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PG AND RESEARCH DEPARTMENT OF COMMERCE

COST ACCOUNTING

UNIT-I

INTRODUCTION:

The function of any accounting system is to make available necessary information accurately for all parties who are concerned with the welfare of the organisation – owners, employees, creditors, prospective investors and management. The requirements of the majority of them are satisfied by means of the P&L A/C and balance sheet. The management, however, requires far more detailed information than what the conventional financial statements can offer. Its main focus lies not in the past but in the future, as the management is concerned with future and not the past. Cost accounting has primarily developed to meet the needs of management as the management needs much more detailed information than supplied by these financial statements. Cost accounting provides detailed cost information to various levels of management. For efficient performance of their functions. The information supplied by the cost accounting acts as a tool for management, making optimum use of scarce resources and ultimately add to the profitability of business.

WHAT IS MEANT BY COST? (OR) WRITE A SHORT NOTE ON COST (OR) DEFINE COST

Meaning:

The Institute of Cost and Management Accountants (ICMA) now known as the Chartered Institute of Management Accountants, London has defined the term cost, costing, cost accounting and cost accountancy

Definition of cost

“The amount cost (i) actual expenditure incurred on a given thing” and (ii) “notional expenditure attributable to a given thing” according to this definition the term ‘cost’ represents the total of all expenses incurred. Whether paid or due, in the production and sale of a product or expended in rendering a service.

American Institute of Certified Public Accountants defined cost as: “cost is the amount, measured in money, of cash expended or other property transferred capital stock issued, services performed, or liability incurred, in consideration of goods or services received or to be received”.

“Cost represents the resources that have been or must be sacrificed to attain a particular objective”

WHAT IS MEANT BY COSTING? (OR) WRITE SHORT NOTE ON COSTING (OR) EXPLAIN THE TERM COSTING (OR) DEFINE COSTING.

Costing:

“The techniques and processes of ascertaining cost,” the term “technique” refers to the principles and rules that are applied for ascertaining cost of products manufactured and services rendered. The process of costing is the day-to-day affairs of ascertaining costs, whatever the costs ascertained may be and by whatever means these costs are determined.

Costing: accounting for cost which begins.

Costing means determining the cost by any technique or process like memorandum records or formal records based on double entry system. Its cost ascertainment is done by various methods and techniques such as job costing, process costing, unit costing etc., it consists of principles and rules which are used for determining:

- a. The cost of producing a product
- b. The cost of providing a service
- c. The cost of performing an activity.

Definition:

According to CIMA London, Costing is defined as “the technique and process of ascertaining costs”.

Staubus observes “costing is the process of determining the cost of doing something i.e., the cost of manufacturing an article, rendering a service or performing a function.”

Wheldon has defined costing as “ the classifying ,recording and appropriate allocation of expenditure for the determination of the costs of products or services; the relation of these costs to sales value; and the ascertainment of profitability.”

NEED FOR COST ACCOUNTING:

Cost accounting is the recent development born in response to the needs of managerial personnel for detailed information about the cost of a product or unit of service. In the initial stages of evolution , cost accounting confined itself to the accumulation of historical costs and presentation of the same for the sole purpose of cost finding or product costing.with the passage of time ,however the scope of cost accounting was broadened and provisions of informations for cost control and cost reducvtion became more important than product costing.

Cost accounting is necessary for the achievement of the following objectives or purposes:

- (a) Cost ascertainment
- (b) Cost control
- (c) Decision making
- (d) Fixation of selling price.

WHAT IS MEANT BY COST ACCOUNTING? (OR) WRITE A SHORT NOTE ON COSTING ACCOUNTING (OR) DEFINE COST ACCOUNTING. (OR) HOW COST ACCOUNTING HAS BEEN DEFINED.

Cost accounting is the process of accounting for cost which begins with the recording of income and expenditure, on the basis of which they are calculated and ends with the preparation of periodical statements and reports for ascertaining and controlling costs”

Definition:

According to ICMA, “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 centers and costs 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.”

WHAT ARE THE PRINCIPLES OF COST ACCOUNTING?

According to the definition given by the official terminology. Costing is the process of determining the cost of products, services or activities. “This process is however, subject to the following principles:

- (a) Recording
 - (b) Incurring
 - (c) Conservatism
 - (d) Abnormal loss
 - (e) Past cost
1. Recording:- for purposes of costing, it is necessary to relate or record cost as closely as possible ,to causes giving rise to those costs.
 2. Incurring:- it is equally necessary that cost should not be charged or added until the same are incurred. In valuing closing stock, for instance selling and distribution cost should not be included.
 3. Conservatism: the concept of conservatism need not be given any recognition. Closing stock should be valued at lower of historical cost or net realizable value.
 4. Abnormal loss:- abnormal losses or costs should be excluded from the purview of cost accounting.
 5. Past costs:- all past cost, from which no benefit is expected in future should be excluded.

WHAT IS MEANT BY COST ACCOUNTANCY? (OR) EXPLAIN THE TERM COST ACCOUNTANCY (OR) DEFINE COST ACCOUNTANCY.

“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“.according to this definition

, the term cost accountancy includes (i) costing and cost accounting (ii) accumulation , analysis and interpretation of cost data for internal use –for planning , control and decision making (iii) the function of keeping costs within prescribed limits , using techniques such as standard costing , budgetary control etc.,

Definition:

According to CIMA cost accountancy is defined as “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.

EXPLAIN THE SCOPE OF COST ACCOUNTING (OR) DISCUSS THE SCOPE OF COST ACCOUNTING. (OR) WHAT IS THE SCOPE OF COST ACCOUNTING?

The term scope refers to field of activity .cost accounting is concerned with ascertainment and the control

of costs. The information provided to the management is helpful for cost control and cost reduction through functions of planning, decisions 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 the 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, local authorities ,farms ,extractive industries etc.,

Discuss the advantages of cost accounting:-

Cost accounting is the very valuable tool of planning and control. It offers a number of advantages of cost accounting.

EXPLAIN THE IMPORTANT OBJECTIVES OF COSTING ACCOUNTING. (OR) STATE THE OBJECTIVES OF COST ACCOUNTING. (OR) DISCUSS THE OBJECTIVES OF COST ACCOUNTING.

The major objectives of cost accounting are cost ascertainment, furnishing of cost data for decision making and control of cost. The cost objectives are listed below:

1. To find out the total cost and cost per unit of various products manufactured;
2. To disclose the proportion of different elements in the total cost
3. To provide necessary data for fixing the selling price;
4. To ascertain the profitability of each product and advise the management as to how these profits can be maximised.
5. To supply estimates of cost, on the basis of historical data, for the preparation of tenders,quotations etc.,
6. To present important cost data to the management for decision making, planning, and control.
7. To adopt a suitable system of inventory control to avoid excessive locking up of the working capital in stocks.

8. To identify the sources of wastages and losses in the business.
9. To formulate incentive bonus plan and implement them to improve labour productivity and reduce cost.
10. To exercise effective control on the idle times of men and machines.
11. To help in the preparation of budgets and implementation of budgetary control.
12. To compare the actual cost with the standard cost and analyse the causes of variance.
13. To supply useful data to the management to take vital decisions such as introduction of new products, replacements of labour machines etc;
14. To advise the management on future expansion policies and proposed capital projects.

WHAT ARE THE FEATURES OF COST ACCOUNTING?

- It is a formal system of accounting by means of which costs of products, services or activities are ascertained and controlled.
- It provides information to management for proper planning, operation, control and decision making
- It relates to transactions connected with the manufacture of goods or services
- Deals partly with facts and figures partly with estimates.
- It is not only positive but also a normative science

WHAT ARE THE ADVANTAGES OF COST ACCOUNTING? (OR) EXPLAIN THE MERITS OF COST ACCOUNTING. ENUMERATE THE ADVANTAGES OF COST ACCOUNTING TO THE MANAGEMENT AND TO THE EMPLOYEES.

Cost accounting is the very valuable tool of planning and control. It offers a number of advantages of cost accounting.

ADVANTAGES:-

1. HELPS IN DECISION MAKING:- It provides vital information for the necessary decision making such as

- a. whether to make a product or buy a product?
- b. whether to accept or reject an export order?
- c. how to utilise the scarce materials profitably?

2. HELPS IN FIXING A PRICES:-

Cost accounting helps in fixing prices . it provides detailed cost data of each product which enables fixation of selling price. cost accounting provides basic information for the preparation of the tenders , estimates and quotations.

3.FORMULATION OF FUTURE PLAN:- cost accounting is not a post mortem examination .it is a system of foresight .on the basis of past experience, it helps in the formulation of definite future plans in quantitative terms. Budgets are prepared and they give direction to the enterprise.

4. AVOIDANCE OF WASTAGE:- cost accounting reveals the sources of losses or inefficiencies such as spoilage ,leakage, pilferage, inadequate utilisation of the plant etc., by appropriate control measure ,these wastage can be avoided or minimised.

5.HIGHLIGHTS CAUSES:- the exact cause of an increase or decrease in profit or loss can be found with the aid of accounting. for instance it is possible for the management to know whether the profits have decreased due to an increase in labour cost or material cost or both.

