

B.Com: Syllabus (CBCS) SEMESTER-V

CORE PAPER - 13

COST ACCOUNTING-I

Objective: To understand the basic concepts and methods of Cost Accounting.

UNIT-I:

Nature and Scope of Cost Accounting Cost Accounting : Nature and Scope - Objectives, Advantages and Limitation Financial Vs. Cost Accounting Classification- Cost Sheet and Tenders- Cost Unit - Cost Centre and Profit Centre Types of Costing and Cost Costing System –

UNIT-II:

Material Purchase and Control Purchase Department and its Objectives Purchase Procedure - Codification of Materials, Material Control: Levels of Stock and EOQ Inventory System, ABC and VED Analysis-Accounting of Material Losses. Classification and - Perpetual

UNIT-III:

Methods of pricing of Material Issues Cost Price Methods: FIFO, LIFO, Average Price Methods: Simple and Weighted Average Price Methods, Notional Price Methods: Standards Price, and Market Price Methods

UNIT-IV:

Labour Cost Control Labour Turnover: Causes, Methods of Measurement and Reduction of Labour Turnover- Idle and Over Time - Remuneration and Incentive: Time and Piece Rate - Taylor S Merricks and Gantt's Task - Premium Bonus System - Halsey, Rowan and Emerson's Plans- Calculation of Earnings of Workers.

UNIT-V:

Overheads Classification of Overhead Costs - Departmentalization of Overheads - Allocation Absorption and Apportionment of Overhead Costs- Primary and Secondary Distribution Overheads -Computation of Machine Hour Rate and Labour Hour Rate.

(Weightage of Marks Problems 80%, Theory 20%) 38

Cost Accounting

Unit 1

Introduction

Cost Accounting

The function accounting system is to provide available information accurately for those who are concerned with the welfare of an organization -owners, employees, creditors, investors and management. All of them are satisfied with profit and loss account and balance sheet. However, management needs detailed information about the financial statements. The main focus is not in the past but in the future of the management.

Cost accountancy is a useful tool for businessman, goods manufactures or services renders. It is an extension of financial accounting and it was developed, on account of limitations of financial accounting, to meet ever growing needs of the management.

Growth of cost accounting

During the second half of 19th Century accurate information need on cost of products lead the development of cost accounting. In the 19th Century much literature on cost accounting is found in England and little was found in the United States. Very rapid growth of in cost accounting is taken place after 1914 due to heavy industry and large scale production as a consequence of First World War when costs other than material and labour (overhead) constituted a significant portion of total cost.

Cost accounting in India

In India the development of cost accounting is the recent origin and more importance given after the independence. The companies act also given a provision of Cost Audit under Sec. 233B.

Definition of Cost, Costing, Cost Accounting and Cost Accountancy

1. Cost

Institute of Cost and Management Accountants (I.C.M.A.), now known as Chartered Institute of Management Accountants (C.I.M.A.), London.

'Cost' is the amount of:

- (a) Actual expenditure incurred on a given thing; and
- (b) Notional expenditure attributable to a given thing.

W.M. Harper,

"Cost is the value of economic resources used as a result of producing or doing the thing costed".

Ryall,

"From a technical point of view, the term cost may be used when referring to the cost of manufacturing only or the cost of selling and distribution of goods, or to indicate the total cost of manufacturing, selling and distribution".

Simply the term cost may be total of all expenses incurred, whether paid or due, in the production and sale of a product, or expended in rendering a service.

2. Costing

I.C.M.A., London

'Costing' is the ascertainment of costs.

- (a) "It the techniques and processes of ascertaining costs and
- (b) Study the principles and rules for the determination of cost of products and services".

3. Cost Accounting

The process of recording and accounting for all the elements of cost is called 'cost accounting' **I.C.M.A.**

"The process of accounting for cost from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units. In its widest usage it embraces the preparation of statistical data, the application of cost control methods and the ascertainment of the profitability of activities carried out or planned".

4. Cost Accountancy

I.C.M.A.

"The application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability. It includes the presentation of information derived there from for the purpose of managerial decision making".

Need for Cost Accounting

- (a) Fixing of selling prices of a product or services
- (b) Control of cost; and (c) Decision making from alternative choices.

Scope and Objectives of Cost Accounting

1) Scope of Cost Accounting: The term 'scope' here refers to field of activity. Cost accounting is concerned with ascertainment and control of costs. The information provided to the management is helpful for cost control and cost reduction through functions of planning, decision making and control. In the initial stages of evolution, cost accounting confined itself to cost ascertainment and presentation of the same with the main objective of finding the product cost. With the development of business activity and introduction of large scale production, the scope of cost accounting was broadened and providing information for cost control and cost reduction has assumed equal significance along with finding out cost of production. In addition to enlargement of scope, the area of application of cost accounting has also widened. Initially cost accounting was applied in manufacturing activities only. Now, it is applied in service organisations, government organisations, local authorities, farms, extractive industries, etc.

(i) Objectives or Purposes or Functions or Aims of Cost Accounting: Main its objectives or purposes or functions or aims of accounting are: (A) Cost finding or cost ascertainment (B) Control of cost (C) Reduction of cost (D) Fixation of selling price (E) Providing information for framing business policy

(A) Cost finding or cost ascertainment

The primary objective of cost accounting is ascertainment of cost. It is done through the methods and techniques of costing. Costing is the process of collection, classification and analysis of costs or expenses.

(B) Control of Cost

A basic function of cost accounting is to control costs. In order to know the efficiency of the organisation and its various Departments and Cost Centres, budgets and standards are fixed for materials, labour and overheads which are compared with the actual performances. The variances reveal whether cost is within control or not. Remedial actions are taken to control the costs which are not within the budgets or standards set.

(C) Cost Reduction

Cost reduction is to be understood as the achievement of 'real and permanent' reduction in the unit cost of goods manufactured or services rendered without impairing their suitability for the use intended. Cost accounting is helpful to management in cost reduction through the techniques of budgetary control, standard costing material control, labor control and overheads control

(D) Fixation of Selling Price.

The price of a product consists of total cost and the margin required. Cost accounts provide detailed information regarding Total cost in the form of various components. They also provide information in terms of fixed cost and variable costs, so that the extent of price reduction to be done in case of intensive competition, etc., can be decided.

(E) Framing business policy:

Cost accounting strives to help the management in formulating business policy and decision making. Break even analysis, cost volume profit relationships, differential costing, etc., are helpful to the management in taking decisions regarding:

- (a) Production or discontinuation of a product;
- (b) Utilization of idle capacity;
- (c) The most profitable sales mix;
- (d) Alternatives based on key - factor,
- (e) Export decisions;
- (f) Make or buy decisions, etc.

(4) Cost Accounting Vs. Financial Accounting and Management Accounting

(a) Meaning and Limitations of Financial Accounting

Financial Accounting records cash and credit transactions of a business on the basis of nature of expenditure so as to prepare the profit and loss account for a specific period and balance sheet as on a specified date. It is helpful in knowing the profit and loss of the business and its state of affairs and financial position on a specified date.

‘Financial Accounting’ does not answer the following questions:

- (a) Can the profit made by the firm be increased? Is the profit made optimum?
- (b) In case of loss, whether loss can be reduced or converted into profit by means of cost control and cost reduction?
- (c) Which departments are performing well? Which ones are incurring losses and how much is the loss in each case?
- (d) What is the cost of products manufactured?
- (e) How can wastage be reduced?
- (f) Whether selling price can be increased or reduced? and if so, to what extent?
- (g) Can expenses be reduced which results in the reduction of product cost and if so, to what extent and how?

Weaknesses of financial accounting find their strength in costing:

(i) Financial accounting emphasizes on reconciliation of cash in hand and with bank with the balance revealed by cash book, but it fails to maintain records regarding, materials, stocks, stores organization, pricing of materials issues, ascertainment of cost of production, etc.

(ii) Labor cost records are not maintained in detail in financial accounts. Whereas the hours worked, direct and indirect labor, labor charges incurred are relevant for product pricing and cost control. Financial accounting fails to provide this kind of detailed information

(iii) It is not possible to find total cost, cost of work - in - progress and estimation of tender price with the help of financial accounts easily.

Cost accounting provides relevant answers to all these questions and shortcomings.

L.W. Hawkins has rightly said "The ordinary trading account is a locked store house of most valuable information to which a cost system is the key".

(b) Distinction between Financial Accounting and Cost Accounting

Differences between Financial Accounts and Cost Accounts are listed below:

	Financial Accounting	Cost Accounting
(1) Objective	The main objective of financial accounting is to prepare profit and loss A/c and balance sheet to report to owner and outsiders.	The main objective of cost accounting is to provide cost information to management for decision making.
(2) legal requirement	Financial records are maintained as per the requirement of companies Act and Income Tax Act.	Cost accounts are maintained to fulfil the internal requirements of the management as per conventional guidelines.
(3) classification of transactions	Financial accounting classifies records and analyses transactions in a subjective manner i.e., according to nature of expensive.	Cost accounting records and analyses expenditure in an objective manner viz., according to purpose for which cost are incurred.
(4) stock valuation	In financial accounts, stocks are valued at cost or realizable value, whichever is lesser.	In cost accounts stocks are valued at cost.
(5) analysis of profit and cost	In financial accounts, the profit or loss of the entire enterprise is disclosed in toto.	Cost account reveal profit or loss of different products, departments separately.
(6) accounting period	Financial reports are prepared annually	Cost reports are of continous process and are prepared as per the requirement of managements, may be daily weekly, monthly, quarterly, or annually.
(7) Emphasis	Emphasis is laid on the recording of transactions and control aspect is not given importance.	Cost accounting lays emphasis on ascertainment of cost and cost control
(8) Nature	Financial accounts are maintained on the basis of historical records.	Cost accounts lay emphasis on both historical and predetermined costs.

(c) Management Accounting

Management accounting is a discipline developed to provide information to management to frame policies, take decisions and control operations.

The Anglo American Council on productivity has defined Management Accounting as:

"The presentation of management information in such a way as to assist management in the creation of policy and in the day - to - day operations of an undertaking"

The sources of data for management accounting are the financial accounting and the cost accounting. The scope of management accounting is to provide information to the management for managerial decision making. That is why cost accounting concepts are used in management accounting.

Although there is overlapping of areas between cost accounting and management accounting, there are several differences between them.

(d) Differences between Cost Accounting and Management Accounting

- (i) Cost accounting is concerned with cost ascertainment, determining profitability and control of costs through budgetary control, marginal costing and standard costing.
Management accounting is concerned with providing relevant information to formulate the policies of the organization and improving its profitability.
- (ii) Cost accounting is developed and improvised out of financial accounting.
Management accounting is conceived out of cost accounting.
- (iii) Cost accounting suggests to the management the best of the alternatives by use of different costing techniques.
Management accounting considers both cost as well as non - cost techniques and information for deciding upon alternatives.
- (iv) Cost Accounting reveals variances to management by using budgets and standard costing techniques.
Management accounting is helpful in suggesting to the management ways and means of deletion of unfavorable variances.

We can conclude by saying that management accounting is an off - shoot of cost accounting with more specialized and specific purposes.

(5) Advantages of Cost Accounting

Deficiencies in financial accounting are compensated by cost accounting. It is immensely useful to the management, to the employees, to the public and the creditors.

The advantages it offers to all the 'stake – holders' are discussed below:

To the Management:

1. Effective decision making
2. Measuring efficiency
3. Cost reduction
4. Fixation of selling price
5. Effective cost control
6. Increase in efficiency
7. Effective inventory control
8. Reduction of wastage
9. Effective utilization of resources
10. Help in effective budgeting

To the Employees:

1. Stability of tenure
2. Fair wage policy
3. Rewards for higher efficiency through incentive schemes.

To the Creditors

1. Understanding the progress and profitability of the firm and future prospects of the firm.

To the Government

1. Granting of subsidies
2. Planning of resources
3. Utilization of scarce resources.

To the Public

1. Removal of wastages
2. Fair price for products
3. Employment opportunities

The above advantages are briefly explained below:

(a) To the Management

1. **Effective decision making:** Cost accounting provides information regarding individual products, departments, divisions, and cost centers. This facilitates the management to identify unprofitable operations and improve overall profitability.
2. **Measuring Efficiency:** With the help of cost accounting, the management can set budgets and standards for various elements of cost and compare them with actuals to measure efficiency
3. **Cost Reduction:** Cost accounting is helpful to management in reduction of cost through its techniques by efficient and effective utilization of raw materials, labor and optimum production of output.
4. **Fixation of Selling Price:** Cost accounting provides information under various classifications. One of them is on the basis of behavior of costs. Availability of information in detail regarding variable and fixed costs helps in fixing selling price under different circumstances.
5. **Effective cost control:** The fundamental objective of cost accounting is to ascertain and control costs. The segregation of cost at different stages is helpful in effective control through standard costing and budgetary control.
6. **Increased Efficiency.** Under an efficient cost accounting system, proper inventory control, labor utilization and proper analysis of expenditure is possible. This results in increased efficiency throughout the organization.
7. **Effective inventory control:** An efficient cost accounting system helps in effective inventory control through techniques like ABC analysis, Stock verification, VED analysis and Levels of stock.
8. **Reduction of wastages of material and labor** · Cost accounting sets predetermined costs for different elements which are compared with actuals to reveal variances. The unfavorable variances are dealt with and controlled effectively. Moreover, standards indicate the norms beyond which cost is not to be exceeded. This acts as a check on wastages.
9. **Effective Utilization of Resources:** Marginal costing helps in decision making regarding 'make or buy' of components, profit planning, export decisions, effective utilization of key

factor, sales mix, etc. Standard costing and budgetary control are also helpful in effective utilization of resources.

10. Effective Budgeting Cost accounting emphasizes and records both historical costs and pre-determined costs, which are essential for the technique of budgetary control. Without additional effort, budgetary control can be operated when costing systems are used.

(b) To the employees

(1) Stability of Tenure: A good costing system is helpful to managements in increasing productivity and profitability of firms. This leads to prosperity of industries, better wages for workers and security of job.

(2) Fair wage policy and suitable incentive schemes: Since cost accounting system keeps records for each element of cost, labor hours and labor cost are recorded in full detail. This will be helpful for the management in introducing a good wage system to reward skilled workers and stimulate them to go for higher production.

(c) To the Creditors:

Before the creditors offer loans to a firm, they can have better understanding of the progress and profitability of the firm through relevant reports. Estimates and budgets can project the future prospects of a firm.

(d) To the Government:

Cost data of specific industries and general trend of costs can influence the government to initiate appropriate changes in granting of subsidies, formulating taxation policies, import and export legislation, etc.

(e) To the Public:

Good costing system helps in proper utilization of resources. Cost reduction is helpful in fair price of products and profitability of organizations to the members of the public, is helpful in prosperity of the industry through more employment opportunities to the members of the public.

(6) Limitations of Cost Accounting

1. Lack of uniformity: There is no uniform system of costing applicable to all industries. Even for the same firm, two different cost accountants may arrive at two different cost figures.

2. Second hand data: Costing depends on financial accounts for a lot of information, which is second hand. Any errors or shortcomings in that data creep into cost accounts also.

3. Conventions: Several conventions are routinely applied or used in costing which may not be appropriate in all situations. For ex. classifying overheads into variable and fixed, recovery of overheads on machine hour or labor hour basis etc.

4. Uncertainty: Estimates are used in different contexts like Tenders & Quotations, Contracts etc. Different methods of pricing of materials are available. Several methods of absorption and apportionment of overheads can be used. All these factors lead to uncertainty and fluidity in costing. It becomes difficult to derive correct costs. Actual costs may differ from estimated costs, rendering quotations etc. erroneous.

5. Costly: The need to observe several formalities to derive benefits of costing makes it costly for small and medium enterprises.

6. Applicability: Costing is applicable primarily in manufacturing and service firms. It is not useful for trading firms.

7. Some items of costs and incomes are fully ignored in cost accounts where as they are shown in financial accounts.

(7) Objections to Cost Accounting Cost accounting has become indispensable tool to management for exercising effective decisions. However, the following are the usual objections raised against cost accounting:

(a) Cost Accounting is costly to operate: One of the objections against cost accounting is that it involves heavy expenditure to operate.

No doubt, expenses are involved in introduction and operation of cost accounting system. This is the case with any accounting system; the benefits derived by operating the system are more than the cost. Therefore an organization need not hesitate to install and operate the system.

(b) Cost Accounting is unnecessary: It is felt by a few that cost accounting is of recent origin and an enterprise can survive without cost accounting.

No doubt financial accounting may be helpful to draw P & L Account and Balance Sheet but an enterprise can work efficiently with the help of cost accounting and it is necessary to increase efficiency and profitability in the long run.

(C) Cost Accounting involves many forms and statements: It is pointed against cost accounting that it involves usage of many forms and statements which leads to monotony in filling up of forms and increase of paper work.

It is true that cost accounting is operated by introducing many forms and preparation of statements. This will become routine and as time passes the utility of forms is realized and the forms can be reviewed, revised, simplified and minimized.

(e) Costing may not be applicable in all types of Industries: Existing methods of cost accounting may not be applicable in all types of industries.

Cost accounting methods can be devised for all types of industries, and services.

(f) It is based on Estimations: Some people claim that costing system relies on predetermined data and therefore it is not reliable.

Costing system estimates costs scientifically based on past and present situations and with suitable modifications for the future. This leads to accurate cost figures based on which management can initiate decisions. But for the predetermined costs. cost accounting also becomes another 'Historical Accounting'.

(8) Installation of Costing System

There is no system or method of costing which can fulfill the requirements of all types of Industries.

To install the most suitable system of costing in a particular organization, the following should be noted

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

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

1. Simple to Operate: The cost accounting system should be simple to understand and operate so that persons involved may not be confused and follow wrong procedures or methods.

2. Flexibility: The cost accounting system should be flexible to adopt new requirements based on changes occurring in the enterprise due to external conditions.
3. Comparability: The costing system should be able to provide comparable data. Comparison can be between the figures of two or more periods of the same firm or between the figures of the firm and those of the competitors for a particular period or periods
4. Economy: The cost accounting system should justify the cost of operation through resultant benefits. The system should be operated with least cost.
5. Timeliness: The system must be capable of providing appropriate information in Time for decisions relating to cost control.
6. Suitability to the enterprise: The cost accounting system devised should be suitable to the nature of business done by the enterprise and it should fulfill the requirements of the business.
7. Minimum changes in current setup: The existing system of Authority and responsibility, delegation etc. should not be disturbed. Changes in the organizational setup should be minimum possible.
8. Minimum clerical work: The clerical work like filling up forms by workers and foremen should be minimum possible so that their basic work rhythm is not disturbed.
9. Simplicity of forms and their standardization: The forms used as part of the costing system should be minimum in number, standardized in format and simple to operate by the personnel so that required information is obtained in time.
10. Effective system to control materials and wages: The system relating to purchase, receiving, inspection, storage and issue of materials should be effective. The method of pricing material issues should be appropriate to the situation in the firm. The procedures for Time recording, Time booking, overtime, payroll preparation, etc. should be systematic and effective.
11. Procedure for overheads: The routine prescribed for overheads should lead to proper allocation, apportionment and absorption of overheads.
12. Reconciliation of cost accounting with financial accounting is to be facilitated to reveal the reasons for difference in profits.
13. External factors: The costing system should ensure compliance of Statutory and legal requirements like cost audit, cost accounting rules etc.
14. Cost Accountant's role: The responsibilities and duties of the cost accountant should be clearly defined. He should have access to all the departments and divisions of the firm.

(b) Steps necessary to install the costing system:

The following steps have to be carefully followed to install a costing system successfully

- (i) Objectives: While installing the cost accounting system the objectives of the system have to be finalized, like materials management, fixing, selling prices, etc. The approach to install the system will depend on its objectives.
- (ii) Organization structure of the business: Organization structure of the business determines the scope of authority and responsibility of each individual in the organization. While installing the system, minor changes, if any, to be made in the structure for the advantage of management may be carried out.
- (iii) Type and method of Costing: Nature of business decides the type of costing to be introduced. Examples are job costing, process costing, operating costing, unit costing, etc. For the purpose of cost control appropriate technique is to be

introduced ie, standard costing or budgetary control or any other appropriate technique.

- (iv) Cost records and books: It is to be decided whether separate set of con and financial books are to be maintained or an integrated accounting system is followed. This depends on nature and size of the enterprise and the existing accounting system.
- (v) Technical Aspects: A detailed study of technical aspects of manufacturing process, operations, material control, labor control, wage disbursement, factory layout, etc. is of great significance. This will be helpful in preventing wastage of labor, material, etc. and designing effective procedures and forms.
- (vi) Control System: Cost accounting system would have to be designed to record and control different elements of cost in accordance with costing procedures and principles and the limitations imposed by the type of organization that exists.
- (vii) Nature of Product and Business: Nature of the product and the type of business decide the emphasis of cost control. If the material forms major part of the total cost, emphasis is laid on material control. If labor constitutes major portion of the total cost, labor is to be controlled with special emphasis.
- (viii) Collection of Data: Cost data is the basis for decision making. An efficient system of collection and verification of the data is to be devised for prompt collection of cost data.
- (ix) Cooperation of Staff: Details of the system should be explained to the staff so that the cost accounting system can work efficiently by cooperation among the staff.
- (x) the Cost office: It is preferable to have a separate cost office which has access to the factory. The staff in the cost office should have facilities and access to
 - (a) Stores - to account for receipts, issues & loss of materials
 - (b) Works - to account for labor Time and output.
- (xi) Relationship of cost office to other departments: All the departments with which the cost office interacts, like purchasing, production, stores etc. , should be instructed by the Top management that appropriate cooperation and coordination with cost office are essential. The cost office should establish a smooth working relationship with the departments concerned.

The cost office is expected to record, analyze and finalize all cost data and achieve the desired level of control over costs.

(c) Problems or Practical difficulties in installing a costing system

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

- (i) Absence of cost consciousness: Cost control measures may be adversely affected due to absence of cost consciousness among the employees at all levels.
- (ii) Lack of support from senior executives and Top management: Unless thoroughly convinced in advance, some senior executives and even individual members of top management may not welcome introduction of costing system under the impression that it may reduce their importance and freedom.
- (iii) Suspicion and resistance from workers and employees: Lower level employees may resist the system and suspect that it is introduced to control and hamper them in their work.

- (iv) Shortage of Trained staff: Suitably trained staff may not be readily available in the organization to take care of different aspects and phases of a costing system
- (v) Cost of introduction: Introduction of an elaborate system of costing may involve huge expenditure which may not be affordable to small and medium sized firms.

(d) Steps to be adopted to overcome practical difficulties

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

- (i) Top management support: support from the Top management should be ensured before the decision to introduce a costing system is made. The decision should not be made by one individual who is at the top. A consensus of the senior directors, executives etc. , is essential for successful introduction of a costing system.
- (ii) Employee Trust and confidence: A broad outline of the system is to be explained to all employees concerned to gain their confidence and trust. All necessary clarifications and explanations can help to sustain morale of the staff.
- (iii) Selection of suitable system and minimizing forms: The costing system chosen should be suitable to the requirements of the firm. Minimizing paper work by avoiding or eliminating unnecessary forms and procedures is necessary
- (iv) Training to the staff: Existing staff should be trained as per the requirements of the system so that it can be implemented smoothly.

In conclusion, we may say that willing acceptance of both managerial and clerical staff along with the workers ultimately decides the success or failure of a newly introduced costing system.

(9) General principles of Cost Accounting

1. Cause - effect relationship: For each item of cost there shall be a relationship established, which is in the form of cause and effect. Each item of cost shall be linked to its cause as minutely as possible and its effect on the respective departments is to be ascertained. The units which pass through the departments shall share the cost.
2. Charging of cost subsequent to incurrence: Cost of units shall include only those costs which are actually incurred.
3. Convention of prudence is ignored: Cost sheet reflects only factual picture of costs and profitability of the project. If contingencies are expected to creep in, it should be shown distinctly.
4. Past costs not to form part of future costs: Unrecovered past costs are not recovered as part of future costs since it will distort the results of future period.
5. Inclusion of normal costs only in cost accounts: All costs incurred because of normal reasons are taken into account while computing the cost per unit. All abnormal costs incurred due to abnormal reasons like theft and negligence are not taken into consideration while computing the unit cost, since it will distort the cost figures and mislead the management in exercising decisions.
6. Double entry for cost ledgers: Cost ledgers and cost control accounts are to be maintained on double entry principle to avoid mistakes or errors

(10) Classification of Cost

Cost classification is the process of grouping costs according to their common characteristics. The following are the bases on which costs can be classified.

- (i) According to elements

- (ii) According to functions
- (iii) According to nature or behavior
- (iv) According to controllability
- (V) According to normality
- (vi) According to relevance to decision making and control

(I) Cost Classification according to Elements: Based on elements, cost is classified into material, labor and expenses. They are subdivided into direct and indirect material, labor and expenses. The total direct cost is termed as prime cost. Indirect material, indirect labor and indirect expenses, together are termed as indirect cost or 'overheads'. Overhead is subdivided into factory overhead office overhead and selling and distribution overhead. A detailed description of these is done in chapter 2 of this book.

(II) Cost Classification according to Functions: Here the classification is under four major functions of the business:

- (a) Production cost
- (b) Administration cost
- (c) Selling cost
- (d) Distribution cost

(a) Production cost is the cost of sequence of operations which begins with supplying materials, labor and services and ends with primary packing of the product "- I.C.M.A.

It is also known as manufacturing or factory cost incurred in converting raw material into finished product.

(b) Administration cost is the cost of formulating the policy, directing the organization and controlling the operations of an undertaking, which is not related directly to a production, selling, distribution, research or development activity or function "- I.C.M.A. Administration cost is incurred for overall planning, organizing and control of the enterprise.

(c) Selling cost is the cost of seeking to create and stimulate demand (sometimes termed marketing) and of securing orders" I.C.M.A.

Selling costs are also known as selling expenses and selling overheads which comprise of all the expenses of selling department including product promotion and advertising.

(d) Distribution cost is "the cost of sequence of operations which begin with making the packed product available for despatch and ends with making the reconditioned, returned empty package, if any, available for reuse" I.C.M.A.

It is also known as distribution expenses or overheads which comprises of packing, warehouse expenses, cost of freight, etc.

The following terms are also defined by ICMA Terminology:

Research Cost: "This is the cost of searching for new or improved products, new application of materials, or new or improved methods".

Development Cost: "Having made the research the management decides to produce a new or improved product or to employ a new or improved method, the cost of process beginning with the commencement of formal production of that product or by that method, is called the development cost".

(III) Cost Classification according to Nature of Costs: Based on nature of behavior, cost is classified into fixed, variable and semi - variable costs.

(a) Fixed cost: "A cost which tends to be unaffected by variations in volume of output. Fixed costs depend mainly on the affluxion of time and do not vary directly with volume or rate of output. Fixed costs are sometimes referred to as period in systems of direct costing" – I.C.M.A.

Thus, fixed costs are those which do not change with increase or decrease in quantum of production but remains static.

(b) Variable cost is "A cost which tends to vary directly with volume of output. Variable costs are sometimes referred to as direct costs in systems of direct costing": - I.C.M.A. Variable costs increase or decrease in direct proportion to increase or decrease in production.

(c) Semi - fixed or semi - variable cost is "A cost which is partly variable" I.C.M.A.

This is a cost which changes but not in direct proportion to the increase or decrease in output.

(IV) Cost Classification according to Controllability: On the basis of controllability, cost can be classified into (a) controllable cost, and (b) uncontrollable cost.

(a) Controllable cost: This is the cost which can be influenced by the action of a specified member of an undertaking. Eg., direct material, direct labor, etc

(b) Uncontrollable cost: This is the cost which cannot be influenced by the action of any specified member of an undertaking. E.g., direct material, direct labor, etc.

(V) Cost Classification According to Normality: This is the cost incurred in the conditions in which the output is normally attained. Normal cost is included in cost of production. Abnormal costs are not usually incurred at a given level of output in the conditions in which that level of output is normally produced. Abnormal cost is excluded from cost of production.

(VI) Cost Classification According to relevance to decision making and control.

Based on the requirement of decision making the following is the classification:

(a) Shut - down Cost: A cost which is incurred irrespective of plant is in operation or is shutdown, e.g., the cost of rent, rates, depreciation, maintenance expenses, etc.

b) Sunk Cost: A cost which is incurred in the past and is not relevant to the current decision making. e.g. , written down value of plant is irrelevant for replacement of machinery.

(c) Opportunity Cost: "The net selling price, rental value or transfer value which could be obtained at a point in time if a particular asset or group of assets were to be sold, hired or put to some alternative use available to the owner at that time, is the opportunity cost ". - I.C.M.A. The costs which are related to the sacrifice made or the benefits foregone are opportunity costs.

(d) Imputed Cost: It is the notional cost to be considered for making costs comparable. For example rent of own building, interest on own capital, etc. , are not actually paid but may be taken as costs notionally.

(e) Out - of - Pocket Cost: This is the cost which is payable in cash as against costs such as depreciation which do not involve cash payment.

(f) Replacement Cost: It is the current cost 'at which an asset or material can be replaced with identical one from the market. It reflects the present market price of such asset or material.

(g) Conversion Cost: This is the cost of production, excluding cost of direct materials. It is the aggregate of direct wages, direct expenses and overhead costs of converting raw materials into finished product.

(h) Product Costs: Product costs are those which are identified with the product and included in inventory values. They can be charged, allocated or apportioned to the products. They include direct material, direct labor, direct expenses and manufacturing or production overheads. Product costs become part of inventories like work in progress and finished goods and become part of Balance sheet. Product cost of goods sold is part of the cost of goods sold. Product costs do not affect the income till the product is sold.

(i) Period Costs: Period costs are those costs which are not identified with product or Job. They are incurred and paid for a particular period, like rent, rates, taxes salaries. Their benefit is usually exhausted with the expiry of a certain period. They are totally deducted as expenses during the period in which they are incurred. They are not included in the inventory values which are carried forward to the next period.

The period costs are necessary to generate revenue but they cannot be identified with units of product. Selling and administration costs necessary to run a business but cannot be associated with products also come under this category.

Period Costs affect the income irrespective of sales.

(11) Some other important Terms

(a) Cost Center: Cost center is defined as "A location, person or item of equipment (or group of these) for which costs may be ascertained and used for the purposes of cost control". - I.C.M.A.

Cost Center is a term which includes various departments - both production and service departments - processes, work orders, operations, machine centers, areas or regions of sales, warehouses, persons, etc. , in relation to which costs are ascertained or accumulated.

Cost Center can be classified into the following four types:

1. Impersonal Cost Center is one which consists of a location or item of equipment (or a group of these).
2. Personal Cost Center is one which consists of a person or group of persons.
3. Operation Cost Center is one which consists of those machines and / or persons carrying out similar operations.
4. Process Cost Center is one which consists of a specific process or continuous sequence of operations.

The Cost Centers are very useful for ascertainment, analysis and control of costs.

(i) Cost unit

Definition: The chartered Institute of Management Accountants, London, defines a unit of cost as "a unit of product or service in relation to which costs are ascertained"

A cost unit is a devise for the purpose of breaking up or separating costs into smaller subdivisions.

These smaller subdivisions are attributed to products or services to find product cost or service cost. The forms of measurement used as cost units are usually the units of physical measurements like number, weight, area, length, value, etc.

Purpose of Cost Unit

The main purpose of cost accounting is collection of costs and their allocation to the selected cost units to know the total cost. The cost collection or accumulation necessitates the identification of cost units in terms of which costs can be expressed. Thus, a cost unit is a 'base' for measurement of cost.

Basis for or factors affecting determination of cost units

1. Organization of the factory
2. Conditions of incidence of cost
3. Requirement of costing system
4. Availability of necessary information
5. Management policy
6. Practicability
7. Adaptable to the industry.

Examples of Cost Unit

Examples of Cost Unit in different Industries are as:

Industry or product	Cost unit
Steel	Tonne
Sugar	tonne
Chemicals	Litre / gallon
Automobile	number
Brick works	1000 bricks
Textiles	Metre of cloth
Fruits, pens, pencils	Dozen
Paper	Ream
Ice cream	Kilogram
Paint	Litre
Soft drink	Pack of 24 bottle
Ready made garments	number
Motor transport	Tone kilometer Passenger kilometer
hospital	Patient bed day
Lodgings	Room day

Types of Cost unit

Cost Lists are of two types (1) Single (2) Composite

(1)Single Line: The output is identical and can be expressed in convenient measures like Kgs, units, etc.

(2) Composite unit: Compound or Composite unit are of combinations of two or more units like “passenger miles”, “ton- kilometers”, “room- days”, “patient- bed days”.

(c)Profit Center: It is a segment of a business responsible for all activities involved in the production and sales of products and services. Profit centre is responsible for revenues and costs. It is created for evaluating performance of a division. Profit centre has autonomy for decisions concerned with the centre.

Differences between Cost Center and profit centre

1. Responsibility: cost centre is a segment of activity or a area of responsibility for which cost are ascertained. Profit centre is a segment or activity of a business for which both revenue and expenses are identified.
2. Purpose: cost centres are identified for accounting convenience and cost control. Profit centres are created for decentralization of operations
3. Autonomy: cost centre are not autonomous. Profit centres are autonomous.
4. Targets: cost centres do not have targets. Profit centre have profit targets.

5. Number of centres: There may be many cost centre where as profit centres are few in number.
- (j) **Added value:** added value is the “ change in market value” of a product or service which is caused by alteration in the ‘form’ or ‘location’ or ‘availability’.

The following are to be noted in this respect.

- (a) It reflects only the change in market value and not market value as it is.
- (b) It excludes cost of material or services purchased from outside.
- (c) It include profit element also (unlike conversion cost which exclude profit element).

Cost control

The fundamental objectives of cost accounting are ascertainment of cost control of cost and reduction of cost.

Meaning of cost control

The chartered Institute of management accountants, London defines cost control as “ the regulation by executive action of the cost of operating an undertaking particularly where such action is guided by cost accounting”.

In the present context of business managements facing problems of survival because of severe completion, hold on the market can be maintained if the costs are controlled and reduced to minimum. Cost accounting can be helpful in this regard by eliminating all inefficiencies and wastages by exercising cost control.

