hourly rate of earning by the worker.

9. Calculate the total earnings from the following data under Halsey Plan and Halsey-Weir plan.

Standard Time : 10 hours

Time taken : 8 hours

Time rate Rs.2.5 per hour

10. Calculate the earnings of a worker under (A) Halsey Premium plan and (B) Rowan scheme.

Time allowed = 48 hours

Time taken = 40 hours

Rate per hour = Re.1

11. Ascertain wages of a worker under Bedeaux's point premium system from the following details:

Standard output per day of 8 hours = 160 units

Actual output during a day of 8 hours 200 units

Rate per hour is Rs.5.00



## **Question Bank**

### **Part-A**

1. What are labour cost and the techniques for effective control of labour cost?
2. What is 'Employee History Card'?
3. What is job evaluation?
4. What is idle time and its types?
5. What do you mean by overtime?
6. Write a short note on pay roll department.
7. What do you mean by wages?
8. What is piece rate system?
9. Write a short note on Bonus.
10. What do you understand by 'Time Keeping'?

### **Part-B**

1. Briefly discuss the causes and effect of labour turnover.
2. What are the advantages and disadvantages of time and piece rate system in wages administration ?
3. Discuss the merits and demerits of Job evaluation and merit rating.
4. Discuss the different methods of remunerations in wage payments.
5. Explain the essentials of a good time – keeping system and wage system.
6. Discuss the scopes and types of work study and idle time.
7. Discuss the different methods of bonus systems in India.
8. Raja, a worker in manufacturing unit, is paid at the rate of Rs.10 per hour. His working hours constitute 42 hours over a 5 day a week. Time allowed per day as approved absence for personal needs etc. is 24 minutes.

Raja's job cards for the week ended 30<sup>th</sup> sep.2005 show that his time during the week is chargeable as under:

Job No A - 42	15 hours
Job No K - 12	20 hours
Job No R - 3	2 hours

The time unaccounted for is due to a power failure.

You are required to show raja's wages for the week and how they would be dealt with in cost accounts.

9. From the following particulars find the amount required for each payment of wages in a factory for a particular month:

Wages for normal hours worked	Rs.200000
Wages for overtime worked	Rs.5000
Leave wages	Rs.4000
Deduction for employees state insurance scheme	Rs.3000
Employee contribution to provident fund	Rs.2000

House rent to be recovered from 20 employees at Rs.50 per month. Employer also contributes an equal towards ESI and PF.

10. Calculate the labour cost for the month of July 2012 relating towards a workman from the following:

Basic pay	Rs.200 per Labour
D.A	Rs.150 per Labour
Employer's contribution to state insurance	6% of Basic and D.A
Fringe benefits	Rs.100 per Labour
Employer's contribution to provident fund	5% of basic and D.A

Employee's contribution to state insurance and provident fund is equal to that of employer.



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## **SCHOOL OF MANAGEMENT**

### **UNIT V - COST ACCOUNTING - SBAX1018**

## UNIT 5      OVERHEADS

Overheads – classification. Allocation, Apportionment and Absorption - Accounting and control of overheads – manufacturing - Administration, selling and distribution. (Primary and Secondary Distribution). Machine Hour rate.

### **Overhead**

**Overhead** expenses are all **costs** on the income statement except for direct labour, direct materials, and direct expenses. **Overhead** expenses include **accounting** fees, advertising, insurance, interest, legal fees, labor burden, rent, repairs, supplies, taxes, telephone bills, travel expenditures, and utilities.

Cost pertaining to a cost centre or cost unit may be divided into two portions direct and indirect. The indirect portion of the total cost constitutes the overhead cost which is the aggregate of indirect material cost, indirect wages and indirect expenses. CIMA defines indirect cost as “expenditure on labour, materials or services which cannot be conveniently identified with a specific saleable cost per unit.”