6. REWARD TO EFFICIENCY:- cost accounting introduces bonus plan and incentive wage system to suit the needs of the organisation. These plans and system reward efficient workers and improve the productivity as well as improve the morale of the work force.

7. PREVENTION OF FRAUD :- cost accounting envisages sound system of inventory control, budgetary control and standard costing. Scope for manipulation and fraud is minimised.

8. IMPROVEMENT IN PROFITABILITY:- cost accounting reveals unprofitable products and activities .management can drop those product and eliminate unprofitable activities. The resource released from unprofitable products can be used to improve the profitability of the business.

9. PREPARATION OF FINAL ACCOUNTS:-cost accounting provides for perpetual inventory system.it helps in the preparation of interim p&l a/c and balance sheet without physical stock verification.

10.FACILITATES CONTROL:- cost accounting includes effective tools such as inventory control,budgetary control , and variance analysis by adopting them, the management can notice the deviation from the plans. Remedial action can be taken quickly.

EXPLAIN THE LIMITATIONS OF COST ACCOUNTING (OR) WHAT ARE THE DEMERITS OF COST ACCOUNTING? (OR) STATE THE OBJECTIVES OF COST ACCOUNTING.

Cost accounting has become indispensable tool to management for exercising effective decisions. The following are the objectives of cost accounting.

1. COSTLY TO OPERATE:

One of the objectives against cost accounting is that it involves heavy expenditure to operate; installation of costing system is also expensive. The benefits derived are less, compared to the expenses incurred.

2. COST ACCOUNTING IS UNNECESSARY:

It is help by a few that cost accountings is of recent origin and an enterprise can survive without cost accounting. Even today, some companies are doing well without cost accounting. Hence, it is unnecessary.

3. NOT APPLICABLE TO ALL TYPE OF INDUSTRIES:

Through a single cost accounting system may not be applicable to all industries but a costing system may be specially designed to meet the needs of a specific industry.

4. IT IS BASED ON ESTIMATIONS:

Some people claim that costing system relies on predetermined data and therefore it is not reliable. It estimators costs scientifically based on past and present situations and with suitable modifications for the future

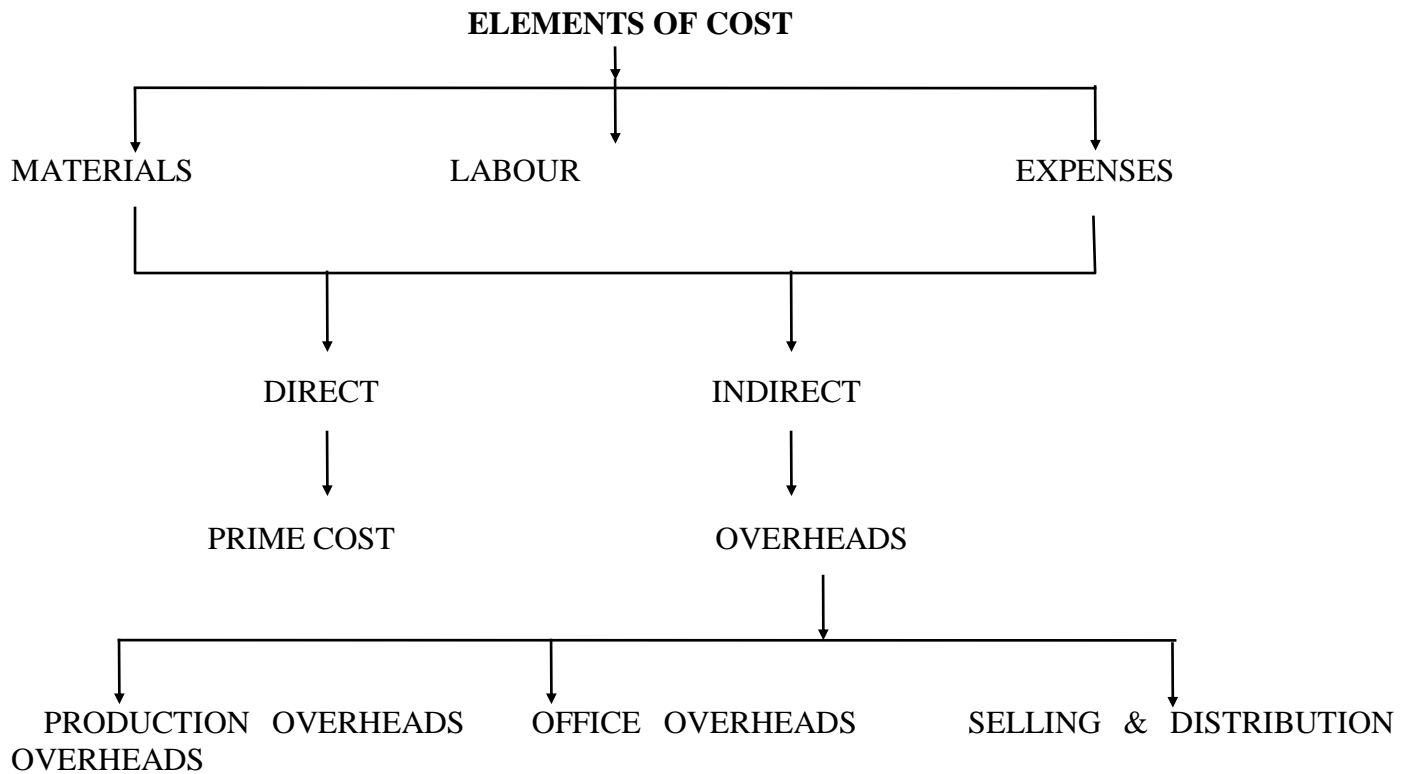
5. TOO MUCH OF PAPER WORK:

A large number of forms and statements are to be sent as a matter of routine. It involves reporting of cost data to the management. As a result, there is a lot of unwanted paper work.

WHAT ARE THE ELEMENTS OF COST? OR EXPLAIN THE MAJOR COMPONENTS OF COST? GIVE A FEW EXAMPLES OF EACH.

Total cost of a product is composed of three elements a. material b. labour and c.expenses. each of these elements may be further divided into two parts – direct and indirect costs.

The various elements of cost may be illustrated as below:



Direct costs:

Direct costs are those costs which can be identified with and allocated directly to a particular product, process or job. These costs are known as prime cost.

Indirect costs:

Indirect costs are those costs, which cannot be allocated but can be apportioned to or absorbed by a particular product, process or job. These costs are known as overheads

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

Prime cost = Direct material + Direct Labour + Direct expenses

Factory cost = Prime cost + Factory overheads

Cost of production = Factory cost + Administrative Overheads

Cost of Sales = Cost of production + Selling and Distribution overheads

The elements of cost are explained below:

Materials:

The substance from which the products are made are known as materials. They can be direct or indirect.

Direct Materials:

Direct materials are those materials, which form a part of the finished product. These materials cost can be conveniently identified with and allocated to a particular product, process or job. It is a part of the prime cost. Eg: Timber in furniture making, cloth in dress making, leather in shoe making, bricks in building a house...

Indirect Materials: Indirect materials are those materials, which do not form a part of the finished product. Cost of indirect materials cannot be identified with and allocated but can be apportioned to a particular product, process or job.

E.g. Cotton waste, lubricant, grease, small tools etc.

Labour:

For conversion of raw materials into finished product human effort is needed. Such human effort is called labour. Labour can be direct as well as indirect.

Direct Labour:

Direct labour is that labour which is directly engaged in the production of goods or services. The wages of such labour are known as direct wages. These labour cost or direct wages can be identified with and allocated to a particular product, process or job. It is a part of the prime cost.

Indirect Labour:

Indirect labour is that labour which is not directly engaged in production of goods or services. It directly helps the direct labour engaged in production. The wages paid for indirect labour is known as indirect wages. Indirect wages cannot be identified with and allocated but can be apportioned to a particular product, process or job. E.g. Wages of mechanics, supervisors, watchman, sweepers, time-keepers etc.

Expenses:

Expenses may be direct or indirect.

Direct or Chargeable expenses:

All expenses (other than direct material cost or direct wages) that are directly charged to production are direct expenses. It is a part of the prime cost. E.g. Excise duty, royalty on production, cost of special drawings and designs, architect's fees, hire charges of special tools or equipments for a particular job etc.

Indirect Expenses:

Expenses (other than indirect material and indirect labour) that are not directly charged to production are indirect expenses. It can be classified as follows:

a. Factory Overheads:

These are also called manufacturing overheads or works overheads or works on cost. Factory overheads cover all indirect expenses incurred from the stage of raw materials to finished goods. It includes indirect material, indirect wages and indirect expenses.

E.g. Factory rent, supervisor's salary, power and fuel, heating and lighting, depreciation on factory building,

b. Administrative Overheads:

These are expenses incurred for running the administrative office E.g. Office rent and salaries, printing and stationery, legal expenses, telephone expenses etc.

c. Selling Overheads:

These are expenses incurred for actual sales and promotion of sales.