Cost control is effected through setting standards and comparing actual performance to ascertain deviations and taking corrective steps to ensure future effective actual performance.

Elements of Cost Control

The major elements of cost control are:

- 1. Setting up of standards
- 2. Recording of actual performance
- 3. Comparision of standards with actual performance to arrive at deviations / variances.
- 4. Analyzing variance and fixing responsibility for variance.
- 5. Initiation of corrective action to eliminate causes of variance and ensure effective future performance.

Cost Control Techniques

Effective tools of cost control are as under:

- 1. Material control
- 2. Labor control
- 3. Over head control
- 4. Budgetary control
- 5. Standard costing
- 6. Marginal costing and
- 7. Productivity and accounting ratios.

Cost reduction

Main objective of any business entity is earning profit. Profit is the result of two varying factors viz. Sales and Cost. Profit is larger if the gap between sales and cost is wider. Profit can be maximized either by increasing the sales or by reducing costs. In a competitive market it may not be possible to increase selling price without having an adverse effect on the sales volume which, ultimately reduces profit. Besides

increase in prices of products, the prices of raw materials, wages of employees and other expenses will also increase, which results in increase of costs. A business entity, therefore, explores methods to cut down expenditure and reduce the cost of products. Hence cost reduction is the better alternative to maximize profits, instead of increase of selling price.

Meaning of Cost reduction

The chartered Institute of management Accountants, London defines cost reduction as under. "Cost reduction is to be understood as the achievement of real and permanent reduction in the unit cost of goods manufactured or service rendered without impairing their suitability for the use intended or diminution in the quality of the product".

The above definition reveals that cost reduction is concerned with reducing costs without affecting the quality of the product.

Features of Cost Reduction

1. Genuine and real: Cost reduction is genuine and real in the course of manufacture of services.
2. Quality of products: Reduction in costs of goods manufactured or services rendered without affecting their suitability for the use intended.
3. Permanent reduction: The reduction in costs shall be real and permanent. Thus reduction due to windfalls, changes in government policy do not come under the purview of cost reduction.
4. Ways of Cost reduction: Cost reduction may be effected in two ways i.e. by reducing expenditure keeping volume constant and by increasing production.

Techniques of Cost reduction

Various techniques and tools used for achieving cost reduction are as follows:

- (a) Budgetary control (b) Standard costing (c) Standardization of product and tools and equipments (d) Improvement in design (e) Material Control (f) Labor control (g) Overhead control (h) Automation (i) Operations research (j) Market research (k) Value analysis (l) Quality Measurement and research

Advantages of Cost reduction

1. Increase in profit
2. Availability of goods at cheaper rates
3. Helpful in facing competition
4. More revenue to government by way of taxation on profit
5. Increase in exports
6. Increase in productivity

Distinction between Cost control and cost reduction

Cost control refers to maintaining the costs at a specific level where cost reduction is the achievement of real reduction in cost of goods manufactured services rendered. However cost reduction and cost control are two effective tools of management but their procedures differ widely. The main difference between cost control and cost reduction are as follows:

1. **Objective:** Objective of cost control is to achieve preset costs, whereas cost reduction aims at reduction of costs to have economy on costs.
2. **Procedure:** Cost control is a routine exercise to achieve operational efficiency where as cost reduction aims at permanent savings in cost by a continuous process.

3. **Process:** The process involved in cost control is to lay down targets, find the actual performance to compare with targets and initiate corrective action. Cost reduction, on the other hand is concerned with maintenance of performance according to standards.
4. **Function:** Function of cost control is static where as the function of cost reduction is dynamic.
5. **Bearing on the past & present:** Main emphasis of cost control is on past and present where as main focus of cost reduction is on the present and future.
6. **Nature:** Cost control is a preventive function and cost reduction is a corrective function.

Cost Audit

Audit means verification of books of accounts and vouchers to establish their accuracy. Cost audit is a preventive measure. Cost audit is a guide for policy formulation and decision making. **Definition of Cost Audit**

Chartered Institute of Management Accountants, London defines cost audit as "the verification of cost accounts and a check on the adherence to the cost accounting plan".

The Institute of cost and works Accountants of India defines cost audit as "Cost audit of efficiency of minute details of expenditure while the work is in progress and not a post - mortem examination. Financial Audit is a fait accompli. Cost Audit is mainly a preventive measure, a guide for management policy and decision, in addition to being a barometer of performance. Thus the term cost audit refers to the following two functions:

1. Verification of cost accounts to find whether they are correctly kept in accordance with the principles of costing.
2. Verification of accuracy of cost accounts, reports and statements to detect errors and prevent frauds.

Cost Manual

The Institute of cost and Management Accountants, London defines cost manual as "A document which sets out the responsibilities of the persons costing in the routine of and the forms and records required for costing and cost accounting". Thus the costing manual lays down all the requirements for successful implementation of costing.

Generally a central body lays down the recommended cost accounting plans and procedures and circulates it to the participating concerns. The manual describes the scheme, method of administration procedure to be followed for collection, analysis, reporting of cost data and their interpretations to the member units. The cost manual also specifies the duties of each person in the costing department

(12) Methods of Costing

The methods to be used for cost ascertainment depend on nature of industry. Costs of production or service rendered differ from industry to industry. As per I.C.M.A. Terminology costing methods can be grouped into two categories. viz. (i) Specific order costing (or Job / Terminal Costing) and (ii) Operation Costing (or Process or Period Costing)

Specific Order Costing: This method of costing is applicable where the work consists of specific orders or Jobs batches or contracts. Job costing, Batch costing and Contract costing come under this category.

Operation Costing: This method of costing is applicable where standardized goods or services result from a sequence of continuous operations. Process costing, unit costing, operating costing, operation costing fall under this category

Various methods of costing are discussed below briefly:

- (a) **Job Costing:** It is applicable in industries where goods are made against individual orders from customers. It is defined by the terminology of the definitions committee, I.C.M.A. , London as, that form of specific order costing, where work is undertaken to customers' specific requirements "In job costing direct costs are traced for specific jobs or orders. Each of the jobs involves different operations. Basic object of costing is ascertain the cost. of each job separately and any profit or loss thereon.
- (b) **Contract Costing:** It is applied in concerns involved in construction work, like laying of roads, bridges and buildings, etc. For each of the contracts a separate account is opened and the total cost incurred identified with it. The contracts may take a long time for completion. also known as terminal costing.
- (c) **Batch costing:** it is applied where orders for identical products are placed in convenient lots or batches. I.C.M.A. defines it as “ that form of specific order costing which applies where similar articles are produced In batches either for sale or for use within an undertaking. In most cases, the costing is similar to job costing”. Cost per unit is ascertained dividing the total cost of the batch by number of units of the batch.
- (d) **Process Costing:** This method of cost ascertainment is used where the input is processed through several distinct process the converted into a finished product. The processes are carried out in a continuous sequence where the raw material is introduced in the first prices and the Finished product of each process becomes raw material for the process until the last process where from the finished product is transferred to finished stock account. In process costing a separate account is maintained for each process.
- (e) **Operating costing:** This method is applicable to service industries where no product is produced but some service is rendered Examples. Transport Lodging, Houses, Cinema theaters, Hospitals, etc.
- (f) **(f)Operation Costing:** This method is applicable where there is mums production and several processes are involved with different operations to be carried out to complete the process of production. It is similar to process costing but cost details are maintained for every minute operation and costs are more accurate.
- (g) **Unit or Output Costing:** This method is applicable where output is uniform in all respects and production is continuous. Under this method cost per unit is ascertained by dividing the cost by number of units produced.
- (h) **Multiple Costing:** This is a system where two or more methods of costing like job costing unit costing and operation costing are applied to find the cost of production. It is th. e application of combination of two or more methods to ascertain the cost of the work done. It is applied in industries where different parts are produced separately and assembled into a final product.
- (i) **Activity Based Costing:** ABC is an accounting methodology that assigns costs to activities rather than products and services. Costs are initially assigned to activities based

on their resources. Then the costs are absorbed by products and services based on their use of activities.

CIMA defines ABC as “Cost attribution to cost units on the basis of benefit derived from indirect activities e g-, ordering, setting up, assuring quality”.

According to Horngren, Foster and Datar, "ABC is not an alternative costing system to Job costing or process costing; rather ABC is an approach to developing the cost numbers used in job or process costing systems.

The distinctive feature of ABC is its focus on activities as the fundamental cost objects. The ABC approach is more expensive than traditional approach. ABC has the potential however, to provide managers with information they find more useful for costing purposes”.

Kaplan and Cooper of Harvard Business school who have developed. ABC approach to ascertain product costs, have classified the costs as ‘short term variable costs’ and ‘long term variable costs’. The approach relates overhead costs to the forces behind them which are named as cost drivers'. Thus ‘cost drives’ are those activities or transactions which are significant determinants of costs.

ABC system is based on the belief that activities caused costs and a link should therefore be made between activities and products by assigning costs of activities to products based on individual product's demand for each activity.

(13) Techniques or types of costing

Costing is the technique and process of ascertaining costs. Costs may be allocated on actual basis or assigned on estimation or standard cost basis. Cost accounting implies a systematic arrangement of cost related details. The following are the various techniques of costing.

- (i) Historical Costing: Ascertaining costs after they are actually incurred refers to "Historical Costing '. According to J. Batty," Historical costing is ascertaining and recording of actual costs when, or after, they have been incurred, was one of the first stages in the growth of the cost accountant's work ". It is known as traditional costing.
- (ii) Standard Costing: Standard cost is a predetermined cost. The standard costs are set in advance for different elements of cost. Actuals are ascertained and compared. with standards. The differences, termed as "variances" are ascertained, causes are investigated and suitable action is initiated to correct unfavorable variances. Standard costing controls costs and improves performance.
- (iii) Marginal Costing: Under marginal costing costs are classified into fixed and. variable. Variable costs are treated as product costs and fixed cost are treated as period costs. Marginal costing is helpful in managerial decision making.
- (iv) Uniform Costing: It is not a different type of costing. It is a policy of different industrial units to follow a specific type of costing, uniformly in all the units to facilitate comparison and assess the comparative performance of each firm to highlight any weakspots. Remedial action taken on the basis of such assessment by the managements of the firms concerned results in overall improvement in performance throughout the industry.

Status of a Cost Accountant

Cost accountant is a specialist, who reads and analyzes cost information and sends appropriate reports to the management and informs the management about problems, if any. Cost accountant is mainly concerned with preparation of budgets, setting of standards analysis of variances and ultimately providing information for cost reduction, cost control and cost - volume - profit relationship

In a large concern, a separate cost accounting department is set up under the control of a full - fledged cost accountant but in a small concern the costing department may be set up as a section of financial accounting department. In a large concern costing department takes care of specialized activities and functions of cost accounting. Thus the status of the cost accountant heading the cost accounting department is equal to other functional managers. The cost accountant has to supervise the work of persons working in cost accounting department and reports directly to the CEO of the organization.

Cost Accounting Department and its relation with Other Departments

Main function of cost accounting department is to record, classify and present cost information. The information is concerned with all the activities of the organization. In order to provide accurate and effective information, cost accounting department should have proper integration with the other departments of the organization. All departments should help mutually to attain the main objective. The relationship of cost accounting department with the other departments is described here.

1. Cost Accounting Department and Production Department

Production department performs the activity of conversion of raw materials into finished product. Cost accounting department helps the production department in estimating material cost, wage cost and other costs involved in producing a product. Cost accounting department helps to find the cost, control the cost and reduce the cost of manufacturing.

2. Cost Accounting Department and Purchase Department

Purchase department has to acquire raw material of right quality and quantity at a low price at the right time from a right supplier to ensure continuous availability raw materials. In this regard cost accounting department is helpful in fixing various levels of stock and EOQ.

3. Cost Accounting Department and Personnel Department

Personnel department is concerned with recruitment, selection, training and placement of employees. It is also concerned with records relating to labor turnover, time booking, fixing of wage rate, preparation of pay roll, Idle time and overtime. Cost accounting department works in close coordination with personnel department in effective implementation of policies relating to employees of the organization. Cost accounting department can be helpful in fixing incentives and maintenance of records relating to employees.

4. Cost Accounting Department and Finance & Accounts Department

In order to control and reduce the cost, there should be a proper co - ordination between financial accounting department and cost accounting department. Cost accounting department helps in estimating cost and recording of actual cost relating to material, labor and other expenses. Finance department has to provide required finance for purchase of

raw material at the right time. Cost accounting department and finance department are depending on each other for various activities to be independently discharged by them.

- 5. Cost Accounting Department and Marketing Department** Marketing department has to effectively discharge the function of marketing the products at competitive prices. Cost accounting department provide information relating to cost of various products, alternative methods of marketing profitability of different markets, effect of change in product mix and variation selling price etc to the marketing department to take effective decision to derive maximum profits.

Theory Questions

(A) Short Answer Questions:

1. Define 'Cost'
2. Define the term "Costing." [Madras, Ist M.Com., April 2005]
3. Define 'Cost Accounting' [Madras, B.Com. Ap 2007; April 2006; Ist M.Com. (Semester) Ap 2008; Nov. 2007; Nov. 2004]
4. State the Functions of Cost Accounting
[Madras, B.Com .. April 2008; BCS April 2004; April 2003]
5. State the objectives of Cost Accounting
[Madras, B.Com., A 2008; B.Com. (CS) April 2007; Ap 2007; April 2006; B.Com., April 2004]
6. What is the scope of Cost Accounting? [Madras, B.Com (PZSA) Nov. 2007]
7. What are the advantages of cost accounting? [Madras, B.Com. (CS) Nov. 2008; B.Com., Oct. 2002]
8. What are the limitations of cost accounting? [Madras, B.C.S (ICE) Oct. 2002; B.Com. Oct. 2000]
9. Mention the limitations of cost accounting [Madras, B.Com., Nov. 2004, Oct. 2003; BCS Oct, 2003; BCS (ICE) May 2003]
10. Enumerate the limitations of Financial Accounting [Madras, B.Com (CS) Ap 2007]
11. Mention any five differences between Cost accounting and Financial accounting.
[Madras, B.Com. (CS) (ICE) Oct. 2002]
12. What is the significance of cost accounting?
13. Narrate any three basic requirements of a good costing system
14. List out the methods of classifying cost.
15. What is Functional classification of cost? [Madras, B.Com. (ICE) May 2001]
16. Write short notes on "Cost center and Investment center [Madras, Ist M.Com. Ap 2007; Ist M.Com. (ICE) May 2003]
17. Define the terms 'Cost units' and ' Cost centers Madras, B.Com (old) Ap. 2007; BCA / B.Sc. (ICE) Oct. 2000)
18. List out the different methods of costing. [Madras, B.Com. (CS) Ap 2008; April 2006]
19. Enumerate the Techniques or Types of costing. Madras, Ist M.Com., Nov. 2004)
20. What is historical costing? [Madras, B.Com., Nov. 2007]
21. Define a "profit center".

(B) Long Answer Questions:

1. Define 'Cost', 'Costing', 'Cost Accounting' and 'Cost Accountancy'.
2. Explain the limitations of Financial Accounting. [Madras, B.Com. April 2006]
3. Define cost accounting. What are its basic purposes? [Madras, B.C.A.B.Sc. (ICE) Oct. 2001; May 2001)

4. Explain the nature and scope of cost accounting. [Madras, B.C.S. (ICE) Oct. 2003; Oct. 2000]
5. Define cost accounting. What are its objectives? [Madras, BCA / BSC Ap 2007; B.C.S. (ICE) Oct. 2004; B.C.A./B.Sc. April 2004; April 2003; B.Com. (old) Oct. 1999]
6. State the meaning and objectives of cost accounting. [Madras, B.Com. (old) (ICE) Oct. 2004; B.C.S. Oct. 2001]
7. Explain the scope and objectives of cost accounting. Madras, B.Com (CS) Nov. 2007; B.Com. April 2001)
8. Discuss the objectives of cost accounting. [Madras, B.Com. , Ap. 2007; Ist M.Com., 2nd Semester Nov. 2004; B.C.A./B.Sc. Oct. 2003)
9. Discuss the purposes and functions of cost accounting. Madras, 2nd M.Com. (ICE) Oct. 2002; M.Com. , April 2002]
10. Explain the Functions of cost accounting. [Madras, B.Com. (ICE) Oct. 2001]
11. What is meant by cost accounting? Explain its functions. [Madras, B.CS, Nov.2007; BCS (old) Ap. 2007; B.Com. April 2000; B.Com. (old) April 2000]
12. Explain the significance of cost accounting. [Madras, B.Com. Oct. 2001]
13. Explain the importance of cost accounting. [Madras, BCA / B.Sc. , Nov. 2007; B.Com. (ICE) Oct. 2004]
14. What is cost accounting? Explain its advantages. [Madras, Ist M.Com, Ap 2005; B.C.A / B.Sc. (ICE) May 2002; B.C.S. (ICE) Oct. 2001]
15. Discuss the Chief uses of cost data. [Madras, 2nd M.com. (ICE) May 2002]
16. Discuss the advantages of cost accounting. [madras, BCA/ b.sc., nov 2007; B.com(CS) ap 2007; B.C.A./B.sc. (ICE) Oct. 2004]
17. Explain the limitations of cost accounting. [madras, B.com (CS) Nov. 2007; Nov 2006; B.com(CS) nov. 2006;]
18. Explain the advantages and disadvantages of cost accounting. [madras, B.C.A./b.SC (ICE) MAY 2003; B.com. Oct. 2002; B.C.S.(ICE) may 2001; B.com (ICE) Oct 1999]
19. enumerate the advantages of cost accounting to the management and to the employees. [madras B.com (old) Nov 2007; B.com. Nov. 2006; B.C.S. April 2003]
20. Explain the advantages of cost accounting to different 'stakeholders' in business [Madras, B.com 2007]
21. A good stem of costing is an invaluable and to the management Discuss [Madras B.com. (ICE) Oct. 2000]
22. Price filing is the only age of costing "De you agree? [Madras,2nd M.Com Oct. 2002]
23. Give account of objectives, Functions, and Limitations of Cost Accounting [Madras, B.com (opd) nov2007, B.Com April 1999]
24. Discuss the main objection raised againts cost accounting [Madras, B.Com(cs) April 2007.B.C.A./B. sc. Oct 1999)
25. Distinguish between Financial Accounting and cost accounting [Madras B.com april 2008; April 2007; B.Com(CS) April 2006: B.Com April 2004 Oct. 2003; B.C.S. (ICE) Oct 2003; B.C.S April 2002; April 2000;B.C.A./ B.sc (ICE) may 2003; B.C.A./B.Sc. Oct 2003: Oct. 2001: April 2001]
26. What are the differences between management accounting and cost accounting [Madres, BBA April 2008]
27. What are the essentials of a good costing system? [Madras, B.Com Nox 2014 I M.Com 2nd Semester Now 2004; 2nd M.Com April 2002]
28. A describe briefly the characteristics which an ideal costing system should possess. [Madras, 1st M.Com. nov. 2005]
29. What are the requisites of a good costing system?

30. State the factor to be considered while installing a costing system [Madras, B.com. (cs) april 2006]
31. Explain the steps to be taken for the installation of costing system[Madres, and Comp23; April 2001]
32. What are the problems of installing a costing system? How do you overcome theme
- 33 Money spent on installing a costing system is not an expenditure but an investment
Comment [Madras, 2nd M.Com. (ICE) (old) Oct. 2004]
34. Describe the Classification of cost '. [Madras, B.Com. (ICE) May 2003; B.C.A./B.Sc. April 2001]
35. Explain the methods of cost classification Madras, B.C.S. (ICE) May 2002)
36. Explain the "Functional classification of cost. Madras, B.Com. (ICE) May 2001)
37. Explain Cost Types by variability, [Madras, B.Com. April 1999]
38. Explain the different. Types of costing Madras, B.Com. April 2002, April 1999)
39. Explain Cost and Profit centers [Madras, B.Com., May 2005 (ICE) B.Com. Oct. 1999]
40. Explain historical and replacement costs. [Madras, BBA, April 2008]
41. Write short notes on
 - (a) Research & development cost (b) Controllable cost
 - (c) Uncontrollable cost (d) Sunk cost
 - (e) Shutdown cost (f) Opportunity cost
 - (g) Inputed cost (h) Out of pocket cost
 - (i) Conversion cost (j) Cost center
 - (k) Profit center (l) Cost unit
 - (m) Historical cost (n) Normal and Abnormal costs.

7. Operating costing is suitable for
 (a) Job order businesses (b) Contractors
 (c) Sugar Industry (d) Service Industries.
 8. Multiple costing is, using in the same firm
 (a) A single costing method (b) Several methods of costing
 (c) Tax saving measures (d) None of these
 9. Process costing is suitable for
 (a) Hospitals (b) Transport firms
 (c) Oil refining firms (d) Brick laying firms.
 10. Cost classification can be done in
 (a) two ways (b) Three ways
 (c) four ways (d) Several ways.
- (Ans: 1. (c); 2. (b); 3. (a); 4. (d); 5. (a); 6. (c); 7. (d); 8. (b) ; 9. (c); 10. (d)]

II. Fill in the blanks:

Fill the blanks in the following with suitable words:

1. Costing refers to the Techniques and processes of _____ costs.
2. Cost accounting was developed because of the _____ of Financial accounting.
3. Cost accounting deals partly with facts and figures and partly with _____
4. Cost accounting provides data to managerial _____
5. Variable cost increases or _____ in proportion to the output.
6. An uncontrollable cost cannot be _____ by any specific member of a firm
7. A cost center may be a location, person or item of equipment for which costs may be _____
8. Operating costing is more suitable for _____
9. All costing methods can be grouped into two categories (a) Specific order costing and (b) _____ costing.
10. _____ cost is to be incurred even when a business unit is closed.

(Ans: 1. Ascertaining; 2. Limitations; 3. Estimates; 4. Decision 5. Decreases; 6. Influenced; 7. Ascertained; 8. Service; 9. Operation; 10. Shutdown)

IV. True or False:

Indicate whether the following statements are True or False:

1. Cost Accounting is a branch of accounting.
2. Financial information is provided by cost accounts.
3. Cost Accounting provides information for cost control and cost reduction.
4. Sunk costs are important for decision making.
5. Imputed costs are notional costs.
6. Profit center is a segment of a business, responsible for all activities involved in purchasing and sales in that segment.
7. Unit costing is also known as operating costing.
8. Job costing is one of the methods under specific order costing.
9. Cost control has no effect on profits.
10. Marginal costing is a Technique of costing.

(Ans: 1. True; 2. False; 3. True; 4. False; 5. True 6. True; 7. False; 8. True; 9. False; 10. True)

Materials

UNIT II & III

I Material Control

Introduction

The important objective of Cost accounting is Control the Cost. Material, Labour and Expenses, are the important elements and it has controlled effectively.

II. Meaning of Material Control

Material Control ensures the quantity of material required for right time and place with minimum investment.

"The regulation of the functions of an organisation relating to the procurement, storage and usage of materials in such a way as to maintain an even flow of production without excessive investment in material stock".

The efficient material control improves the input output ratio. The effective integration on various aspects and includes the scheduling of requirements, purchasing, receiving and inspection, maintaining stock records and stock control. The preparation of periodical reports and records relating to purchasing, receiving, inspection and issue of materials are used for material control.

III. Need for/objectives of Material control

The major portion of cost of production involves of material cost, the cost accounting system can be effective only when there is an efficient material control.

Objectives of material control

1. Ensuring supply of adequate quantity of materials

To carry out uninterrupted production and does not stop the work due to non-availability of materials the sufficient quantity of material should be available for all the activities and departments in the organisation.

2. Optimum investment in materials of working capital.

The key objective of material control is to keep the amount invested in material under control. The locking of funds in stocks results in mismanagement of working capital. Overstocking results in the excessive investment and it is avoided by fixing maximum stock at level for all major items of materials.

3. Favourable terms of purchase

The purchase price and other terms of purchase should be of maximum advantage to the firm. At the same time, quality and specifications of the materials should be as per requirements.

4. Control of Wastage

Wastage of material during storage and handling on the production floor should be minimised. Standards can be fixed for wastage and efforts can be made to keep the actual wastage below the standard level. Pilferage, theft, etc. should be minimised to keep material cost within control.

5. Control of obsolescence and spoilage

Loss due to materials becoming out of date or getting spoiled and unusable is a major cause for material losses. Fixing stock levels and utilising materials in time can minimise such losses.

6. Proper reporting to Management

Management has to be informed frequently about stock of raw materials so that production is planned. This is possible only if there is proper reporting system and updating of records by the store keeper.

7. Prevention of misappropriation of materials

Proper internal check of receipts, issues and consumption of raw materials helps in prevention of misappropriation of materials by the employees.

8. Proper control system for settlement of invoices

Suppliers' invoice is to be paid only after verifying the physical receipt of materials to avoid excess payment to the suppliers.

IV. Essentials of Material Control

The process of material control is divided into four stages- Purchase control Stores control, Issue control and Control of material losses. The various aspects of material control is discussed below:

1. Co-ordination: Effective control of material requires effective co-ordination among the departments involved in purchasing- receiving and inspection storage, production, sales and accounting departments so that adequate materials are available for continuous production and sales. At the same time excessive investment in materials and over stocking are avoided.

2. Centralised Purchasing: In order to economise the buying and to avoid reckless buying of raw materials the purchasing function is to be centralised.

3. Proper scheduling of materials requirements ensures availability of materials at the right time.

4. Classification and codification of material leads to easy identification and proper control of materials.

5. Receipt of Materials: Checking and inspection of material by receiving department ensure correct quantity and quality of material as ordered by the organisation.

6. Usage of Forms: Standard forms are to be designed and used for purchase requisition, purchase order, receiving of materials, requisition of materials and transfer of material from jobs to stores or to other jobs.

7. Storage of materials should be entrusted to a qualified store keeper to plan effective storage and avoid losses due to obsolescence, pilferage and theft.

8. Issue of Materials: A good method of issue of materials to various jobs, processes and orders should be devised to ensure delivery of right material at the right time and right quantity and quality for smooth flow of production.

9. Stocktaking: Perpetual inventory should be followed for stock verification to reveal differences in stock due to pilferage theft and wastage. Moreover perpetual inventory system avoids closing down of factory for stock verification and valuation.

10. Levels of stocks are to be maintained in the form of reorder level, maximum level and minimum level to avoid shortage and over stocking of materials.

11. Economic ordering quantity is to be operated for each type of materials to optimise the cost of buying and storage.

12. Pricing of Issues: A suitable method of pricing is to be followed for correct valuation of material cost of jobs, orders, processes and valuation of closing stocks.

13. Control of materials during the production process: Proper Accounting and records are to be maintained to avoid wastage of materials during consumption.

14. Suitable reporting system helps management to take decisions regarding investment in materials and avoidance of obsolete, dormant and slow moving materials.

V. Advantages of Material Control

An effective material Control system-

1. Ensures the availability of material for production.
2. Reduces the wastage of raw materials.
3. Achieves economy of buying and storage cost.
4. Reduces pilferage, theft, obsolescence and other material losses.
5. Control excess investment on stocks.
6. Maintaining perpetual inventory system to furnish information to management.
7. Helps in ascertaining value of jobs, processes and orders.

VI. Materials Management and Organisation of Material Control

Material management minimize the cost by coordination of planning, purchasing, receiving, storing and control of materials in an effective manner. In these days of mechanisation and specialisation, logistics of purchasing and integrated management are practised. This has resulted in professional development of managers which will make them proficient in satisfying the requirements of an integrated materials management to bring together complex, conflicting and related functions of materials management.

The policies of government to tackle inflation through credit squeeze require professional management of materials. In order to perform inter-related functions through integration, the materials manager should be efficient enough to coordinate and control with a overall view to balance the conflicting objectives of various individual functions and aspects of materials.

The main merits of integrated materials management are performance, growth, accountability and adaptability to electronic data processing.

Organisation of Material Control

Material Control is affected through cooperation and co-ordination of various departments involved such as purchasing department, receiving and inspection department, stores, production and stock control departments. The role and function of each of this department is discussed below:

(a) Purchasing department- Functions

1. To receive purchase requisitions from various departments.
2. To invite quotations from different suppliers to deliver materials as per the specifications of purchase requisitions.
3. Preparing a comparative statement of quotations of suppliers.
4. Selecting a supplier from the comparative statement of quotations, one who offers most favourable terms with due regard to quality.
5. Drafting of purchase order and sending it to the supplier.
6. Following-up of purchase order to receive the materials at the specified time.
7. Checking various documents and certifying that materials of require quantity and quality are received; and

8. Passing purchase invoice for payment if everything is in order.

(b) Receiving and Inspection Department - Functions

1. Receiving materials from various suppliers through various modes of transport and acknowledging the receipts.
2. Preparing Goods received note by filling up the details of quantity, grade and other information about materials by count, weight, etc.
3. Inspection of materials to check the quality and other specifications of materials.
4. Sending the materials received to stores and other places.
5. Communicating to the purchasing department and accounts department about materials received and inform them of any damage, shortages, etc.

(c) Store keeping Department - Functions

1. Initiate purchase requisitions for materials, based on the position of stock.
2. Maintain various levels of stock.
3. Receipt of materials from receiving and inspection department.
4. Check the materials received by comparing with purchase requisition and place them in the proper bins.
5. Issue of materials on receipt of materials requisitions from various departments.
6. Maintenance of stores records like bincards, by entering the receipt, issue and balance of materials.
7. Send periodical reports to the management regarding slow moving, dormant and obsolete materials to enable them to take suitable decisions and avoid losses.

(d) Production Department - Functions

1. Initiate requisition for raw materials of required quantity and quality at the right time to carry on with smooth flow of production.
2. Verification of raw material received from stores.
3. Maintain proper records of materials charged to various jobs, processes and operations.
4. Prepare proper notes for return of material, transfer of material from one job or department to another.
5. Prepare proper records regarding work-in-progress, scrap, wastage spoilage and defectives and send periodical reports to management to minimize these losses.

(e) Stock Control Department - Functions

1. Maintenance of perpetual stock records.
2. Make suitable adjustments of stock, based on the receipt of authorised notes and minimise these losses.
3. Ascertain the average consumption of raw materials in terms of quantity and value.

(B) PURCHASE CONTROL

1. Introduction Efficient purchase of raw material is vital for every organisation. It is of extreme importance to a manufacturing company since it has its effect on all the factors concerning the manufacture i.e., quantity, quality, cost, efficiency, economy, prompt delivery, volume of production, etc. It is by shrewd purchasing that much money can be lost or saved.

II. Purchasing Department and its Objectives

Purchasing includes procuring of raw materials, stationery, machines, tools, spares, equipment, maintenance, supplies required for business, etc. It is a specialised activity

entrusted to a separate department under the headship of a buyer or purchasing officer. This department can concentrate only on purchasing aspect to reap the benefits of specialisation over a period of time. The purchase department procures required things at the most economical price, favourable terms with maintenance of desired quality and at the right time. The objectives of establishing a separate purchase department are as follows:

1. **Specialisation:** The purchase department is to concentrate on purchase function alone; hence they can tap best sources of supply and reap all the advantages of accumulated expertise.
2. **Economy in Purchasing:** Due to bulk buying, the terms of suppliers will be favourable for the company.
3. **Optimum Investment;** Purchase of materials in reasonable quantities rationalise the investment.
4. Maintenance of cordial relationship with vendors will be helpful in acquiring quick delivery of raw material, assured supply of material extension of credit facilities and other favourable terms for the organisation
5. *Developing alternative sources* of supply as a precautionary means against a particular supplier failing to meet the requirements.
6. Adoption of best methods of purchase to avoid financial losses, ensure delivery of raw material and avoid disputes with suppliers.
7. **Source of Information:** Purchase Department can be a reliable source of information regarding materials, suppliers prices, mode of transportation, freight charges and various terms of purchasing, etc.

To summarise, the basic objective of setting up of a purchase department is to make sure that materials are available for continuous production, economy in purchasing and availing the best terms from suppliers.

III. Centralised Vs. Decentralised Purchasing

Purchasing function may be centralised or decentralised.

Centralised purchasing refers to purchasing of requirements of the entire organisation by one particular department. It reduces the cost of administration by avoiding duplication, maintains uniformity of purchasing, avoids overlapping and can bring about reduction in cost of purchasing. Decentralised purchasing refers to each of the departments in an organisation buying their requirements directly, when the organisation has a number of branches or divisions, to derive the advantages of localised purchasing. Whether the organisation should have centralised or decentralised system of purchasing is a decision to be taken after considering the merits and demerits of both the methods. It is necessary to consider other factors like type of product, raw material required, number of divisions, cost of transportation, time factor, etc.

Advantages of Centralised Purchasing

1. *Favourable purchase terms:* The entire requirements are bought in single purchase as bulk buying; more discounts and economy in transport will lead to reduction in overall material cost.
2. *Specialisation:* The purchase manager and his staff concentrate only on purchasing which leads to specialisation in purchasing and efficient buying of material of good quality and availability of material for production.
3. *Avoidance of duplication* and reduction of administration cost as different departments buying the raw material is avoided. Moreover this leads to better control over purchasing of materials.
4. *Maintenance of records:* As the purchasing staff perform only one function proper records and various documents are well maintained and preserved for various requirements.
5. *Better service to various departments:* The various departments of the organisation have to deal with purchase department for their requirements. Better service in time can be expected by them.
- 6 *Good relationships with suppliers'* results in better credit policies and economy to vendors also, since they have to deal with only one purchase officer.
7. *Uniform policies:* As the function of purchasing is with specialised staff, uniform and consistent policies result in efficient purchasing in the quickest possible time.

Disadvantages of Centralised Purchasing

1. *Delay in purchase:* Since different departments have to place requisitions with purchase department and then the purchase department has to initiate the purchasing procedure, there is the possibility of considerable time being consumed and delay in acquiring the materials.
2. *Lack of knowledge* of specific departments and their requirements may lead to purchase of inferior or unsuitable or lower grade materials.
3. *Non utilization* of locally available materials by different division of the organisation which are at various locations.
4. *High cost of* maintaining a separate department, when the staff of the departments concerned can purchase their requirements without additional staff being recruited for purchasing.