Indirect costs are those costs which are incurred for the benefit of a number of cost centers or cost units. Indirect cost, therefore, cannot be conveniently identified with a particular cost centre or cost unit but it can be apportioned to or absorbed by cost centers or cost units.

### **Importance of Overhead Costs:**

In various five-year plans, industrialization was given due importance. The result is that a large number of establishments have grown up both in the public and private sectors for mass production for which use of improved and costlier and special type of machines has become absolutely necessary. With the increasing trend towards plant automation, heavy expenditure is being incurred which cannot be charged directly to any particular unit and can be called as cost common to all units of production.

Overhead expenses being a significant proportion of the total cost have assumed an added importance and require analysis for purposes of cost ascertainment and control by function and for guidance in certain managerial decisions by the extent of the variability with production.

Overhead costs cannot be allocated but have to be suitably apportioned and then absorbed by suitable methods. The cost accountant is required to pay so much attention to the accounting of overhead cost as prudence choice of various bases used for apportionment and absorbing the overheads in the cost of products has to be made by him.

### **Classification of Overhead Costs:**

Cost classification is the process of grouping costs according to their common characteristics and establishing a series of special groups according to which costs are classified.

**Thus, it involves two steps:**

- (i) The determination of the class or groups in which the overhead costs are subdivided,
- (ii) The actual process of classification of the various items of expenses into one or the other of the groups.

The method to be adopted for the classification of overhead costs depends upon the type and size of the business, nature of the product or services rendered and policy of the management.

### ***Classification Of Overheads***

#### **1. Classification Of Overheads Based On Function**

- (a) Manufacturing Overhead,
- (b) Administration Overhead,
- (c) Selling & Distribution Overhead,
- (d) Research and Development Expenses

#### **2. Classification Of Overheads Based On Behavior**

- \* Fixed Overheads
- \* Variable Overheads
- \* Semi-variable Overheads
- \* Semi-fixed Overhead

#### **3. Classification Of Overheads Based On Elements**

- \* Indirect Materials
- \* Indirect labor (Wages)

#### **4. Classification Of Overheads Based On Control & Nature**

- \* Controllable Overheads
- \* Uncontrollable Overheads

A concern may adopt one or more of the above classifications. For example, the overhead expenses in a concern may

be first divided according to functions i.e. manufacturing, administration, selling and distribution groups. The expenses pertaining to one group say manufacturing may further be classified into fixed, variable and semi-variable.

Each of these groups may then be grouped into the elements i.e. indirect material, indirect labour and indirect expenses and under each element, the expenses may be further subdivided according to their nature i.e. depreciation, salary, repairs and maintenance etc.

## **I. Functional Classification of Overheads**

When overhead expenses are classified with reference to major activity divisions of a concern, it is called functional classification of overhead. This classification is necessary for the segregation of the cost of each of the principal functional division of the concern and for having separate methods of accounting and control for the diverse nature of expenses in each division.

**The main groups forming the basis of the classification are**

(a) **Manufacturing Overhead:** (also referred to as factory overhead, factory burden, and manufacturing support costs) refers to *indirect* factory-related costs that are incurred when a product is manufactured. Along with costs such as direct material and direct labor, the cost of manufacturing overhead must be assigned to each unit produced so that Inventory and Cost of Goods Sold are valued and reported according to generally accepted accounting principles (GAAP).

### **(b) Administration Overheads**

The overheads incurred for the overall administrative work of the organisation. They include:

- Indirect Materials such as office supplies, stationery and printing items, brooms etc.
- Indirect Labour such as salaries payable to manager, clerk etc.
- Indirect Expenses such as lighting, bank charges, legal/audit charges, rent/insurance of office.