E.g. Salaries of sales manager, commission, travelling expenses of salesman, and promotion expenses like advertising and publicity, after sales services etc.

d. Distribution overheads:

These are expenses concerned with the packing and delivery of goods to the customers.

E.g. Packing charges, warehouse expenses, depreciation of delivery van, loading charges etc.

HOW WILL YOU CLASSIFY THE COSTS? OR EXPLAIN THE VARIOUS CLASSIFICATIONS OF COSTS.

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

1. According to elements
2. According to functions
3. According to nature
4. According to controllability
5. According to normality
6. According to relevance to decision making and control

I. Cost classification according to elements

Based on elements, cost is classified into material, labour and expenses. They are subdivided into direct and indirect material, labour and expenses. The total direct cost is termed as prime cost. Indirect material, indirect labour and indirect expenses. Together are termed as indirect or overheads. An overhead is sub divided into factory overheads and selling and distribution of these is done later.

(1) Materials

Cost of tangible, physical input used in relation to output/production; e.g., cost of raw materials, consumable stores, maintenance items etc.

(2) Labour

Cost incurred in relation to human resources of the enterprise; e.g., wages to workers, salary to office staff, training expenses etc.

(3) Expenses

Cost of operating and running the enterprise, other than materials and labour; this is the residual category of costs. E.g., Factory rent, office maintenance, salesmen salary etc.

II. Cost classification according to function

Here the classification is under four major functions

(1) Production cost:-

The cost of sequence of operations which begins with supplying materials, labour and services and ends with primary packing of the product-ICMA

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

(2) Administration cost:-

“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-ICMA”.

(3) Selling cost:-

Selling cost is the cost of seeking to create and stimulate demand and of securing orders. These are sometimes called marketing costs. Some examples are advertisement, salesmen remuneration, showroom expenses, cost of samples etc.

(4) Distribution cost:-

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.-ICMA

III. Cost classification according to variability/nature

(1) Fixed cost:- Fixed cost is “A cost which tends to be unaffected by variations in volume of output”. Fixed cost depend mainly on the effluxion of time and do not vary directly with volume or rate of output. Fixed cost are sometimes referred to as period cost in systems of direct costing”-ICMA

(2) Variable cost

Variable cost is “a cost which tends to vary directly with volume of output. Variable cost are sometimes referred to as direct cost in systems of direct costing”-ICMA.

(3) Semi-Variable cost

Costs are those which are partly fixed and partly variable.

IV. Cost classification according to controllability:

(1) Controllable cost

This is the cost which can be influenced by the action of a specified member of an undertaking. E.g., direct material, direct labour etc.

(2) Uncontrollable cost

This is the cost which cannot be influenced by the action of any specified member of an undertaking. E.g., rent, rates, taxes insurance, etc.

V. Cost classification on the basis of relationship:

(1) Direct costs:

Costs which are directly related to / identified with / attributable to a cost centre or a cost unit is known as direct cost. E.g., Cost of basic raw material used in the finished product, wages paid to site labour in a construction contract etc.

(2) Indirect costs:

Costs which are not directly identified with a cost centre or a cost unit is known as indirect cost. Such costs are apportioned over different cost centres using appropriate basis. E.g., Factory rent incurrent over various departments; salary of supervisor engaged in overseeing various construction contracts etc.

VI. Cost classification according to capital and revenue expenditure:

(1) Capital costs are those costs incurred in the acquisition of assets, either to earn income or increase the earning capacity of the business. For example, cost of plant, machinery etc.

(2) Revenue costs are those costs incurred to maintain the earning capacity of the firm. In costing, only revenue expenditure is taken into account while capital cost is ignored.

VII. Cost classification on the basis of normality:

(1) Normal cost:

Costs which can be reasonably expected to be incurred under normal, routine and regular operating conditions is known as normal cost.

(2) Abnormal cost:

Cost over and above normal cost; which not incurred under normal operating conditions e.g, fines and penalties.

VIII. Cost classification according to managerial decision:

(1) Relevant costs

(a) Marginal cost:

Marginal cost is the total variable cost i.e. prime cost plus variable overheads. Marginal cost is a relevant cost for decision as this cost will be incurred in future for additional units of production.

(b) Differential cost:

It is the change in costs due to change in the level of activity or pattern or method of production.

(c) Opportunity cost:

This refers to the value of sacrifice made or benefit of opportunity foregone in accepting an alternative course of action.

(d) Out-of-Pocket costs:

These are costs which entail current or near future outlays of cash for the decision at hand as opposed to costs which do not require any cash outlay such as depreciation. Such costs are relevant for decision-making, as these will occur in near future.

(e) Replacement cost:

It is the cost at which there could be purchase of an asset or material identical to that which is being replaced or revalued.

(f) Imputed costs:

These are notional costs appearing in the cost accounts only e.g. Notional rent charges, interest on capital for which no interest has been paid.

(2) Irrelevant costs:

(a) Sunk cost:

It is a cost which has already been incurred or sunk in the past. It is not relevant for decision-making and is caused by complete abandonment as against temporary shut-down.

(b) Committed cost:

A cost which has been already committed by the management is not relevant for decision-making.

(c) Absorbed fixed cost:

Fixed costs which do not change due to increase or decrease in activity is irrelevant for decision-making. However, if fixed costs are specific, they become relevant.

DISTINGUISH BETWEEN FINANCIAL ACCOUNTING AND COST ACCOUNTING. (OR) WHAT ARE THE DIFFERENCE THAT EXISTS BETWEEN FINANCIAL ACCOUNTING AND COST ACCOUNTING?

Distinguish between cost accounting and financial accounting:

s.no	Basis	Financial accounting	Cost Accounting
1	Purpose	The main purpose of financial accounting is to prepare p&L a/c and balance sheet for reporting to owners or share holders and other outside agencies ie., external users.	The main purpose of cost accounting is to provide detailed cost information to management. Ie., internal users.
2.	Statutory requirements	These accounts are obligatory to be prepared according to the legal requirements of companies act and income tax act	Maintenance of these accounts is voluntary except in certain industries where it has been made obligatory to keep cost records under the companies act.
3.	Analysis of cost and profit	Financial accounts reveal the profit and loss of the business as a whole for a particular period. It does not show the figures of cost and profit individual products, departments and processes	Cost accounts show the detailed cost and profit data for each product line, department, process, etc.,
4.	Periodicity of reporting	Financial reports (profit and loss account and balance sheet) are prepared periodically, usually on a normal basis	Cost reporting is a continuous process and may be on daily, weekly, monthly basis etc.,
5.	Control aspect	It lays emphasis on the recording of financial transactions and does not attach importance to control aspect	It provides for a detailed system of controls with the help of certain special techniques like standard costing and budgetary control.
6.	Historical and predetermined costs	It is concerned almost exclusively with historical records. the historical nature of financial accounting can be easily understood in the context of the purposes for which it was designed.	It is concerned not only with historical cost but also with pre-determined costs. This is because cost accounting does not end with what has happened in the past. It extend to plans and policies to improve performance in the future.
7.	Format of presenting information	Financial accounting has a single uniform format of presenting information ie., profit and loss account, balance sheet and cash flow statement	Cost accounting has varied forms of presenting cost information which are tailored to meet the needs of management and thus lacks a uniform format.
8.	Types of transactions	Financial accounting records only external transactions like sales, purchases,	Cost accounting not only records external transactions but also internal

	recorded.	receipts,etc., with outside parties. It does not record internal transactions	or inter-departmental transactions like issue of materials by store keeper to production departments.
9.	Type of statements prepared	It prepares the general performance statement like profit and loss account, balance sheet.that is to say that financial accounting must produce information that is used by many classes of people , none of whom have explicitly defined informational needs	It generates special purpose statements and reports like report on loss of materials ,idle time report, variance,report etc., cost accounting identifies the user ,disusses his problems his problems and needs and provides tailored information

WHAT ARE THE METHODS OF COSTING?/ BRIEFLY EXPLAIN THE METHODS OF COSTING?

1. Job costing:

Under this method, the cost of each job is ascertained separately. It implies that the direct cost of each job is traceable and identifiable. It is suitable in all cases where work is undertaken on receiving a customer's order/assignment. Some examples are: printing press, motor workshop etc.

2. 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 is identified with it. The contracts may take a long time for completion. It is also known as terminal costing.

3. Batch costing:

It is an extension of job costing. It is used where the output under a particular work order consists of similar units. It may not be economically feasible to ascertain cost per unit. Hence a collection or lot of units called a batch is taken for cost ascertainment purposes. Each batch is treated as a unit of cost and thus separately costed.

4. Multiple costing:

It represents a combination of two or more methods of costing outlined above. For example, if a firm manufactures bicycles including its components; the parts will be costed by batch costing system but the cost of assembling the bicycle will be computed by the single or output costing method. The whole system of costing is known as multiple costing.\

5. Process costing and operation costing:

The cost of completing each stage of work is ascertained, like cost of making pulp and cost of making paper from pulp. In mechanical operations, the cost of each operation may be ascertained separately; the name given is operation costing.