Compromise between Centralised and Decentralised Buying

Centralised purchasing is preferable to decentralised purchasing because of its merits over the latter. But all concerns cannot be adopting centralised buying because of differences in size, location of various divisions, etc. Centralised buying is preferable in case of small organisations and also large organisations where different divisions are not far away from one another. However, if various divisions are situated far away from one another due to availability of raw materials and other favourable local factors, it is better to have decentralised system which may lead to cheaper buying but loss of control. To strike a balance between the two, a compromise may be made whereby the divisions may be asked to buy local raw materials with the knowledge of purchase department and buy the other materials through the centralised purchasing department.

IV. Purchase Manager-His/her Qualifications and Duties

Purchase Manager of a company occupies a very important position, since he/she has the power to use the large amount of working capital to be invested on materials. Any incompetent person may risk the resources of an organisation and moreover failure to acquire appropriate materials results in causing considerable damage to the company. Therefore, the organisation should appoint a skilled person as a purchase manager.

The qualifications of a Purchase Manager

Knowledge

1. About the organisation, industry and products,
2. About the production process,
3. About materials required and used by the organisation;
4. Sources of supply;
5. Government policies regarding export and import;
6. Financial position and policies of the organisation;
7. Economic conditions, laws of demand and supply;
8. Person of integrity;
9. Experienced administrator to run the department;
10. Law of Contracts, Sale of Goods Act, etc.

Duties of purchase Manager

1. Preparing a purchase budget with the assistance of store keeper, production department and finance department.
2. Receiving purchase requisitions from various departments.
3. Inviting tenders or quotations from various suppliers.
4. Selection of reliable suppliers.
5. Placement of purchase orders.
6. Following up of purchase orders to receive materials as per the agreed schedules for delivery of raw materials.
7. Receiving Goods Received Notes (GRN) and verifying them with purchase orders to ensure that the quantity, quality and Price of materials received are in accordance with the orders placed.
8. Rejecting and returning the materials which are not in accordance with agreed terms and quality.
9. Checking the invoices and passing them for payment if found in order.
10. Helping the R&D department to develop in-house production of raw materials.
11. Assisting the engineering, production and store keeping departments to properly classify and codify the materials and placement of materials in different locations for easy identification.

V - PURCHASE PROCEDURE OR ROUTINE OR CYCLE

A systematic procedure for purchase of raw materials helps in buying materials quickly with consistency. In general, purchase procedure of an organisation includes the following aspects.

- (a) Receiving authorised purchase requisition;
- (b) Studying the market and selecting a supplier;
- (c) Issuing purchase order and following up delivery;
- (d) Arranging for receiving and inspection of materials;

(e) Verifying and passing suppliers' invoice for payment.

(a) Receiving Purchase Requisition:

The purchase department cannot buy the material on its own as it will not be aware of what materials are required, their quantity, quality and other details. Therefore, it will have to be intimated about the materials required by those departments which are in need of materials. This is done through purchase requisitions. The purchase manager comes to know the details of materials required by the concern through the purchase requisitions. Purchase requisition is prepared by the store keeper for materials required for regular stock items and by the other departmental heads for specific requirements which are not available in the store. This requisition has to be approved by the head of the department in addition to the person who is originating the requisition.

The purchase requisition is to be prepared in triplicate. The original copy is sent to the purchase department. The duplicate is retained by the store keeper or the department which initiates the requisition and the third copy is kept by the authorising executive.

The purchase requisition is initiated by the store keeper when materials reach the ordering levels. This is done to make fresh supplies of material available before stocks are exhausted.

Specimen form of a purchase requisition is given below:

Specimen of Purchase Requisition

ABC Limited Purchase Requisition

PR No. _____

Date _____

Date by which materials are required

Item No.	Code	Description	Quantity required	Remarks
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Requested by _____ Checked by _____ Approved by _____ Purchase Manager

The purchase requisition given above makes it clear to the purchase department three basic aspects:

- (a) What type of material is to be purchased?
- (b) When the materials are required? and
- (c) The quantity of materials to be purchased.

(b) Studying the market and choosing the supplier: The purchase department generally maintains a list of suppliers and other details for each type or group of materials. Tenders/quotations may be invited from these suppliers. A comparative statement of various quotations is to be prepared and the best supplier offering most favourable terms should be selected. When selecting a particular supplier the purchase department should keep various critical aspects in mind:

- (1) Reliability for supply of required quantity
- (2) Price quoted
- (3) Financial position of the supplier
- (4) Previous time schedules maintained by existing supplier
- (5) Terms of payment
- (6) Reputation of the supplier

(7) Discounts offered.

All the terms being same, the price should be the lowest. The supplier should be reliable regarding quantity, quality and keeping up of time schedules for delivery of materials. The purchase manager should not be penny-wise and pound-foolish.

There should be updating of information about suppliers to eliminate from the list of suppliers those who are unreliable regarding terms of supply.

(c) *Issuing purchase order and following up of delivery schedules:* Once the supplier is selected the purchase order is to be prepared. The purchase order is the written commitment from purchase department to buy the materials and authorisation to the supplier to supply materials. It is the contract between the buyer and seller for stated terms and conditions. The supplier is committed to supply the materials and the buyer has to accept supply and make payment. It is also an authorisation to goods receiving department to receive the materials and to the accounts department to accept the invoice for payment to the supplier.

Normally, 5 copies of the purchase order are prepared and used as follows:

1. One copy is sent to the supplier.
2. One copy is retained by the purchasing department.
3. One copy is sent to the store keeper/department which has requisitioned materials.
4. One copy is sent to the receiving department.
5. One copy is sent to the accounts department.

The following is a specimen form of purchase order.

Specimen form of Purchase Order

ABC Limited

Purchase Order

No.

Date

Our Ref.

Your quotation number _____ dated _____ has been accepted. Supply the following items in accordance with various terms and conditions mentioned herewith: S. No. Description Quantity Price Unit Total Remarks Per unit Value Delivery terms Discount Excise Duty Receipt of this order may please be acknowledged For ABC Company Sales tax Carriage and Freight Terms of payment Other Particulars Signature For Office Use

Follow up: Acknowledgement

Received on

Reminder

Date of Delivery

Invoice No. Date

The purchase order provides detailed information to the supplier regarding price, quantity, delivery terms, etc. It reduces the purchasing and clerical work into a routine. Follow up of purchase orders by making enquiries at regular intervals as the delivery dates approach is necessary to see that materials are available at the right time. Alternative source

of supply of material may be tapped if there is any difficulty in obtaining the materials on the agreed dates. Extension of time may be given based on acceptable reasons, subject to any penalty as agreed upon. This is necessary to ensure availability of materials to safeguard against disruption in production due to non-availability of materials.

Receiving and Inspection of materials:

In large organisations there may be a separate department for receiving the materials. But in small organisations, this may be entrusted to the store keeper. The functions of the receiving department are as under:

1. Keeping purchase order files in a systematic way;
2. Receiving and unpacking of materials sent by suppliers under various challans.
3. Verifying the materials received by comparing with purchase orders. This includes checking quantity, quality and physical condition of material.
4. Submitting a report of any materials to be rejected with valid reasons.
5. Preparing a Goods received note, entering the details of materials received for the information of all those concerned with materials.

Generally, five copies of goods received note are prepared and used as given below:

1. One copy is retained by the Goods receiving department.
2. Four copies are sent to the store keeper along with the materials. The store keeper will verify the entries with the actual goods, countersign them and will send one copy to the purchase department; one copy to the Accounts department; one copy to the department which initiated the requisition and one copy is retained by the store keeper.

A specimen copy of goods received note is given below :

Specimen of Goods Received Note

ABC Company

Goods Received Note

Supplier's Name

Purchase Order No. No. Date

S. No.	Description	Code No.	Quantity	Rate	Amount	Remarks	about
--------	-------------	----------	----------	------	--------	---------	-------

Inspection

Received by

Inspected by

Stores Ledger

(e) Verifying and passing supplier s invoice for payment:

Based on Goods Received Note, purchases are verified and payment is made to supplier. When the invoice is received from the supplier, it is sent to the accounting department to check the authenticity as well as accuracy. The quantity, price and amount received are checked with reference to purchase order and goods received note. If everything is found in order, the accounting section approves the invoice for payment and the cashier makes the payment as per the terms agreed.

(C) STORE KEEPING AND STOCK CONTROL OR INVENTORY CONTROL

I. Meaning and Importance

Store Keeping is a specialised function involving efficient management of materials, identifying, classifying and maintenance of stock records. Since, materials form major portion of cost of production and the total cost and most of the working capital is invested

in materials, the materials are to be well kept and accounted for by an efficient stores department. Effective control over materials will lead to efficient running of business. Moreover, material losses due to theft, obsolescence, careless handling, negligence in checking materials, etc. may lead to reduced profit. Hence, it is desirable to have efficient store keeping to obtain maximum benefit out of it.

Reliability of cost accounting department depends to a great extent on the performance of stores department. Store keeping includes physical custody of materials in stock and maintenance of stock records. The cost accounting department can trace the material cost of jobs, processes, orders, etc., with the help of stock records maintained by store keeper and his assistants. The cost department requires the following from the store keeper:

1. Report of quantities of materials issued from stock.
2. The job numbers, processes, operations or departments to be charged for material issued for consumption.
3. Details about materials returned with job numbers, operations, processes or departments to be credited.
4. Complete information about scrap delivered to stores from production.
5. Coordinating inventory control work along with stores auditors.

II. Duties and Responsibilities or Functions of Stores Keeper

Store keeping is a specialised activity requiring constant attention. Therefore, it is to be handled by a person with ability to maintain the stores. The stores department is kept under the control of a store keeper who is to organise the routine of store keeping and control the men under his charge. The store keeper is expected to have expertise in stores routine. His duties and responsibilities are:

1. To receive goods as per goods received note along with proper documents.
2. To place the materials in proper bins.
3. To maintain materials in good condition to avoid deterioration.
4. To issue materials against properly authorised material requisitions.
5. Proper maintenance of stores records to enter all the quantities received and issued out of stores.
6. To report to the management on obsolete, slow moving and dormant stocks to enable the management to take suitable decisions to reduce such losses.
7. To keep the stores clean and accessible.
8. To supervise and control the work of his staff in the stores.
9. To prevent unauthorised persons from entering into stores.
10. To verify bin card balances with physical quantities to complete stock verification.

III. Location and Layout of Stores

Location of stores is an important aspect to be planned and decided carefully. It should be close to the receiving department and also close to materials consuming departments. The location is to be decided at the time of construction of factory, so that the stores is located at a desirable place. As far as possible the stores should be close to roads, railway sidings and wharfs. An ideal location of stores will bring down the transport cost. If stores and consuming departments are situated far apart, sub stores in each consuming department may be setup to avoid delay in internal transmission. Layout of stores is also another important aspect to be suitably arranged. The bins, shelves and racks are to be

properly located and they should be accessible from various points of stores. The stores also should be equipped with various other receptacles for keeping various items and space should be provided for movement of trucks, lifts, conveyor belts and other mechanical devices.

IV. Centralised and Decentralised stores / Central stores with sub stores

There are three types of stores

- (1) Centralised stores
- (2) Decentralised stores and
- (3) A central store with sub stores.

1. Centralised Stores: In this system, all the items of materials are received and issued by one department. The main advantages are:

1. Specialisation in store keeping leads to efficient planning and organisation.
2. Better maintenance of stores.
3. Efficient supervision of stores.
4. Better utilisation of space.
5. Optimum investment in stores as stores are minimised.
6. Better layout and control of stores.
7. Lower cost as minimum staff, equipment and stationary are used.
- 8 Stock taking is made easier.
9. Flow of materials is maintained as the staff are to concentrate only on store keeping.
10. Timely placement of purchase requisitions.
11. Materials can be issued quickly without any delay.

Disadvantages of Centralised Stores

1. Risk of loss by fire is more as stocks are kept at one place.
2. Delay in getting materials from centralised stores, if stores are situated far away from consuming departments.
3. Any disruption in internal transport will affect production adversely.
4. Cost of material handling will be more.
5. Specific needs of individual departments may not be given importance.
6. Keeping all materials at one place may result in congestion and will affect the operation of stores.

2. Decentralised Stores

Under this system, each department maintains its own stores. Receiving and issuing are done by respective consuming departments. This system avoids all the demerits of centralised stores. But the supervision and control of stores is lost as the departmental heads are not specialised in stores control.

3. Central stores with sub stores

This system is operated like imprest/petty cash system. It is adopted by large organisations with many production departments and the production departments are situated far away from stores. In order to avoid the delay in internal transport and minimise the handling charges, a sub store is maintained in the production department. A fixed quantity of materials is issued by the central stores to the sub-stores at the beginning of a period. At the end of the period, the central stores replenishes the quantity required to maintain the fixed quantity, determined for each store. It is similar to imprest system of petty cash.

Advantages

1. It mainly avoids delay in issuing and receiving of materials.
2. It caters to the special requirements of individual departments.
3. Easier detection of discrepancies in stores.
4. Central stores are reminded constantly the various needs of departments.
5. It minimises demerits of centralised stores.

V. CLASSIFICATION AND CODIFICATION OF MATERIALS

For an efficient store keeping, proper classification and codification of material is essential. Materials are to be classified on the basis of their nature and they may be classified on the basis of type, shape, colour, etc. once the materials are classified they are to be allotted codes which will be helpful for easy identification.

Advantages

1. Quick and easier identification of materials.
2. Elimination of purchase and issue of wrong materials.
3. Secrecy of materials description is maintained.
4. Proper material control.
5. Better accounting by identifying materials with jobs, etc., by mechanised accounting methods.
6. Clarity for quick work.
7. Economy in material handling cost.

Types of Coding

1. *Alphabetical method* : An alphabet is allotted to each item of stores. For example 'A' for nut, 'B' for bolt, etc. This system is not flexible. If the organisation is large, where there are number of items of stores, this method is not suitable.
2. *Mnemonic* : It is an improvement over the alphabetical method. In this method, the first sound of the name is considered for each material. For example Petrol can be 'PT', Diesel as 'DS', Kerosine as 'KS', etc. The material can be easily traced without referring to index.
3. *Numerical Method* : A number is allotted to each material for example 01, 02, 03, 04 and so on. When large number of items are there, this method is suitable. There are two types of numbering-Straight numbering and Block numbering.
4. *Alphabetical-cum-Numerical method* : In this method, alphabet and numerals are used in combination. For example, Steelwire-1 "Sw1, Copper wire2" - CW2, brasswire 1"- BW1 etc.
5. *Standardisation and Simplification*: Standardisation and simplification aim at inventory control by reducing the number of varieties of materials stocked in stores. For each item in store, specifications are allotted. This will facilitate buying of correct materials as it makes it clear to the buyer and seller the correct material are required. The specifications ensure that

material of correct quality is used in production to maintain the required quality of finished output.

Standardisation is made easier, since the help of Indian Standards Institute (ISI), International Organisation for Standardisation (ISO) and other specialised agencies may be taken for standardisation of stores.

Simplification is a corollary of standardisation and aims at minimising a number of items carried in the stores so that carrying cost and investment materials may be reduced. Standardisation and variety reduction is a continuous process.

Advantages:

1. Effective stores control : Standardisation and simplification are tools of inventory control to optimise the number of materials carried in stores
2. Economy : Since items of stores are reduced, lower carrying cost will reduce the material cost.
3. Control of material losses : Losses on account of obsolescence, slow moving items and dormant materials are reduced.
4. Quality of output : As standardised materials are purchased and consumed, the quality of output is maintained.
5. Reduction of Inspection cost : A standardised material need not be put for rigorous tests which leads to reduction of Inspection and material overhead cost.

VII. Receipt and Issue of Materials

The Goods Receiving and Inspection departments receive, inspect and approve the materials. These materials are passed on to the appropriate stores together with the Goods Received Note. The store keeper arranges to keep various items in their appropriate bins and makes entries in the receipt column of appropriate bincards. For easy identification of material, assigning location code to each bin will be helpful. Moreover location codes help in mechanised accounting and leads to efficiency in store keeping.

The Bin Card provides complete information of material placed in the bin. It shows description, material code, location code, receipt of material, issues and balance of quantity. This is an important document showing the details of Jots or departments which have drawn material and reference of goods received notes against which material are received. The specimen is provided below.

Specimen of a Bin Card
ABC Company BIN CARD

Description
E.O.Q.
Maximum level
Minimum level
Reorder level
Unit

Material Code
Location Code
Bin No.

Issue

Date M.R. No. Qy

Balance

Remarks Receipts

Date GRN No.

Stock verification

Issue of Materials from Stores

The department which is in need of raw materials has to specify the material requirements on a document called material requisition which authorises and records the issue of material for consumption. The store keeper issues the material only on receipt of materials requisition. The requisition provides detailed information regarding description, quantity, code number of material, Cost centre and the job to be charged. The requisitions are normally prepared in triplicate.

One copy is retained by the department initiating the requisition and the other two copies are sent to the store keeper. The store keeper retains one copy and makes entries in the issue column of bin card. The other copy is sent to the stock control department, which makes necessary entries and forwards it to the Cost office, where the value of materials are ascertained and this forms the voucher for accounting entries. Material requisition authorises the cost office to charge the particular job, the department, work-in-progress account, or overhead control account with the value of materials consumed and to pass a corresponding credit to the stores ledger account. A specimen of material requisition is given below:

SPECIMEN OF MATERIAL REQUISITION

ABC Company

Material requisition

Date To Deliver the following materials to

For Order No

Job No. Remarks

Office use only

Rate

Description	Quantity	Code No.	Amount
-------------	----------	----------	--------

Authorised by	Issued by	Stores Ledger Folio	Received by
---------------	-----------	---------------------	-------------

Cost office ref No. Priced by-

Material Returned to Stores

The department which has received the material may find the quantity received is in excess of requirement. The excess quantity is returned to stores together with a material return note. The return note is drawn up in the form which is similar to that of material requisition but in different colours. The stock records and cost accounts are adjusted from the details provided in the material transfer form. **Transfer of Material**

Material transfer from one job to another is allowed through "material transfer notes". Such transfer is permitted only when an urgent job has to be executed and work on less urgent job may be postponed. The note shows data for adjusting the Cost accounts affected. The notes are sent to the Cost office for necessary adjustment in the records.

VIII. Stores or Material Records

(a) Bin Card: Each bin in which materials are kept is attached with 'bin card'. It consists of Receipt, Issue and Balance of quantity in the bin. The entries are made after each receipt and issue and the balance is updated after-every entry. The Bin Cards are maintained by the store keeper. The store keeper is answerable for any differences in the physical stock and balance shown in the Bin Card. The card is helpful for control of stock. The card has details regarding minimum, maximum and reorder stock levels. As and when the quantity

reaches reorder level, the store keeper can initiate purchase requisition for acquiring material in time.

Double bin system: Some organisations divide the bin into two portions namely, the smaller portion to store the minimum level quantity and the other portion to keep the remaining quantity. The quantity in the smaller portion is not issued as long as quantity is available in the other portion. It helps in physical verification and acts as signal to buy when the quantity in smaller portion is to be used.

(b) Stores ledger card: The stores ledger card is maintained in the costing department. It has similar details as contained in the Bin card regarding Receipts, Issues and Balance of materials quantity. In addition to quantity the stores ledger card contains information in terms of values also. The pricing of materials issued is done in the stores ledger account.

Utility or benefits of stores ledger card or stores ledger:

- (a) It provides information for pricing of material issues
- (b) Quantity and monetary value of each item in store can be obtained whenever required.
- (c) It provides counter check to the Bincard because it is maintained by costing department from independent sources.

The specimen of stores ledger card is given below.

Specimen of Stores Ledger Card

ABC Company Stores Ledger

Description of the Article Code No. Bin No.

Minimum level Maximum level Reorder level Reorder quantity Date Particulars Receipts
Issues Balance Reference Qty Rate Amount Qty. Rate Amount Qty Rate Amount d ot

Bincard Vs. Stores Ledger

The differences between a Bin card and the Stores ledger are mentioned below.

Bin Card		Stores Ledger
1.	It is maintained by stores	It is maintained by costing department.
2.	Bin Card provides quantities received, issued and the Balance in the bin.	Stores ledger contains both quantity and value of receipts, issues and the balances
3.	Entries are made before the transactions take place.	Entries are made after the transactions take place
4.	Each and every transaction is individually entered	Transactions are summarised and entries are made periodically

IX. INVENTORY CONTROL AND ITS TECHNIQUES

Inventory control is a system which ensures the maintenance of required quantity of inventories of the required quality at the required time with minimum amount of investment.

The terms inventory includes raw materials, stores, supplies, spare parts, tools, components, assemblies partly finished goods and finished goods The objective of inventory control is to achieve maximum possible inventory turnover.

The quantity of inventory to be maintained is based on the following factors.

- (a) Availability of Finance.
- (b) Quantity discounts allowed.
- (c) Storage space available.
- (d) Ordering Cost.

- (c) Receiving Cost.
- (g) Risk of loss due to price fluctuations.
- (g) Risk of loss due to evaporation, obsolescence, theft, deterioration, etc.
- (h) Economic ordering quantity; and (i) time to obtain delivery or lead time.

The main objectives of Inventory control are as follows:

- (1) Keeping required material of adequate quantity in order to avoid disruption of production.
- 2) Optimising investment in inventory and reducing carrying cost.
- 3) Following the policy of M.B.E. (Management by Exception) by relieving the top management from involving in each and every decision relating to inventory.

The cost accounting department has a vital role to play in inventory control

- (1) Maintaining price records of all items of stores.
- (2) Pricing of material issues.
- (3) Preparing material abstract to identify the material cost of jobs, departments and cost centres or processes.
- (4) Maintenance of stores inventory subsidiary ledgers to record receipts and balances of materials under the perpetual inventory system.
- (5) Maintenance of records of material losses, scrap, defectives, etc. The following are various inventory control techniques used in different industries:

1. Demand and supply method of stock control-Levels of stock and EOQ:

This method of material control utilises the principles of planning the demand for and supply of each item of material:

- * At the lowest cost possible
- *With the lowest possible inventory
- * Consistent with operating requirements.

Optimum quantity of purchasing and manufacturing lot sizes are determined to economise the cost of procuring, storing and consuming each item of material.

For effective demand and supply method of stock control, information of the following aspects has to be estimated for each item of raw material.

- (a) Rate of consumption for a specific period.
- (b) Lead time for acquiring the material.
- (c) Economic ordering quantity to optimise the cost of carrying and the cost of ordering and receiving.
- (d) Reserve stock to be maintained as safety stock to take care of abnormal consumption during the lead time or lead time being more than normal or a combination of both.
- (e) Reorder level quantity, being the quantity to be consumed during the lead time plus reserve stock.
- (f) Maximum and minimum levels of material to control overstocking and to maintain minimum quantity being available for production requirements.

With the help of accurate estimation of the above aspects, it is possible to see that actual purchasing and consumption conform to the standards set. The various levels of stock used in demand and supply method are explained in detail below:

(a) Minimum stock level : This is the minimum quantity of material to be maintained in stores throughout the year. The following factors are essential for fixing minimum stock level-

1. Reorder level.
2. Normal consumption of material.
3. Time required to obtain material from the time of issuing purchase order to the time of physical receipt of the material.
4. Nature of material.

(b) Maximum stock level: It is that quantity above which the stock of any item should not be allowed to exceed. Fixation of this quantity depends on several factors as given below:

1. Rate of consumption required for production.
2. Availability of storage space.
3. Cost of storage.
4. Availability of finance.
5. Extent of price fluctuations.
6. Reorder level and time required to obtain delivery of supplies.
7. Availability of quality raw material.
8. Economic ordering quantities.
9. Risk of obsolescence, evaporation and natural waste.
10. Cost of insurance.

(c) Danger level : This is the stock level below the minimum level. When stocks reach this level action for immediate purchase is necessary. Issues are controlled by stopping normal issues and issuing only on special instructions.

(d) Reorder level : It is between maximum and minimum stock levels. Once the stock level reaches reorder level, the store keeper initiates purchase requisition to obtain fresh stocks. Reorder level depends on economic ordering quantity, lead time and rate of consumption of material.

Methods of calculating stock levels

1. Reorder Level Maximum = Consumption x Maximum reorder period

$$R.L = M.C. \times M.R.P.$$
2. Minimum Level = Reorder level - (Normal consumption x Normal reorder period)

$$Min. L = R.L. - (N.C. \times N.R.P.)$$
3. Maximum Stock Level = Reorder Level + Reorder Quantity - (Minimum Consumption x Minimum Reorder period)

$$Max.L. = R.L. + R.Q - (Min C. \times Min.R.P.)$$
4. Average Level = Minimum level + $\frac{1}{2}$ of reorder quantity

$$OR \quad \frac{1}{2} (Maximum level + Minimum level)$$
5. Danger Level = Average Consumption x Maximum reorder period for emergency purchases

ECONOMIC ORDERING QUANTITY

This is an important item of inventory control to be decided. In these days of inflationary trend, the buying costs, carrying cost and ordering costs are very high. Firms should minimise these costs to control and reduce material cost of production. Economic

ordering quantity depends on many factors like cost of purchasing and receiving, normal consumption; interest on capital, availability of storage accommodation, ordering and carrying costs. Economic ordering quantity is the reorder quantity, which is the quantity to be purchased each time an order is placed.

Economic ordering quantity aims at minimising both carrying cost and cost of ordering. (A) Carrying costs are incurred on maintenance of materials in stores and include cost of material handling, interest on capital, obsolescence, pilferage, rent, insurance and other storage costs. (B) Ordering costs are incurred for acquiring material into stores. These costs are incurred each time the materials are purchased. The ordering costs include cost of processing, receiving,

inspection and general administration overhead cost of purchase department As number of units per order is increased, ordering costs are reduced (fi, placement of less number of purchase orders) but at the same time carrying costs are increased as quantity of material kept in the stores increases. With the equalisation of ordering and carrying costs, the economic ordering quantity will be ascertained where the total cost of inventory will be minimum. When the purchase price remains constant, the economic ordering quantity will be determined based on the following formula:

$$EOQ = 2AB/CS$$

Where = Economic Ordering Quantity

A = Annual consumption or usage of material in units.

B = Buying cost per order

C = Cost per unit

S = Storage and carrying cost percentage per annum.

Though the above formula is the most popular the following are some other variations of the same formula with different abbreviations:

$$EOQ = \frac{2UO}{C} \text{ EOQ}$$

Where

U = Usage in units per annum.

O = Ordering costs

C = costs Cost of carrying one unit in inventory during one year.

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

C = Consumption of the material in units per year

O = Ordering costs

I = Interest and other carrying cost per unit per annum.

All the formulae provide the same result. However, the first formula, which is the more popular one, is used in this chapter for illustrations.

Sometimes, consumption of material may not be given in units but only in value. In such cases, the formula for EOQ is slightly altered.

$$EOQ = \frac{2AB}{S}$$

EOQ = where Economic Ordering Quantity in Rupe

B = Buying cost per order.

A = Annual consumption of material in Rupees.

S = Storage and carrying cost %.

This formula is applicable only when consumption of material is not given in units.

[See Illustration No. 3 on Page 3.52]

2. Stock Control according to value-ABC Analysis:

It is 'Management by exception' system of Inventory control. In this Always Better Control (ABC) technique of inventory control, the materials are classified and controlled according to value of the materials involved. It is also called proportional parts value analysis. Thus, high value items are paid more attention than low value items. The materials are classified under 'A', 'B' or 'C' designation on the basis of their value and importance.

"A" category consists of a few items of high value. Category 'B' includes more items of medium value and category 'C' includes all other materials of small value.

The general classification of items under ABC categories are as given below:

	Percentage of total items	Percentage of total material cost Category
A	5 to 10	70-80
B	10 to 20	10-20
C	70 to 80	5-10

From the above classification, it is clear that 'A' items are of minimum quantity and of maximum value out of total quantity and value of materials. They have to be controlled to the fullest possible extent by all methods of inventory control from the time of purchase till they are consumed in production. 'B' and 'C' items are of major portion of total quantity of raw materials but having minimum capital investment. Therefore, they are to be managed through less stringent controls.

1. Effective control is applied on the high value items rather than concentrating on all items. This results in reduction in value of material losses.
2. Optimum investment in materials as minimum required quantity of 'A' items with high value are purchased.
3. Storage cost is kept at minimum amount as high value materials representing minimum quantity are kept in stores.

Limitations of ABC Analysis may be cumbersome and difficult process.

- (a) In a big using numerous materials, dividing them into ABC categories may be cumbersome and difficult process.
- (b) Division of materials into ABC categories may become subjective processes. Since it is difficult to lay comprehensive and precise criteria for such division.
- (c) Very little attention to B & C categories of materials may affect their availability in time.

3. Perpetual Inventory System

The ICMA defines perpetual inventory as "A system of records maintained by the control department which reflects the physical movement of stocks and their correct balance". According to Wheldon "perpetual inventory system is a method of recording stores balances after every receipt and issue regular checking and to obviate closing down for stock taking". It is clear from the above definitions that perpetual inventory system:

- (a) is a method or system of recording materials.
 - (b) reflects the physical movement of materials and records the balance of material after every receipt and issue;
 - (c) facilitates regular checking and avoids the need for closing down for stock taking.
- The records forming part of the system are:
- (1) Bin card maintained by the store keeper in which all the physical quantities of receipts, issues and balance are recorded;

(2) Stores ledger cards maintained by the costing department in which quantities as well as values of receipts, issues and balance are recorded. Physical verification of the stores is also made by a programme of 'continuous stock taking'. Any shortage or surplus noted are immediately rectified. Discrepancies due to unavoidable causes are tolerated but those due to avoidable causes are given attention by fixing responsibility to individuals. Thus, bincard, stores ledger card and physical verification together constitute the perpetual inventory system.

Merits of Perpetual Inventory System

1. It is not required to close the operations to verify stocks as it has been done throughout the year.
2. Profit and Loss A/c and Balance Sheet can be prepared at any time as stores ledger accounts reveal stock quantity and value at any time of the facilitate year.
3. Continuous stock taking ensures reliable check on stocks,
- 4 As stock verification is done systematically more reliable figures are revealed.
5. Continuous stock taking acts as vigilance on the work of store keeper and accountant to maintain accurate records and quantities.
6. Production is planned according to the quantity of raw material available as the perpetual inventory reveals the information about stocks at all times of the year.
7. Parallel maintenance of bincard and stores ledger card facilitates operation of internal check system.
8. Shortage of stocks due to pilferage, damages, theft and other causes are revealed immediately and necessary efforts can be made to avoid or minimise such losses in future.
9. Investment in stores is controlled by comparing actual stocks with maximum and minimum levels.
10. Correct stock figures are made available to insurance company to claim against loss on account of fire.

Discrepancies in Physical Stock

Perpetual Inventory system ensures the accuracy of inventory records by physical verification of stocks. The balance of stock shown by bin cards or stores ledger may be different from actual stock as revealed by continuous or periodic stock verification. This difference may be due to avoidable and unavoidable causes.

Avoidable Causes

1. Clerical Errors : Wrong postings, non posting of entries, wrong casting, etc. are the clerical errors which can be rectified.
2. Pilferage and theft.
3. Damages due to mis-handling of material.
4. Issue of excess or short quantity due to faulty weighing or counting of the material.

Unavoidable Causes

1. Losses due to shrinkage and evaporation.
2. Shortage due to breakdown of fire and riots.
3. Sometimes, materials may be lost due to 'breaking up of bulk' material into smaller parts for issue.
4. Actual balances may be more due to absorption of moisture,

Operation of Perpetual Inventory System

- (a) The entries for receipt or issue of the material are made in the bin card and stores ledger account and the balance is ascertained.
- (b) Stores received but not inspected are not mixed up with regular stocks.
- (C) Stock taking is done continuously. The stores records are compared and entered in stock verification report for suitable treatment.

4. Just-in-time Inventory (JIT)

Business concern are giving maximum attention to reducing stock levels by establishing cardinal relationship with suppliers to arrange for frequent delivery of quantities. This is called Just in-time purchasing. The objective of just-in-time purchasing is to obtain delivery of material immediately before their use. This is possible with the co-operation of the supplier. The company guarantees to purchase large quantities. The supplier guarantees good quality materials at reasonable prices. This arrangement helps in directly delivering the material to the shop floor instead of receiving into stores. Moreover the stocks consists of few items at more or less same prices where LIFO, FIFO and average cost price will be the same.

Just in time buying of raw materials recognises the disadvantage associated with high inventory cost with high inventory levels. Hence JIT advocates making timely purchases as and when need for raw materials arises. The purchases are made from proven suppliers who can make ready delivery of goods as and when need arises.

EOQ model assumes constant order quantity, where as Jit buying policy assumes different quantity for each order if demand fluctuates. Similarly EOQ lays stress on carrying costs where as Jit lays emphasis on all the costs and moves outside the assumptions of EOQ model. Jit purchasing provides special significance to cost of quality and timely deliveries rather than considering price alone as main factor affecting choice of suppliers.

Main Advantages of JIT Purchasing

- (a) The investment in stocks is minimum.
- (b) The clerical work relating to issues is minimised. As purchase price of different lots will not fluctuate much, the issue price is same. This results in reduction of clerical cost.
- (c) Good rapport with vendors has several long term benefits.
- (d) Carrying cost of inventories is practically negligible.

5. VED Analysis

Vital, essential and desirable analysis is done mainly for control of spare parts. Spares are controlled on the basis of their importance. Vital spares are crucial for production. Non-availability may stop production. The 'Stock out cost' of these spares is very high. Essential spares are spares the 'stock out' of which cannot be sustained for more then a few hours and cost of loss of production is high. Desirable spares are needed but their absence for a short time may not lead to stoppage of production.

Some items of spares though negligible in value may be vital for production. Such items may not be given importance under ABC analysis method which operates on value based control.

6. FNSD Analysis

Under FNSD analysis the stores items are divided under four categories. The basis of classification is their usage rate. Decending order of usage is followed where by 'F' stands for fast moving items that are consumed quickly. 'N' stands for normal moving items which are exhausted over a period of a year or so. 'S' stands for slow moving items which are not

consumed frequently but are expected to be exhausted over a period of two years or more. 'D' stands for dead items and the consumption of such items is nil.