### **(c) Selling Overheads**

The overheads incurred from the stage of final manufacturing of finished goods till the stage of goods sold in the market and collection of dues from the customers. They include:

- Indirect Materials such as samples, packing materials, etc.
- Indirect Labour such as salaries and commission payable to sales manager, salesmen etc.
- Indirect Expenses such as rent, carriage outwards, warehouse charges, discount offered to customers, advertising expenses, bad debts etc

**(d) Research and Development Expenses:**

Research and development (R&D) describes activity or expense associated with the research and development of a company's goods or services. R&D expenses are a type of operating expense and can be deducted as such on a business tax return. This type of expense is incurred in the process of finding and creating new products or services.

**II. Classification with Regard to Behaviour of Expenditure:**

Under this overheads are classified with reference to their tendency to vary with production/sales volume or activity level. Some expenses vary directly with the rise and fall in output, some remain constant in spite of change in the level of activity of the concern whereas there are some other items which are constant only upto a certain level and then change their character to become variable or which vary with volume of output but less than proportionately.

**Based on this behaviour, the expenses may be classified into**

***1. Fixed Overheads***

Fixed overheads are also called period costs or capacity costs. Fixed overheads are incurred for creating an output capacity of the concern for a fixed period of time. They are the costs which remain fixed or constant in total despite changes in the volume of production or sales. Fixed overheads remain fixed in total up to a certain level of activity which is known as *relevant range of activity* but fixed overheads per unit always vary with the production or sales volume in an opposite direction. For example, per unit fixed overheads decrease with an increase in the production or sales volume and vice versa. Examples of fixed overheads are rent, salaries, depreciation, interest and legal expenses.

***2. Variable Overheads***

Variable overheads are those type of overheads which vary positively with the production and sales volume. Hence, they vary directly in proportion to the volume. Variable overheads increase in total with the increase in volume and vice versa. They, however, remain constant in per unit. Examples of variable overheads are indirect materials, indirect wages and power expenses.

### ***3. Semi-variable overheads***

Semi-variable overheads are neither completely fixed nor variable. Therefore, they are also called semi-fixed costs. Semi-variable overheads comprise the quality of both the fixed and variable costs. They vary disproportionately with the change in the volume of output. They do not vary directly proportion to the volume. They are the mixed type of overheads. The semi-variable overheads increase with the increase in output units but not at the same rate. Telephone, electricity, repair and maintenance, heating, lighting, supervision and inspection, salesmen remuneration are some of the examples of semi-variable or semi-fixed overheads.

### ***4. Step Fixed Overheads***

Step fixed overheads remain fixed within a certain range of output level and jump up once the range of output level exceeds. Step fixed overheads remain constant for a given volume, but increase by another fixed amount the moment there is addition of volume, and keep on increasing by a fixed amount with the addition of volume. Hence, such overheads increase step by step according to the relevant range of output level. For example, a college bus driver is paid salary of \$ 2500 a month which will remain constant until another bus is bought or hired. But as soon as the number of college bus increases, the salary cost will be increase by \$2500 with every addition of such buses.

### **Overhead Allocation**

The allocation of certain overhead costs to produced goods is required under the rules of various accounting frameworks. In many businesses, the amount of overhead to be allocated is substantially greater than the direct cost of goods, so the overhead allocation method can be of some importance.

There are two types of overhead, which are administrative overhead and manufacturing overhead. Administrative overhead includes those costs not involved in the development or production of goods or services, such as the costs of front office administration and sales; this is essentially all overhead that is not included in manufacturing overhead. Manufacturing overhead is all of the costs that a factory incurs, other than direct costs.

### **Advantages of Overhead Classification**



1. It ensures effective cost control.
2. It helps the management for effective decision making.
3. The application of marginal costing is essentially for profit planning, cost control, decision making etc. are based on the classification of overheads.
4. On the basis of classification of fixed and variable cost, flexible budgets are prepared at different levels of activity.
5. It facilitates fixing of selling price.
6. Cost classification is useful for break-even analysis. Break-even analysis mainly depends on overall cost and profit which can be useful for making or buying decision.
7. It helps to find out the unit cost of production.