6. Single or output costing:

Cost is ascertained for a product, the product being the only one produced like bricks, coals etc.

7. Operating or service costing:

Ascertainment of cost of rendering or operating a service is called service costing or operating costing. It is used in the case of concerns rendering services like transport, cinema, hotels, etc., where there is no identifiable tangible cost unit.

DIFFERENCES BETWEEN COST ACCOUNTING AND MANAGEMENT ACCOUNTING.

S. no	Cost accounting	Management accounting
1.	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.
2.	Cost accounting is developed and improved out	Management accounting is conceived out of

	of financial accounting.	cost accounting.
3.	Cost accounting suggests to the management the best of the alternative by use of different costing techniques.	Management accounting considers cost as well as non cost techniques and information for deciding upon alternatives.
4.	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 unfavourable variances.

HOW DO YOU INSTALL THE COST ACCOUNTING SYSTEM? OR BRIEFLY EXPLAIN THE INSTALLATION OF COST ACCOUNTING?

The following steps should be taken at the time of introducing a costing system in an organization:

1. The nature of business and the process of operations carried on should be studied.
2. The costing system should be designed in such a manner to suit the specific requirements of the business.
3. The degree of accuracy desired and frequency and regularity of supplying cost data to the management should also be determined before designing the costing system.
4. The system of costing should be simple and easily understood by the operators.
5. Before it is put into effect, its benefits should be clearly explained to all the people connected with it to obtain their co-operation.
6. It should be introduced gradually and smoothly without much disturbance to the existing organization.
7. The relative profitability of the amount to be spent and the benefits to be obtained from the introduction of a costing system should also be considered.
8. The cost department should function independently. It should have easy access to the other departments which helps it to understand their problems and to take corrective action.

WRITE SHORT NOTES ON THE FOLLOWING:

(1) Costing system:

The term costing system refers to an accounting system followed to accumulate cost of product or jobs, to prepare cost information using some procedures and principles for recording of cost data.

(2) Cost unit:

It is a unit of production, service or time or combination of these, in relation to which costs may be ascertained or expressed. It should be one with which expenditure can be most readily associated. Cost units differ from one business to the other. They are usually units of physical measurement like number, weight, area, volume, time, length and value.

(3) Profit centre: Profit centre is a centre whose performance is measured in terms of income earned and cost incurred. It is created for evaluating performance of a division.

(4) Cost centre:

It is defined as –

A location – E.g. Chennai factory, Calcutta factory etc.

A person – E.g. Sales manager A, B etc.

An item of equipment – E.g. Machinery X, Y or Process I, II etc.

Or a group of these, for which cost may be ascertained and used for the purpose of cost control.

(5) Cost control:

It is defined as the guidance and regulation by executive action of costs of operating an undertaking. It is exercised through numerous techniques like standard costing, budgetary control, inventory control, quality control etc.

(6) Cost reduction:

It is concerned with reducing costs. It is a continuous process. The advantages are:

1. Reasonable price for the customers
2. Continuous employment for the workers
3. Increase in productivity
4. Expected return on capital
5. Prosperity of the industry
6. Economic use of resources
7. Increased credit worthiness etc.

(7) Allocation:

Allocation means charging of expenses to a department, cost centre, process, cost unit or operation. It is the process by means of which all cost incurred for a particular cost centre or cost unit are fully charged to it. For example, salary of the foreman in a factory can be fully allocated to the production department.

(8) Apportionment:

Apportionment means charging of a proportionate amount of overhead to a cost centre or cost unit on an appropriate basis. It is the process by means of which expenses are indirectly charged and distributed to the cost centre or cost unit i.e., they cannot be directly allocated to them.

For example, factory manager’s salary or rent of factory building cannot be directly allocated to any product or department, but they are apportioned to the department on an appropriate basis.

WHAT IS COST SHEET? WHAT ARE THE PURPOSES OF COST SHEET?

Cost Sheet:

It is a statement showing the total cost of a product or job in detail. It also shows the various elements of cost and cost per unit.

Purposes of cost sheet:

- To fix up the selling price
- To determine the estimated prices for tenders or quotations
- To enable the manufacturer to control and minimize the cost
- To formulate the production policies

WRITE A NOTE ON TENDER OR QUOTATION.

Generally, producers are required to give tender or quotation for the supply of goods manufactured by him or for completing the job. While granting such tender or quotation the following factors are kept in mind:

1. Past cost figures, Variations in cost in the current period, Expected profit margin, Competition in the field.

Since the lowest tender is accepted by the intending buyer, the producer has to carefully take into consideration the above factors. The preparation of tender takes the form of a cost sheet. Sheet includes estimated materials, wages, overheads and expected profits.

WHAT IS THE PERFORMA OF THE COST SHEET?

SPECIMEN FORM OF SIMPLE COST SHEET (Without stocks)

Particulars	Total Rs.	Cost per unit Rs.
Direct material	xxxx	xxx
Direct Labour / wages	xxxx	xxx
Direct expenses / Chargeable expenses	xxxx	xxx
PRIME COST	xxxx	xxx

Add: Production / Factory / Works overheads	XXXX	XXX
FACTORY COST	XXXX	XXX
Add: Office & Administration overheads	XXXX	XXX
COST OF PRODUCTION	XXXX	XXX
Add: Selling & distribution overheads	XXXX	XXX
COST OF SALES OR TOTAL COST	XXXX	XXX
PROFIT / LOSS	XXXX	XXX
SALES	XXXX	XXX

SKETCH OUT THE SPECIMEN FORM OF COMPREHENSIVE COST SHEET (WITH STOCKS)?

SPECIMEN FORM OF COMPREHENSIVE COST SHEET (With stocks)

Particulars	Rs.	Rs.
<u>Direct material consumed:</u>		
Opening stock of raw material	XXXXXX	
Add: Purchases	XXXXXX	
Carriage inwards	XXXXXX	
Transit insurance	XXXXXX	
Expenses on purchase	XXXXXX	
Less: closing stock of raw material	<u>XXXXXX</u>	XXXXXX
Direct labour / wages		XXXXXX
Direct expenses / chargeable expenses		XXXXXX
PRIME COST		XXXXXX
Add: <u>Production/ Factory/ Works overheads</u>	XXXXXX	
Indirect materials	XXXXXX	
Indirect wages	XXXXXX	
Factory rent	XXXXXX	
Factory lighting and heating	XXXXXX	
Factory rates	XXXXXX	
Power and fuel	XXXXXX	
Repairs and maintenance	XXXXXX	
Drawing office expenses	XXXXXX	
Research and experiment cost	XXXXXX	
Depreciation of factory plant	XXXXXX	
Works stationery	XXXXXX	
Insurance of factory	XXXXXX	XXXXXX
Factory managers salary		
Add: Opening stock of work in progress		XXXXXX
Less: Closing stock of work in progress		XXXXXX
FACTORY COST		XXXXXX
Add: <u>Office and Administration overheads</u>		

Office salary	XXXXXX	
Office rent and rates	XXXXXX	
Cleaning expenses	XXXXXX	
Telephone and postages	XXXXXX	
Printing and stationery	XXXXXX	
Depreciation of office furniture	XXXXXX	
Depreciation of office equipment	XXXXXX	
Insurance	XXXXXX	
Legal expenses	XXXXXX	XXXXXX
COST OF PRODUCTION		XXXXXX
Add: Opening stock of finished goods		XXXXXX
Less: Closing stock of finished goods		XXXXXX
COST OF GOODS SOLD		XXXXXX
Add: <u>Selling and Distribution overheads</u>		
Advertising	XXXXXX	
Salesman's salaries	XXXXXX	
Samples and free gifts	XXXXXX	
Sales office rent	XXXXXX	
Sales promotion expenses	XXXXXX	
Packing and demonstration	XXXXXX	
Showroom rent and rates	XXXXXX	
Commission	XXXXXX	
Travelling expenses	XXXXXX	
Warehouse rent and rates	XXXXXX	
Repairs of delivery van	XXXXXX	
Carriage / freight output	XXXXXX	XXXXXX
COST OF SALES OR TOTAL COST		XXXXXX
PROFIT / LOSS		XXXXXX
SALES		XXXXXX

COST OF PRODUCTION		XXXXXX
Add: opening stock of finished goods		XXXXXX
Less: closing stock of finished goods		XXXXXX
COST OF GOODS SOLD		XXXXXX
Add: <u>Selling And Distribution Overheads:</u>	XXXXXX	
Advertising	XXXXXX	
Salesman's salaries	XXXXXX	
Samples and free gifts	XXXXXX	
Sales office rent	XXXXXX	
Sales promotion expenses	XXXXXX	
Packing and demonstration	XXXXXX	
Showroom rent and rates	XXXXXX	
Commission	XXXXXX	
Travelling expenses	XXXXXX	

Warehouse rent and rates	XXXXX	
Repairs of delivery van	XXXXX	XXXXX
Carriage / freight output		
COST OF SALES SOR TOTAL		XXXXXX
COST		XXXXXX
PROFIT /		
LOSS		
SALES		XXXXXX

UNIT I PROBLEMS

Simple cost sheet

1. The following details are obtained from the books of ganesh ltd., for the quarter ended 31-3-99 ascertain the direct material consumed for the period.