Stock control under FNSD is done by continuous monitoring of all the four categories of items. Fast moving items are properly ordered to avoid 'Stock-out' of such items. Normal moving items are reviewed at regular intervals and orders for restoring shall be made as per a planned schedule.

Stock of slow moving items of stores are reviewed very carefully to avoid over stocking of such items. Dead stock items are taken as obsolete items which have become outmoded and have no further use. Alternative uses should be found for dead stock items or else they should be disposed of at the earliest so that their value may not deteriorate further.

7. Automatic Order System

This method of inventory control is done with the help of computers. Order for fresh purchases is automatically placed when the inventory reaches 'order point quantity' (OPQ). For each type of material, records are maintained by data processing in the form of receipts and issues. When the records show order point the staff concerned place order for necessary quantity. This system ensures that materials are always promptly replaced.

8. Ordering Cycle Method

In this method, the review of materials held in stock is done in a regular cycle. The length of cycle depends on the nature of material. Materials which are expensive and essential have a shorter review cycle and non-vital materials have longer review cycle. At the time of review order is placed to bring the inventory to the desired level. Ordering cycle method is also called '90-60-30 cycle' method. The maximum stock level is equal to 90 days supply. When the inventory reaches 60 days supply an order is placed for 30 days supply. The reorder point is equal to 60 days supply and reorder quantity would be equal to 30 days supply.

8. Min-Max method

The demand and supply method is an improvisation of min-max method, In the min-max method, each item of material is fixed with its maximum and minimum levels. When the quantity reaches minimum level, an order is placed for such a quantity as would make the inventory reach its maximum level.

9. Inventory Turnover Ratio Kohler defines inventory turnover ratio as "a ratio which measures the number of times a firm's average inventory is sold during a year". In his view the ratio is an indicator of a firm's inventory management efficiency. A high inventory turn over ratio indicates fast movement of material. A low ratio on the other hand indicates over investment and blocking up of working capital. The Inventory turnover is calculated on the sales or cost of sales. It is measured in terms of value of materials consumed to the average inventory during a period. It indicates number of times the inventory is consumed and replenished. If the number of days in a year are divided by turnover ratio, the number of days for which the average inventory is held can be ascertained.

The turnover ratio differs from industry to industry. On the basis of the ratio, a decision is made to reduce investment on slow moving materials and stop overstocking of undesirable material.

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Materials Consumed}}{\text{Cost of Average Stock}}$$

$$\text{Average Stock} = \frac{\text{Opening Stock of Material} + \text{Closing stock Material}}{2}$$

$$\text{Inventory Turnover Ratio in days} = \frac{\text{Days in the period}}{\text{Inventory Turnover}}$$

II Input-output Ratio Analysis

This is yet another method of inventory control. Input output ratio is the ratio of the quantity of material to production and standard material content of the actual output. This is possible in industries where the product and raw material are being expressed in same quantitative measurement such as kilograms, Metric tonnes, etc.

The input-output ratio analysis indicates whether the consumption of actual material when compared with standards is favourable or adverse. The raw material cost of the finished product can be arrived at by multiplying material cost per unit by the input-output ratio.

The ratio is obtained as given below:

$$\frac{\text{Standard cost of Actual quantity}}{\text{Standard cost of Standard quantity}}$$

12. Material (Inventory) Cost Reports:

Material control is effected by coordinating the functions of all the departments involved with material namely purchasing department, stores department, production department and costing department. Management needs information to analyse and take appropriate decisions. Material cost reports communicate facts relating to materials to the attention of various levels of management. Material control is concerned with three aspects, viz., purchase control, stores control and consumption control. Departments concerned with these aspects have the responsibility to function effectively in the specific area of their activity. The extent of efficiency of different departments is reported frequently to enable the management at different levels to check inefficiency and achieve desired level of activity. Designing appropriate material reports will ensure effective communication of material control aspects to the concerned levels of management. Types of reports and frequency of reporting is based on individual requirements of organisations. The following are some of the reports generally prepared:

- (i) **Material consumption report:** This report is prepared weekly and sent to works manager. It provides information regarding quantity of materials used against standard quantity specified. It helps in controlling consumption of materials and elimination of wastage, spoilage, defectives and scrap.
- (ii) **Material purchase efficiency report :** This report is prepared monthly and sent to purchase committee. It contains information in respect of actual purchase prices of materials and standard prices of materials and the variance there on. The purpose of the report is to watch price movements and control cost of material.
- (iii) **Purchasing report :** This report is prepared once in a month. It is also submitted to the purchase committee. It contains information in respect of actual purchases, consumption and stock figures. Objective of this report is to show the effect of policies laid down for purchasing.

- (iv) Inventory report : This report is prepared as and when required for the top management. It reveals information regarding slow moving, dormant, and obsolete stocks. The objective of the report is to control the losses and investment in material.
- (v) Stock verification report : This report contains details regarding discrepancies between physical balance and record's balance of stocks. This report is sent to storekeeper, The purpose of the report is to control storage of material.

(D) PRICING OF MATERIAL ISSUES

Need for Pricing

Ascertainment of accurate cost is one of the main objectives of cost accounting. For a manufacturing company material consumption and material cost are vital aspects. Ascertainment of accurate cost depends on correct valuation of material used in the product. The material cost consists of invoice price plus freight, carriage, cartage, insurance, taxes, stores costs, etc.

Materials are issued to different departments, different orders and jobs from stores. The jobs are to be correctly charged with material consumed. But the material in stores will be of different lots received at different prices on different occasions. This makes it necessary to decide about the price to be charged to jobs which are issued with materials from different lots.

The following are essential for ascertainment of accurate material cost:

- (1) Computation of total cost of material purchased.
- (2) Systematised material issue procedure.
- (3) Appropriate methods of pricing material issues.

(I) Computation of Total Cost of Material Purchased

Most of the details needed to ascertain the total cost of material purchased can be obtained from the invoice sent by the supplier. The basic purchase price has to be adjusted in the light of delivery and forwarding charges, sales tax, excise duty, etc. Similarly, transport charges and cost of containers have to be included. Any discounts receivable have to be appropriately subtracted.

(a) Discounts: There are three types of discounts to be considered:

(i) Trade Discount: This is a discount allowed by the supplier to compensate the buyer for the costs of 'breaking bulk', selling in small lots to customers, repacking, etc. The supplier is relieved from all these costs by the buyer by purchasing a large quantity. This discount is usually given by the wholesalers.

(ii) Quantity Discount or Bulk Discount: This discount is allowed by the supplier as a measure of savings in cost which arise from the production of longer runs and the distribution of larger quantities. Part of the savings accruing to the supplier out of a large order is passed on to the buyer by means of quantity discount.

(iii) Cash Discount: This discount is offered by the supplier to the buyer as an option. The discount is linked to payment of the invoice amount before a specified due date or within a specified number of days. The purchaser may make use of the option and obtain the discount if his cash position permits it. Generally, this discount is considered as a matter of 'financial policy' and not taken into account for computation of material cost.

(D) Transport and Storage Costs:

If transport cost and cost of storage in transit are not included in the invoiced price of the supplier, they may be added as the direct costs of purchase to the cost of material. If it is not possible to identify such costs with specific materials because of paying a combined amount for several materials, they may be treated as indirect expenditure and included in the overhead.

(c) Cost of Containers:

The supplier may or may not charge separately for containers. If no charges are made, no accounting treatment is required. If container charges are made, the treatment may depend upon the following circumstances:

- (a) Non returnable containers : The container costs are added to the purchase price.
- (b) Returnable containers credited at reduced value on return: The difference between the cost of containers and the amount credited by the supplier on return is added to the purchase price.
- (c) Returnable containers credited at full value on return : The cost of containers is not added to the price since no cost is incurred by the buyer.
- (d) Sales tax, excise duty, insurance, etc. : These items are added to the purchase price to ascertain the total cost of material purchased.

(II) Material Issue Procedure

Materials kept in the stores are to be issued to production departments whenever the departments require them. The store keeper is to issue materials only when a material requisition is presented to him.

Material Requisition: It is a properly authorised document initiated by the production departments to draw the required material from stores. It has to be initiated by properly authorised person to avoid misappropriation of material. The ruling of material requisition is given earlier.

The requisition serves as authority to the store keeper to issue materials. The store keeper puts serial number on the requisition and makes entries in the issue column of the bin card. After this the requisitions are sent to the cost office where the value of material issued is also filled up and credit is given to the material issued in the stores ledger and the job receiving the material in the job ledger is debited.

It is a document listing all the materials required with quantities required for a particular job, order or process. The bill of material serves the purpose of material requisition. The bill of material is prepared for a job of non standardised type so that estimate of all materials required for the job is made by the production department before the job is started. This is helpful to estimate material cost of the job for submitting tenders or quotations. A specimen form of a bill of materials is given below:

ABC Company

Bill of Materials

Job No. No.

Department Date

Serial Description No. Material Quantity for Cost office use

Code No. Remarks Rate Amount

Authorised by Priced by Issued by Stores Le

Treatment of Surplus Materials

- (a) Return of Surplus Material

Sometimes, excess materials may be issued to production departments. When these materials are returned to stores a Material Return Note is to be prepared by the department which has the excess materials. Generally, three copies are prepared. One copy is retained by the department which is returning the material. Two copies are sent to the store keeper. The store keeper keeps one copy for making entries in the Bin card and the second copy is sent to the cost office for making entries in the stores ledger and for giving credit to the job where the material is in excess.

(b) Transfer of Surplus Materials

Transfer of excess materials from one job to another job is to be avoided as far as possible. This is because record for transfer may not be made and actual material cost of jobs may be inaccurate. However, sometimes the material may be allowed to be transferred to avoid delays and handling charges. The transfer is to be allowed only with preparation of material transfer note so that the cost of material transferred is debited to the job receiving the material and credited to the job transferring the material.

(iii) Methods of Pricing Material Issues

The purchase prices of materials fluctuate on account of changes in the product prices, buying from different suppliers and on account of quantity discounts. Because of price fluctuations, the stock may include several lots of the same material purchased at different prices. When these materials are issued production, it is important to consider the correct price at which these materials are charged to production.

There are various methods in use.

They are broadly classified under the

L Cost Price Methods

- a) First in First out (FIFO)
- b) Last in First out LIFO)
- c) Specific price
- d) Base stock
- e) Higher in first out (HIFO) .

2. Derived from Cost Prices or Average Price methods

- 1. Simple Average Periodic
- 2. Weighted Average
- 3. Periodic Simple Average
- 4. Periodic Weighted Average
- 5. Moving simple average
- 6. Moving weighted average

3. Notional Price Methods

- 1. Standard Price
- 2. Inflated Price
- 3. Re-use Price
- 4. Replacement Price

All the above methods are explained below in detail.

L COST PRICE METHODS

This group of methods consists of all those methods wherein each lot of material purchased is charged to various departments at the actual cost of material purchased. When one lot at a particular price is exhausted, the next lot is issued at the price of that lot and so on, as per the

particular method used. Thus, prices charged are always the actual purchase prices and not average or notional prices

(a) First in First out method (FIFO)

Different lots of the same material received are noted in the order in which they have entered into the stock. When an issue is made, the price of the earliest lot in the stock is charged to the receiving department. When that lot is exhausted, the next lot is issued at the respective price of that lot. This method resembles the 'queue' system because the material which entered the store first goes out first.

Advantages of FIFO Method

1. Prices are based on actual costs. No profit or loss on stocks results from using this method.
2. Stock balances are of fair commercial value representing the latest market prices.
3. This method is suitable in case of slow moving materials.
4. It is appropriate in situations of falling prices to charge the jobs with higher prices purchased earlier.

Disadvantages of FIFO Method

1. Possibility of more clerical errors due to more number of calculations
2. The cost of similar jobs differs if the prices fluctuate.
3. In times of rising prices, the cost of jobs does not reflect current market prices. This inflates the profits unnecessarily, resulting in higher taxes

(b) Last-in-First out method (LIFO)

Under this method, the price of material last purchased and kept in stores is charged for the issues first and then the preceding lots purchased are issued.

This method is used to take advantage of rising prices.

Advantages of LIFO Method

1. This method is simple to operate when issues are not too many.
2. Prices are based on actual cost. Therefore there is no possibility of profit or loss in stocks.
3. Production cost reflects latest market prices.
4. This method is suitable in case of rising prices because materials are issued at current market prices. The jobs and production are charged at the latest prices. Thus, profit on the jobs is not unnecessarily inflated.

Disadvantages of LIFO Method

1. This method also involves tedious clerical work which may lead to clerical errors.
2. Comparison of jobs becomes difficult as they use same raw material but are charged with different prices.
3. During the period of falling prices the stocks are at high prices, which may necessitate writing off stock values to show the stocks at their market values

(c) Specific Price Method

This method is followed in concerns which use job order costing. In order to show the correct material cost of a job, materials are purchased for the job and the purchase price is charged to that job. This is done when non standard materials are to be purchased for a particular job specifications. A firm may use a standard method for pricing and when the material specifically purchased are issued for a specific job, the specific purchase price is charged to that job.

(d) Base Stock Method

This method involves usage of any method of pricing of issues, keeping a 'minimum stock' of material at all times at a fixed price irrespective of the price fluctuations. Such minimum stock is not used unless an emergency arises. The method is based on the logic that stock never reaches 'Zero' level and an absolute minimum balance of stock is called the Base Stock and it is shown at a fixed price.

(e) Highest in first out method

Under this method, the highest priced materials in stock are issued first. This method is based on the principle of consumption at the highest cost and inventory value of material at the lowest possible price.

2. DERIVED FROM COST PRICE METHODS (OR) AVERAGE PRICE METHODS

When materials are purchased frequently and issues to jobs or production are also made very often, cost price methods can distort the cost structure of different jobs or output. The same material is charged at different prices, sometimes even on the same day. Costing data may not be useful for comparison purpose. To avoid such grave danger, average price methods are followed by many organisations. The following are the different average price methods prevailing in practice.

(A) Simple Average Price Method

When the variance between purchase prices is very little, this method is the most suitable one. Here the total of the prices of materials in the stock (from which the material to be priced could have been drawn) is divided by the number of prices used to ascertain the 'simple average price'. Irrespective of the quantities, the average of the prices is found. One lot may be 5 Kgs and another lot may 5,000 Kgs. But the prices per Kg of both lots are taken for average purpose.

It should be noted that for the purpose of physical movement of materials, FIFO (First in First Out) method is assumed which forms the basis of simple average method. Thus, the prices of earlier lots are left out of simple average calculation, as and when materials are issued and older lots are exhausted.

Advantages

1. It is simple and easy to calculate the issue price.
2. This method reduces the effect of fluctuation of prices by averaging the price.

Disadvantages

1. This method does not take into accounts the quantity purchased at each price. This may lead to abused results.
2. As the actual price is not used, profit or loss on material will usually arise.
3. The value of closing stock under this method is absurd. When price fluctuates sharply, the closing stock shows credit balance, that is ne figure!

(b) Weighted Average Price Method

The weighted average price is calculated by dividing the value of stock in the stores by the quantity in the stock from which materials are to be issued. As this method takes into account the relative weights, it reduces the effect of fluctuations in prices.

The method is different from all other methods because in this method prices are calculated on receipt of material and not at the time of issue of materials.

Advantages

1. This method is suitable where the prices vary very much from one purchase to another. As it uses quantities for calculation of average prices, the fluctuations are evened out.
2. The basis of calculation in the method is simple as the price is calculated by dividing the value of materials by their quantity.
3. A new price is calculated when new materials are purchased. All the subsequent issues are made at the price calculated until next lot is received. Thus, the clerical work is simplified and reduced.
4. The stock balance reflects fair prices which may be taken for financial statements.

Disadvantages

1. This method is more complicated than simple average price as it takes into account the total quantity and value.
2. Since actual price is not used, Profit or Loss may arise in material cost by using this method.
3. Where receipts are numerous, calculations will be many and may result in errors.
4. The price may have to be taken upto three or four decimal places to calculate the correct value of large quantities. Otherwise, approximation may lead to difference in accounts.

(c) Periodic Simple Average Method

Under this method the total value of the purchases is divided by the total number of prices during the accounting period to find average price. This method is similar to that of simple average price with the exception that only one price is to be calculated periodically. This method is adopted in costing continuous processes where each individual order is absorbed into the general cost of production,

(d) Periodic Weighted Average Method

This price is calculated by dividing the total value of material by the total quantity of material purchased and received during the accounting period. This method takes into account the quantities as well and therefore it is used when prices fluctuate substantially. This method is used in process industries.

(e) Moving Simple Average Method

This is a price which is calculated by dividing the total of periodic simple average prices of a given number of periods by the number of periods. This method is used when there are high fluctuations in material prices.

(f) Moving Weighted Average Method

This price is calculated by dividing the total of periodic weighted average prices of a given number of periods by the number of periods. The effect of Price fluctuations is dampened by using this method as in the case of moving simple average price method.

3) NOTIONAL PRICE METHODS

This group of methods is either predetermined prices or some other prices other than the original purchase prices, not even the average of the purchase price. Thus, the prices charged under these methods are completely different from the actual purchase prices.

(i) Standard Price Method

This price is predetermined price fixed on the basis of all factors affecting the price. A standard price is fixed and the actual price is compared with the standard price. If actual price is more than the standard price, loss occurs and if actual price is less than the standard price, a profit will be obtained. While operating the pricing method the issue price is uniform for all quantities issued. The loss or profit on material is termed as 'Material price variance',

Advantages

1. This method is relatively simple to operate as a single issue price is used during the accounting period.
2. Comparison of jobs becomes easier as the issue price is same
3. It eliminates clerical errors as issue price is fixed.
4. This method facilitates ascertaining efficiency or otherwise of material purchases.

Disadvantages

1. This method may show profit or loss on issue and closing stock may show absurd figures.

(b) Inflated Price Method

This method aims at covering the costs of contingencies in addition to the purchase price. The issue price includes purchase price plus losses due to evaporation, wastage in handling and storage, carrying costs, etc. This method aims at recovering the full material cost.

(c) Re-use Price Method

This method is followed in pricing of materials issued for 're-use'. Materials originally purchased for a particular purpose but returned to the stores from the concerned department may be reissued to another department for a different purpose. The price charged is the normal price of material used for such works and not the original purchase price. Usually, material loss is incurred when re-use price method is employed.

(d) Replacement Price Method

The current market price of materials is charged on the issues. The method is used to reflect the production cost at current market prices. This method shows profit during rising prices and losses during falling prices on the material issues. Stocks also do not represent correct values.

(E) MATERIAL LOSSES

The material requirements of production are issued on the basis of material requisitions. The output is obtained along with wastage, scrap, spoilages and defectives. The accurate cost of output can be computed after taking the losses into account.

Losses in the form of waste, scraps, spoilage and defectives are inherent and inevitable with any manufacturing activity. These losses can be controlled through adequate reporting and responsibility accounting. Standard for each type of loss is fixed. Actuals are compared and action is to be taken by the management to control the abnormal losses, based on the variances.

Different types of Material Losses

1) Waste

Waste is inherent in any manufacturing activity. Waste is a part of raw material lost in the process of production having no recoverable value. Waste occurs invisibly in the

form of evaporation or shrinkage. It can be visible and solid also. Examples of visible wastes are gases, dust, valueless residue, etc. Sometimes disposal of waste entails additional expenditure. Example: atomic waste. Loss in the form of waste increases the cost of production.

2) **Control of Waste:**

A waste report is prepared periodically. The actual waste is compared with standard waste and remedial action is taken to control abnormal waste.

Accounting Treatment

Waste has no value. The accounting treatment differs according to waste being normal or abnormal.

1. Normal waste:

This is the inherent waste while manufacturing. It is in the form of evaporation, deterioration etc. The total cost of normal waste is distributed among the good units of output.

2. Abnormal waste:

The abnormal waste is transferred to costing profit and loss A/c to avoid fluctuation in production cost.

ABC Company Ltd.

Waste Report No.

Department

Cost Centre Date

Weight of Waste

Percentage of Waste to Normal Percentage of Waste Remarks Process or

Job No. production Action taken by Entered by Signature of Inspector

2) **Scrap**

Scrap is the residue from certain manufacturing activities usually having disposable value. It can also be the discarded materials which can fetch some income. Examples of scrap are outlined material from stamping operations, sprues, and 'flash' from foundry and moulding processes. Scrap may be sold or reused.

Control of Scrap

Scrap is controlled by fixation of standards for scrap Control of Scrap reporting helps in control of scrap. Actual scrap is compared with standard Suitable action is taken for excessive actual scrap over standard scrap.

ABC Company Ltd.

Scrap Report

Department

Cost Centre Date Normal Abnormal Scrap Quantity Value Actual Scrap

Actual % Remarks Process or Job No. of Scrap Kg/Pcs.

Action taken by

Entered by

Accounting Treatment

(a) *Sale value of scrap credited to profit and loss A/c* : The sale value is credited to profit and loss account as other income. The cost of output is inclusive of scrap cost. This method of accounting treatment is adopted when the value is negligible.

(b) *The Sale value credited to overhead or material cost* : The sale value is reduced with selling cost of scrap and the net sale value is deducted from factory overhead or from material cost. This method is adopted when several jobs are done simultaneously and it is not possible to segregate the scraps jobwise.

(c) *Crediting the sale value to the Job or process in which Scrap arises* : The sale value of scrap is credited to the job or process concerned from which the scrap has arisen. This method is followed when identification of scrap with specific jobs or processes is easy.

3. Spoilage

Spoilage occurs when goods are damaged beyond rectification. Spoilage is disposed off without further processing. Spoilage cost is the cost upto the point of rejection less sale value.

The method of sale of spoilage depends on the extent of spoilage. Some of the spoilage is sold as seconds if the extent of damage is less; rest may be sold as scrap or treated as waste.

Control of Spoilage:

Spoilage is controlled through proper reporting about the extent of spoilage. Standards are fixed as a percentage on production. Actual Spoilage is compared with standard and variance is recorded. If the actual spoilage is more than the standard, suitable action is suggested to control it.

Accounting Treatment of Spoilage

Accounting treatment depends on whether the spoilage is normal or abnormal. Normal spoilage is borne by good units of output since it is inherent with production and it happens even under efficient conditions. Abnormal spoilage is avoidable under efficient conditions. The cost of abnormal spoilage is charged to profit and loss account.

ABC Company Ltd.

Spoilage Report

Department

Cost Centre

No.

Date

Process or Spoiled Units	Actual	Standard	Cost of Spoilage	Cost of Abnormal Spoilage	Remarks for Spoilage	Spoilage Job No.	Action taken by	Entered by

Defectives

It is a part of production which can be rectified and made into good units with additional cost. The defective work occurs due to raw materials of inferior quality, had planning and poor workmanship. Defective units are rectified with additional cost of material, labour and overheads and sold as 'first quality' or 'seconds'.

(a) Control of Defectives:

As in the case of other losses, defectives are controlled by accurate and periodical reports. Standards are fixed for defectives Actual defective work is compared with standards, If actuals are more than the standards remedial action is taken to control it.

(b) Accounting Treatment of Defectives:

The accounting treatment depends on the extent of defectives production. If it is normal being inherent with production, it is identified with specific jobs. The cost of rectification is charged to specific jobs. If the cost is not traced with a job, the cost of rectification is treated as factory overhead.

If the defective work is out of abnormal circumstances the cost of rectification is transferred to profit and loss account.

ABC Company Ltd.

Defective Work Report No.

Department

Cost Centre

Date Cost of Disposal Remarks Process or Defective Normal Abnormal Job No.
Defective

Defective Rectification Value Units

Units Action taken by Entered by

Signature of Inspector

4. Obsolete, Slow moving and Dormant Stocks

These items are part of inventory. They need suitable and timely action or the part of the management to avoid occurrence of loss in due course and to prevent locking up of working capital.

(a) Obsolete Stocks: They are those stocks in the inventory which have been lying unused due to change in product process and design or method manufacturing. They are generally out of date.

(b) Slow moving Materials: They are items in stock used at long inventory and thus lying idle for long periods.

(c) Dormant Stocks: They are items in stock not at all in use for a significant period of time.

The store keeper should highlight such items in his periodical reports so that the management may try (a) to dispose them off at any price or (b) clear them out to save space in the stores (c) exercise caution in future purchase of such items of materials.

ILLUSTRATIONS

I. PURCHASE PRICE COMPUTATION

(A) Selection of Supplier

Illustration 1

After inviting tenders, two quotations are received as follows:

Supplier A: Rs. 2.20 per unit

Supplier B: Rs. 2.10 per unit plus Rs. 2,000 fixed charges irrespective of units ordered. (1) Calculate the order quantity for which the purchase price per unit will be the same. (2) The purchase officer wants to place an order for 15,000 units. Which supplier should be selected?

Solution:

Based on the quotations of suppliers, it is obvious that :

Quotation of supplier 'A' is Re. 0.10 more per unit without any fixed cost.

Quotation of supplier 'B' is Re. 0.10 less per unit with fixed cost of Rs. 2,000.

(1) The order quantity for which

Amount of Fixed cost the purchase price per unit will be the same = Difference in purchase price per unit $000'7 = 20,000$ units. or At an order quantity of 20,000 units, both suppliers' quotations are equal A- $20,000 \times 2.20 = \text{Rs. } 44,000$ B- $20,000 \times 2.10 + 2,000 = 42,000 + 2,000 = 44,000$ Purchase price per unit in both cases in Rs. 2.20

(2) For orders above 20,000 units, quotation of supplier 'B' is cheaper by Re. 0.10 per unit. For orders below 20,000 units, quotation of supplier 'A' is cheaper, in total. Total cost of order, if it is placed with supplier 'A' = $15,000 \times 2.20 = \text{Rs. } 33,000$ If the same order is placed with supplier 'B': Total cost of order Rs. $2,000 + (15,000 \times 2.10) = 2,000 + 31,500 = \text{Rs. } 33,500$ Purchase officer should place the order of 15,000 units with supplier 'A' because it is cheaper by Rs. 500 ($33,500 - 33,000$).

(B) Computation of Purchase Price

Illustration 2

A supplier quotes for material M' as follows:

Lot price 200 Kg @Rs. 5 per Kg.

500 Kg@ Rs. 3.5 per Kg.

800 Kg@Rs. 2.5 per Kg.

He allows a trade discount of 25% and a cash discount of 3% if payment made within 15 days. One container is required for every 100 Kgs, of the material and the containers are charged at Rs. 15 each but credited at Rs., 10 on return. The buyer decides to buy 800 Kgs. Transport charges amounting to Rs. 200 re charged by the supplier. Calculate the purchase price of 800 Kgs.

Solution:

Statement of Cost of Quotation for Materials

Ordering quantity 800 Kg. Particulars

Amount

Rs. 800 Kgs at Rs. 2.5 per Kg. $000'7 \ 25 \times 000 \ 001$

Less: Trade Discount at 25% $00S \ 00S$

Add: Cost of Containers : $008 \times 15 \ 120 \ 001$

Less : Credit on return $8 \times 10 \ 08$

Add: Transport Charges 007

Total cost of Material Note:

Cash discount is a matter of financial policy and depends on liquidity position the purchasing firm. So, it should be ignored unless specific data is given abo opting for such discount.

Unit 4

Labour

I. COMPUTATION AND CONTROL OF LABOUR COST

I. Introduction

Labour cost is an important element of cost. It also forms significant part of prime cost and total cost. Labour costs are associated with human beings. This association makes it a significant item of cost not only because of huge wage bill of modern organisations but also because labour cost has certain special features which other elements like material do not possess. The human element makes the control of labour cost difficult. Labour is the most perishable commodity. Once unused it cannot be recovered and the labour cost is bound to increase cost of production. At the same time labour is the only factor which has the unlimited productive capacity. In many instances labour can achieve wonders in regard to the amount and quality of work performed by them. However, labour is complex and therefore it requires systematic planning and control.

2. Types of Labour

As in the case of materials, labour is also classified into (a) direct labour and (b) indirect labour.

(a) Direct labour cost is cost of labour expended in altering the construction, composition or condition of the product. Direct labour cost is easily identified and allocated to cost units. It fluctuates in proportion to output. It can be easily ascertained and allocated because of its close relationship with the output.

(b) Indirect labour cost is the amount of wages paid to workmen who are not directly involved in altering the composition of the product. Examples of indirect labour cost are remuneration to sweepers, helpers, watchmen, mechanics and supervisors. The indirect labour cost cannot be identified and allocated to cost units.

Strictly speaking the main difference between direct and indirect labour cost is based not only on the nature of work done but also on the basis of practicability and expediency. If a particular worker spends considerable time on a specific job which makes the identification of his time to the job practicable the wages of worker becomes direct. If both of these conditions are not satisfied the worker's wages become indirect. Direct labour cost forms part of prime cost, whereas indirect labour cost forms part overheads.

The distinction between direct and indirect labour cost is very important. Direct labour is variable effectively controlled. Indirect labour can be controlled through labour budgets and comparing actual indirect labour cost with budgeted indirect labour.

3. Objectives of Management in relation to labour cost

Labour cost amounts to a significant portion of total cost. Because of long duration of life of labour, it is a repeated investment by the firm. Whereas in case of fixed assets it is only fixed one time investment, labour cost forms a significant portion of working capital of the company. Inefficiency material by labour on account of inefficient supervision, etc., will result in increase of labour cost. Moreover if labour is not properly utilised the idle time and overtime will increase which will further increase the cost of production. Proper utilisation of labour will reduce the labour cost and production cost. Every organisation is interested in labour cost with the following objectives:

- (a) To estimate the correct labour cost of orders, jobs and processes to ascertain the cost of each job, process or order.
- (b) Reduction of labour turnover.
- (c) Absorption of overheads by using direct labour as a basis.
- (d) To find out the correct amount of overheads by ascertaining the indirect labour cost.

(e) To increase the efficiency of labour by taking direct labour cost as a guideline. In order to achieve these objectives effective control of labour costs is essential.

4. General techniques for effective control of labour cost

(a) Scientific production planning: Effective production planning involves time and motion studies of various operations. Production planning includes product engineering, process engineering, scheduling and routing. By time and motion studies standard time is fixed and it is to be seen that actual time conforms to the standard time.

b) Fixation of labour budgets: based on production planning and scheduling labour budget has to be prepared.

c) Setting labour standards: based on standard time and production required standard labour cost is determined. actual labour costs are compared with the standard, variances are arrived at and unfavourable variance are probed and remedial actions are taken.

D) labour reports: frequent labour reports are obtained from various department concerned with labour to judge the effectiveness of incentive schemes and utilization of labour.

(e) labour cost accounting: effective cost accounting system is necessary to ascertain the direct and indirect labour cost. It helps in accurate estimation of cost of orders, jobs and processes.

Techniques of controlling labour costs can be effectively used by coordinating the activities of various department concerned with the labour, namely:

- (A) Personnel department
- (B) Engineering and work study department
- (C) Time keeping department
- (D) Pay roll department and
- (E) Cost accounting department

The functions of these departments regarding labour cost ascertainment and control

(A) PERSONNEL DEPARTMENT

The Board of Directors lays down the policies relating to the recruitment, training, placement, transfer and promotion of employees. The personnel officer who heads the personnel department has to implement these policies. The main function of this department is recruiting workers, training them and their placement in suitable jobs.

The personnel department recruits workers on receipt of employee placement requisition from various departments.

(i) Employee Placement Requisition:

This is a document initiated by a department which is in need of employees. On receipt of the requisition, the personnel department initiates action to appoint worker by receipts of applications, scrutiny of applications, interviewing of applicants and finally selection of suitable candidates. The proforma of employee placement requisition is given below:

All the workers are appointed as per labour budget. The budget Specifies number of workers to be appointed and skills required. It is the task of the personnel department to adhere to the budget and appoint additional workers only if sanctioned by competent authority.

On appointment, each worker is allotted a number, which is to be quoted in all correspondence concerned with the workers. This facilitates easy identification of workers and systematic maintenance of information concerned with the workers in EDP.

(ii) Employee' History Card:

The personnel department maintains full details of workers employed. The particulars of each employee are maintained in employee's history card. The card contains all the

relevant information like (a) Name and address, (b) Number, (c) Department, (d) Date of employment, (e) category, (f) educational qualifications, (g) experience, (h) name of farmer, (i) scale of pay, (j) skills, (k) promotions, (l) reason for leaving. These details will help the management to assess the employees and particular the last column will help the management to prevent labour turn over.

Specimen form of card is as follows:

XYZ Co.

Employee's History Card

Name _____
 Category _____
 Number _____
 Grade _____
 Department _____ Scale of pay _____
 Date of Birth _____
 Material Status _____
 Date of Appointment _____
 Educational Qualification _____
 Previous Employer _____
 Reason for leaving previous employer _____
 Reason for leaving:
 Particulars of service regarding changes in pay

Date	Grade	pay	Reason for change - Promotion, Increment, etc remark
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Leave record

Date	detail of	leave	reason for leave
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balance of leave

Eligible leave applied

In order to have optimum number of suitable workers, control over recruitment of workers is essential. The following measures will help to control labour recruitment.

- (1) Recruitment is to be routed through the personnel department.
- (2) Recruitment is made as per labour budget.
- (3) Recruitment is to be made only on receipt of employment placement requisition.
- (4) Additional labour over and above the budgeted labour has to be received only if the station is made by appropriate authority.
- (5) Requirement of casual worker is to be properly sanctioned.
- (6) Mechanization is to be introduced wherever possible.
- (7) Labour utilization reports are to be insisted from all department concerned to enable the management to take decisions regarding the surplus workers, employment of casual labour, utilization of surplus labour, reduction of labour, reduction of labour turnover, etc.

LABOUR TURNOVER

(a) Meaning

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

(b) Methods of Measurement of labour turnover - Three methods

(1) Labour Turnover under Separation Method :

The basis of calculating labour turnover under this method is the number of employees discharged during a period. It does not consider surplus labour being discharged by the firm (retrenchment).

$$\text{Labour turnover} = \frac{\text{Number of employees left from the organisation during a period}}{\text{Average number of employees during a period}}$$

(2) Labour turnover under Replacement Method :

The number of employees recruited as 'Replacements' during a period is taken as basis for calculating labour turnover. This does not consider expansion programmes.