### **Codification of Overhead**

Codification is a process of representing each item by a number, the digits of which indicate the group, the subgroup, the type and the dimension of the item.

### **Advantages of Codification**

- (1) It enables systematic grouping of similar items and avoids confusion caused by long description of the items.
- (2) It serves as the starting point of implication and standardization.
- (3) It helps in avoiding duplication of items and results in the minimisation of number of items, leading to accurate records.
- (4) It helps in allocation and apportionment of overheads to different cost centers.
- (5) It assists the grouping of overheads for cost control.
- (6) It helps in reducing clerical efforts to the minimum

### **Methods of Codification**

- (1) Numerical Codes Method.
  - (2) Decimal Codes Method.
  - (3) Codes with a Combination of Numbers and Alphabets.
- 1) Numerical Method: Under this method, numerical codes are assigned to each item of expenses.
- (2) Decimal Codes: Under this method, the whole numbers are allotted to indicate

master group and the decimals indicate the sub-group

(3) Codes with a Combination of Numbers and Alphabet: Under this method the alphabet indicates the main group and the type of expenses is indicated by the numerical

### **Procedure or Steps in overhead**

Overheads are incurred for work in general. Overhead is added to the prime cost in order to measure the total cost of production or cost of goods sold. For allocation and apportionment of overhead in the cost of production or cost of goods sold the following procedures are involved:

**(1) Classification Overhead:** We have already discussed the classification of overhead in the preceding pages, and the discussion on other procedures would follow in this chapter and the subsequent one.

**(2) Collection of Overhead:** The production overheads or factory overheads are collected and identified under separate overhead code numbers or standing order numbers. These overheads are collected from different sources and documents. The following are the important sources and documents .

### **(3) Overhead Analysis :**

#### **(a) Allocation and Apportionment of Overhead to Cost Centers**

The first step of overhead analysis is distribution of overhead to production department and service department. Before analysing overhead, we should know the concept of Allocation, Absorption and Apportionment.

**Allocation:** Cost allocation refers to the allotment of whole item of cost to cost centers. The technique of charging the entire overhead expenses to a cost centre is known as cost allocation.

**Absorption:** Cost absorption refers to the process of absorbing all overhead costs allocated to apportioned over particular cost centre or production department by the unit produced.

**Apportionment:** Apportionment is the process of distribution factory overheads to cost centers or cost units on an equitable basis. The term apportionment refers to the allotment of expenses which cannot be identified wholly with a particular department. Such expenses require division and apportionment over two or more cost centers in proportion to estimated benefits received.

## **Allocation Vs Apportionment**

(1) Allocation deals with whole amount of factory overheads while apportionment deals with proportion of item of cost or proportion to cost centers.

(2) The item of factory overhead directly allocated and identified with specific cost centers. Whereas apportionment requires suitable and equitable basis. For example, factory rent may be allocated to the factory and has to be apportioned among the producing and service departments on an equitable basis.

### **(b) Re-apportionment (Re-distribution):**

Re-distribution of overhead from various service departments to production departments is known as Re-apportionment or Secondary distribution. Accordingly, allocation and apportionment of overheads from service departments or centers to production centers or departments.

## **Methods of Re-apportionment or Re-distribution**

The following are the important methods of re-distribution of service department overheads to production department :

- (1) Direct Re-distribution Method
- (2) Step Distribution Method
- (3) Reciprocal Service Method - this method further grouped into:
  - (a) Repeated Distribution Method
  - (b) Simultaneous Equitation Method
  - (c) Trial and Error Method

**(1) Direct Re-distribution Method:** Under this method, the cost of service department is directed to re-distribution to the production departments without considering the services rendered by one service department to another service department.