Material purchased- 4, 48,000.

Import duty on material purchased – 38,000.

Stock of material 1.1.99 - 1, 62,000.

Carriage on material purchased – 40,000.

Stock of material on 31.3.99 – 1,46,000.

Realization from material scrap – 14,000.

2. From the following information calculate the cost of direct material consumed

Direct material purchased- 80000.

Cost of material sold (due to unsuitability)- 1000

Material returned to suppliers(defective material)-2000

Sale of direct material scrap-1000

Closing stock of material-10000

Opening stock of material-8000

Octroi and custom duties-6000

Carriage inwards-2000

3. Ascertain prime cost from the following:

Direct wages-50000

Chargeable expenses-5000

Opening stock of raw material-10000

Raw materials bought during the period-60000

Closing stock of raw materials-20000

Carriage inward-1500

Carriage outward-2000

Raw materials returned to supplier-1500

4. prepare a cost sheet from the following details

raw material consumed-80000.

Wages-20000

Work expenses are charged at 100% of wages, office overhead is charged at 25% on work cost, and selling overhead at 10% on work cost.

5. In a factory 20000 units of a product “A” were manufactured in the month of july 1990 from the following figures obtained from the costing records. Prepare a cost sheet showing cost per unit.

Opening stock of raw material-5000

Purchases-55000

Closing stock of raw material-10000
Direct wages-25000
Factory overheads-40000
Office and administration overheads-20000

6. A factory produces 100 units of a commodity. The cost of production is

Direct materials -10000

Direct wages-5000

Direct expenses-1000

Factory overhead 125% on wages .office overhead 20% on work cost. expected profit 25% on sales

Calculate the price to be fixed per unit

7. A factory produces 100 units of a commodity the cost of production is

Direct materials-10000

Direct wages-5000

Direct expenses-1000

Factory overheads -6500

Administrative overheads-3480

If profit of 25 % on sales is to be realized, what would be the selling price of each unit of the commodity. Prepare the cost sheet.

Cost sheet –with details of overheads:

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

Stock of material 1.1.94-47000

Stock of material 31.12.94-50000

Material purchased-208000

Office salary(drawing)-9600

Counting house salaries-14000

Carriage inwards -8200

Carriage outwards-5100

Cash discount allowed -3400

Bad debts written off -4700

Repairs to plant & machinery-10600

Rent rates etc., factory-3000

Rent rates etc office-1600

Travelling expense-3100

Travelling commission-8400

Production wages-140000

Depreciation plant & machinery-7100

Depreciation office furniture-600

Director fees-6000

Gas and water charges- factory-1500

Gas and water charges –office-300

General charges-5000

Manager's salary-12000

Out of 48 hours in a week , the time devoted by the manager to the factory and to the office was an average 40 hours and 8 hours respectively , throughout the accounting year.

9. Prepare a statement giving the following information (a) prime cost (b) factory cost, factory on cost as a percentage of the production wages.(c) general on cost as a percentage of factory cost and (d) total cost.

Particulars	rs	Particulars	Rs
Direct wages	150000	Direct material	500000
Power	2500	Oil& water	2500
Store keeper's wages	5000	Transfer to general reserve	5000
Factory rent	25000	Foreman's salary	12500
Office rent	12500	Factory lighting	7500
Repair Factory Plant	17500	Depreciation factory plant	2500
Office building	2500	Depreciation office building	6250
Good will written off	2500	Manager's salary	25000
Consumable stores	12500	Office stationaery	2500
Director's fees	6250	Postage	1250
Telephone rent	625	Travelling expenses	2500
Sales man salaries	6250	Warehouse rent	2500
Advertising	6250	Dividend paid	10000
Income tax	50000	Sales	947500

Prepare a statement showing cost and profit from the following details ,clearly showing (a) prime cost, (b) work cost, (c) cost of production (d)cost of sales (e) profit.

10. Following data are extracted from the pavan kishore for the year 1991

Opening stock of raw material -25000

Closing stock of raw material -40000

Purchase of raw materials -85000

Carriage inwards -5000

Wages direct-75000

Wages indirect – 10000

Other direct charges-15000

Rent & rates factory -5000

Rent & rates office -500

Indirect consumption of material -500

Depreciation plant -1500

Depreciation office furniture -100

Salary office -2500

Salary sales men -2000

Other office exp -900

Other factory exp-5700

Managing director remuneration -12000

Other selling exp -1000

Traveling exp-1100

Carriage out wards -1000

Sales -250000

Advance income tax paid -15000

Advertisement-2000

Managing directors remuneration is allocated as rs 4000 to the factory , rs 2000 to the office and rs 6000 to the selling departments

From the above information find out:

Prime cost b. Work cost c. Cost of production d. Cost of sales e. Net profit

11. Prepare production statement giving maximum breakup of cost and profit

Particulars	1.4.08	30.04.08
Stock of materials	26000	15000
Work in progress	15000	10000

Finished goods	40000	51000
Purchase of raw material		174000
Wages		
Direct		73000
Indirect		17000
Rent and rates		
Factory		24800
Office		18750
Warehouse		10500
Salaries –factory		55500
Salaries –office		50250
Sales man salary		47750
Expenses:		
Direct		18500
Indirect		16200
Depreciation		
Plant and machinery		14000
Office building		12000
Delivery van		7500
Income tax		4500
Dividend		6000
Debenture interest		5400
Sales		580000

12. Calculate cost of sales in each of the following cases

- Cost of goods sold rs 120000, selling and distribution expenses 20% of cost of sales
- Sales rs 100000 profit 25% on sales
- Sales rs 100000 profit 25% on cost

Cost sheet – closing stock valuation.

13. the following data relate to the manufacture of a product during the month of april

Raw material consumed rs 80000

Direct wages rs 48000

Machine hours worked - 8000

Machine hour rate rs 4/ hr

Office overhead 10% on work cost

Selling overhead rs 1.50 per unit.

Units produced -4000 units

Units sold 3600 at rs 50 each

Prepare cost sheet and show (a) cost per unit (b)profit for the period.

14. The following data relate the manufacture of a standard product during 4 weeks ended 26.3.1991.

Raw materials consumed – 15000

Direct wages – 9800

Machine hours worked – 2300 hrs

Machine hour rate – 0.50 p

office on cost – 10% of work cost

Selling on cost – re.0.10 per unit

Units produced – 19030

Unit sold – 11418 @ rs 2 each

15. From the following information prepare a cost sheet for the month of dec 1985

Stock in hand 1-12-85	
Raw material	25000
Finished goods	17300
Stock in hand 31.12.85	
Raw material	26200
Finished goods	15700
Purchase of raw material	21900
Carriage on purchase	1100
Work in progress 1-12-85 at work cost	8200
Work in progress 31-12-85 at work cost	9100
Sale of finished goods	72300
Direct wages	17200
Non-productive wage	800
Direct expense	1200
Factory overhead	8300
Administration overhead	3200
Selling expenses and distribution expense	4200

Cost sheet – with sales price computation

16. A company has received an enquiry for the supply of 10000 steel folding chairs. The cost are estimated as following .

Raw materials – 100000 kgs at re.1 per kg

Direct wages 10000 hrs at is 4 per hr

Variable overheads :

Factory – rs 2.40 per labour hr

Selling & distribution – rs 16000

Fixed overhead :

Factory – rs 6000

Selling & distribution – rs 14000

Prepare a statement showing the price to be fixed which will result in a profit of 20% on the the selling price

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

Direct material-40000 tons at rs 5 per ton

Direct wages -8000labour hours at rs 50 per hour

Overheads

Variable: Factory rs 10 / labour.

Selling rs 20/ unit

Fixed : Factory rs 100000

Office rs 200000

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

18. E ltd., furnish the following information for 10000 units of a product manufactured during the year 2008

Material-90000

Direct wages -60000

Power and consumable stores -12000

Indirect wages-15000

Factory lighting -5500

Cost of rectification of defective work-3000

Clerical salaries & management expenses-33500

Selling expenses -5500

Sale proceeds of scrap-2000

Repairs , maintenance and depreciation of plant-11500

The net selling price was rs 31.60 per unit. sold and all the units were sold.

As from 1-1-2009, the selling price was reduced to rs31 per unit. It was estimated that production could be increased in 2009 by 50% due to space capacity.

Rates for materials and direct wages will increase by 10%

You are required to prepare.

Cost sheet for the year 2008 showing various elements of cost per unit and

Estimated cost and profit for 2009. Assume that 15000 units will be produced and sold during the year and factory overhead will be recovered as a percentage of direct wages and selling expenses as a percentage of work cost.

19. Prepare a cost sheet for the year 1986 from the following showing the total cost and cost per unit.

Number of units produced 2000.