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

(3) Labour Turnover Under Flux Method:

This method takes into account the number of employees who left the organization and those recruited by the organization during a period.

$$\text{Labour Turnover} = \frac{\text{Number of employee + number of employees recruited during a period}}{\text{Average number of employees during a period}}$$

(4) Additions Method

Under this method of measurement of labour turnover, number of employees recruited during a particular period alone is taken into consideration, including those recruited for expansion programmes etc.

$$\text{Labour Turnover} = \frac{\text{Number of additional during a period} \times 100}{\text{Average number of workers during the period}}$$

Note: the above four methods including the additions methods are listed with the formula in I.C.W.A. institute's publication 'Intermediate cost and Management Accounting'

(c) Causes for Labour Turnover

The causes for labour turnover can be broadly classified under three heads:

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

(1) **Personal Causes:** Some of the employees may leave the organisation on account of personal reasons as given below:

- (a) Circumstances of family
- (b) Retirement on reaching the prescribed age.
- (c) Change in marital status in case of women employees.
- (d) Dislike for the job or place
- (e) Death of the employee
- (f) Employee getting recruited in a better job
- (g) Permanent disability due to accidents
- (h) Involvement of employee in activities of moral turpitude.

(2) **Unavoidable Causes:** In certain instances the organisation may discharge employees due to unavoidable reasons as mentioned below:

- (a) Termination of workers on account of insubordination or inefficiency.

- (b) Discharge of workers on account of irregularity or long absence.
- (c) Retrenchment of workers by the company on account of shortage of work.
- (4) **Avoidable causes:** some of the employees may leave the organization on account of the following reason:
 - (a) Non availability of promotion opportunities.
 - (b) Dissatisfaction with incentive schemes
 - (c) Unhappy with remuneration
 - (d) Unsuitable to job due to wrong placement
 - (e) Unhappy with working conditions
 - (f) Non availability of accommodation, health and recreational facilities
 - (g) Lack of stability of Tenure

(d) Effects of Labour turnover reasons:

The labour turnover ranges between 10% to 80% depending on nature of trade. Being too low is also not desirable as it offers few opportunities for youngsters for promotion and they may look elsewhere for suitable positions. High labour turnover results in high cost of production on account of the following reason:

- (1) Reduction in output due to changes in labour force
- (2) Increase in cost of production due to newly recruited employees who may lack expertise and skill of carrying out the jobs.
- (3) Newly recruited employees may be unfamiliar with the work and cause increased loss of raw materials. Defectives, scrap and spoilage ultimately increase the cost of production.
- (4) Inexperienced workers may cause more damage to tools and machinery which results in frequent break-down of machinery, hampering production.
- (5) Non availability of suitable employees may disrupt flow of production.

(e) Cost of Labour Turnover

As explained above the effect of labour turnover is to push up the cost. The expression of loss of output, damage to materials, spares, depreciation of machinery and replacement cost of labour in terms of money is called cost of labour turnover. The cost of Labour turnover is broadly classified under two main heads:

1. Preventive costs
 2. Replacement costs
- 1) **Preventive costs:** These costs are incurred to prevent labour turn. They are incurred to avoid the causes of labour turnover. They include the following:
- (i) Administration cost incurred to provide better working conditions.
 - (ii) Cost of health care facilities provided for workers.
 - (iii) Cost of welfare facilities like recreation, sports and games, subsidized food and drinks, crèches for workers' children, etc.
 - (iv) Cost of old age facilities: this includes pension, gratuity, leave encashment, etc.
2. **Replacement Costs:** These costs include the following:
- (1) Recruitment cost;
 - (2) Training Cost;
 - (3) Losses arising due to inefficiency of newly recruited employees;
 - (4) Loss of output;
 - (5) Cost of machine breakdown;
 - (6) Cost of spares, tools, etc.
 - (7) Cost of compensation for employees involved in accidents, etc.

Treatment of costs of labour turnover

Preventive costs are to be apportioned to different departments on the basis of number of employees in each department.

The replacement costs are allocated to the department which is the cause for labour turnover. If the labour turnover is a result of short sighted policies of management, the replacement cost is treated as overhead and apportioned between different departments on the basis of number of employees in each department.

(f) Reduction of labour turnover:

Normal labour turnover is desirable to recruit young employees into the firm. Labour turnover is inherent in every organisation. However, high labour turnover leads to increased cost of production. Therefore, high labour turnover is to be controlled by removing avoidable causes. The following control measures will be helpful in reducing high labour turnover.

- (1) Recruitment and placement: An efficient system of labour policy will avoid inefficient workers being employed and helps in placement of right person for the right job.
- (2) Good working conditions: Efficient supervision, quality tools, good safety measures and sufficient health care facilities will reduce labour turnover to a great extent.
- (3) Good wage payment scheme: fair remuneration and suitable incentive scheme attract skilled employees and retain them in the firm.
- (4) Promotion opportunities: fair promotion policy will induce the employees to stay in the firm rather than seeking opportunities elsewhere.
- (5) Opportunities for creativity: employee creativity and innovation are to be encouraged through suitable rewards.
- (6) Labour participation: labour participation in management will improve the labour relations and comprehension of workers about the organization will lead to reduction in labour turnover.

Thus, labour turnover can be kept at reasonable levels only by creating suitable environment for employees. Personnel department plays a vital role in this context.

(B) ENGINEERING AND WORK STUDY DEPARTMENT

(a) Introduction

This department is concerned with improving working conditions by undertaking the following activities.

1. Conducting work studies such as methods study, motion study and time study for each operation
2. Maintaining required safety such as methods study, motion study and time study for each operation.
3. Conducting job analysis and job evaluation.
4. Preparing specification and time schedules for each job.
5. Devising suitable wage system
6. Conducting research and experimental work.

The engineering department is basically concerned with work content, standard time, work performance, etc. They are achieved by conducting detailed work study which includes method study, motion study and time study.

(b) Work Study

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

1. **Methods study:** it is a procedure to analyse the work to remove unnecessary operations or practices, systematic arrangement of remaining work and standard of work methods. It is only after deciding the best method of doing the work that motion study follows:

2. **Motion study:** this is a vital part of work study which divides the work into several important elements. Each of these elements is analysed in detail separately and in relation to each other. When these elements are timed, 'least waste is the result' because motion study eliminates unwanted and inefficient motion. main purpose of motion study is to be standardise the method of working by economising efforts, reducing fatigue and improving efficiency. motion study takes into account human element in the job, plant and machinery, tools and material to be used. when motion study is completed, 'Time study' has to be undertaken.
3. **Time Study:** Fixing of standard time for each operation is called Time study' it is also called work measurement. A standard hour is fixed for each operation which is hypothetical hour. This helps the management in assessing labour requirements, fixation of wages rate and introducing of incentive schemes. Systematic methods study along with motion study and Time study helps in standardising jobs, equipment and methods. It is also helpful in cost control and output and wages control.

Job Analysis

Job analysis is a process of determining the list of qualifications to be possessed by workers to perform the work effectively.

United states Department of Labour defines Job analysis as "The process of determining, by observation and study and reporting pertinent information relating to the nature of Job. It is the determination of the tasks which comprise the Job and the skills, knowledge, abilities and responsibilities required of the worker for successful performance and which differentiates the Job from all others".

Thus Job analysis is the study of the job and identifying the duties and responsibilities involved in the performance of the job, conditions for performance, nature of the job, qualifications to be possessed, opportunities and privileges.

Elements of Job analysis

Information relating to a job can be analysed under two sub-heads.

1. **Analysis of information relating to the Job:** Under this analysis the requirements of the Job are analysed. The requirement is known as Job descriptions.
2. **Analysis relating to the Jobholder:** Under this analysis qualities to be Possessed by the employee are analysed. The qualities to be possessed by the Job holder are called job specifications.

Advantages of Job Analysis

1. Fixation of suitable rates of pay: since rates are fixed according to the nature of work of each job, the rates fixed will be suitable and equitable.
2. Eliminating of personal prejudices: since the rates are fixed on the basis of job content rather than individual workers worth, disputes relating to pay disparities are avoided.
3. Effective recruitment: job analysis ensures the policy of right man for the right job or "no square pegs in round holes" as the job description and job specifications are the main elements of job analysis.
4. Effective training: job analysis procedure leads to identifying the qualifications and skills required for each job. Thus workers can be given training in the skills needed for a specific job.

(c) Job Evaluation :

(1) Meaning and Purpose: Job evaluation is the process of studying and assessing the relative values of jobs within an industry, to ascertain their comparative worth. In addition to indicating relative wage value, job evaluation serves the following varied purposes:

- (a) It helps to know whether workers are placed in jobs best suited to them and to the advantage of employers.
- (b) It assists the personnel department in recruitment of workers by indicating the responsibilities, requirement and conditions of work and qualities required for each job.

(c) Job evaluation forms the basis for training schemes.

(2) Advantages of Job evaluation:

(1) To the employer

(a) As the qualities required for a job are specified, the recruited employees will be suitable for jobs. Therefore there are 'no square pegs in round holes'.

(b) As the labour worth is ascertained by job evaluation, the wage fund is fairly distributed.

(c) Jobs evaluation helps in minimising the labour turnover.

(II) To the Employee

(a) The jobs are best suited to the employees as they are appointed to jobs based on the requisite qualities, skills and experience.

(b) Job evaluation reveals comparative worth of a job and any prospects it has for the employee.

(c) it makes workers happier as the total wages are distributed among the workforce fairly.

(3) Job evaluation Procedure:

(a) Detailed study of the jobs

(b) Description of Jobs

(c) Job analysis

(d) Arrangement of Jobs in Progression

(f) Determining the wage value of Jobs.

(4) Methods of job evaluation: there are four methods of job evaluation as explained below:

(a) Ranking Method: Under this method the jobs are graded from the highest to lowest according to their relative responsibilities and complexities and not in terms of wage rates. The wage rates are assigned to the jobs on the basis of prevailing rates in the locality. This method is simple and suitable in case of small factories. It is limited in effectiveness as accurate measurement of work is not done.

(b) Grading or Classification Method: Under this method, the basis of evaluation is defined and the jobs are classified into different grades. For example, grades may be classified as skilled, unskilled, supervisory, executive and administrative. Once grades are established the jobs are reviewed and then placed in suitable grades. The jobs in each grade are ranked as a further refinement.

(c) Factor Point Scoring: Job evaluation under this method is done by comparing and analyzing jobs into common factors points are allotted to each factor according to its relative importance. Following are the common factors generally recognised:

(a) Education

(b) Experience and Skill

(c) Complexities of duties

(d) Responsibilities

(e) Effort

(f) Working conditions

Once the jobs are analysed and points are allotted on the basis of common factors, the available wages are distributed among the jobs in the ratio of total points of respective jobs.

The main advantages of this method are that it is simple to operate and the results are accurate. The main disadvantages are:

(1) The points are not clearly defined

(2) The points to each factor are not scientifically allocated.

(3) Jobs requiring unusual expectations cannot be analysed by fixed factors.

(d) Factor comparison Method:

This is similar to factor point scoring method. Jobs are analysed, compared and Ranked under the following five factors:

(a) Mental requirements

- (b) Skill requirements
- (c) Physical requirements
- (d) Responsibility and
- (e) Working conditions

The factors are valued by apportioning existing rate of pay among each of them. The jobs are compared factor by factor with the scales of Key Jobs'.the total values of all the factor is the cash rate for each job.

(e) Merit Rating:

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

- (1) Educational Qualification and knowledge
- (2) Skill and experience
- (3) Attitude to the work
- (4) Quality of work done
- (5) Efficiency
- (6) Regularity Integrity
- (8) Reliability
- (9) Qualities like leadership, initiative, self confidence and sense of judgement
- (10) Discipline
- (11) Cooperation

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

Importance of Merit rating

Merit rating is a valuable tool considered to be important for human resource measurement. Merit rating has the following advantages:

- (1) It helps to know the individual worker's worth and traits; this helps supervisor to assign the tasks in which the worker is proficient.
- (2) It points out traits in which the workers are not proficient. The workers will have an opportunity to improve by suitable training.
- (3) It helps in increasing wages and promotion opportunities.
- (4) It helps to stimulate the self- confidence of workers as it recognizes the merit and worth of workers.

Limitation of merit rating

- 1. The worker may be rated high based on a single trait. The rater may ignore the other traits in which the worker may not be good.
- 2. The difference of opinion between the members of merit rating committee may lead to unsatisfactory evaluation.
- 3. The men doing the rating may be influenced by their personal ill feelings towards particular workers which may lead to unsatisfactory ratings.

Operation and Process for calculating labour cost department wise, job wise and time booking is considered for computing time spent for each Department, Job, time of workers. Attendance time is recorded for wage calculation and job time or and job (3) ignore the other traits in which the worker may not be good. (1) The worker may be rated high bascd on a single trait. The rater may Labour Timitations of Merit Rating 415 committee may lead to unsatisfactory evaluation. towards particular workers which may lead to unsatisfactory ratings

(C) TIME-KEEPING DEPARTMENT

(1) Introduction

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

(2) Objectives of Time-Keeping

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

Depending on the size of the organisation, a separate time office may be maintained at the gate of the factory. If the firm is small personnel of the gate office may take care of time recording. Since payment of wages are on the basis of time spent by the workers, accurate time recording is essential.

3) Essentials of a good Time-keeping System

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

- (1) Manual methods
- (2) Mechanical methods

(1) Manual methods of time keeping are as follows:

- (a) Attendance registered method
- (b) Metal disc method

(a) Attendance registers Method:

This is one of the traditional methods of time keeping. An attendance register is kept at the time office adjacent to the factory gate or in each department for the worker of that department. The register contains detail regarding name of the worker, worker's number, department in which he is employed, arrival time, departure time. Normal time, over time, etc. the arrival and departure time may be recorded by the time keeper.

This method is inexpensive and simple. It is suitable in small organizations. Dishonest practices are possible in this method on account of collusion between workers and time keeper.

b) Metal Disc method:

Under this method the workers are allotted a disc or token with a hole bearing the identification number of the workers. The disc or tokens are hung in board with pegs. Board may be maintained separately for each department. The workers remove their tokens as they enter the factory and put them in a specified box. Once the scheduled time lapses the box is removed. The workers who come late have to remove their token and handover to time keeper who will record exact time of arrival. If any tokens remain they indicate the absentee workers. Later on the time keeper records the attendance in a register known as "Daily Muster roll" which is used by the payroll department to prepare wage bill and wage slips.

This method is simple and easy to follow. It can be followed even if there are illiterate employees. They can easily identify their tokens. It is usable by companies which are large in size with more number of workers. But it has certain disadvantages.

(a) An employee may remove his companion's token to have the attendance marked even when his companion is absent.

(b) Disputes may arise regarding the arrival time of the workers as the time keeper may commit mistakes.

(c) There is possibility of time keeper including dummy or ghost workers in muster roll keeping, time keeping. An attendance register is kept at the time office adjacent to the factory gate or in each department for the workers of that department. The register contains details regarding name of the worker, worker's number, department in which he is employed, arrival time, departure time, normal time, over time, etc. The Dishonest practices are possible in this method on account of collusion between

2. Mechanical Methods: Time recording clocks are used to maintain accuracy and reliability. There are two types of such device

There are two types of such devices: (a) Time recording clocks

(b) Dial time records

(a) Time recording clocks: Time card is allotted to each worker for a week's duration. Time cards are kept in a tray at the gate in serial numbers. The worker picks up his card from the tray and enters it in the time recording clock which records the exact time of arrival in the allotted space. This can also be done for departure, lunch break and over time.

The time cards may also give details regarding hourly rate, gross wages, deductions, net wages payable. Wages are calculated on the basis of time recorded. The specimen of combined time and pay roll card is given below;

XYZ Company
Combined Time and Pay Roll Card

Name of the worker :..

Number :.

Week ending

:.....

Department:

day	Regular		overtime		Total time	
	In	out	In	out	In	out
Monday						
Tuesday						
Wednesday						
Thursday						
Friday						
Saturday						
Sunday						
Calculating of wages		Hours worked	rate	amount	deduction	Net amount
	Normal time					
	Over time					
total						

Time keeper.....

clerk.....

pay roll

Foreman.....

worker.....

(b) Dial Time Recorder: This machine has a dial around the clock. The dial has about 150 holes and each hole bears a number corresponding to the identification number of the worker concerned. The dial has a radial arm at the centre. The worker has to place the radial arm at the hole of his number and his time will be automatically recorded on a roll of paper against the worker's number. The time of workers is transferred by the machine to the wage of workers. It provides great accuracy and saves time. The only limited number of workers.

(5) Time booking

Time spent by the worker on different jobs and workers. The following are the objectives of time booking:

1. It ensures that the time paid for, as per time keeping is properly utilized on jobs and orders.
2. It enables the cost department to ascertain the labour cost each job or work order.
3. It helps in allocation and apportionment of wages among different department where labour hour rate method is used as basis.
4. It helps to calculate idle time.
5. It helps when incentive schemes are in operation in the factory by revealing the time spent by the workers on different jobs.
6. Time booking also helps in measuring the efficiency of workers by comparing standard time for the jobs with actual time.

The documents used for time booking are as under:

(a) Daily time sheet

(b) Weekly time sheet

(c) Job ticket or job card

(a) Daily time sheet: the daily time sheet is issued to each worker who records the time spent on different jobs during the day. These sheets are used in small firms with less number of workers. The daily time sheet is verified and signed by the foreman at the end of day. The specimen of daily time sheet is given below

XYZ Co.

Daily time sheet

Name of the worker :..						
Date....						
Number :..						
No:.....						
Department:						
Job No.	Description of the work	Time		hours	rate	amount
		on	off			
Worker....				Foreman...		
Cost Dept.....						

(b) weekly Time Sheet: This is an improvement over daily time sheet because the daily time sheet increases the number of documents and volume of work. The weekly time sheets are filled up by the worker and verified and counter signed by the foreman. In some cases it is filled up by the departmental clerk to avoid incorrect entries by the workers. Moreover the precious time of the foreman is not wasted verifying the entries made by the workers. The specimen form of weekly time sheet is given below:

XYZ COMPANY

Weekly Time Sheet						
Worker		name			:..	
Date....						
Worker No :.						
Department:						
No.....						
Job No.	Description of the work	Time		hours	rate	amount
		on	off			
Monday						
Tuesday						
Wednesday						
Thursday						
Friday						
Saturday						
Sunday						
Total						
Worker....					Foreman...	
Cost Dept.....						

(c) Job Cards

In order to accurately arrive at the time spent on each job, the job cards are used. There are four types of job cards in use.

i) Job Card for each worker

(ii) Job Card for each Job

iii) Combined time and Job card

iv) Piece work card.

i) Job Card for each Worker: A Job card is issued to each worker for a week or for a day. The starting and completing of each job are recorded. It serves double purpose of ascertaining the time spent on each job and total time worked by the workers during the week or for the day. The ruling of the Job Card is give below:

XYZ company

Job card for each worker						
Worker		name			:..	
Date....						
Worker No :.						
Department:						
No.....						
Job No.	Description of the work	Time		hours	For cost office	
		on	off		rate	amount

Monday						
Tuesday						
Wednesday						
Thursday						
Friday						
Saturday						
Sunday						
Worker....						Foreman...
Cost Dept.....						

(ii) Job Card for each Job: A card is issued for each job. This is essential when job has to pass through a number of workers for completion. The total number of hours on the job and total labour cost can be ascertained from the card. Specimen of job card is given below:

XYZ Company								
XYZ Company								
Job card for each job								
Job								No...
Hours on the job....								
Job	description							...
Time allowed....								
Date	Operation	Dept.	Worker No.	Time		Total	Cost Office	
				on	off		rate	amount
Checked and verified....							Foreman...	
Costed by.....								

(iii) combined time and job card: this serves dual purpose of time keeping and time booking. The card reveals the attendance time and job time. The utilization of the card is practicable only when the number of workers is low. The specimen of the card is given below:

only when the number of workers is low. The specimen of the card is given below:

XYZ Company Combined Time and Job card							
Worker		name				...	
Date....							
Worker No.:							
Department:							
No.....							
day	Job No.	Time		Time		For cost office	
		on	off	Ordinary	overtime	rate	amount

Worker.... Costed by.....							Foreman...

(iv) piece work card: this card is maintained by firms which use piece- work method of payment of wages. When the payment is made by result basis the quantity produced is taken into account but not the time spent by the workers. However, to maintain the flow of production and discipline among the workers time also has to be recorded. The piece wages payable. The specimen of piece work card is given below:

XYZ Company									
Piece work card									
Worker name				...					
Date....									
Worker No				..					
Time taken...									
Department:									
quantity.....									
day	Description of work done	Job No.	Time		No of units			For cost office	
			on	off	made	Rejected	Accepted	rate	amount

Worker....							Foreman...		
Costed by.....									

(6) Reconciliation of Time keeping and Time booking

(I) Idle Time: The attendance time should agree with job time. Generally it does not happen on account of many reasons. E.g.: time required for walking from factory gate to the department, time lost in waiting for materials, tools, instructions, time lost due to break-down of machinery, power failure, etc. This time which is wasted is termed as idle time. Idle time card is prepared to ascertain the idle time. The idle time card shows the reason for idle time, so that action can be taken to prevent the avoidable idle time. The specimen of the idle time card is given below:

XYZ Company						
Idle Time card						
Worker name :..						
Worker No :.						
Department.....						
Reason for idle time	Time		Time	For cost office		
	on	off	lost	rate	Amount	Remark

1.Time spent in waiting For material For Tools For instruction 2.Power failure 3. machine break down 4. Inspection 5. Other reason					
Worker.... Costed by.....	Foreman...				

Types of idle time

Based on causes or reason for its occurrence, idle time can be divided into two categories i.e

(a) Normal idle time

(b) Abnormal idle time

(a) Normal idle time this is inherent in all kinds of employment and cannot be avoided. The cost of this time is borne by the respective jobs or products or departments. Examples of normal idle time are given below:

(1) Time consumed by the workers to walk from gate to department.

(2) Time taken to pick up tools, change of dress and picking up instructions for work.

(3) Time consumed for changing from one job to another.

(4) Time taken for personal needs and tea break.

(5) Waiting time when the machine is made ready for production work, called setting up time.

Treatment of Normal Idle Time : Normal idle time is unavoidable and its cost charged to production. There are two ways of charging normal idle time to production.

(1) Normal idle time cost is taken as factory expenses and recovered as indirect charge.

(2) The normal idle time cost is directly charged to production as direct wages.

(b) Abnormal Idle Time: The abnormal idle time is avoidable idle time which occurs due to conditions which can be prevented. The reasons for abnormal idle time are as follows:

(1) Time lost due to machine break down,

(2) Time lost due to power failure;

(3) Time lost on account shortage of materials;

(4) Time wasted due to lack of instructions;

(5) Time lost on account of strikes and lock outs.

Treatment of Abnormal idle time: A basic principle of cost accounting is to eliminate the effect of all abnormal losses and gains on jobs or processes or operations by transferring all abnormal costs and gains to profit and loss account. they should not form part of the cost of production. Wages paid for abnormal idle time is charged to costing profit and loss account.

Control of Idle Time

The abnormal idle time can be controlled by effective planning. The reasons for idle time are to be analysed and steps are to be taken to provide for all contingencies like preventive maintenance of machinery, proper arrangement for providing sufficient materials, preparation of job instructions in advance, avoidance of strikes, etc. Even normal idle time can be controlled by efficient administrative planning and supervision.

II Overtime

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

The Indian Factories Act provides for payment of wages at double the normal rates for overtime. If a worker works for more than 9 hours in a day or for more than 48 hours in a week, he is treated to have worked overtime and is given wages at double the normal rate for such time. The wages are calculated at normal rate up to 9 hours and at double the normal rate for hours worked beyond 9 hours a day or calculated at single rate up to 48 hours and at double the normal beyond 48 hours.

The additional amount paid to workers on account of over time is called overtime premium. Overtime is not to be encouraged as it increases cost of production because of the under mentioned reasons:

- (1) Overtime is paid at double the normal time rates.
- (2) Overtime is done after normal hours which are late hours, when fatigue sets in and the efficiency of workers may not be at the required level.
- (3) In order to have sufficient work for overtime, the workers may not work to their potential during normal time.
- (4) Expenditure incidental to overtime like electricity, maintenance of-le- wear and tear and supervision, etc. have to be additionally incurred.

Each of the above will push up the cost and therefore over time is not preferable unless the demand for output is such that revenues justify the additional cost.

Treatment of Overtime: The normal wages form part of direct labour cost whereas there is controversy regarding treatment of overtime premiums. The work done during normal time has to bear single rate and work done during over time to cost double which creates 'inequity'. To do away with this, the normal wages are to be increased to include overtime premiums so that the jobs either during normal time or during overtime will bear the same cost. But if overtimes is done on account of pressure from a specific customer, the over time premium is charged to that customer. If the overtime is due to abnormal reasons like machine premium is break down, power failure, the overtime premium is charged to costing profit and loss account directly, as an abnormal cost.

Control of Overtime

Since the overtime has many disadvantages it is to be avoided and controlled to the fullest extent. The following measures are suggested.

- 1 All usual work has to be completed in normal time to leave little scope for over time work.
- 2 The justification for over time should be backed up by substantial benefits and the over time should be sanctioned by a competent authority.
- 3) The maximum limit of over time should be fixed for each worker.
- (4) Frequent and periodical reports are to be prepared and forwarded to the management relating to hours of over time and its cost. This will enable the management to take corrective action.

(D) PAY ROLL DEPARTMENT

(1) Objectives: This department prepares the pay bill of the entire organisation. The objectives of the pay roll department are mentioned below:

- (1) Maintaining a record of Job, department and wage rate of each worker and to arrive at each worker's total earnings, deductions and net earnings.
- (2) Ascertaining wages of different cost centres.
- (3) Summarising the total deductions to post them to the accounts concerned.
- (4) Ascertaining the total hours of each cost centre to calculate labour cost and rate per hour for control purpose.
- 5) Ascertaining overtime and idle time wages.

(2) Preparation of Pay roll

Preparation of pay roll has two aspects; one is to arrive at gross wages payable in the form of wages including over time premium and allowances. The second aspect of pay roll is to

compute deductions in the form of ESI, PF, Income Tax, recovery relating to loans and advances, etc. Most of the firms prepare the nowadays through computers.

Various kinds of frauds may take place in connection with payment of wages. Unless a suitable system is designed to prevent these frauds, the loss may be recurring and will reduce the profitability of firms. An effective internal check and certain precautions will help in reducing and prevention of frauds payment. A detailed procedure regarding time keeping, time booking, preparation of pay roll and finally payment of wages is mentioned below to help reducing frauds in wage payment.

1. Time keeping is to be done mechanically as much as possible and adequate and efficient to avoid frauds in time keeping.
2. The methods of computation of wages, various allowances and deductions is to be made simple and clear so that doubts do not arise.
3. If the piece work rate is prevailing, the output is to be promptly inspected to maintain quality of output and wages are paid for only good output.
4. If incentive schemes are in operation based on time, records are to be maintained for actual hours worked and time saved.
5. The over time should be approved by proper sanction of competent authority. Actual over time is to be compared with approved overtime to reveal any unapproved over time to take suitable action for it

6. Effective internal check is to be introduced in wage sheet preparation. The work done by a clerk should be verified by another clerk to have internal checks to ensure accuracy and to prevent frauds.
7. The cashier should not have any roll in preparation of wage sheets. Similarly the clerk involved in preparation of wage sheet should not have any hand in preparation of wage envelops.
8. The Wage sheets are to be verified by personnel officer to detect any dummy workers included fraudulently.
9. it is to be seen that the workers are identified before the wages are handed over to each of them.
10. The payment of wages are to be made simultaneously in all departments to avoid any worker being present at two places.
11. The wages of absentee workers due to sickness are to be paid only on proper authorisation letter.
- 12) The undisbursed wages are to be entered in a separate record kept for that purpose. Care is to be exercised while disbursing these wages.

(E) COST ACCOUNTING DEPARTMENT

Introduction

The department is responsible for ascertaining correct cost of production. Cost ascertainment involves classification, collection and computation of labour cost of output. In most of the organisation a representative of cost department is posted in the production department to accumulate and classify the cost. The cost accountant supervises the work of the representatives and uses the information contained in time cards and pay roll to find the labour cost of production by production departments, operations, production orders, etc.

The cost accounting department also analyses the labour cost in the form of idle time and overtime. Labour cost reports are also submitted to the management to intimate the effectiveness of labour utilization.

2. Documents of Wages Accounting

1. clock cards, job cards and idle time cards: These are the basic documents to calculate labour cost jobs, departments, operations and production orders. Reconciliation between clock cards and job essential to reveal idle time.

2) Rate of Pay schedules and deduction charts: These documents are heloful for preparing payroll.

3) Wage analysis or wages abstract: This is an analysis of payroll in respect of different control accounts. It is an abstract of wages paid job wise and wages paid for idle time. The total of these should agree with total wages paid.

(4) Journal and Ledger Accounts: Posting of various transactions relating to labour cost is done from the pay roll. Various transactions are posted to control accounts in the general ledger. Various subsidiary ledgers in the form of work-in-progress ledger, factory over head ledger, etc. are posted with the relevant labour cost items.

(3) Wage Analysis

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

When the jobs done are more as in the case of large firms, the total labour cost on the time sheets will be pre listed and agreed with the pay roll summary.

The ruling of wages abstract is given below:

ABC Company																	
Wages analysis sheet or wages abstract																	
No..... ending.....															Week		
Job no 10			job no 11			job no 12			job no 13			Over heads			Cost leader folio		
Clo cks No.	Hr s.	A mt .	Clo cks No.	Hr s.	A mt .	Clo cks No.	Hr s.	A mt .	Clo cks No.	Hr s.		Clo cks No.	Hr s.		Clo cks No.	Hr s.	A mt .
Total																	
Prepared by....					Cost ledger posted by....					Checked by.....							

The analysis sheet shows the labour cost of different jobs and indirect labour cost charged as overheads.

II REMUNERATION AND INCENTIVES)

(1) Introduction

Total wages earned by the employees is termed as remuneration. Time wages or piece wages earned plus other financial incentives constitute the earnings of employees. Productivity depends mainly on labour and, other things like better equipment, production planning are contributory factors to higher productivity. Good wage system along with effective incentive system will encourage the Go force to give their best to the employer. More over attractive 'pay package' will reduce labour turnover. In addition to monetary incentives non monetary incentives also encourage employees to improve their productivity. Non monetary incentives include, promotional opportunities, training schemes etc. The remuneration system should serve the twin objectives of reducing the labour cost and at the same time the workers are to be compensated adequately for their work.

(2) Essentials of a Good Wage System/ Principles of Labour Remuneration

The features of a good wage system are listed below:

- (1) The wage system has to be fair to employees and the employer.
- (2) The workers are to be assured of minimum guaranteed wages irrespective of work done.
- (3) Workers are to be compensated on the basis of their relative efficiency.
- (4) The wage system should be flexible to incorporate future changes.
- (5) The wage system should encourage higher productivity and reduce- labour turnover.
- (6) The wage system should be as per the labour policy of the government and follow the legislation applicable.
- (7) The wage system should equate with industry wage levels.
- (8) the method of computation of wages, wage rates and incentive system should be simple and easy for workers to understand.

G)Methods of Remuneration

The remuneration paid to employees should reduce labour turnover, increase productivity of employees and improve the quality of output. There are two basic methods of wage payment:

- (1) Payment made on the basis of time spent by the workers in the factory irrespective of output produced.
- (2) Payment of wage on the basis of production or work done irrespective of time taken by the worker.

(A) TIME RATE SYSTEM

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

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

(1) Flat time rate : Under this method workers are paid at a single rate on the basis of the time they are employed. The flat rate may be per hour, per day or per week or on monthly basis. The earnings of employees depend on total time they spend in the factory. The flat rate is decided on the basis of rates prevailing in the locality where the industry is situated.

This flat rate is suitable for highly skilled workers, unskilled workers and apprentices. It is suitable in the undermentioned types of work.

- (1) Where high quality goods are being produced
- (2) Where production is mechanised and involves high speed.
- (3) Situations where output cannot be measured.
- (4) Where effective and close supervision is possible.
- (5) Be directly involved with the final output. which far outweigh its advantages: the basis of output.

Time rate is simple and easy to calculate. The worker is assured of payment for time spent in the factory. However, this method has the following disadvantages which far outweigh its advantages:

- (1) employees are not rewarded on the basis of merit as both inefficient and efficient workers are paid at the same rate
- (2) Employees are paid for idle time also, since they are not paid on the basis of output
3. The labour cost per unit does not remain constant as the output fluctuates and this makes it difficult to prepare tenders or quotations.
4. Supervision cost may go up as strict supervision is essential to get the work done.
5. The workers may go slow on work to create scope for overtime which doubles the labour cost.

To conclude the flat time rate does not recognise effort and it is not helpful in increasing output.

(2) High day rate: This method is introduced to attract skilled workers by offering the highest wages in the industry. This method also intends to remove the drawbacks of flat time rate which does not provide incentive for efficiency. High rate is paid to employees to achieve present targets of output. The target or standard output fixed is at high level which only a skilled worker can achieve. When high rate of wages are paid, overtime work is not permitted. High day rate reduces the labour cost and overhead cost per unit with the help of high output. This method will be successful only if efficient workers cooperate in achieving high standards of output.

(3) Measured day rate : Under this method of time wages the workers are given a particular work to be performed and the rate is fixed on the basis of the level of performance of specified work. This gives incentive to workers to get paid at high rate for high performance. The main drawback of measured day rate is that the workers are not paid any additional remuneration for any improvement in the level of performance originally specified.

(4) Graduated time rate: Under this method the wage rate is fixed by linking with cost of living index. The rate of wages goes on changing with change in cost of living index. During the period of rising prices the workers find it helpful they are compensated for increased prices.

(5) Differential time rate: This method recognises individual efficiency and skill. The workers in the same group will be paid at different rates. High rates are paid for efficient workers and lower rates are paid for inefficient workers. There is positive incentive offered for improvement of performance.

(B) PIECE RATE SYSTEM

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

Variations of piece wages

There are four variations of piece wages. They are as under:

- (I) Straight piece rate
- (II) Differential piece rate:
 - (a) Taylor's differential piece rate system
 - (b) Merrick's multiple piece rate system
 - (c) Gant's task and bonus plan

(I) Straight piece rate system

Under straight piece rate system workers are paid according to the number of units produced at a fixed rate per unit.