**(2) Step Method:** Under this method the cost of most serviceable department is first distributed to production departments and other service departments. Thereafter, the next service department is distributed and later the last service department until the cost of all the service departments are redistributed to the production department

**(3) Reciprocal Service Method :** This method recognizes the fact that if a service department receives services from other department, the services should be charged in

the receiving department. Thus, the cost of inter departmental services is taken into account on reciprocal basis. The following are the three important methods available for dealing with reciprocal distribution :

(a) **Simultaneous Equation Method:** Under this method, the true cost of total overhead of each service department is ascertained with the help of Simultaneous or Algebraic Equation. The obtained result is reapportioned to production department on the basis of given percentage.

(b) **Repeated Distribution Method:** Under this method, the total overhead costs of the service departments are distributed to service and production departments according to given percentage of the service departments are exhausted, in turn repeatedly until the figures become too small to matter.

(c) **Trial and Error Method:** In this method, the cost of a service centre is apportioned to another service centre. Then, the cost of another service centre along with the apportioned cost from the first centre is again apportioned back to the first service centre. This process is repeated till the amount to be apportioned becomes zero or negligible.

## **Overhead Calculation**

The typical procedure for allocating overhead is to accumulate all manufacturing overhead costs into one or more cost pools, and to then use an activity measure to apportion the overhead costs in the cost pools to inventory. Thus, the overhead allocation formula is:

$$\text{Cost pool} / \text{Total activity measure} = \text{Overhead allocation per unit}$$

## **Absorption of Overhead**

### **Meaning**

Absorption of overhead is also termed as levy, recovery, or application of overhead. Cost absorption refers to the process of absorbing all overhead costs allocated to apportioned over particular cost centre or production department by the unit produced. Accordingly, the distribution of the overhead cost to the cost centres or cost units is known as Overhead Absorption.

## Overhead Rate

The apportionment of overhead expenses is done by adopting suitable basis such as output, materials, prime cost, labour hours, machine hours etc. In order to determine the absorption of overhead in costs of jobs, products or process, a rate is calculated and it is called as "Overhead Absorption Rate" or "Overhead Rate."

Types of overhead rate

**Different overhead rates** are applied based on the features and objectives of the business organization.

( 1) Actual Overhead Rate

(2) Predetermined Overhead Rate

(3) Blanket Overhead Rate

(4) Multiple Overhead Rate

(5) Normal Overhead Rate

(6) Supplementary Overhead Rate

**(1) Actual Overhead Rate:** Actual overhead rate as otherwise called the historical rate. This rate is calculated by dividing the actual overhead absorbed by the actual quantity or value of the base selected for a particular period.

**(2) Predetermined Overhead Rate:** Predetermined overhead rate is determined in advance of actual production and the rate is computed by dividing the budgeted overhead for the accounting period by the budgeted base for the period.

**(3) Blanket Overhead Rate:** Blanket overhead rate is also termed as Single Overhead Rate. A single overhead rate when computed for the entire factory is known as Blanket Rate.

**(4) Multiple Overhead Rate:** Multiple overhead rates involve computation of separate rates for each production department, service department, cost centre, each product or line and for each production factor.

**(5) Normal Overhead Rate:** Normal Overhead Rate is a predetermined rate calculated with reference to normal capacity.

**(6) Supplementary Overhead Rates:** These rates used to carry out adjustment between overhead absorbed and overhead incurred.

## Methods of Absorption of Overhead

There are number of methods applicable for computing overhead absorption rate. The following are the various methods of absorbing "Manufacturing Overhead" depending upon the suitable basis selected for the purpose :

- (1) Direct Material Cost Method
- (2) Direct Labour Cost Method
- (3) Direct Labour Hours Method
- (4) Prime Cost Method
- (5) Unit of Output Method
- (6) Machine Hour Rate Method

**(1) Direct Material Cost Method:** Under this method, the rate of absorption is calculated on the basis of direct material cost method. The rate of manufacturing overhead absorption is determined by dividing the manufacturing overhead by the direct material cost. The result obtained the rate of absorption is expressed as percentage.