Opening stock of raw materials – 10000

Purchases – 180000

Direct wages – 56000

Indirect wages – 48000

Closing stock of raw materials – 12000

Working in progress on 1-1-86 – 5000

Factory overheads – 26000

Office overheads – 45000

Selling overheads – 16000

Opening stock of finished goods (100 units) – 20000

Closing stock of finished goods (120units) – profit 10% on sales

During the year 1987. It is decided to increase the productions to 2400 units it is anticipated that

(a) Material prices will increase by 10%, Wages will reduce by 20%, Other exp will remain constant per unit, Expected profit 20% on sales, Ascertain selling price to be fixed per unit

20. A manufacturer of scooter finds that in 1993 it cost him rs.720060 to manufacture 175 scooters which he sold for rs.5400 each the cost is made up of

Material – 282000, direct wages – 324000

Factory overheads – 48600, office overheads – 65460

For the year he estimate that

(a) Each scooter will require material of rs.1600 and labour rs.1800

(b) The factory overheads will bear the same relation to wages in the previous year

(c) The office overhead percentage on factory cost will be the same as in the past prepare a statement showing the profit he would make per unit if he reduces the price of scooter by rs.200

Cost sheet-tenders quotation

21. The accounts of a machine manufacturing company disclose the following information for the six months ending 31.12.88

Material used – 150000, Productive wages – 120000, Factory overhead expenses – 24000

Establishment and general expenses – 17640

Prepare a cost sheet of the machine and calculate the price which the company should quote for the manufacture of a machine requiring materials valued at rs 1250 and expenditure in productive wages of rs 750 so that the price may yield a profit of 20% on the sellinf price

22. The accounts of pleasant company ltd show the following details for the year 1990.

Materials – 350000,

Labour – 270000,

Factory overheads – 81000,
Administration overheads – 56080

It is estimated the rs 1000 for material and rs 700 for labour will be required for one unit of the finished product for quotation purpose

Absorb factory overhead on the basis of labour and administrative overheads on the selling price is required on quotation

- (a) Prepare a cost sheet
- (b) Prepare a statement of the selling price per unit of the finished product.

23. The following details are available from a company books

Stock of material 1.1.90-12800
Stock of finished goods 1.1.90-28000
Purchase during the year -292000
Production wages -198800
Sale of finished goods -592000.
Stock of raw materials 31.12.90-13600
Stock of finished goods-31.12.90-30000
Work over head-43736
Office expense-35547

The company is about to send a tender for a large plant . The costing dept estimates that material required would cost rs 20000

And wages for making the plant would cost rs12000.tender is to be made keeping net profit of 20% on the selling price state what would be the amount of the tender, if based on the usual percentages.

24. Compute the cost of raw material purchased from the data given below

Opening stock of raw material -10000,
Closing stock of raw material-15000,
Exp on purchase-5000,
Direct wages-50000,
Prime cost-100000

25. From the following information, prepare a cost sheet fro the month of December 1999.

Stock on hand -1.12.99
Raw materials-25000
Work in progress-8200
Finished goods-17300
Raw material consumed-21800
Work cost for the month(after adjusting work in progress)-48400
Cost of production of goods sold-53200
Purchase of raw material-21900
Carriage on purchase-1100
Sale of finished goods-72300
Direct wages-17200
Direct expenses-1200
Factory overheads -9100
Administration overhead-3200
Selling and distribution overhead-4200

26. Selvi. kavitha furnishes the following data relating to the manufacture of a standard product during the month of the April -1994

Raw material consumed rs 15000
Direct labour charges –rs 9000
Machine hours worked -900 hrs

Machine hour rate rs 5
Administrative over head-20 % on work cost
Selling overhead re0.50 per unit
Units produced: 17100
Units sold -16000@ re 4 per unit
You are required to prepare statement showing cost and profit per unit .

Reference books:

1. **Cost accounting: - T.S Reddy and Y.Hari Prasad Reddy.**
2. **Cost accounting:- M.N Arora**

**UNIT-I COMPLETED
UNIT-II**

INTRODUCTION:-

The major objective of cost accounting is cost control. every element of cost has to be effectively controlled. out of the three elements of cost ., material, labour and expenses, material form a major chunk of cost of production . An analysis of financial statements of a large number of private and public sector organization reveals that about 55% of cost of production consists of material cost, on an average, it is essential , therefore for every organization to devise a suitable system of material control from the time of placement of purchase requisition to the time of final consumption of the material.

The term material refers to the all commodities consumed in the “process of manufacturing .according to CIMA of UK, material cost is “ the cost of commodities supplied to an undertaking”.

Material represents an important asset and is the largest single item of cost in almost every manufacturing business. The important role played by this element in the total cost structure can be realised by the fact that usually more than fifty percent of the total product cost is material cost”.

INVENTORY/MATERIAL CONTROL:-

SIGINIFICANCE:- No cost accounting system can become effective without proper and efficient control of materials. This is so because quite often materials is the largest single element of cost and as such an efficient system of the material control leads to a significant economy in the total cost of production.

DEFINE MATERIAL CONTROL./ WHAT DO YOU MEAN BY MATERIAL CONTROL?

MEANING AND DEFEIFITION:-

Material control is a system which ensures required quantity of material of the required quality at the right time and place with minimum investment of capital.

Material control is defined as “Safeguarding of company’s property in the form of materials by a proper system of recording and also to maintain them at the optimum level considering operating requirements and financial resources of the business”. This wide definition embraces control over purchases, storage and consumption of material and determining the optimum level for each item of inventory. The system of someone makes a request for eh purchase up to the stage when materials are consumed and their costs complied and assembled in cost sheet.

EXPLAIN THE OBJECTIVE SOF MATERIAL CONTROL. / WRITE A NOTE ON THE IMPORTANCE OF MATERIAL CONTROL

OBJECTIVES OF MATERIAL CONTROL:-

1. **No under stocking:-**

Under stocking leads to materials running out of stock at some time or the others. Shortages of materials may arise at the time when they are urgently needed and production then be delayed. Delay or stoppage i production due to non- availability of materials is very costly as it may result in loss of profits; materials control system ensures that there is no shortage of materials.

2. No overstocking:-

Investment in materials must be kept as low as possible, considering the production requirements and the financial resources of the business .overstocking of materials unnecessarily locks up capital and cause high storage costs, thus adversely affecting the profits.

3. Minimum wastage:-

Proper storage conditions must be provided to different types of material losses of material may occur due to the deterioration,obsolescence,theft, evaporation, etc., all efforts should be made to keep these losses at minimum.

4. Proper Quality Of Materials:-

While purchasing of materials, due to consideration should also be given to the quality. it is no use purchasing materials of inferior quality or of very superior quality. for each type of product there is a particular quality of materials is needed and that quality alone should be purchased.

5.Economy In Purchasing:- The purchasing of material is a highly specialized function. By purchasing materials at the most favorable prices, the efficient purchaser is able to make a valuable contribution to the success of a business.

6. Information about materials:-

Not only that materials should be available as and when required, but also there should be a system to give complete and up-to-date accounting information about the stock of materials. Sometimes inadequate information about the availability of materials may cause new purchases be made of materials already in stock.

7. Material Report to Management: -

The material control system should be so designed so as to serve the purpose to accurate and up-to date reports to management about purchase , consumption and stock of materials.

WHAT IS THE ADVANTAGE OF MATERIAL CONTROL?

ADVANTAGES OF MATERIAL CONTROL:-

An effective material control system-

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

WHAT ARE THE ESSENTIAL REQUIREMENTS OF MATERIAL CONTROL?

ESSENTIAL REQUIREMENTS AND PRINCIPLE OF INVENTORY CONTROL:-

Ideally the material control must ensure that the following requirements are fully met:

1. There should be proper coordination and cooperation between various departments dealing in materials; viz purchasing department , stores department, receiving and inspecting department, accounting department etc.,
2. There should be central purchasing department under the control of a competent and expert purchase manger.
3. There should be proper classification and codification of materials.
4. Material requirements should be properly planned.
5. The perpetual inventory system should be operated so that up-to date information is available about the quantity of material in stock.
6. Adequate records should be introduced to control materials during production and the quantities manufactured for stock.
7. The storage of all materials should be well-planned subject to adequate safeguards and supervision.
8. The various stock levels like minimum, maximum, etc., should be fixed for each item of material.
9. Purchase of materials should be controlled through budgets.
10. An efficient system of internal audit and internal check should be operated so that all transactions involving materials are checked by reliable and independent persons.
11. There should be regular reporting to management regarding purchase, issue and stock of materials. Special reports should be prepared for obsolete items, spoilage, returns to suppliers, abnormal losses etc.,

WHAT ARE THE CLASSIFICATION OF MATERIALS/EXPLAIN SOME OF THE CLASSIFICATIONS OF MATERIAL

Classifications of materials:-

1. Direct material:- it is the cost that which can be conveniently identified with and allocated to cost units. Direct materials generally become a part of the finished product. For example cotton used in a textile mill is a direct material. Other examples of direct material are leather in shoes, timber, used in furniture, steel used in the making machines.