1. Employees are paid according to merit as the efficient workers earn more wages as their output is more. In this way it distinguishes between efficient and ordinary workers.
2. Piece rate acts as incentive to induce the workers to produce more.
3. Higher output brings down the cost per unit and increases the margin of employers.
4. Under this method employer has no worries about payment for idle time and more over it reduces idle time, thus ensuring effective usage available time.
5. Submitting of tenders does not create any difficulty as the labour cost per unit is constant.
6. Machinery and tools are taken care of by the workers as they are aware that the defects or breakdown will reduce their chances of high production and higher wages.
7. The supervision cost is low, It is in the workers' interest to work sincerely and close supervision is not required.
8. There is inducement or encouragement to average workers also to produce more and earn more wages.

Disadvantages

- (1) Fixing of straight piece rate is difficult. If low piece rate is fixed it will frustrate the workers. Thus, 'equitable piece rates' are to be fixed to induce the workers.
- (2) Flat piece rate being piece rate paid to the employees irrespective of levels of output, it may not induce efficient workers to produce more and reach higher levels of effectiveness.
- (3) The wages of employees may reduce considerably due to the fault of employer or co-workers in many instances.
- (4) In situation of declining demand for goods, the production may go on increasing, embarrassingly.
- (5) Workers will always be aiming to produce more and in their anxiety may cause more accidents and undue haste and strain may prove to be injurious to the worker's health.
- (6) The workers' anxiety for higher production may lead to more defectives, spoilage, and wastage of raw materials.

II Differential Piece Rates

This is an improvement over straight piece rate to increase the performance of both efficient and inefficient workers. Two or more rates are offered to workers. Higher performance is paid at a higher rate and lower performance is paid at lower piece rate. In other words the increase in wages is in proportion to increase in production.

There are three types of differential piece rates.

- (1) Taylor's differential piece rate
- (2) Merrick's differential piece rate system (Multiple piece rate system)
- (3) Gantt's Task and Bonus plan

(1) Taylor's differential piece rate system

The 'Father of Scientific Management' F.W. Taylor has introduced this method. Main features of the method are as under.

- (a) Time wages or minimum wages are not guaranteed
- (b) Standard output is determined and standard time is fixed for the output, based on time and motion studies.
- (c) Actual performance of workers is compared with the standard and the efficiency level of the performance is computed as percentage of the standard.
- (d) Two piece rates are to be applied for computation of earnings of each worker.

'Low piece rate' is applicable for below standard output

'High price rate' is applicable for output at or above standard.

For example, if standard output per hour is 10 units high piece rate is Re.1.20 per unit and low piece rate Re. 0.80 per unit, workers producing 10 units or more per hour are paid at Rs. 1.20 per unit hour 1.20 per unit and low piece rate Re. 0.80 per unit.

Though no rates are specified, high piece rate of 120% of the straight piece rate and low piece rate of 80% of the straight piece rate are usually employed.

This method is intended to reward efficient workers and penalize substandard workers. The assumption is that 'slow workers' also will try to improve and attain the standard to earn more.

This method was not popular due to its 'harsh' treatment of average workers and trade unions were against it because it does not guarantee time wages.

(2) Merrick's multiple or differential piece rate system

This method is an improvement over Taylor method. This method has three rates for difference level of performance is less than 83% of standard output; 110% of the ordinary piece rate is given to workers whose level of performance is between 83% and 100% of the standard and 120% of the ordinary piece rate is given to workers who produce more than 100% of the standard output.

(3) Gantt's Task and Bonus plan

Under this method a standard time is fixed for a task to be performed by workers. Actual time taken is compared with the standard time and efficiency is ascertained (1) Time wages are paid to the workers whose performance is below 100%, i.e., those who take more than Premium The f of time wages as bonus are paid to those workers who take standard complete the job (whose performance is at 100%) (3) Wages at high piece the whole output are paid to the workers who take less than standard time (efficiency is above 100%).

Some authors have provided for 20% bonus over and above high piece me for above standard workers. But an overwhelming majority of authorities concur with the rates given above and are used here.

Premium and Bonus Plans

Premium plans are introduced to enhance the individual performance e workers. The workers are induced to show efficiency by performance of j01 less than the standard time.

Under the premium plans, a standard time is fixed for a specific job or opera and the worker is paid for the actual time taken by him at hourly rate plus w for a portion of the time saved as bonus. "A premium and bonus plan" is called "incentive plan" because the worker is provided incentive to earn more wages by completing the work in less time.

Factors to be taken into account in designing a premium plan (or) factors governing incentive schemes

- (1) The plan should be simple and easy for worker to understand.

- (2) The should offer sufficient incentive to the workers.
- (3) The standard time should be set on the basis of time and motion study and should be realistic.
- (4) Standard time once fixed should remain for a long duration unless there are changes in the method of work.
- (5) The system should increase production and lower the cost of production.
- (6) The workers should have scope for higher earnings with each improvement in the method of work.
- (7) The quality of output is also to be maintained.
- (8) The system should also benefit indirect workers.
- (9) It should reduce labour turnover.
- (10) The cost of operating the schemes should be minimum.

Premium bonus systems

The following are some of the popular premium bonus systems

- (1) Hasley premium plan
- (2) Hasely- weir premium plan
- (3) Rowan system
- (4) Barth variable sharing plan
- (5) Emerson's efficient plan
- (6) Bedaux point premium system
- (7) Accelerating premium plan, etc.

(1) Hasley premium plan

This system is known as fifty fifty plan. It was introduced by F.A. Hasey, an American engineer. Under this method a standard time is fixed for the performance of each job; worker is paid for actual time taken at an hour rate plus 50% of time saved as bonus:

$$\begin{aligned}\text{Total earnings} &= \text{hours worked} \times \text{rate per hour} + 50/100 (\text{time saved} \times \text{rate per hour}) \\ &= T \times R + 50\%(S-T)R\end{aligned}$$

Merits

- (1) It is simple to understand and easy to calculate.
- (2) Standard time is fixed for each job.
- (3) Both employer and employee get benefited equally from the time saved by the worker
- (4) Introducing this method is easy.
- (5) It provide incentive for efficient workers. At the same time below average workers are not penalized.
- (6) The time saved has the effects of reducing labour cost and overhead.

Demerits

- (1) Fixation of standard time, which is to be uniform is very difficult.
- (2) If wage rate are low incentives value may be low.
- (3) Earnings are reduced at high level of efficiency.
- (2) **Hasey –Weir scheme:** Under this method the worker gets a bonus at 30 % of time saved unlike 50% under hasey plan. Except for this change, hasey and halsey- weir plans are similar.
- (3) **Rowan system or rowan plan:** This scheme was introduced in 1901 by David Rowan of Glasgow, England. The wages are calculated on the basis of hours worked where as the 'bonus is that production of the wages of time taken which the time saved bears to the standard time allowed'. Time saved

Total earnings under Rowan plan

$$\begin{aligned}&= \text{Hours worked} \times \text{rate per hour} + \frac{\text{Time saved}}{\text{Standard time}} \times \text{hours worked} \times \text{rate per hour} \\ &= S \times R + \frac{S - T}{T} \times T \times R\end{aligned}$$

$$= T \times R + \frac{\text{ } \times T \times R}{S}$$

Merits

- (1) Time wages are guaranteed to the worker
- (2) It is suitable for learners and beginners
- (3) Both the workers and employers are benefited
- (4) It pays higher bonus to workers when compared with Halsey scheme up to a specific level of time saved.

Demerits

1. It is difficult to understand and calculate for the ordinary workers.
2. Efficiency beyond certain point is not rewarded.
3. The system is more complex and expensive.

(4) Barth's Variable sharing plan: under this scheme wages are not guaranteed. The earning is calculated by multiplying the rate per hour by the

Earning = rate per hour $\times$ standard time $\times$ actual time

5. Emerson's efficient plan: under this plan, a standard time is fixed for every job or work. Worker's output is measured as a percentage of the standard fixed. When a worker's efficient reaches 66 2/3% of the standard, he becomes eligible to get bonus at given rate. The rate of bonus increases gradually when efficient percentage goes up from 67% to 100% of the basic time rate. For every additional 1% efficient beyond 100%, additional bonus is 1% of the time rate.

Schedule of bonus

Efficiency%	Bonus
(A) Below 66 2/3 %	No bonus. Only time wages are paid.
(B) 66 2/3 % to 100%	Bonus starting from 0.01% for 67% efficiency gradually touches 20% at 100% efficiency.
(C) Above 100%	Bonus of 20% of time rate + 1% additional bonus for each additional 1% efficiency beyond the 100%

The rate of bonus payable at various levels of efficiency is as follows:

Schedule of Bonus

Efficiency%	Bonus as % of wages earned on time basis	Efficiency%	Bonus as % of wage earned on time basis
67	0.01	87	7.56
68	0.04	88	8.32
69	0.11	89	9.11
70	0.22	90	9.91
71	0.37	91	10.74
72	0.55	92	11.64
73	0.76	93	12.56
74	1.02	94	13.52
75	1.31	95	14.53
76	1.64	96	15.57
77	1.99	97	16.62
78	2.38	98	17.70
79	2.80	99	18.81
80	3.27	100	20.00
81	3.78	101	21.00
82	4.33	105	25.00

83	4.92	110	30.00
84	5.53	120	40.00
85	6.17	130	50.00
86	6.84	So on	1% additional bonus for every 1% increase in efficiency

Emerson's plan is beneficial to the workers as they are guaranteed with time wages and also are entitled to get bonus. Even average workers can earn bonus since it starts at 66 2/3% of the standard. When workers attain and cross the standard by reaching and surpassing 100% efficiency level, bonus also accelerates.

(5) **Bedeaux's point premium system:** it is a combination of time and bonus schemes. Standard time for a job determined by time study. Standard production hour is fixed and the unit of measurement is 'minute'. An hour is taken as sixty minutes. Each minute at standard time is called a point- bedaux point or "B". the number of points has to be determined in respect of each job. If actual time is more than the standard time, the worker is paid on hourly basis. Excess production is counted in points, for which a bonus of 75% is allowed to the worker and remaining 25% goes to the foreman, which itself is a novel feature.

$$BS \times RH$$

$$\text{Earning} = \text{hours worked} \times \text{rate per hour} + \frac{75}{100} \times \frac{\text{BS} \times RH}{60}$$

Where

B.S= Number of points saved, ie., number of points actually earned less the standard number of points for the job

R.H = Basic rate per hour.

(7) **accelerating premium plan:** under this premium plan, bonus increases at a faster rate as output increases. The plan offers a higher incentive to the workers. The efficiency is determined on the basis of time saved or increases output. The plan is a complex one. It goads and forces the workers to increase production. Beyond a limit, workers may find the strain is intolerable.

Group bonus systems

Premium bonus schemes are meant for individual incentive where their output can be measured. In some cases individual output cannot be measured. Under such circumstances group bonus schemes take the place of individual bonus plans. The total bonus earnings are determined according to productivity of the group. Such bonus can be shared between workers of different skills in different specified proportions, the latter being commonly based on the individual time rates although agreed percentage allocations may be used. The main group bonus schemes are as under:

- (1) Budgeted expenses bonus,
- (2) Cost efficient bonus,
- (3) Priest man system,
- (4) Town's Gain sharing system and
- (5) Waste reduction scheme.

(1) **Budgeted expense bonus:** under this method bonus is based on the savings in actual expenditure compared with the total budgeted expenditure.

(2) **Cost efficiency bonus:** under this method, the bonus is based on reduction of total cost or of specific elements of costs. The standard cost is fixed, actual cost is compared with the standard and the difference in the form of saving is ascertained and a portion of such saving is paid to employees as bonus.

(3) Priestman System : This method is used in foundries and related works in which standard output is fixed. Where actual production exceeds the standard, workers are paid bonus equal to the percentage in output over the standard. When actual production is less than the standard, no bonus is paid though time rates are guaranteed.

(4) Towne' Gain sharing plan: This group bonus scheme was introduced by Mr. H.R. Towne in U.S.A., during the year 1886. The bonus is paid on the basis of savings in labour cost. The actual costs are compared with standard costs, one half of the savings is paid to workers pro rata with the wages earned. In addition to the workers the supervisory staffs are also paid a part of the bonus.

5) Waste reduction bonus: This method intends to reduce material wastage. It is adopted in industries where material cost is high.

In this scheme standard wastage is fixed; a percentage of the reduction in wages is paid as bonus to the workers

Indirect monetary incentives

The prosperity of business firms depends on employees. The employees are given a share in the profits based on the prosperity of the concern. Thus, co- partnership and profit sharing schemes fall under the category of indirect monetary incentives

(a) Profit sharing: In this scheme there is an agreement between the monetary incentives, management and employees, whereby the employer pays them a predetermined share of the profits of the undertaking in addition to wages.

In India payment of bonus based on profit sharing is governed by payment of bonus Act, 1965. The available surplus during the year is ascertained as per the provisions of the Act and 67% of the available surplus is treated as amount available for bonus in the case of companies (except banking companies). In case of a banking company 60% of available surplus is treated as allocable surplus. The minimum bonus is 8.33% of salary and maximum bonus is 20% of salary.

Disadvantages of profit sharing scheme: Although both direct and workers are entitled to bonus this scheme has certain drawbacks, Profit depends on the efforts of workers to a limited extent. Profits may not s if production and productivity is high. Profits fluctuate year to year. Moreover profit is influenced by accounting decisions and business policies frustrate the employees. It is very difficult to find a suitable way for apportioning profits on the basis of efficiency and there is a time lag between service rendered and payment of bonus. Therefore, it may not induce higher efficiency

(b) **Co-partnership:** In co-partnership or co-ownership employees are allotted shares of the company and they are to receive profits in proportion to capital. In certain cases employees are given loan to buy the shares of the comp and minimum period of service to be rendered is prescribed to get the shares allotted. This reduces labour turnover. This scheme increases morale of the employees to a great extent if the company is profitable. Example: The stock option schemes in software companies.

Non-monetary incentives: The employees are provided better facilities, instead of additional monetary payments. This is done to attract the efficient workers Non financial incentives include the following:

- (1) Favourable working conditions
- (2) Free health care
- (3) Providing rent free accommodation
- (4) Free education facilities for children
- (5) Free transport facilities
- (6) Free holiday facility
- (7) Providing subsidised food
- (8) Welfare facilities
- (9) Opportunities for advancement

(10) Protective clothing, liveries, uniforms, etc.

Advantages of non-monetary incentives

- (1) Attracting efficient and skilled labour force
- (2) Increasing the morale of employees
- (3) Reduction of labour turnover
- (4) Establishment of goodwill for the company
- (5) Reduction in absenteeism.

Overheads

An overhead is the amount which is not identified with any product. The name overhead might have come due to the reason of over and above the normal heads of expenditure. It is the aggregate of indirect material, indirect labour and indirect expenditure. The generic term used to denote indirect material, indirect labour and indirect expenses. Thus overheads forms a class of cost that cannot be allocated or absorbed but can only be apportioned to cost units.

In earlier days, overheads were not given much importance, because the prime cost constitutes 50-80% of the total cost. However, with the modern trend towards the mechanisation, automation, and mass production, overhead costs have grown considerably in size and in many undertakings the proportion of overhead costs to the total costs of products is appreciably high. High overheads do not indicate inefficiency if the increase in overheads is due to the following likely causes:

- (a) Improved methods of managerial control like Accountancy, Production Control, Work Study, Cost and Management Accountancy...etc. In the process of reducing costs of other elements, viz. direct material and direct labour, overhead costs are likely to increase.
- (b) Large scale production or mass production.
- (c) Use of costly machines and equipments increases the amounts of depreciation, maintenance expenditure and similar other items of overhead costs.
- (d) Less human efforts are necessary with automatic machines. A major portion of the cost is allocated direct to machines, thus increasing the machine overhead costs.
- (e) Increased efficiency and productivity of labour has the effect of pushing up the overhead to direct labour ratio.

According to CIMA, overhead costs are defined as, 'the total cost of indirect materials, indirect labour and indirect expenses'. Thus all indirect costs like indirect materials, indirect labour, and indirect expenses are called as 'overheads'. Examples of overhead expenses are rent, taxes, depreciation, maintenance, repairs, supervision, selling and distribution expenses, marketing expenses, factory lighting, printing stationery etc. **As per CAS-3, overheads are defined as follows 'Overheads comprise costs of indirect materials, indirect employees and indirect expenses which are not directly identifiable or allocable to a cost object in an economically feasible manner'**

Overhead Accounting

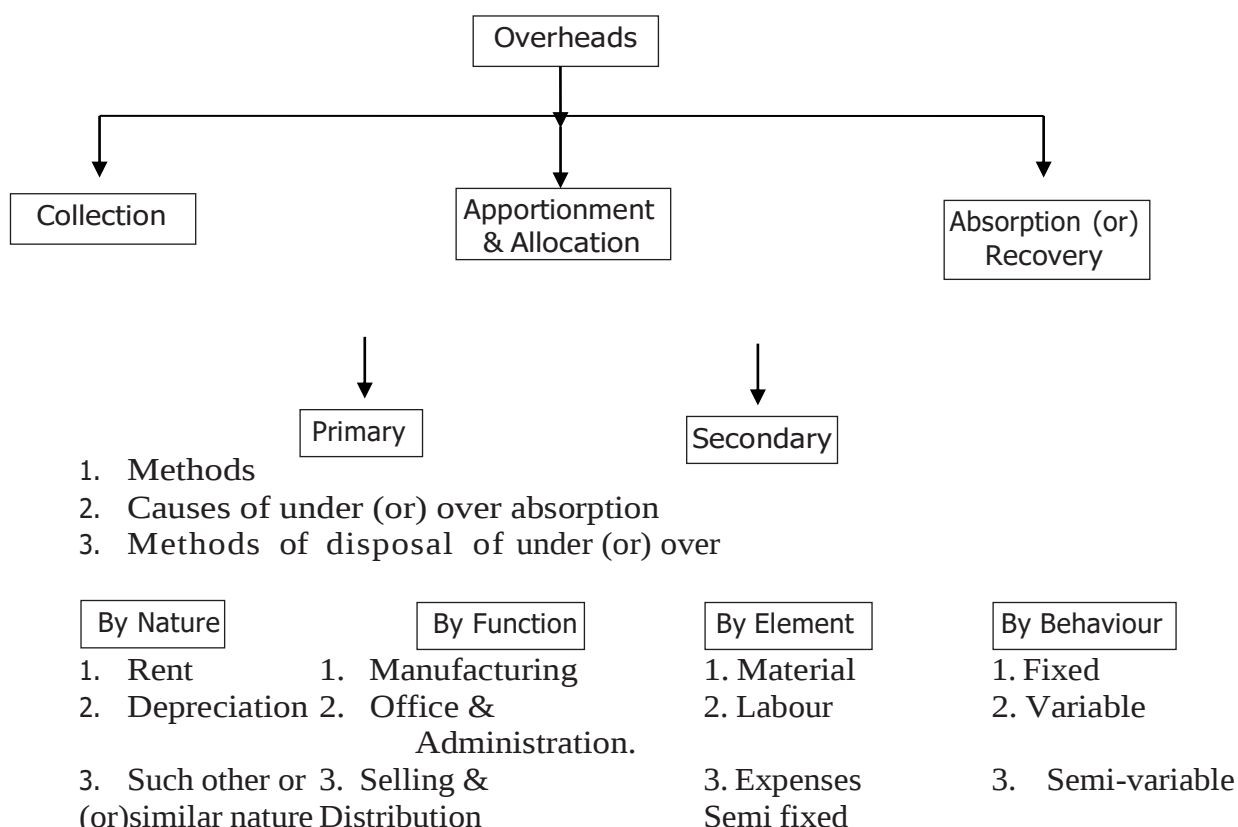
The ultimate aim of Overhead Accounting is to absorb them in the product units produced by the firm. Absorption of overhead means charging each unit of a product with an equitable share of overhead expenses. In other words, as overheads are all indirect costs, it becomes difficult to charge them to the product units. In view of this, it becomes necessary to charge them to the product units on some equitable basis which is called as 'Absorption' of overheads. The important steps involved in Overhead Accounting are as follows:-

- (a) Collection, Classification and Codification of Overheads.
- (b) Allocation, Apportionment and Reapportionment of overheads.

(c) Absorption of Overheads.

As mentioned above, the ultimate of Overhead Accounting is ‘Absorption’ in the product units. This is extremely important as accurate absorption will help in arriving at accurate cost of production. Overheads are indirect costs and hence there are numerous difficulties in charging the overheads to the product units.

Study of Overheads can be better understood from the following diagram:



(a) Collection, Classification and Codification of Overheads: -

These concepts are discussed below:-

Collection of Overheads:

Document	Overhead Costs	Nature
Stores Issue note, purchase voucher	Indirect material	Consumables, lubricants etc.
Payroll sheets, time sheets	Indirect labour	Wages, salaries, contribution to statutory benefits, bonus, incentives, idle time
Cash books	Indirect material, Indirect labour & indirect expenses	All type of costs
Subsidiary records journal	Indirect material, Indirect labour & indirect expenses	For provisions of costs that are not actually paid for
Other reports	Indirect expenses	Depreciation, scrap, wastage etc.

Overheads collection is the process of recording each item of cost in the records maintained for the purpose of ascertainment of cost of each cost centre or unit.

The following are the source documents for collection of overheads:-

- (i) Stores Requisition
- (ii) Wages Sheet
- (iii) Cash Book
- (iv) Purchase Orders and Invoices
- (v) Journal Entries
- (vi) Other Registers and Records

Source document and the nature of overheads are enumerated as below.

For the purpose of overhead accounting, collection of overheads is very important. It is necessary to identify the indirect expenses and the above mentioned source documents are used for this. Proper collection of overhead expenses will help to understand accurately the total overhead expenses.

Classification of Overheads

Classification is defined by CIMA as, 'the arrangement of items in logical groups having regard to their nature (subjective classification) or the purpose to be fulfilled (Objective classification). In other words, classification is the process of arranging items into groups according to their degree of similarity. Accurate classification of all items is actually a prerequisite to any form of cost analysis and control system. Classification is made according to the following basis:

Based on Elements: Indirect Materials, Indirect labour and Indirect expenses.

Based on Functions of the organisation: Manufacturing overheads, Administrative overheads, Selling and Distribution overheads, Research & Development overheads.

Based on the Behaviour: Fixed Overheads, Variable Overheads & Semi variable overheads.

Classification according to Elements

According to this classification overheads are divided according to their elements. The classification is done as per the following details:-

Indirect Materials

Materials which cannot be identified with the given product unit of cost centre is called as indirect materials. As per CAS-3 indirect material cost is defined as 'Materials, the cost of which cannot be directly attributed to a particular cost object'. For example, lubricants used in a machine is an indirect material, similarly thread used to stitch clothes is also indirect material. Small nuts and bolts are also examples of indirect materials.

Indirect Labour

As per CAS-3, indirect employee cost is the employee cost, which cannot be directly attributed to a particular cost object. Wages and salaries paid to indirect workers, i.e. workers who are not directly engaged on the production are examples of indirect wages.

Indirect Expenses

As per CAS-3, *Indirect Expenses are expenses, which cannot be directly attributed to a particular cost object.* Expenses such as rent and taxes, printing and stationery, power, insurance, electricity, marketing and selling expenses etc. are the examples of indirect expenses.

Functional Classification

Overheads can also be classified according to their functions. This classification is done as given below:- Manufacturing Overheads

As per CAS-3, *Indirect Cost involved in the production process or in rendering service.* Manufacturing overheads has different names such as Production Overheads, Works Overheads, Factory Overheads. Indirect expenses incurred for manufacturing are called as Manufacturing Overheads. For example, factory power, works manager's salary, factory insurance, depreciation of factory machinery and other fixed assets, indirect materials used in production etc. It should be noted that such expenditure is incurred for manufacturing but cannot be identified with the product units.

Manufacturing is a separate function like administration, selling and distribution. The term manufacturing stands for activities, which begin with receipt of order and end with completion of finished product. Manufacturing Overhead represents all manufacturing costs other than direct materials and direct labour. These costs cannot be identified specifically with or traced to cost object in an economically feasible way. In other words, manufacturing overhead are indirect manufacturing costs. The term overhead is peculiar and therefore, there is a growing tendency to prefer the term indirect manufacturing cost to overhead. Following synonyms have been used for Manufacturing Overhead:-

- (i) Factory overhead;
- (ii) Manufacturing overhead;
- (iii) Factory on cost;
- (iv) Works on cost;
- (v) Factory burden and;
- (vi) Manufacturing expenses.

Given below are a few examples of different items included in different groups of manufacturing overhead:

Indirect Material Cost: Glue, thread, nails, rivets, lubricants, cotton waste, etc.

Indirect Labour Cost: Salaries and wages of foremen and supervisors, inspectors, maintenance, labour, general labour; idle time etc.

Indirect Services Costs: Factory Rent, factory insurance, depreciation, repair and maintenance of plant and machinery, first aid, rewards for suggestions for welfare, repair and maintenance of transport system and apportioned administrative expenses etc.

Manufacturing Overhead further explains in apportionment, allocation and absorption.

Administrative Overheads

Indirect expenses incurred for running the administration are known as Administrative Overheads. As per CAS-3, *Administrative Overheads are defined as Cost of all activities relating to general management and administration of an organisation.*

As per the functional classification, Administration Overheads comprise of those indirect costs which are related to the general administrative function in the

company. Such functions are related to policy formulation, directing the organisation and controlling the operations of the company. Administration overheads are incurred for the benefit of organisation as a whole. Controlling them is difficult for they do not vary with most of the variables viz. production or sales. Examples of such overheads are, office salaries, printing and stationery, office telephone, office rent, electricity used in the office, salaries of administrative staff etc. The size as well as control over these overheads depends largely on decisions of management. Organisations growing very fast face the problem of controlling Administrative Overheads. Multi-location set up leads to duplication of many administrative costs.

Collection and Absorption of Administration Overheads

The collection of overheads is done firstly by nature of the expenses through the chart of accounts. Administrative departments in an organisation could be Corporate Office, Finance and Accounts,

Company Secretary, Human resources, Legal, General Administration. The overheads that are common to all these departments are apportioned on some suitable basis e.g. in the following manner:

- (a) For Office rent, rates & taxes - Floor space as the basis,
 - (b) For Depreciation on office building - Floor space as the basis
 - (c) For Legal fees - No of cases handled as the basis
 - (d) For Salaries of common staff - Ratio of salaries of departments as the basis
 - (e) For Typist pool - No of documents typed as the basis
- Absorption of the Administrative Overheads into cost units is very difficult. Many times it is advised that these overheads may not be absorbed into product units because of the difficulty and non-relevance of them with production activity. Normally, the Administrative Overheads are totalled together and then using a suitable basis, a rate of recovery is arrived at to absorb the same. It could be mostly a percentage of Works cost or factory cost. Based on the principle of '*charging what the traffic can bear*', the absorption could be on the basis of a percentage of gross profit. Whatever method selected, it will be arbitrary and could lead to erroneous conclusions. A Cost Accountant has to use all the experience and history of the organisation before he selects a particular method to adopt.

Treatment of Administration Overheads

There are three different ways of treating the administration overheads as follows:-

1) Apportion between Production and Selling & Distribution functions:

This treatment is based on the logic that the administrative functions are for the entire company and these functions facilitate both production as well as selling. In other words, the absorption of Administration Overheads would happen through Production and Selling Overheads. This means these overheads lose their identity. The problem is of course, selection of basis to divide these overheads over the two principal functions of production and selling.

2) Transfer to P & L Account

This method agrees that administrative costs are all time based costs and as such bear no relation what is produced or what is sold. These are mainly of fixed nature. Hence there is no point in dividing them further to be included in the cost of production or cost of selling. They should be simply charged to the P & L Account. However, this may lead to undervaluation of stocks.

3) Treating as a separate addition to cost of production & sales

In this method, administration is treated as a separate function and is added as a separate line in the cost computation sheet for a job or an order. Here again, the basis for inclusion as a part of cost of a job is a difficult choice. Generally, a

percentage of factory cost is taken as a basis. A care needs to be taken to ensure that the Administration Overheads are charged equitably to Cost of Sales, FG stock and WIP as well.

Controlling Administration Overheads

Given the nature of these expenses, they cannot be controlled at the lower level of management. They can be better controlled by top management as they pertain to formulating policy and directing the organisation. The first step in the control mechanism is proper classification of expenses & departmentalisation. The actual expenses are collected for each department and then compared with a benchmark. Deviation are analysed and causes for increase are mitigated by fixing responsibility on the departmental head. The control benchmarking can be done with respect to:

- (i) Figures of the previous year. Expenses could be compared with the figures of previous year and increase or decrease are analysed. However, comparison with previous year may not help as the condition may have totally changed from one year to the other.
- (ii) Use of budgets. Budgets are estimates for the current year, and they take into account the changed conditions. They also built in the year's complete plan which would factor all changes in the cost structure. It is advisable to compare budgeted overheads with actual for control purpose.
- (iii) Use of standards. Although very scientific, this method is difficult to operate. Administrative activities (being very subjective) cannot be standardised. On a certain level it can be applied e.g. the time taken to process a voucher by accountant can be standardised, or time taken for processing a payment could be standardised.

Selling and Distribution Overheads

As per CAS-3, Selling Overheads, also known as Selling Costs, are the expenses related to sale of products and include all Indirect Expenses in sales management for the organization. Overheads incurred for getting orders from consumers are called as Selling Overheads. On the other hand, overheads incurred for execution of order are called as Distribution Overheads. As per CAS-3, Distribution Overheads, also known as Distribution Cost, are the cost incurred in handling a product from the time it is ready for dispatch until it reaches the ultimate consumer. Examples of Selling Overheads are sales promotion expenses, marketing expenses, salesmen's salaries and commission, advertising expenses etc. Examples of Distribution Overheads are warehouse charges, transportation of outgoing goods, packing, commission of middlemen etc.

The magnitude of S & D Overheads in the total cost would depend on many factors such as nature of the product, type of customers, spread of market, statutory restrictions etc. A consumer product needs heavy expense on advertising. A sale to institutions rather than individual customers needs a different selling effort. Distribution Costs will increase if the spread of the market is large. Some activities cannot be advertised at all such as a Doctor, a Cost Accountant. The total magnitude of S & D Costs and the proportion of selling and distribution efforts will decide the treatment thereof and control mechanisms to be used. For some of selling expenses there may not be a direct relationship with the product. If a company incurs expense on advertising, it may be difficult to relate to a specific product unless it's a product advertisement. But further, there may be a substantial

time lag between the expense and the benefit arising out of that. In case of Distribution Costs many of them may be possibly linked to the product.

Collection and Absorption of S&D Overheads

While classifying the S & D Costs are properly bifurcated and coded accordingly. This could be done by having separate account codes for Selling Overheads such as: advertising, sale commission, travelling expense, communication, exhibition, market survey, free samples, credit & collection costs, bad debts, and Distribution expenses such as: transportation vehicle related expenses, warehousing and storage at different places, depreciation. Depending upon the size of the organization, there may be proper departmentalization of S&D activities. The departments could be:

- Sales head office
- Sales regional offices
- Depots
- Direct selling department
- Dealers management

Credit and collection (commercial) The costs are collected through various source documents under the above heads and for the above departments. For absorption, the basis to be used will have practical difficulties, as one will have to look for a relationship between the expenses and the cost unit. Some expenses like sales commission, shipping costs, and direct selling expenses can be absorbed directly. The other expenses can be absorbed on the basis of either sales value, cost of goods sold, gross profit or number of units sold. Out of these the sales value method is the most commonly used.

Control over S & D Expense

The S & D Expenses are related to sales and distribution activity which is externally focused. The extent of these expenses depend mainly on external factors like consumer profile, changing habits, technology improvements etc. Controlling these expenses does not mean capping them. It aims at increasing the effectiveness of these expenses e.g. getting maximum sales per rupee of S & D Expenses. For control purpose, a great care should be taken to ensure correct classification and collection of S & D Overheads. The collected expenses must be analysed to assess the effect of them on sales. Such analysis could be done as follows:

- (a) Analysis of sales and S & D Expenses by geographical locations – This could be regions, zones, domestic and international etc.
- (b) Analysis by type of customers - This could be done as institutional, government, retail etc.
- (c) Analysis by products or services – This may be done as range of products, the application of products, brands etc.
- (d) Analysis by salesmen.
- (e) Analysis by channel of distribution – This analysis pertains to wholesalers, retailers, commission agent etc.

The analysis of sales, profits and S & D expenses on the basis of above factors will give a good insight into the performance as well as control over expenses. All these three parameters may be compared with

- Previous year;
- Budget for the current year or
- Standards for the current year

Research and Development Overheads

Research Cost is defined as the cost of searching for new or improved products, new applications of material, or new or improved methods, process, systems or services. In the modern days, firms spend heavily on Research and Development. Expenses incurred on research and development is known as Research and Development Overheads. Research may be of the following types:

- (i) Pure or basic research to gain general know-how regarding the production or market, not directed towards any particular product.
- (ii) Applied research which applies the basic knowledge in practice. i.e improvement of existing products, new process, exploring of new products, improved measures of safety, etc.

Development cost is the cost of the process which begins with the implementation of the decision to use scientific or technical knowledge to produce a new or improved product or to employ a new or improved method, process, system, etc. and ends with the commencement of formal production of that product by that method. Development starts where the research ends. Development cost is the expenditure incurred for putting the results of research on a practical commercial basis.

Special features of Research & Development Costs

The features are as follows:-

- (a) Expenditure is incurred ahead of the actual production and may not be charged to current production.
- (b) The amount of expenditure may often be substantial.
- (c) The expenditure may at times be entirely fruitless, yielding no tangible results.
- (d) Benefit of the expenditure may be realized over a number of years.
- (e) Difficulty in fixation of standards for control.

Collection of R&D Overheads

Accumulation of Research and Development Overheads is essential for the following reasons:-

- (a) For review cost to date.
- (b) For planning the activities subsequent to research.
- (c) For evaluation of performance with relation to past performance or for inter-firm comparison.