**(2) Direct Labour Cost Method:** Direct Labour Cost Method is also termed as Direct Wages Method. Under this method direct wage rate can be determined by dividing the estimated factory overhead cost apportioned by the predetermined direct wages, and the result obtained is expressed as a percentage.

**(3) Direct Labour Hours Method:** Under this method the rate is determined by dividing the production overheads by direct labour hours of each department. This method is designed to overcome the objections of direct labour cost method. This method is most suitable in such industries where the production is carried out manually or by skilled labours.

**(4) Prime Cost Method:** Under this method, both direct material cost and direct labour cost are taken into account for determination of recovery rate. The actual or predetermined rate of factory absorption is computed by dividing actual or budgeted overhead expenses by the aggregate of direct material or direct labour cost of the department.

**(5) Unit of Output Method:** This method is also termed as Production Unit Method or Cost Unit Rate Method. Under this method absorption rate is determined on the basis of number of units produced is known as Cost Unit Rate. The recovery rate is calculated by dividing the actual or budgeted factory overheads by the number of cost

units produced.

**(6) Machine Hour Rate:** Machine hour rate means the cost or expenses incurred in running a machine for one hour. It is one of the scientific methods of absorbing factory expenses where the process of manufacturing are carried out by machines. Under this method overhead costs are allocated on the basis of the number of hours a machine or machines are used for a particular job.

*According to the Institute of Cost and Management Accountants, England a machine hour rate is "an actual or predetermined rate of cost apportionment or overhead absorption, which is calculated by dividing the cost to be apportioned or absorbed by the number of machine hours expended or to be expended."*

#### **Calculation Machine Hour Rate:**

The following **steps** are required for computing the machine hour

(1) Identify the overhead expenses relating to a specific machine or group of machine in order to require for computing machine hour rate

(2) Each machine or group of machine treated as a cost centre.

(3) Manufacturing overhead or machine expenses are grouped into two types:

*(a) Fixed or Standing Charges:* Fixed or Standing Charges which remain constant irrespective of the use of machine. For example, rent, insurance charges, rates, supervision etc.

*(b) Variable Machine Expenses:* These expenses are variable with use of the machine. For example, power, depreciation, repairs etc.

(4) An hourly rate of fixed or standing charges will be calculated by totaling of fixed charges and dividing by the number of normal hours worked by machine.

(5) Normal working hours are calculated by adding the cost relating to non-productive time, i.e., normal ideal time for maintenance and setting up etc.

(6) Separate hourly rate for each machine expenses will be calculated.

(7) The total of the standing charges rate and the machine expenses rates per hour will give the machine hour rate.

#### **Advantages**

- (1) It helps to measure the relative efficiency of different machines.
- (2) It facilitates comparison of cost of operating different machines.
- (3) It helps to ascertain idle time of machines relating to non-productive time.
- (4) It is the most desirable scientific method, where the time factor is taken into account.

### ***Disadvantages***

- (1) It involves more clerical labour in determining the number of machine hours worked.
- (2) It does not consider where the expenses not proportional to the working hours of machines.
- (3) It is very difficult to measure the machine hours where the works are completed without operating any machinery.

## **Question Bank**

### **Part-A**

1. Define „overheads“.
2. What are fixed and variable overheads?
3. Enumerate the major groups under function wise classification of overheads.
4. What is „apportionment of overheads „?
5. What you mean by machine hour rate?
6. What is meant by „allocation of overhead“?
7. What is selling and marketing overheads cost?
8. What is research and development costs?
9. List the methods of codification.
10. What is cost segregation?

### **Part-B**

1. Explain the different methods of classifying overheads.
2. Discuss the differences between fixed, variable and semi-variable overheads.
3. Explain the methods of absorption of overhead along with merits and demerits.



4. A manufacturing company has three production department „A“, „B“ and „C“ and two service departments „D“ and „E“. The following figures are extracted from the records of the company.