2. Indirect material:- these are those material which cannot be conveniently identified with individual cost units, these are the minor in importance, such as (1)small and relatively inexpensive items which may become a part of the finished product. Eg pin , screw, nuts and bolts etc., (2) those items which do not physically become a part of the finished product eg., coal, lubricating oil and grease and sand.

3. Supplies:- supplies are indirect materials used in the production which do not become part of the finished product. Oil and grease used in keeping machines in running condition, soaps and owels use din by the workmen.

4. Finished or component parts:- in assembly type production like refrigerator, radio, tv., car etc., component parts may be purchased or produced within the organization.

5. Stores:- the term stores is a very wide term and includes raw materials, component parts, tools etc.,

6. Inventory:- the term inventory covers stock of raw materials , work in progress and finished products.

WHAT ARE THE TECHNIQUES USED IN INVENTORY CONTROL?/ EXPLAIN IN DETAIL ABOUT THE THECHNIQUES OF INVENTORY CONTROL.

TECHNIQUES OF INVENTORY CONTROL:-

Various technique commonly used for inventory control are listed below:

1. ABC technique.
2. Minimum, maximum and re-order levels.
3. Economic order quantity.
4. Proper purchase procedure.
5. Proper storage of materials.
6. Inventory turnover ratio to review slow and non-moving materials.
7. Perpetual inventory system.
8. Fixation of material cost standards.
9. Preparation of material budgets.

1. ABC TECHNIQUE:-

Efficient store keeper requires sufficient control over all items of stores. However,greater care is necessary in the case of costlier items. Therefore ABC analysis envisages varied degree of care and control for different categories of materials, according to their value. Hence it is known as selective value approach. It is also referred to as Always Better Control system.

The inventory of some concern may consist of a small number of items representing a major portion of the inventory value, and a large number of items may represent only a minor portion of the inventory value. In such concerns ABC analysis is very useful.

Under ABC analysis, the materials are classified into three categories on the basis of their value.

Category A –high value materials.

Category B – medium value materials

Category C- low value materials.

The concept may be made clear by the following illustration

Category	Quantity	% of total quantity	Value	% to total value	Average cost per unit
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A	40	10	70000	70	1750
B	80	20	24000	24	300
C	280	70	6000	6	21.42
	400	100	100000	100	

Category A materials account for 10 percent of the total quantity of materials. But, in terms of value, they account for 70 % of the total. Hence, maximum control must be Exercised on category A items.

Category B materials represent 20 % of the total quantity and their share in the total value is 24%. These items require reasonable degree of care and control.

Category C materials represent 70% of the total quantity but their value is only 6% of the total of inventory. They need a simple and economic system of control.

Advantages:-

1. It ensures closer and stricter control on costly items in which the large amount of capital has been invested.
2. Scientific and selective control helps in the maintenance of high stock-turnover ratio.
3. Investment in inventory can be regulated and funds can be utilised in the best possible manner.
4. Management time is saved since attention is paid only to some of the items having more value.

MINIMUM, MAXIMUM AND RE-ORDER LEVEL:-

The purpose of material control is to maintain the stocks of raw materials as low as possible. At the same time, they must be made available as and when required by the production department. There may be over stocking or under stocking of materials if there is no proper planning. Proper maintenance of stock level of each material is the main function of the stores department. Following are the different levels of stock to be fixed by the store keeper for the purpose of material control.

MAXIMUM LEVEL:-

This is the level above which the stock should not be allowed to exceed at any time. This is fixed by taking into account the following factors:

- a. Availability of capital
- b. Storage space available
- c. Rate of consumption of material
- d. Seasonal price fluctuations
- e. Economic order quantity
- f. Possibility of change in fashion
- g. Government restrictions as in the case of explosive materials
- h. The cost of maintenance
- i. Time required to obtain fresh supply of material.

Formula:-

$$\text{Maximum level} = \text{re-order level} - (\text{minimum consumption} * \text{minimum re-order period})$$

Minimum 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.

Minimum level = reorder level-(normal consumption * normal reorder period).

REORDER LEVEL:-

This is the level at which a new order for materials is to be placed by the store keeper. In other words, this is the level at which a purchase requisition is made out. It is fixed in between maximum level and minimum level to ensure that the stock on the hand does not fall below the minimum level before the receipt of ordered material. This level is fixed by taking into account the following factors:

- a. Rate of consumption of material
- b. Minimum level
- c. Delivery time
- d. Variation in delivery time.

Re-order level= maximum consumption * maximum re-order period

ECONOMIC ORDER QUANTITY (EOQ):-

It is not a stock level. It is the ideal quantity of material to be purchased at any time. If purchase are made in large quantities. The cost of holding the stock will be higher but the cost of purchasing would be less. On the other hand, if purchases are made in small quantities, the cost of holding the stock will be less while the cost of purchasing would be high. Therefore, the most economical size of order is that the costs of purchasing as well as the costs of holding will be at the minimum.

$$EOQ = \sqrt{2AB/CS}$$

A = annual consumption

B = buying cost

C = carrying cost

S = storage cost

DANGER LEVEL:-

This is fixed below minimum level. When the stock reaches this level urgent action for purchase of material is taken.

Danger level = minimum rate of consumption * emergency delivery time.

AVERAGE LEVEL:-

This level indicates the average stock held by the firm. It is calculated as follows:

Average level = minimum level + 1/2 of re-order quantity (or)

Average level = maximum level + minimum level / 2

PURCHASE PROCEDURE:-

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

- a. Receiving authorized 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 supplier's 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.

b) Studying The Market And Choosing The Supplier:-

The purchase department generally 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 favorable terms should be selected. When selecting a particular supplier the purchase department should keep various critical aspects in mind.

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 authorization to the supplier to supply materials. It is the contract between the buyer and seller for stated terms and conditions.

d) Receiving and inspection of materials:-

In large organization there may be a separate department for receiving the materials. But in small organizations 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.

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 every thing is found in order. The accounting section approves the invoice for payment and the cashier makes the payment as per the terms agreed.

5. PROPER STORAGE OF MATERIALS:-

BINCARD:-

Bin is a place ,rack or cupboard, where materials are kept. Each bin has a card to show the position of stock in the bin. This card is known as bin card or stores card. Only quantities are entered in the bin card. These card are used not only for recording of receipts and issues of stores but also to assist the store-keeper to control the stock.

When the material are received an entry is made in the receipt column and simultaneously the balance is entered in the balance column. So, the balance in stores can be readily obtained. The storekeeper is answerable for any difference between the physical stock and stock balance shown in the bin card .by seeing the bin card, the storekeeper can be send the material requisition for purchase of the materials in time.

Advantages:

1. It enables the store keeper to plan the receipts and issues of materials and keep the stocks within the minimum and maximum levels.
2. It provides up-to-date record of materials received ,issued and balance in stock .it helps in the successful operation of a perpetual inventory system.
3. By seeing the bin card, the store keeper can send the materials requisition for the purchase of material in time.

Bincard

Name of the material

Minimum level

Material code no:

Maximum level:

Bin no:

Re-order level:

Stores ledger folio no :

Re-order quantity:

Date	Receipts		Issues		Balance	
	Goods received note number	Qty	Requisition no.	Qty	Qty	Remarks.

STORES LEDGER:

A store ledger is kept in the costing department .it contains accounts for each class of material. It is usually maintained in the loose leaf form. it is written up by a stores accountant or stores clerk. In the stores ledger, stores received and issued are recorded both in quantity and value, the ledger contains a continuous record of stores received, issued and also the balance on hand at any time. Hence, it is considered as part and parcel of perpetual inventory system.

Stores ledger

Name of the material

Minimum level

Material code no:

Maximum level:

Description :

Re-order level:

Stores ledger folio no:

Re-order quantity:

	Receipts	Issues	Balance
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Date	G.R.NO	QTY	RATE	VALUE	M.R.NO	QTY	RATE	VALUE	QTY	RATE	VALUE	REMARKS

DISTINGUISH BETWEEN STORES LEDGER AND BIN CARD.

s.no	Bincard	Stores ledger
1.	It is maintained by the store keeper.	It is maintained by the cost accounting department
2.	It is record of quantities only	It is a record a quantities as well as values
3.	Entries are made at the time when the transaction takes place	Entries are made only after the transaction has taken place.
4.	It is attached to the bin	It is kept in cost office.
5	Each transaction is individually posted.	Transactions may be summarised and posted periodically.

CONTINUOUS STOCK TAKING:-

Continuous stock taking is an essential feature of the perpetual inventory system. Under continuous stock taking system, a permanent stock taking team is appointed. This team, daily or at frequent intervals verifies the stock of different items selected at random. Thus stock verification is done throughout the year.

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 this view the ratio is an indicator of a firm’s inventory management efficiency. A high inventory turnover ratio indicates the fast moving of material. A low ratio on the other hand indicates the slow moving of the material and thus investment and blocking u 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 over-stocking of undesirable material.

Formula:-

Inventory turnover ratio= cost of goods sold/ cost of average stock

Average stock= opening stock + closing stock/2

Inventory turnover in days = days in the period/ inventory turnover ratio.

WHAT IS PERPETUAL INVENTORY? WHAT ARE THE ADVANTAGES OVER PERIODICAL INVENTORY?