The collection of R&D Overheads is made through the following documents. Material requisitions, labour time cards, invoices, vouchers (royalty, patent, license. etc). Research & Development expenditure may be identified by its nature i.e basic or applied research or development by the elements of cost, by business sector, by project. Each Research & Development project is allotted a project work order number. Separate series of work orders or codes should be used to distinguish from regular work orders.

R & D overheads can be accumulated as follows:-

- (a) All expenditure under the direct elements (direct material, labour and expenses) must be charged to the work orders.
- (b) Expenses like supervisor salary, material handling charges, maintenance of equipments can be directly allocated to particular research work order.

(c) Items of general overheads like depreciation of building, depreciation of maintenance equipment, share of purchase department expenses may be suitably apportioned to the research work order.

Accounting of R&D Overheads

Accounting of Research & Development Cost arise due to the following causes:-

(a) The expenditure is in the nature of pre-production costs and there is a considerable time lag between

the incidence and expenditure and realization of benefit.

(b) There is no immediate production, or the production is so small that it becomes difficult to charge such costs to products.

It is because of these difficulties that the accounting of Research and Development Costs has been a subject of some controversy. Three methods are available for charging Research and Development Costs as:

(a) Charging off to the current year Profit & Loss Account.

(b) Capitalization so that cost may be amortized on a long term basis.

(c) Deferment and charge-off to costs of the next two or three years-a short/medium term amortization.

Research and Development may be regarded as a function of production and the Research & Development Costs may be charged to costs to be recovered through the general overhead rates. There are many arguments for and against charging the Research & Development Costs in current revenue. The arguments in support of this method are as follows:-

(a) All research & development expenses may not result in new processes or saleable products.

(b) Some of the research & development projects may result in failures.

(c) These expenses may be incurred simply to maintain the present competitive position of the concern.

(d) It is difficult to assess the period over which the know-how or knowledge acquired may be spread over.

(e) It may be more advantageous to recover a substantial portion of the cost immediately, as the life

of the new products are uncertain.

(f) In certain cases, the effect of these research costs on future revenues may be doubtful.

The classification used for cost collection is mostly combination of elemental and functional. The behavioural classification cannot be used for booking of costs; it is used only for analysis and decision making.

Elements	Material	Labour	Expense
Factory or production or manufacturing or works overheads	Nuts & bolts, consumables, lubricants, welding electrodes, cleaning materials, nails, threads, ropes etc.	Salaries & wages to foremen, supervisors, inspectors, maintenance labour, idle time	Factory lighting & heating, factory rent, power & electricity, factory insurance, depreciation on machinery, repairs
Administrative Overheads	Printing & stationery, office supplies	Salary of office staff, managers, directors, and other administrative departments as IT,	General office rent, insurance, telephones, fax, travel, legal fees, depreciation on office assets

		audit, credit, taxation	
Selling Overheads	Price lists, catalogues, mailings, advertising material such as leaflets, danglers, samples, free gifts, exhibition material	Salaries of sales staff & managers, commission on sales, bonus on schemes	Sales office expenses, travelling, subscription to sales magazines, bad debts, rent & insurance of showrooms, cash discount, brokerage, market research
Distribution overheads	Secondary packing, material items used in delivery vans	Salaries of delivery staff such as drivers, dispatch clerk, logistic manager	Carriage outwards, forwarding expenses, rent & insurance of warehouses & depots, insurance, running expenses & depreciation of delivery vans

Classification based on behaviour

Fixed Overheads

The amount of overhead tends to remain fixed for all volumes of production within a certain range. Examples of Fixed Overheads are Audit fee, Interest on capital, Depreciation of plant & machinery, Insurance, Rent of buildings, etc. A fixed overhead represents constant expenditure incurred during a period without regarding to the volume of production during that period. Even when production completely ceases in a particular period, this constant amount of expenditure will continue to be incurred partially, if not wholly. Therefore the Fixed Overheads are also known as Period Costs. Sometimes these costs are also termed as Shutdown or Stand-by Costs.

Features of Fixed Costs

Fixed Costs are stated to be by and large uncontrollable, in the sense they are not influenced by the action of a specified member of an undertaking. For example, the supervisor has practically no control over the fixed costs like depreciation of plant & machinery. The production supervisor can only see that the maximum possible utilization of the assets is made.

The fixed overhead amount is constant per period; the cost per unit of production varies with the volume. This variation is inverse since with increase in production, cost per unit decreases as the same amount of fixed overheads is spread over larger units of production.

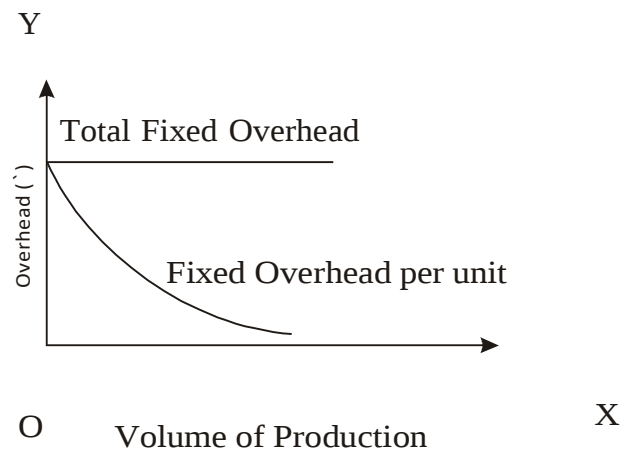
Factors affecting the Fixed Overheads

When a plant or a department is completely idle and there is no production, several items of Fixed Overheads disappear. Fixed Overheads are thus, of two types, viz. a lower standing fixed cost when production is nil and a higher running fixed cost when the plant is running. For instance, maintenance expenditure incurred at

plant shutdown has to be increased to a higher level when production starts.

Any long term change in the productive capacity of an undertaking also affects the basic characteristic of fixed overhead. Fixed costs are constant for short term periods only, within a limited range of capacity. Another factor that affects the fixed nature of fixed overhead is the change in basic price level.

Graphical representation of Fixed Costs is depicted as below:



Fixed Costs may be broadly classified into three basic types:-

- (i) Fixed costs that have no casual relationship with the volume of output and are incurred mainly as results of policy decisions of the management. Research, development, design, employee training, advertisement and marketing expenses are examples of this expenditure. Accountants term such costs as discretionary fixed costs (also known as programmed costs or managed costs).
- (ii) Fixed costs that do not change significantly in the short term such as depreciation, rent, etc.
- (iii) Fixed costs that are fixed for short period for a particular capacity, but change considerably when there is a long-term change in the volume or capacity.

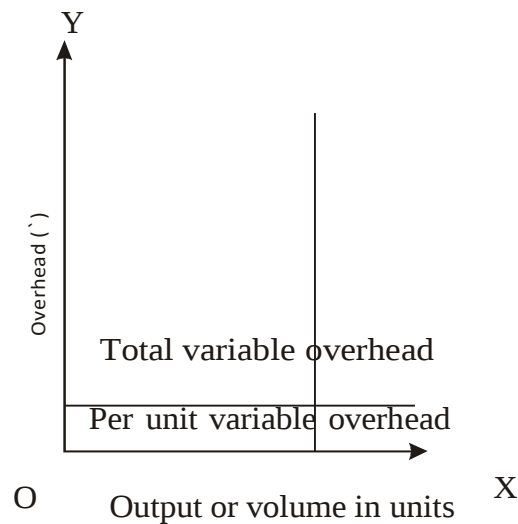
Variable Overheads

Variable Costs are those which vary in total direct proportion to the volume of output. These costs per unit remain relatively constant with changes in production. Thus Variable Costs fluctuate in total amount but tend to remain constant per unit as production activity changes. Examples are indirect material, indirect labour, lubricants, cost of utilities, etc.

The variable overhead costs seldom reveal the characteristics of perfect variability. i.e. an expenditure which varies directly with variation in the volume of output. They simply tend to vary rather than vary directly in direct proportion of output. We come across three types of variable overhead expenses in actual practice as explained below:-

- (i) 100% variable expenses. For all production the variable expenditure remains constant.
- (ii) The expense per unit of production is low at lower ranges of output but gradually increases as production goes up.
- (iii) The expenses per unit of production are more at lower ranges of output but

gradually decrease
with the decrease with the increase in production.
Nature of variable expenses is shown as below:-



The relationship of fixed and variable overheads with the volume of output is exhibited in the following table. The range of output is considered as 5000-10000 units. Variable overheads are taken at ₹2 per unit and fixed overheads are assumed to be at the level of ₹25000. Can you check for yourself how the graph will look like for the following figures?

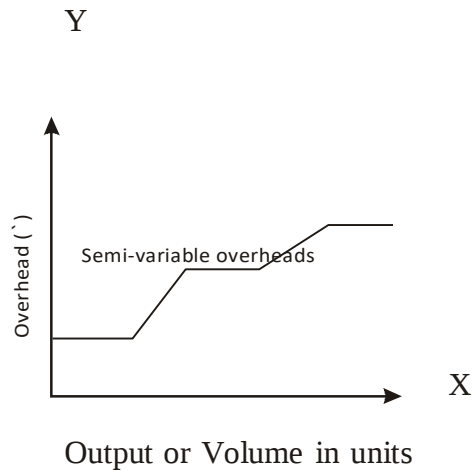
Output units	Fixed Overheads	Variable Overheads	Total Overheads	Overheads per unit		
				Fixed	Variable	Total
5000	25000	10000	35000	5.00	2.00	7.00
6000	25000	12000	37000	4.17	2.00	6.17
7500	25000	15000	40000	3.33	2.00	5.33
8000	25000	16000	41000	3.13	2.00	5.13
9000	25000	18000	43000	2.78	2.00	4.78
10000	25000	20000	45000	2.50	2.00	4.50

Semi-Variable Overheads:

These are a sort of mixed or hybrid costs, partly fixed and partly variable costs. For example Telephone expenses, include a fixed portion of annual charge plus variable charge according to the calls. Thus total telephone expenses are semi-variable.

Semi-variable overheads are of two types:-

- The expenses which change with the change in volume of output, but the variation cost is less than proportionate to change in output. Examples are power & fuel, lighting, repairs and maintenance of buildings, etc.
- The costs tend to remain constant within certain range of output, then jump up and remain constant for another range and so on.



Semi variable cost need to be classified into fixed and variable due to the following reasons:

(a) **Effective Cost Control:** Fixed costs are in the nature of policy costs or discretionary costs and as such can be controlled by the management. However variable costs can be controlled at lower levels. Separation of two elements facilitate the fixation of responsibility, preparation of overhead budget and exercise effective control.

(b) **Decision Making:** The classification is very useful in management decisions relating to utilization of capacity. If cost information is to be of use in such problems, it is essential that fixed and variable costs which behave differently with changes in volume should be segregated.

(c) **Preparation of Break-even Charts:** Separation of fixed and variable cost is essential for the study of cost volume profit relationship and for the preparation of breakeven charts and profit charts.

(d) **Marginal Costing:** The basic requirement of the technique of Marginal Costing is the separation of fixed and variable costs. While the latter are taken into consideration for the determination of Marginal Cost and contribution, the fixed costs are treated separately.

(e) **Method of Absorption Costing:** Separate method may be adopted for determination of rates for fixed and variable costs for absorption in production. Further a separate fixed overhead rate also serves as a measure of utilization of the facilities of the undertaking; any under recovery or under absorption denotes the idle or surplus capacity or production efficiency.

(f) **Flexible Budget:** In a Flexible Budget, the budgeted amounts vary with the levels of activity & fixed cost remains constant. It is the variable cost that varies. Breakup of overhead cost into fixed and variable is therefore necessary for establishment of budget and for the purpose of variance analysis.

Methods of classification of semi variable cost in fixed and variable

(a) **Graphical Method** – The costs at number of levels are plotted on a graph, x-axis represents the volume and y-axis represents the amount of expenditure. A straight line known as regression line or line of best fit is drawn between the points, plotted in such a manner that there are equal number of points on both the sides of a line and as far as practicable, pairs of points on either side are in equal distance from the line. Points falling far beyond the line are erratic and are not considered. If the regression line is drawn carefully so that most of the plotted points are on the line or not far from it, the scatter chart provides a fairly accurate method for the separation of fixed and variable.

(b) **Simultaneous Equations** – This uses the straight line equation of $y = m x + c$ where y represents total cost, m is variable cost per unit, x is the level of output and c is fixed costs. The total costs at two different volumes are put into these equations which are solved for the values of m and c.

(d) **High and Low Method** – The highest and lowest levels of output and costs are taken and the differential is found. This difference arises only due to variable costs. The remaining portion will be fixed costs. Under this method the variable cost per unit will be computed first and then the fixed cost will be derived. Variable cost per unit is computed by dividing the difference in cost at highest level and lowest level with the difference in volume between highest and lowest level.

(d) **Least Square Method** – This statistical tool uses straight line equation and finds the line of best fit to solve the equations. Also known as Simple Regression Method. Under this method first the mean of volume and mean of costs are computed. The deviations in volume (x) from the mean and deviation in cost (y) from mean are computed.

Codification of Overheads

It is always advisable to codify the overhead expenses. Codification helps in easy identification of different items of overheads. There are numerous items of overheads and a code number to each one will facilitate identification of these items easily. Codification can be done by allotting numerical codes or alphabetical codes or a combination of both. Whatever system is followed, it should be remembered that the system is simple for understanding and easy to implement without any unnecessary complications.

Cost Centre codes	Department name
1100	Turning department
1200	Grinding Department
1300	Components manufacturing
1400	Assembly
2100	Maintenance
2200	Quality control
2300	Stores
3100	HR & Administration
3200	Accounts

You may observe the logic in giving the codes. All codes starting with 1 are production departments, all codes starting with 2 are factory related services and all codes starting with 3 are general services. This coding helps collection of costs on

functional basis and also to identify an item of expense directly to a department or cost centre.

Allocation, Apportionment and Reapportionment of Overheads

After the collection, classification and codification of overheads, the next step is allocation and apportionment of overheads into the product units. The following steps are required to complete this process.

Departmentalization

Before the allocation and apportionment process starts, the first step in this direction is 'Departmentalization' of overhead expenses. Departmentalization means creating departments in the firm so that the overhead expenses can be conveniently allocated or apportioned to these departments. For efficient working and to facilitate the process of allocation, apportionment and reapportionment process, an organization is divided into number of departments like, machining, personnel, fabrication, assembling, maintenance, power, tool room, stores, accounts, costing etc and the overheads are collected, allocated or apportioned to these departments. This process is known as 'departmentalization' of overheads which will help in ascertainment of cost of each department and control of expenses.

Allocation

CIMA defines Cost Allocation as, 'the charging of discrete, identifiable items of cost to cost centres or cost units'. In simple words *complete distribution of an item of overhead to the departments or products on logical or equitable basis is called allocation*. Where a cost can be clearly identified with a cost centre or cost unit, then it can be allocated to that particular cost centre or unit. In other words, allocation is the process by which cost items are charged directly to a cost unit or cost centre. For example, electricity charges can be allocated to various departments if separate meters are installed, depreciation of machinery can be allocated to various departments as the machines can be identified, salary of stores clerk can be allocated to stores department, cost of coal used in boiler can be directly allocated to boiler house division. Thus allocation is a direct process of identifying overheads to cost units or cost centres. So the term allocation means allotment of whole item of cost to a particular cost centre or cost object without any division.

Apportionment

Cost Apportionment is the allotment of proportions of items to cost centers. Wherever possible, the overheads are to be allocated. However, if it is not possible to charge the overheads to a particular cost centre or cost unit, they are to be apportioned to various departments on some suitable basis. This process is called as 'Apportionment' of overheads. The basis for apportionment is normally predetermined and is decided after a careful study of relationships between the base and the other variables within the organisation. The Cost Accountant must ensure that the selected basis is the most logical. A lot of quantitative information has to be collected and constantly updated for the purpose of apportionment. The basis selected should be applied consistently to avoid variations. However, there should be a periodical review of the same to revise the basis if needed.

In simple words, distribution of various items of overheads in portions to the departments or products on logical or equitable basis is called apportionment.

A general example of various bases that may be used for the purpose of apportionment is shown below:

Overhead item	Basis
Rent and building	Floor space occupied by each department
General Lighting	No. of light points in each department
Telephones	No. of extensions in a department
Depreciation of factory building	Floor space
Material handling	No. of material requisitions or Value of material issued

The above list is not exhaustive and depending upon peculiarities of the organisation, it could be extended. *This allocation and/or apportionment is called as **primary distribution of overheads**.*

Distinction between Allocation & Apportionment

Although the purpose of both allocation and apportionment is identical, i.e to identify or allot the costs to the cost centres or cost unit, both are not the same.

Allocation deals with the whole items of cost and apportionment deals with proportion of items of cost.

Allocation is direct process of departmentalization of overheads, where as apportionment needs a suitable basis for sub-division of the cost.

Whether a particular item of expense can be allocated or apportioned does not depends on the nature of expense, but depends on the relation with the cost centre or cost unit to which it is to be charged.

Principles of Apportionment of Overhead Cost

(i) Services Rendered

The principle followed in this method is quite simple. A production department which receives maximum services from service departments should be charged with the largest share of the overheads. Accordingly, the overheads of service departments are charged to the production departments.

(ii) Ability to Pay

This method suggests that a large share of service department's overhead costs should be assigned to those producing departments whose product contributes the most to the income of the business firm. However the practical difficulty in this method is that, it is difficult to decide the most paying department and hence difficult to operate.

(iii) Survey or Analysis Method

This method is used where a suitable base is difficult to find or it would be too costly to select a method which is considered suitable. For example, the postage cost could be apportioned on a survey of postage used during a year.

(iv) Efficiency Method

Under this method, the apportionment of expenses is made on the basis of production targets. If the target is exceeded, the unit cost reduces indicating a more than average efficiency. If the target is not achieved, the unit cost goes up, disclosing there by, the inefficiency of the department.

Illustration 1

A factory has 3 production departments (P1, P2, P3) and 2 service departments (S1 &

S2). The following overheads & other information are extracted from the books for the month of January 2016.

Expense	Amount `
Rent	6,000
Repair	3,600
Depreciation	2,700
Lighting	600
Supervision	9,000
Fire Insurance for stock	3,000
ESI contribution	900
Power	5,400

Particulars	P1	P2	P3	S1	S2
Area sq ft	400	300	270	150	80
No. of workers	54	48	36	24	18
Wages	18,000	15,000	12,000	9,000	6,000
Value of plant	72,000	54,000	48,000	6,000	
Stock Value	45,000	27,000	18,000		
Horse power of plant	600	400	300	150	50

Allocate or apportion the overheads among the various departments on suitable basis.

Solution:

The primary distribution of overheads is as follows:-`

Expense	Total	Basis	P1	P2	P3	S1	S2
Rent	6,000	Area sq ft	2,000	1,500	1,350	750	400
Repair	3,600	Plant value	1,440	1,080	960	120	-
Depreciation	2,700	Plant value	1,080	810	720	90	-
Lighting	600	Area sq ft	200	150	135	75	40
Supervision	9,000	No of workers	2,700	2,400	1,800	1,200	900
Fire Insurance for stock	3,000	Stock value	1,500	900	600	-	-
ESI contribution	900	Wages	270	225	180	135	90
Power	5,400	Horse power	2,160	1,440	1,080	540	180
Total	31,200		11,350	8,505	6,825	2,910	1,610

Secondary Distribution of Production Overheads

After the primary distribution as shown above is over, the next step is to re-distribute the service department costs over the production departments. This also needs to be done on some suitable basis, as there may not be a direct linkage between

services and production activity. The products actually do not pass through the service departments. So does it mean that the service cost is not a part of cost of production? It very much is the part of production cost! Hence the loading of service costs onto the production departments is necessary. *This process is called secondary distribution of overheads.*

The basis for secondary distribution is dependent on:-

- (i) The nature of service given e.g. it may be maintenance department or stores.
- (ii) Measurement of service based on surveys or analysis.
- (iii) General use indices

In the above Illustration No. 1, the costs of S1 (£2910) and that of S2 (£1610) will have to be loaded onto the totals of P1, P2 and P3.

Some examples of the bases that can be used to distribute cost of different service departments:

Service department	Basis
Quality	No of inspection done
Maintenance	No of maintenance calls or Material usage for maintenance or Time spent on maintenance
Stores	Indirect material cost or No of issue slips or Quantity of material issued or Value of stock handled
Canteen, welfare	No workers
Internal transport	No. of trucks or trolleys used or Tonne-miles consumed
Payroll office	No. of labour hours
Purchase office	No of purchase orders or Value of material purchased

Again this is not an exhaustive list and could differ from company to company. Many times percentage estimation is also done for such distribution if the service cannot be measured on the basis of any of the above bases. It may be decided that the cost of S1 is to be distributed as P1-40%, P2-25% and P3-35%. Such arbitrary method should be avoided as far as possible.

Methods of Secondary Distribution

(a) Direct Distribution Method

This method is based on the assumption that one service department does not give service to other service department/s. Thus between service departments there is no reciprocal service exchange. Hence under this method, service costs are directly loaded on to the production departments. This is simple, but the assumption may not be correct. Can we say that the canteen service is not available to other service departments like labour office or stores or maintenance department? This is incorrect and thus the method should not be used as far as possible.

In the above example consider that if the S1 and S2 costs are to be distributed on assumption of services rendered as S1 to P1- 40%, P2-30% and P3-10% and the S2 costs are on the basis of 5:3:2, then the table for redistribution of S1 and S2 costs over the production departments P1, P2 and P3 will be as given below.

Department	Total	Basic	P1	P2	P3
Overheads as per primary distribution	26,680		11,350	8,505	6,825
Distribution of S1	2,910	40%;30%;30%	1,164	873	873
Distribution of S2	1,610	5:3:2	805	488	322
Total	31,200		13,319	9,861	8,020

(b) Step Distribution Method

This method does away with the assumption made under above method, but only partly. It recognises that a service department may render service to the other service department, but does not receive service from it. In above example, S1 may render services to S2 but not vice versa, i.e. S2 may not renderservice to S1. In such situation, cost of that service department will be distributed first which render services to maximum number of other service departments. After this, the cost of service department serving the next large number of departments is distributed. This process is continued till all service departments are over. Because it is done in steps, it is called as Step Method of Distribution.

Illustration 2

A manufacturing company has two production departments Fabrication and Assembly and 3 service departments as Stores, Time Office and Maintenance. The departmental overheads summary for the month of March 2016 is given below:

Fabrication - ₹24000

Assembly - ₹16000

Stores - ₹5000

Time office - ₹4000

Maintenance - ₹3000

Other information relating to the department was:

Particulars	Production departments		Service departments		
	Fabrication	Assembly	Stores	Time office	Maintenance
No of employees	40	30	20	16	10
No of stores requisition slips	24	20			6
Machine Hours	2400	1600			

Apportion the costs of service departments to the production departments.

Solution:

We will have to determine the sequence in which the service departments should be selected for distribution and the bases on which each of them will be distributed. The following logical bases are decided based on the additional information given:

Time office - No of employees

Stores - No of stores requisitions

Maintenance - Machine hours

Also, it can be easily noticed that the time office serves maximum departments (i.e. both production departments, stores & maintenance departments). Stores serve the next larger number of departments (i.e. both production departments and maintenance department).

Maintenance department serves only production departments. Hence the sequence for distribution will be time office, stores and maintenance. This is shown in the following table:

Particulars	Total	Basis	Fabrication	Assembly	Time office	Stores	Maintenance
As per primary distribution	52,000	as given	24,000	16,000	4,000	5,000	3,000
Time office	4,000	no of employees	1,600	1,200	(4,000)	800	400
Stores	5,800	no of req. slips	2,784	2,320		(5,800)	696
Maintenance	4,096	Machine hours	2,458	1,638			(4,096)
		Total	30,842	21,158			

Please notice when we distribute the time office costs first, the charge to stores department is `800. This makes the total cost of stores to be distributed as `5800 (5000+800). Same is the logic for `4096 of Maintenance department.

(c) Reciprocal Service Method: This method takes cognizance of the fact that service departments may actually give as well as receive services from and to the other service departments on reciprocal basis. Such inter-departmental exchange of service is given due weight in the distribution of the overheads. *There are two methods used for distribution under this logic. One is called Repeated Distribution Method and the other Simultaneous Equation Method.*

(d) Repeated Distribution Method: This is a continuous distribution of overhead costs over all departments. The decided ratios are used to distribute the costs of service departments to the production and other service departments. This is continued till the figures of service departments become 'nil' or 'negligible'.

Illustration 3

The summary as per primary distribution is as follows:

Production departments A- `2400; B- `2100 & C- `1500 Service departments X – `700; Y- `900

Expenses of service departments are distributed in the ratios of:

X dept. : A- 20%, B- 40%, C- 30% and Y- 10%

Y dept. : A- 40%, B- 20%, C- 20% and X- 20%

Show the distribution of service costs among A, B and C under repeated distribution method.

Particulars	Production departments			Service departments	
	A	B	C	X	Y
As per primary distribution	2400	2100	1500	700	900
Service dept X	140	280	210	(700)	70
Service dept Y	388	194	194	194	(970)

Service dept X	38.8	77.6	58.2	(194)	19.4
Service dept Y	7.76	3.88	3.88	3.88	(19.4)
Service dept X	0.776	1.552	1.164	(3.88)	0.388
Total	2975.336	2657.032	1967.244	0	0.388

It can be noticed that the undistributed balance in service department is very negligible and thus can be ignored for further distribution

(e) Simultaneous Equations Method: Under this method, simultaneous equations are formed using the service departments' share with each other. Solving the two equations will give the total cost of service departments after loading the inter-departmental exchange of services. These costs are then distributed among production departments in the given ratios.

In the above Illustration No. 3, service dept X gives 10% of its service to Y and receives 20% of Y's service.

Let 'x' be the total expenses of dept X (its own + share of Y) and 'y' be the total expenses of dept Y (its own + share of X)

This can be expressed as:

'x' = 700 + 20% of 'y' and

'y' = 900 + 10% of 'x'

i.e. $x = 700 + 0.2y$ and

$y = 900 + 0.1x$

Multiplying both equations by 10, we get $10x = 7000 + 2y$ i.e. $10x - 2y = 7000$ and $10y = 9000 + x$ i.e. $-x + 10y = 9000$

Now multiplying 2nd equation by 10, and then adding the two equations we get, $98y = 97000$

Thus $y = 990$ and $x = 898$

Based on this we distribute the service department costs over production departments.

Redistribution Statement

	Department				
	A	B	C	X	Y
Primary Distribution	2400	2100	1500	700	900
X	180	359	269	(898)	90
Y	396	198	198	198	(990)
Total	2976	2657	1967	—	—

(a) Trial and Error method

This method is to be followed when the question of distribution of costs of service cost centres which are interlocked among them arises. In the first stage, gross costs of services of service cost centres are determined. In the second stage cost of service centres are apportioned to production cost centres.

Limitations of Apportionment

Whichever method we may use, it still depends on a suitable basis used. The basis will always lead to approximations. If an approximate data is used for analysis, control and decision-making, it may cause erroneous results. Thus one has to be careful in relating the cost data to cost centre or cost unit. The natural relation of most of the indirect costs i.e. overheads is to a time period. In other words, almost all

overheads are period costs and hence an attempt to link it to cost unit will always be arbitrary. As such, the traditional methods of allocation and apportionment are often challenged by many in the industry. The techniques like Marginal Costing owe their origin to such limitations of Traditional Costing.

Capacity of Overhead Rate

Influence of activity level on overhead rate

In determination of overhead rate, a good deal depends upon the activity level, which is assumed. In other words, capacity consideration influence overhead rate. Overhead rate will be different at different capacity levels. Efficient utilization of capacity is desirable both for society and management. Following capacity concepts merit consideration for overhead rate determination:-

Theoretical or Maximum Plant Capacity

Maximum Capacity or the Ideal Capacity is the capacity for which plant is designed to operate. It is only Theoretical Capacity. It does not give allowance for waiting, delays and shut-down. The capacity is significant for designing the plant mechanically. For cost considerations, this capacity is not important. Ideal Capacity is never used to determine overhead rates for its disregard to even necessary interruptions in production process.

Practical Capacity

When this capacity is determined, allowance is given for unavoidable interruptions like time lost for repairs, inefficiencies, breakdown, delay in delivery of raw material and supplies, labour shortages and absence, Sunday, holidays, vacation, inventory taking, etc. Thus, Practical Capacity is the maximum Theoretical Capacity with minor unavoidable interruptions. These unavoidable interruptions are based mostly on internal influences and do not consider main external causes like lack of customers orders. The Practical Capacity is determined with reference to nature of industry and circumstances in which a particular factory is situated. Normal unavoidable interruptions account for 15% to 25% of the maximum capacity. The Practical Capacity, thus, ranges between 75% and 85% of maximum capacity after giving allowance for normal unavoidable interruptions.

Normal Capacity

Idle capacity due to long-term sales trend only is reduced from Practical Capacity to get Normal Capacity. Calculation of Normal Capacity of a plant presents considerable problems. Normal Capacity is determined for the business as a whole. Then, it is broken down by plants and departments. For Normal Capacity determination, prime considerations are physical capacity and average sales expectancy. It should be noted that average sales expectancy to be considered for this purpose takes into account a period enough to level out cyclical fluctuations. The determination of Normal Capacity helps in: i) the preparation of flexible budgets and computation of predetermined factory overhead rates. ii) the use of Standard Costing, iii) estimating sales price etc., iv) scheduling production, v) inventory valuation, vi) determination of breakeven point, vii) controlling costs.

Importance of determining Normal Capacity

The Normal Capacity considerations are important for:

- (a) budget preparation;
- (b) determination of overhead rate;

- (c) determination of standard cost, and
- (d) preparation of operation of operational plans.

For determining the Normal Capacity, machinery purchased for future use and outmoded machinery should be excluded for consideration.

Capacity based on Sales Expectancy

Capacity may be based on sales expectancy for the year. The distinction between Normal Capacity and capacity based on sales expectancy should be properly understood. While Normal Capacity considers the long-term trend analysis of sales, which is based on sales of a cycle of years, the capacity based on sales expectancy is based on sales for the year only. When long-term sales trends are determined, cycle of years long enough to even out cyclical fluctuations is considered. Capacity based on sales expectancy is influenced more by general economic conditions and forecast of industry than long term sales trends. The main advantages of determining overhead rate based on sales expectancy are

i) Overhead rate is linked with actual sales expectancy, ii) Overhead costs are adequately spread over the production and iii) Overhead rate determined for this purpose is very useful for making decisions like price fixation, etc.

Idle Capacity and Excess Capacity

Practical Capacity is determined after giving allowance to unavoidable interruptions like time lost for repairs, inefficiencies, breakdown and labour shortage, etc., Even this Practical Capacity is not normally fully achieved. Some losses due to idleness of workers and plant facilities to occur even in most carefully administered companies. These losses are not taken into account for determining the Practical Capacity, because for the purpose of determining Practical Capacity only unavoidable interruptions are considered. Thus, the difference between Practical Capacity and Normal Capacity, i.e., the capacity based on long-term sales expectancy is the Idle Capacity. However, if Actual Capacity happens to be different from capacity based on sales expectancy, the idle capacity will represent difference between Practical Capacity and Actual Capacity. Idle Capacity is that part of Practical Capacity which is not utilized due to factors like temporary lack of orders, bottlenecks and machine breakdown, etc. Idle Capacity represents unused productive potential, which fails to be realized due to interruptions that are not unavoidable. Idle capacity is that part of Practical Capacity which is not utilized due to irregular interruptions.

Idle Capacity is different from Excess Capacity. Idle Capacity refers to temporary idleness of available resources due to irregular interruptions. Excess Capacity results either from managerial decision to retain larger production capacity or from unbalanced equipment or machinery within departments. Excess Capacity refers to that portion of Practical Capacity which is available, but no attempt is made for its utilization for strategic or other reasons. If the Excess Capacity results from purchase of assets not required, it will be a prudent policy for company to dispose of the assets which cause Excess Capacity. Alternatively, action should be taken for utilization of resources in the form of Excess Capacity. Excess Capacity also results from imbalance or bottlenecks in certain departments. This situation can be remedied by attempting synchronization in the working of various departments, working overtime, running double shift and temporary off-loading to departments having spare capacity. While overhead rate includes cost of Idle Capacity, Excess Capacity is excluded from overhead rate consideration.

Idle time is distinguished from Idle Capacity and its cost is separated in the accounts. Idle time represents lost time of men and machines arising from lack of

business or of material, a breakdown of equipment, faulty supervision or other similar causes whether avoidable or not. Idle Capacity is the difference between Practical Capacity and Actual Capacity and represents the unused production potential.

Idle Capacity costs are represented mostly by the fixed charges of owning and maintaining plant and equipment and of employing services, which are not used to their maximum potential. The principal causes of idle capacity are: Production Causes

These causes primarily result from poor organization of operational plan. Following production causes

often lead to Idle Capacity:-

- (a) Repetitive machine adjustment - i) Setup and change-over. ii) Repairs and adjustment.
- (b) Lack of materials or tools – i) Internal ii) External
- (c) Lack of supervision, inspection and instruction.
- (d) Lack of power – i) Internally produced. ii) Externally produced

Administrative Causes:

Sometimes various administrative decisions taken at various level of management result in Idle Capacity.

Major administrative causes that lead to Idle Capacity are: a) Excess plant for anticipated expansion,

b) Special machines prepared for particular jobs, and c) Strikes / Lockouts.

Economic Causes

Sometimes demand for the goods is seasonal as in case of wool, ice cream and furs and production cannot be evenly distributed. This is especially true, when there exists danger of deterioration of the product or where carrying charges for stock are too large. Thus, seasonal, cyclical and industrial causes also lead to Idle Capacity.

Various practices are followed in different companies for disposing of Idle Capacity cost. It is often agreed in principle that normal production losses should be absorbed in product costs. Abnormal losses should be treated as non-operating expenses in product costs. Abnormal losses should be treated as non-operating expenses by direct debit to Profit and Loss Account. Certain companies follow the practice of computing idle time costs on their leading products by use of statistical techniques. Cost Accountants should particularly analyse the reasons for idle plant and equipment not used during the period for non-controllable causes. The review of practices of different companies reveals that Idle Capacity is a somewhat flexible concept. It is an individual problem which should be considered after taking into account the special situations. For the growth and survival of the organisation, the management is keenly interested to know the idleness, its causes, its cost and its available remedies. Normally different companies follow a bit varying restricted accounting concept of Idle Capacity. In many cases unabsorbed fixed overhead represents losses due to managerial decisions and it becomes a subjective matter to refer it as idle capacity cost. Overhead rates of different capacity levels will be different due to influence of fixed overhead.