Particulars	Amount in Rs
Rent	5000
Indirect wages	1500
Depreciation of machinery	10000
General lighting	600
Power	1500
Sundries (wages)	10000

Following further details are available:

Basis	Total	A	B	C	D	E
Floor space in Sq.ft	10000	2000	2500	3000	2000	500
Lighting points	60	10	15	20	10	5
Direct wages(Rs)	10000	3000	2000	3000	1500	500
H.P.of machine	150	60	30	50	10	-
Value of machinery	250000	60000	80000	100000	5000	5000

Apportion the cost to various departments on the most equitable basis by preparing a primary departmental distribution summary.

5. RMKV silks is divided into four departments : production department „A“, „B“ and „C“ and service department „D“. The actual expenses as follows

Particulars	Amount in Rs
Rent	10000
Repair to plant	6000
Depreciation of plant	4500
Lighting expenses	1000
Supervisory expenses	15000
Fire insurance (on Stock)	5000
Power	9000
Employer's liability for insurance	1500

The following information is available in respect of four departments.

<b>Basis</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Area in Sq.ft	1500	1100	900	500
Number of Lights	75	11	9	5
Total wages(Rs)	60000	40000	30000	20000
Number of employees	200	150	100	50
Value of plant (Rs)	240000	180000	120000	60000
Value of stock (Rs)	150000	90000	60000	-

Apportion the cost to various departments on the most equitable basis by preparing a primary departmental distribution summary.

6. A company has three production departments and two service departments their respective expenditures are given below:

<b>Production department</b>		<b>Service department</b>	
A	Rs.800	X	Rs.234
B	Rs.700	Y	Rs.300
C	Rs.500		

Service departments give service in the following manner to various departments

<b>Service departments</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>X</b>	<b>Y</b>
X	20%	40%	30%	-	10%
Y	40%	20%	20%	20%	-

You are required to show the distribution of service department overheads under simultaneous equation method in secondary distribution overheads methods.

7. The following information of Leyland company Ltd is available

<b>Months</b>	<b>Units of production</b>	<b>Indirect labour expenses in Rs.</b>
Jan	1000	5000
Feb	1200	5600

Mar	1400	6200
April	1880	7640
May	1480	6440
June	1760	7280
July	1800	7400
Aug	1680	7040
Sep	1600	6800
Oct	1720	7160
Nov	1520	6560
Dec	1080	5240

Segregate indirect expenses into fixed labour expenses and variable labour expenses with the help of least square method.

8. From the following particulars compute the machine hour rate

Particulars	Amount in Rs
Cost of machine	11000
Scrap value	680
Repairs for the effective working life	1500
Standing charges for 4 weekly period	40
Effective working life	10000 hours
Power used	6 units per hour @ 5 paise per unit
Hours worked in 4 weekly period	120 hours

9. Workout the machine hour rate for the following machine whose scrap value is nil

Particulars	Amount in Rs
Cost of machine	360000
Freight and initialization charges	40000

Working life	20 years
Working hours	8000 per year
Repair charges	50% of depreciation
Power	10 units per hour @ 10 paise per unit
Lubricating oil	Rs.2 per day of 8 hours
Consumable stores	Rs.10 per day of 8 hours
Wages of operator	Rs.4 per day of 8 hours

10. A shop has four new machines, each occupying an equal area of space and costing respectively Rs.200000 for („A“); Rs.25000 for („B“); Rs.30000 for („C“) and Rs.40000 for („D“). The following are the expenses for the year of machine shop.

Particulars	Amount in Rs
Rent	10000
Water	4250
Light and heat	3150
Power : A	5100
B	5000
C	12000
D	14500
Administrative expenses	9500
Repair expenses	20000

Prepare the statement of machines hour rate for each of the machines presuming 45 hours a week and 50 weeks in a year; 80% is the utilization. The machines are expected to last for 10 years, but do not have any scrap value.