Absorption of Overheads

Once the steps of primary and secondary distribution are carried out, what we get is total indirect costs of production departments. The next step is to assign these totals to the individual product units. A job or a product passes through all or many

production departments before it is formed into a finished saleable product. It is necessary to know the cost of each department it passes through per unit. The absorption of overhead enables a Cost Accountant to recover the overhead cost spent on each product department through each unit produced. Overhead absorption is also known as levy or recovery of overheads. How is this done? Suppose in turning department a total of 1200 tubes are turned and the cost of turning department overheads (after secondary distribution) are ₹72000, then can we say the cost of turning per tube is ₹6/-? Most probably yes. This ₹6 per unit is called as *Overhead Absorption Rate*.

Absorption means 'recording of overheads in Cost Accounts on an estimated basis with the help of a predetermined overhead rate, which is computed at normal or average or maximum capacity'

In general, the formula for overhead absorption rate is given as:-

Overhead Rate = Amount of Overhead / No of units of the base

Overhead Absorption Rates: For the purpose of absorption of overhead in costs of jobs, processes, or products overhead rates related to suitable factors or bases to be determined. There are several methods in use for determining the overhead rates i.e Actual or Predetermined Overhead Rate, Blanket or Multiple Rates. Actual Overhead Rate

Actual Overhead Rate is obtained by dividing the overhead expenses incurred during the accounting period by actual quantum on the base selected. Assuming that the rates are worked out on a monthly basis the formula is:-

Overhead Rate = Actual overhead during the month ÷ Value/Quantity of the base during the month

Absorption of overheads based on actual rates may not be adopted due to the following reasons:-

- (a) Actual overhead rate can be computed only after the accounting period is over.
- (b) The incidence of some of the items of expenses like repairs, overhauling, etc is not uniformly spread over all the accounting periods.
- (c) Actual overhead rates do not provide any basis for cost control.

Pre-determined Overhead Rate

Predetermined Rate is computed by dividing the budgeted overhead expenses for the accounting period by the budgeted base (quantity, hours, etc)

Overhead Rate = Budgeted overhead expenses for the period / Budgeted Base for the period

Advantages of Predetermined Overhead Rate

- (a) Enables prompt preparation of cost estimates, quotations and fixation of selling prices.
- (b) Cost data is available to management along with financial data.
- (c) In case of Cost-plus contracts prompt billing is possible through pre-determined recovery rates.
- (d) In concerns having budgetary control system, no extra clerical efforts are required in computing the pre-determined overhead rate.

Blanket (Single) Overhead Rate

A single overhead rate for the entire factory may be computed for the entire

factory. So this is known as factory wide or Blanket Overhead Rate Method.

Blanket Rate = $\frac{\text{Overhead Cost for the factory}}{\text{Total Quantum of the base}}$.

Blanket Rate of overheads may be applied suitable in a small size concerns. Blanket Rates are easy to compute. The use of Blanket Rate of overheads gives erroneous and misleading results, where several products passing through number of different departments. With Blanket Rate of overhead, satisfactory level of managerial control is not possible.

Multiple Rates:

This method is most commonly used to determine the multiple overhead rates, i.e. separate rates:

- (a) For each producing department;
- (b) For each service department;
- (c) For each Cost Centre; and
- (d) For each product line.

The multiple rates are worked out according to the below formula:

Overhead Rate = $\frac{\text{Overhead cost allocated \& apportioned to each product, dept /}}{\text{Corresponding Base}}$

The number of overhead rates a firm may compute would be fixed taking into consideration of two opposing factors viz clerical costs involved and the degree of accuracy level desired

Production Unit Method
Simply put the concept here is to average out the total overheads on total units produced. In a tube manufacturing unit the total overheads are ₹72000 and total tubes processed are 12000. The overhead absorption rate is: $\frac{72000}{12000}$ i.e. ₹6 per tube. If this rate is based on the budgeted costs and number of units, and if the factory now gets an order for 2500 tube processing, the amount of production overheads to be charged to that order will be (2500×6) i.e. ₹15000/-

Percentage of Direct Wages

Under this method, overhead for a job is recovered on the basis of a predetermined percentage of direct wages. This method is used when the component of direct wages is higher. If the overhead to be absorbed is ₹120000 and the direct wages are estimated at ₹800000, the predetermined rate will be calculated as $(\frac{120000}{800000})$ i.e. 15%. If a job is received where direct wages are estimated at ₹9000/- then the production overheads to be absorbed will be 15% of ₹9000 i.e. ₹1350. This method is useful if the direct labour hours can be standardised and the labour rates do not fluctuate too much. However, this method ignores the contribution made by other resources like machinery. The method also ignores the fact that there may be different types or grades of workers and each may cost differently. It also sidelines the fact that most of the production overheads are time-related.

Percentage of Direct Material Cost

Here the absorption rate is expressed as a percentage of direct material cost. This method is useful when the proportion of material cost is very high and that of labour cost is comparatively negligible. It is useful if material grades and rates do not fluctuate too much. If production overhead to be absorbed is ₹2000 and the material cost is expected to be ₹4000, then the absorption rate will be $(\frac{2000}{4000})$ i.e. 50%. Thus 50% of direct material cost. Thus for a job requiring direct material of ₹200, the production overheads to be absorbed will be ₹100 i.e. 50% of ₹200. However, many overhead items bear no relationship with material cost, and also the fact of time dimension of overheads is not taken into account by this method.

Percentage of Prime Cost

This method combines the benefits of direct wages and direct material cost methods as we know prime cost means direct material plus direct wages plus direct expenses. This method could be used when prime cost constitutes a major proportion of the cost and the rates of material & labour are stable. It is needed that the product made is standard product. If the prime cost is expected to be ₹50000 and the production overheads are estimated at ₹2500, then the absorption rate will be 5% of prime cost. If a job has a prime cost of ₹800, then overhead absorbed on that job will be ₹40/-

Direct Labour Hour

Under this method, the absorption rate is calculated by dividing the overhead amount by the actual or predetermined direct labour hours. This is extremely useful when the production is labour intensive. This method is superior to the earlier ones, because it takes cognizance of the time factor. If the direct labour hours for a month amount to 10000 and the overheads to be absorbed are ₹5000, then the absorption rate is ₹0.50 per hour (i.e. $5000/10000$). If a job is going to require a labour time of 250 hours, the production overheads to be loaded on the job will be ₹125 (i.e. $250 * 0.50$). The data related to labour hours has to be properly collected or estimated. The labour hour rate may be calculated as a single rate or different for different group of workers.

Machine Hour Rate

In the days of mechanised production processes, the most relevant rate to be applied is the machine hour rate. This is the rate calculated by dividing the actual or budgeted overhead cost related to a machine or a group of machines by the appropriate number of machine hours. These hours could be actual hours or budgeted hours. When budgeted hours are used they are taken at average capacity at which a factory normally operates. You cannot take full capacity hours as the factory may not operate at that level and then the absorption rate may be unnecessarily fixed at a lower level. The overheads in a highly mechanised factory are mostly related to the number of hours a machine runs. Hence this is supposed to be the best method for absorbing overhead costs into the cost unit. If a machine normally runs for 2000 hours in a month and monthly overheads to be absorbed are ₹15000, then the machine hour rate will be calculated as $(15000/2000)$ i.e. ₹7.50 per machine hour. If a job takes 75 hours on that machine, then ₹562.50 ($75 * 7.5$) will have to be loaded as cost of using the machine for that job.

A machine hour rate may be calculated using only those overheads which are directly related to the machine e.g. power, fuel, repairs, maintenance, depreciation etc. These expenses are totalled and then divided by the hours to compute the rate. This is called as *Ordinary Machine Hour Rate*. Whereas, if costs not related to machine are also included (e.g. supervision, rent, lighting, heating etc.) for the rate calculation, such rate is called as *Composite Machine Hour Rate*. While calculating machine hour rate, the wages paid to machine operators may be added to the total costs. This is because these operators directly work on the machines & thus related to machine operation. At times a factory may have more than one similar machines simultaneously working. In such case, a *group machine hour rate* may be calculated.

Factors influencing the selection of Overhead Recovery Rate

The particular method or methods selected for application in a company would depend upon the factors mentioned below. Selection of the most equitable method is of paramount importance since a method that is not suitable will distort costs and thus make them useless for control and decision making purpose.

Selection of Overhead Recovery Rates depends on the following factors:-

- (a) Nature of the product and process of manufacture.
- (b) Nature of overhead expenses.
- (c) Organisational set-up of the undertaking into departments and or cost centers.
- (d) Individual requirements with regard to the circumstances prevailing.
- (e) Policy of the management.
- (f) Accuracy vis-a-vis cost of operating the method. Some of the methods are comparatively more accurate and provide equitable bases for overhead absorption.

The main features of a satisfactory overhead rate are as follows:-

- (a) Simple, easy to operate, practical and accurate;
- (b) Economic in application;
- (c) Fairly stable so that cost from period to period does not vary;
- (d) Related to time factor as far as practical;
- (e) Departmental rates are preferable to blanket rates;
- (f) Area of activity selected for computation of the rate should be homogeneous cost unit;
- (g) Base for the rate should lay stress on the main production element of the concern.

Under-absorption and Over-absorption of Overhead

The amount of overhead absorbed in costs is the sum total of the overhead costs allotted to individual cost units by application of the overhead rate. When a predetermined rate worked out on the basis of anticipated or budgeted overhead and base is applied to the actual base, the amount absorbed may not be identical with the amount of overhead expenses incurred if either the actual base or the actual expenses or both deviate from the estimates or the budget.

If the amount absorbed is less than the amount incurred, which may be due to actual expenses exceeding the estimate and / or the output or the hours worked may be less than the estimate, the difference denotes under-absorption.

On the other hand if the amount absorbed is more than the expenditure incurred, which may be due to the expense being less than estimate and / or the output or hours worked may be exceeding the estimate, this would indicate over-absorption, which goes to inflate the costs.

Under or over absorption of overhead may arise due to one or the other of the causes given below:-

- (a) Error in estimating overhead expenses.
- (b) Error in estimating the level of production, i.e the base.
- (c) Major unanticipated changes in the methods of production.
- (d) Unforeseen changes in the production capacity.
- (e) Seasonal fluctuations in the overhead expenses from period to period.
- (f) Overhead rate may be applied to the Normal Capacity which may be less than the full operating capacity of the undertaking.

How does one deal with the situation of over or under absorption. There are three ways to handle it:

(a) Write-off (in case of under absorption) or write back (in case of over-absorption) to the P & L

Account. This treatment is valid if most of the overhead items are related to time.

(b) Carry forward to the next period through a reserve account. This method is not recommended on the logic that it is inconsistent with Accounting Standards.

(c) Use of supplementary rates to adjust the effect to the cost of sales, finished stocks

and Work in Process stocks. This sounds logical as it does not carry forward the unabsorbed or over absorbed overheads to the next accounting period entirely. It aims at splitting the total effect between the cost of sale (which is charged to current year's profits) and stocks (which get carried forward to the next year).

Illustration 4

Overhead incurred ₹ 1,50,000
Overhead recovered ₹ 1,00,000
Cost of sales ₹ 10,00,000
Finished goods ₹ 8,00,000
Work in process ₹ 7,00,000

Solution:

Here, the overheads under-absorbed are (1,50,000-1,00,000) ₹ 50,000. Total of Cost of sales, FG stock & WIP is ₹ 25,00,000

The supplementary rate will be $50,000/25,00,000$ i.e. 0.020

This will be distributed as:

₹ 20,000 to cost of sales (i.e. $10,00,000 \times 0.020$)

₹ 16,000 to FG stock (i.e. $8,00,000 \times 0.020$) and

₹ 14,000 to WIP (i.e. $7,00,000 \times 0.020$)

Reporting of overhead costs:

Presentation:

- 1 Overheads shall be presented as separate cost heads like production, administration and marketing.
- 1 Element wise and behavior wise details of the overheads shall be presented, if material.
- 1 Any under-absorption or over-absorption of overheads shall be presented in the reconciliation statement.

Disclosure:

- The basis of assignment of overheads to the cost objects.
- Overheads incurred in foreign exchange.
- Overheads relating to resources received from or supplied to related parties
- Any Subsidy / Grant / Incentive or any amount of similar nature received / receivable reduced from overheads.
- Credits / recoveries relating to the overheads.
- Any abnormal cost not forming part of the overheads.
- Any unabsorbed overheads.

Illustration 5

In an Engineering Factory, the following particulars have been extracted for the quarter ended 31st December, 2015. Compute the departmental overhead rate for each of the production departments, assuming that overheads are recovered as a percentage of direct wages.

Production Depts. Service Depts.

	A	B	C	X	Y
Direct Wages (₹)	30,000	45,000	60,000	15,000	30,000
Direct Material	15,000	30,000	30,000	22,500	22,500
No. of workers	1,500	2,250	2,250	750	750
Electricity KWH	6,000	4,500	3,000	1,500	1,500
Assets Value	60,000	40,000	30,000	10,000	10,000
No. of Light points	10	16	4	6	4
Area Sq. Yards	150	250	50	50	50

The expenses for the period
were:

Power	1,100
Lighting	200
Stores Overhead	800
Welfare of Staff	3,000
Depreciation	30,000
Repairs	6,000
General Overheads	12,000
Rent and Taxes	550

Apportion the expenses of Service Dept. Y according to direct wages and those of Service Department X in the ratio of 5: 3 : 2 to the production departments
Solution:

Statement showing apportionment of overheads and computation of OH rates:

Particulars	Basis	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Material	Actual	45,000	—	—	—	22,500	22,500
Wages	Actual	45,000	—	—	—	15,000	30,000
Power	KWH (4:3:2:1:1)	1,100	400	300	200	100	100
Lighting	Light Points (5:8:2:3:2)	200	50	80	20	30	20
Stores overhead	Materials (2:4:4:3:3)	800	100	200	200	150	150
Welfare of staff	No. of workers (2:3:3:1:1)	3,000	600	900	900	300	300
Depreciation	Assets Value (6:4:3:1:1)	30,000	12,000	8,000	6,000	2,000	2,000
Repair	Assets Value (6:4:3:1:1)	6,000	2,400	1,600	1,200	400	400
General Over-heads	Direct Wages (2:3:4:1:2)	12,000	2,000	3,000	4,000	1,000	2,000

Rent & Taxes	Area (3:5:1:1:1)	550	150	250	50	50	50
		1,43,650	17,700	14,330	12,570	41,530	57,520
Costs of 'X'	5:3:2		20,765	12,459	8,306	(41,530)	—
Costs of 'Y'	2:3:4		12,782	19,173	25,565	—	(57,520)
			51,247	45,962	46,441	—	—

Overhead Rate as % on direct wages A = $[51,247/30,000] \times 100 = 170.82\%$ B = $[45,962/45,000] \times 100 = 102.14\%$ C = $[46,441/60,000] \times 100 = 77.40\%$

Illustration 6

The New Enterprises Ltd. has three producing departments A,B and C two service Departments D and

A. The following figures are extracted from the records of the Co.

Rent and Rates	5,000
General Lighting	600
Indirect Wages	1,500
Power	1,500
Depreciation on Machinery	10,000
Sundries	10,000

The following further details are available:					
	A	B	C	D	E
Floor Space (Sq.Mts.)	2,000	2,500	3,000	2,000	500
Light Points	10	15	20	10	5
Direct Wages	3,000	2,000	3,000	1,500	500
H.P. of machines	60	30	50	10	--
Working hours	6,226	4,028	4,066	--	--
Value of Material	60,000	80,000	1,00,000	--	--
Value of Assets	1,20,000	1,60,000	2,00,000	10,000	10,000
The expenses of D and E are allocated as follows:					
	A	B	C	D	E
D	20%	30%	40%	--	10%
E	40%	20%	30%	10%	--

What is the factory cost of an article if its raw material cost is `50, labour cost `30 and it passes through Departments A, B and C. For 4, 5 & 3 hours respectively.

Solution:

Statement showing apportionment of overheads to departments

Particulars	Basis	Total (₹)	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)
Rent & Rates	Space (4:5:6:4:1)	5,000	1,000	1,250	1,500	1,000	250
Lighting	Light Points (2:3:4:2:1)	600	100	150	200	100	50
Indirect wages	Direct wages (6:4:6:3:1)	1,500	450	300	450	225	75
Power	Horse Power (6:3:5:1)	1,500	600	300	500	100	--
Depreciation	Value of Asset (12:16:20:1:1)	10,000	2,400	3,200	4,000	200	200
Sundries	Direct wages (6:4:6:3:1)	10,000	3,000	2,000	3,000	1,500	500
Wages	Actual	2,000	--	--	--	1,500	500
		30,600	7,550	7,200	9,650	4,625	1,575

Repetitive Distribution Method

Particulars	A	B	C	D	E
Totals	7,550	7,200	9,650	4,625	1,575
Cost of D (2:3:4:1)	925	1,387	1,850	(4,625)	463
	8,475	8,587	11,500	--	2,038
Cost of E (4:2:3:1)	815	408	611	204	(2,038)
	9,290	8,995	12,111	204	--
Cost of D (2:3:4:1)	41	61	82	(204)	20
	9,331	9,056	12,193	--	20
Cost of E (4:2:3:1)	8	4	6	2	(20)
	9,339	9,060	12,199	2	--
Cost of D (2:3:4:1)	--	1	1	(2)	--
	9,339	9,061	12,200	--	--
Working Hours	6,226	4,028	4,066		
Rate per hour	1.5	2.25	3.00		

Computation of Factory Cost of the Article

Particulars	Amount
Material Labour Overheads	50.00
Dept A (4 x 1.5)	30.00
Dept B (5 x 2.25)	6.00
Dept C (3 x 3)	11.25
	9.00
Factory Cost	106.25

Simultaneous Equation Method

Let total cost of service Department D be ` 'd'. Let total cost of Service Department E be ` 'e = 4625 + 10/100 ee = 1575 + 10/100 d

- $100d = 46250 + 10e$
- $100d - 10e = 462500$ □ (1)
- $100e = 157500 + 10d$
- $-10d + 100e = 157500$ □ (2)

$$\begin{array}{rcl}
 \text{Equ. (1)} & 100d - 10e & = 462500 \\
 \text{Equ. (2) x} & -10d + 100e & = 157500 \\
 10 & & \\
 & 990e & = 2037500 \\
 & e & = 2037500 / 990 \\
 & & = 2,058
 \end{array}$$

Substituting the value of 'e' in Equation (1), we get

- $100d - 10(2058) = 462500$
- $d = 483080 / 100$
- $d = 4831$

Particulars	A	B	C	D	E
Totals	7,550	7,200	9,650	4,625	1,575
Costs of D (2:3:4:1) (4831)	966	1,450	1,932	(4,831)	483
Costs of E (4:2:3:1) (2,058)	823	412	617	206	(2058)
	9,339	9,062	12,199	--	--

Illustration 7

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

Material used	36,000
Direct Wages	30,000
Labour hours	12,000
Hours of Machinery-operation	20,000
Overhead Chargeable to the Dept	25,000

On one order carried out in the department during the period the relevant data were:-

Material used (₹)	6,000	
Direct Wages (₹)	4,950	
Labour hours worked	1,650	Hrs.
Machine Hours	1,200	

Calculate the overheads chargeable to the job by four commonly used methods.

Solution:

The four commonly used methods of absorbing or recovering overheads are as follows:

1. % of overheads on material = $(25,000 / 36,000) \times 100 = 69.44\%$
2. % of overheads on direct wages = $(25,000 / 30,000) \times 100 = 83.33\%$
3. Overhead rate per labour hour = $25,000 / 12,000 = 2.083$
4. Machine hour rate method = $25,000 / 20,000 = 1.25$

The overheads chargeable to job under the above methods is as follows:

1. Material = $6,000 \times 69.44\% = 4,166.40$
2. Wages = $4,950 \times 83.33\% = 4,125$
3. Labour hour rate = $1650 \times 2.083 = ₹ 3,437$
4. Machine hour rate = $1,200 \times 1.25 = ₹ 1,500$

Illustration 8

In a machine department of a factory there are five identical machines. From the particulars given below; prepare the machine hour rate for one of the machines.

Space of the department 10,000 sq.mts.

Space occupied by the machine 2,000 sq.mts.

Cost of the machine (₹) 20,000

Scrap value of the machine (₹) 300

Estimated life of the machine 13 years

Depreciation charged at $7\frac{1}{2}\%$ p.a

Normal running of the machine

2,000 hours Power consumed by the machine as shown by the meter 3,000 p.a

Estimated repairs and maintenance throughout the working life of the machine (₹)

5,200 Sundry supplies including oil, waste etc. charged direct to the machine amount to ₹ 600 p.a.

Other expenses of the department are :	₹
Rent and Rates	9,000
Lighting (to be apportioned according to workers employed)	400
Supervision	1,250
Other charges	5,000

It is ascertained that the degree of supervision required by the machine is $\frac{2}{5}$ th and $\frac{3}{5}$ th being devoted to other machines.

There are 16 workers in the department of whom 4 attended to the machine and the remaining to the other machines.

Solution:**Computation of Machine Hour Rate**

Particulars		Rate per hr.
Standing Charges		
Rent & Rates	$9000 \times (2000 / 10000) =$	1800
Lighting	$400 \times (4 / 16) =$	100
Supervision	$1250 \times (2 / 5) =$	500
Other Charges	$5000 \times (1 / 5) =$	<u>1000</u>
	$= 3400$	
Standing charges per hour	$3,400 / 2,000 =$	1.70
Machine Expenses		
Depreciation	$(20000 \times 7.5\%) \div 2,000 =$	0.750
Power	$(3,000 / 2,000) =$	1.500
Repairs & Maintenance	$(5200 / 13) \div 2,000 =$	0.200
Sundry Supplies	$(600 / 2,000) =$	0.300
Machine Hour Rate =		4.45

Illustration 9

From the following particulars given below compute Machine hour rate for a machine.

- Cost ` 24,000
- Scrap value ` 4,000
- Estimated Working life 40,000 hours
- Estimated cost of repairs and maintenance during the whole life ` 2,000
- Standard charges of the shop for 4 weekly period ` 3,000
- Working hours in 4 weekly period 100 hours
- No. of machines in the shop each of which is liable for equal charge are 30 machines.
- Power used per hour 4 units @ 10p. per unit.

Solution:

Computation of Machine Hour Rate

Particulars		Rate per hr.
Standing Charges		
Standing Charges	$[3,000 / (100 \times 30)]$	1.00
Machine Expenses		
Depreciation	$[(24,000 - 4,000) / 40,000] = 0.50$	
Repairs	$[2,000 / 40,000] = 0.05$	
Power	$[4 \times 0.1] = 0.40$	
		0.95
Machine Hour Rate =		1.95

Illustration 10

The following particulars relate to a processing machine treating a typical material. You are required to calculate the machine hour rate.

The cost of the machine ₹ 10,000

Estimated life 10 years

Scrap value ₹ 1,000

Working time (50 weeks of 44 hrs. each) 2,200 hrs. Machine maintenance per annum 200 hrs

Setting up time estimated @ 5% of total productive time

Electricity is 16 units per hour @ 10 paise per unit.

Chemicals required weekly ₹ 20

Maintenance cost per year ₹ 1,200

Two attendants control the operations of the machine together with 6 other machines, their combined weekly wages are ₹ 140. Departmental overhead allocated to this machine per annum ₹ 2,000.

Solution:

Annual Working hours: 50 weeks X 44 hrs.	2,200
Less : Maintenance time	<u>200</u>
Productive hours	2,000
Less : 5% Setting up time	<u>100</u>
Effective hours	<u>1,900</u>

Computation of Machine Hour Rate

Particulars		Rate per hr.
Standing Charges		
Chemical Solution	$(50 \times 20) = 1,000$	
Attendants wages	$(140 \times 50 \times 1/7) = 1,000$	
Departmental overheads	$= \underline{2,000}$ $= \underline{4,000}$	
Rate per hour	$4,000 / 2,200$	1.82

Machine Expenses Depreciation Maintenance Power	$[(10,000 - 1,000)/10] \div 1900 = 0.47$ $(1,200 / 1,900) = 0.63$ $(16 \times 0.1) = 1.60$	2.70
Machine Hour Rate =		4.52

Illustration 11

Your company uses a historical cost system and applies overheads on the basis of “Predetermined” rates. The following are the figures from the Trial Balance as at 30-9-2015:

	Dr. (₹)	Cr. (₹)
Manufacturing overheads	4,26,544	---
Manufacturing overheads-applied	---	3,65,904
Work-in-progress	1,41,480	---
Finished Goods Stock	2,30,732	---
Cost of Goods Sold	8,40,588	---

Give two methods for the disposal of the under absorbed overheads and show the profit implications of the method.

Solution:

Overheads incurred	= 4,26,544
Overheads absorbed	= <u>3,65,904</u>
Under absorption	= <u>60,640</u>

The following are the 3 methods for disposing off this under absorbed overheads:

1. Transferring to the costing P & L A/c under this method, the profit will decrease by ₹ 60,640.
2. The amount may be disposed off by carrying forward to the next year. In this case, there will be no effect on profit.
3. Applying Supplementary Overhead Rate and further absorbing, which may be shown as follows. Under this method also, the profit will decrease by ₹ 60,640.

Supplementary OH Rate = $[60,640 / 12,12,800] \times 100$
= 5%

		Suppl. OH (5%)	Total
Work in Progress	1,41,480	7,074	1,48,554
Finished Goods	2,30,732	11,537	2,42,269
Cost of goods sold	8,40,588	42,029	8,82,617
	12,12,800	60,640	12,73,440

Illustration 12

In a factory the expenses of factory are charged on a fixed percentage basis on wages and office overhead expenses are calculated on the basis of percentage of works cost.

	I Order (°)	II Order (°)
Material	12,500	18,000
Wages	10,000	14,000
Selling price	44,850	61,880
Percentage of profit on cost	15%	12%

Find the rate of Factory OH and Office OH.

Solution:

Let 'X' and 'Y' be the % of Works Overhead on wages and Office Overhead on works cost respectively.

Particulars	Order I	Order II
Material	12,500	18,000
Wages	10,000	14,000
Prime Cost	22,500	32,000
(+) Factory OH's	$(10,000 \times X/100) = 100X$	$(14,000 \times X/100) = 140X$
Works Cost	$22,500 + 100X$	$32,000 + 140X$
(+) Office Overheads $[(100X + 22,500) \times Y/100]$ $[(140X + 32,000) \times Y/100]$	$XY + 225Y$	$1.4XY + 320Y$
Total Cost	$100X + XY + 225Y + 22,500$	$140X + 1.4XY + 320Y + 32,000$
Cost	$44,850 \times (100/115) = 39,000$	$61,880 \times (100/112) = 55,250$

$$100X + XY + 225Y + 22,500 = 39,000$$

$$\square 100X + XY + 225Y = 16,500$$

$$\square \text{Equ. (1)} 140X + 1.4XY + 320Y + 32,000 = 55,250$$

$$\square 140X + 1.4XY + 320Y = 23,250 \quad \square \text{Equ. (2)} \text{Equ. (1)} \times 1.4$$

$$\square 140X + 1.4XY + 315Y = 23,100 \text{Equ. (2)}$$

$$\square 140X + 1.4XY + 320Y = 23,250$$

$$\begin{array}{r} (-) (-) \quad (-) \quad (-) \\ \hline \end{array}$$

$$5Y = 150$$

$$\text{Therefore, } Y = 150/50 = 30$$

$$\text{Substituting the value of Y in Equ. (1), we get } X \quad 100X + 30X + 225 \times 30 = 16,500$$

$$\square \text{Equ. (1)}$$

$$130X + 6750 = 16,500$$

$$130X = 9,750$$

$$X = 9,750/130 = 75$$

$$\% \text{ of Factory OH on wages} = 75\%$$

$$\% \text{ of Office OH on works cost} = 30\%$$

Illustration 13

Self-help Ltd. has gensets and produced its own power Data for power costs are as follows :-

	Production Depts.		Service Depts.	
	A	B	X	Y
Horse Power Hours	10,000	20,000	12,000	8,000
Needed at capacity production used during the month of May	8,000	13,000	7,000	6,000

During the month of May costs for generating power amounted to ₹ 9,300, of this ₹ 2,500 was considered to be fixed. Dept X renders service to other Depts. in the ratio of 13:6:1, while Y renders service at A & B in the ratio of 31:3. Given that the direct labour hours in Depts. A and B are 1,650 hours and 2,175 hours respectively, find the power cost per labour hour in each of these two departments.

Solution:

Statement Showing apportionment of power cost and computation of cost per hour

Particulars	Basis	Total	A	B	X	Y
Fixed Cost	(5:10:6:4)	2,500	500	1,000	600	400
Variable Cost (9,300 – 2,500)	(8:13:7:6)	6,800	1,600	2,600	1,400	1,200
		9,300	2,100	3,600	2,000	1,600
Costs of X [(as it renders to more depts. (3))]	(13:6:1)		1,300	600	(2,000)	100
			3,400	4,200	--	1,700
Costs of Y	(31:3)		1,550	150	--	(1,700)
			4,950	4,350	--	--
Labour Hours			1,650	2,175		
Cost of power per labour hour			3	2		

Illustration 14

At Ltd engineering Co. having 25 different types of automatic machines, furnishes you the following data for 2016-17 in respect of machine B:

- Cost of the machine ₹ 50,000 Life - 10 years Scrap value is nil
- Overhead expenses are:
 Factory Rent ₹ 50,000 p.a.
 Heating and Lighting ₹ 40,000
 Supervision ₹ 1,50,000 p.a Reserve equipment of machine B ₹ 5,000 p.a.
 Area of the factory 80,000 sq.ft.
 Area occupied by machine B 3,000 sq.ft.
- Wages of operator is ₹ 24 per day of 8 hours including all fringe benefits. He attends to one machine when it is under set up and two machines while under

operation.

Estimated production hours 3,600 p.a.

Estimated set up time 400 hrs.
p.a.

Power 0.5 per hour

Prepare a schedule of comprehensive machine hour rate and find the cost of the following jobs:

	JOB 1102	JOB 1308
Set up time (Hrs.)	80	40
Operation time (Hrs.)	130	160

Solution:

Computation of machine hour rate when machine is in operation

Particulars		Amount
Standing Charges:		
Rent	$50,000 \times 3/80 = 1875$	
Heating & Lighting	$40,000 \times 3/80 = 1500$	
Supervision	$1,50,000 \times 1/25 = 6000$	
Reserve equipment	$= \underline{5000}$	
	$= 14375$	
Cost per hour	$14375/4000$	3.59
Machine Expenses:		
Depreciation	$[50,000 \div (10 \times 3600)] = 1.39$	3.39
Wages	$[24/8 \times 1/2] = 1.50$	
Power	$= 0.50$	
Machine Hour Rate		6.98

Computation of machine hour rate when machine is under setup

Particulars		Amount
Standing Charges:		
Rent	$50,000 \times 3/80 = 1875$	
Heating & Lighting	$40,000 \times 3/80 = 1500$	
Supervision	$1,50,000 \times 1/25 = 6000$	
Reserve equipment	$= \underline{5000}$	
	$= 14375$	
Cost per hour	$14375/4000$	3.59

Machine Expenses:		
Depreciation	$[50,000 \times (10 \times 3600)]$	$= 1.39$
Wages	$[24/8]$	$= 3.00$
Power		$= ----$
Machine Hour Rate		7.98

Computation of cost of the jobs

Particulars	Job 1102	Job 1308
Setup cost		
Job 1102 : 80×7.98	638.40	319.20
Job 1308 : 40×7.98		
Operation Cost		
Job 1102 : 130×6.98	907.40	1,116.80
Job 1308 : 160×6.98		
Total Cost of the Job	1,545.80	1,436.00

SELF EXAMINATION QUESTIONS:

1. What is meant by classification of overheads and why it should be attempted?
2. What do you understand by Semi-Variable Overheads? Explain the various methods of segregating Fixed and Variable Overhead Costs.
3. What are the main sources of overhead expenses? State with examples the procedure for such collection from these sources.
4. Define Cost Allocation and Cost Apportionment. Explain fully the distinction between Cost Allocation and Cost Apportionment.
5. Explain the various basis of apportionment of overheads to departments with illustrations as to the items of expenses.
6. Briefly describe two ways of dealing with the problem of apportioning service department costs among service departments which, in addition to do work for the main operational departments, also serve one another.
7. How are the following items treated in Cost Accounts?
 - a. Defectives due to bad workmanship and bad materials.
 - b. Major repairs of a plant to prolong its useful life.
 - c. Labour amenities.
 - d. ESI contribution
 - e. Fringe benefits to workers.
 - f. After sales service cost
 - g. Losses due to obsolescence.
 - h. Lay off wages paid to workers.
8. As a Cost Accountant explain with reasons how would you treat the following items in Cost Accounts:
 - a. Bonus payable under the Payment of Bonus Act, 1965.
 - b. Bad Debts
 - c. Leave Travel Assistance.
 - d. Night Shift Allowance.
9. Explain the terms "Practical Capacity", "Normal Capacity", "Idle Capacity", and "Imbalanced Capacity". With reference to any industry with which you are familiar, how will you measure the effect of Idle Capacity?
10. What is Absorption? What are the various methods of absorbing overheads in

Cost Accounts?

11. What is Under or Over Absorption? What are the causes for Under or Over Absorption?
12. What are the various methods of disposing off under or over absorbed overheads?
13. Write a note on Supplementary Overhead Rate.
14. How to report overhead cost in the cost statement?
15. Explain the nature of administration overheads. How they are apportioned?
16. On what basis would you analyse selling overheads for the purpose of judging the effectiveness of these expenses? "While manufacturing overheads are part of costs, selling overheads are result of policy". Comment.
17. "Management's interest in overheads is not in the method of their absorption but in their behaviour under various conditions of production" As a CMA please throw light on the above statement.