Inventory means stock. Every manufacturing concern has to maintain proper and accurate records regarding the quantity and value of inventory in hand. The records may be maintained according to any one of the following two systems.

1. Perpetual inventory system.
2. Periodical inventory system.

PERIODICAL INVENTORY SYSTEM:-

Under this system, stocks are verified only at the end of accounting period. Usually a year. Periodic inventory system has the following disadvantages.

- a. Business or production has to be stopped during the period stock-taking . this will result in loss of revenue to the firm.
- b. Physical verification of stock is time consuming and tedious.
- c. Stock verifiers are not experts in stock-taking .so, verification cannot be perfect.
- d. The element of surprise check which is essential for effective control is completely absent.
- e. Stock discrepancies are not detected till the end of the accounting period.

The system of continuous stock taking overcomes disadvantages of the periodic stock taking.

PERPETUAL INVENTORY SYSTEM:-

This system is also known as “ automatic inventory system” . it is an important aid to material control. Its main object is to make available details of the quantity and value of stocks of each item, at all times .it consists of maintaining records for each type of material. Showing the quantities and value of material received, issued and in stock. It also covers continuous stock –taking.

Definition:- the institute of cost and management accounts(ICMA) London , defines the perpetual inventory as ,“a system of records maintained by the controlling department , which reflects the physical movements of stocks and their current balance”.

DIFFERENCE BETWEEN THE CONTINUOUS STOCK TAKING AND PERIODICAL STOCK TAKING.

S.NO	CONTINUOUS	PERIODICAL
1	It is held throughout the year.	It is held once in a year.
2.	It is a continuous process	It is completed at one sitting
3	It requires permanent stock taking team consisting of experts.	It is carried out by a temporary committee composed of persons from other departments.
4	It is a costlier method.	It is a cheaper method.
5	Normal and routine work will not be affected.	Normal and routine work will be affected.
6	Discrepancies can be rectified without delay.	There is delay in taking action.

BILL OF MATERIAL:-

A bill of material gives a complete list of material required for a particular job or work order.it is generally prepared by the planning department as soon as the work order is received. When the job is started,all the materials listed in the bills are sent to the production department .for regular products ,printed forms of bills of materials may be used. In the case of large jobs, a separate bill of materials may be prepared for each part of the job. Thus the bill of material serves as purchase requisition to the purchase department. Material requisition to the store-keeper and work order to the production department.

Advantages:-

1. A bill of material is kind of written authorization to the store keeper for issue of material.
2. It serves as a purchase requisition to the purchase department.
3. It is possible to calculate the material cost of all articles before they are produced.
4. Procurement of materials can be planned in advance to avoid production delays.
5. It may be used as a guide for controlling consumption of materials as it provides a complete list of materials required for each job.
6. A copy of bill of material to the accounts department will render the work of accounting easier and speedier.

METHODS OF PRICING OF MATERIAL ISSUES:-

The purchase price of material fluctuate on account of changes in the product price , 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 to 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 following categories:

1. Cost price methods.
 - a. First In First Out (FIFO)
 - b. Last In First Out (LIFO)
 - c. Specific price.
 - d. Base stock.
 - e. Highest in First out(HIFO)
2. Derived from cost prices or average price method.
 - a. Simple average.
 - b. Weighted average.
 - c. Periodic simple average.
 - d. Periodic weighted average.
 - e. Moving simple average.
 - f. Moving weighted average.
3. Notional price methods.
 - a. Standard price.
 - b. Inflated price.
 - c. Re-use price.
 - d. Replacement price.

COST PRICE METHODS:-

The group of methods consists of all those methods wherein each lot of material purchased is charged to various departments at the actual cost of purchase. when one lot at a particular price is exhausted, the next lot is issued at the purchase price of that lot and so on, as per the particular method used. Thus, the price s charged are always the actual purchase price and not average or notional prices.

FIRST IN FIRST OUT(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 the lot is exhausted the next lot is issued at the respective price of that lot.

Advantages:

- a. Prices are based on actual costs.
- b. Stock balances are of fair commercial value representing the latest market prices.

- c. This method is suitable in case of slow moving materials.
- d. It is appropriate in situations of falling prices to change the jobs with higher prices purchased earlier.

Disadvantages:-

- a. Possibility of more clerical errors.
- b. The cost of similar jobs differ if the price is fluctuate.
- c. It does not reflect on the current market price.

LAST IN FIRST OUT(LIFO):

Under this method the price of the price of material last purchased and kept in stores is changed for the issues first and then the preceeding lots purchased are issued .this method is use to take advantage of rising price.

Advantages:

- 1. It is simple to operate.
- 2. Prices is based on the actual cost.
- 3. Production cost reflects latest market price.
- 4. This is useful at the time of rising price.

Disadvantages:

- 1. Tedious clerical job
- 2. Comparison of job becomes difficult.
- 3. During the period of falling prices the stock values to show are at high prices , which may necessitate writing off stock values to show the stocks at their market values.

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. Material are purchased for a 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.

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 the emergency arises.

Highest in first out:

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

Derived from cost price method:-

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 samae material is charged at different prices, sometimes even on the same day. Costing data may not be used for the comparison purpose.

a. Simple average method:-

When the variance between purchase price is very little , this method is used. Here the total of the prices of materials in the stock is divided into number of prices use dto ascertain the “ simple average prices” irrespective of quantity the average of the prices are found.

Advantages:-

- 1. It is the simple and easy to calculate the issue price.

2. This method reduces the effect of fluctuations of prices by averging the price.

Disadvantages:-

1. This method does not take into account the quantity purchased at each price. This may lead to absurd results.
2. As the actual price is not used , profit or loss on material will usually arise.

WEIGHTED AVERAGE 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 effort 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 material.

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 the calculation in the method is simple as the price is calculated by dividing the value of materials by their quantity.

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.

PERIODIC SIMPLE AVERAGE METHOD:-

Under this method the total value of the purchase 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.

PERIODIC WEIGHTED AVERAGE METHOD:-

This price is calculated by dividing the total value of the 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 substsntially. This method is used in process industries.

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 period by the number of periods. This method is used when there are high fluctuations in materials price.

MOVING WEIGHTED AVERAGE METHOD:-

This price is calculated by dividing the total of periodic weighted average prices of a given number of period by the number of periods.

NOTIONAL PRICE METHODS:-

Standard price:-

This price is a 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 the actual price is more than the standard price, loss occurs. And if the actual price is less than the standard price, a profit will be obtained.

Inflated price:-

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

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 work and not the original purchase price. Usually, material loss is incurred when re-use price method is employed.

Replacement price:-

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.

WRITE SHORT NOTE ON THE FOLLOWING:-

JUST IN TIME INVENTORY:-

Business concerns are giving maximum attention to reducing stock levels by establishing cordial relationship with suppliers to arrange for frequent delivery of quantities. This is called just-in-time purchasing.

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.

PROBLEMS:-

PURCHASE PRICE COMPUTATION COMPUTATION OF MATERIAL COST

1. The following quotation is received from a supplier in respect of material X

Lot price:-

10000 units at rs 25 per unit

20000 units at rs 20 per unit.

Trade discount 25% cash discount at 5% (if payment is made within a week) freight charges rs 1000 per order. Containers, one for every 1000 units, are charged at rs 250 each. If they are returned within 2 months credit will be given at rs 230 each.

Calculate the material cost for 20000 units assuming the container will be returned.

2. A quotation is received from a supplier in respect of material "D" as follows:

lot price:

10000 kg @ rs 50 per kg
50000 kg @ rs 45 per kg
100000 kg @ rs 40 per kg

Trade discount is at 25% and cash discount of 10% if payment is made within 15 days. One container is required for every 10000kgs .of the material and containers cost rs 10000 each but rs 9000 will be credited if returned within 3 months .calculate the material cost for 50000 kg of material , assuming that the containers are returned in the due course.

3. A supplier quotes as follows for material X:

Price:

200units @ rs 5 each
400 units @ rs 4.50 each
600 units @ rs 4.00each

He allows a trade discount of 25% and cash discount of 3% . if payment is made within 15 days . freight charges per order is rs 200 containers are charged at rs 15 each. One container is required for every 100 units and if the container are returned within 2 months ,credit would be received at rs 5 each if the purchaser place an order for 600 units . Calculate the material cost.

4. A consignment consist of two chemicals X and Y teh invoice gave the following data.

Chemical X 4000 Kg @ rs 5/ Kg =20000
Chemical Y 2000 Kg @ rs 4/kg =8000
Sales tax @ 5% =1400
Railway freight =600

30000
-----.

A shortage of 200 kgs in X and 100 kgs in Y was noticed due to the breakage.ascertain the effective e cost of material per kg. If provision has to be made for a further wastage of 5% due to the careless handling of material X and Y.

Selection of supplier:-

5. The following quotations were received from two suppliers for a material after inviting tenders.

Supplier-I –rs 1.80 per unit

Supplier-II – rs 1.60 per unit.

Plus rs 5000 fixed charges per order.

- i. calculate the order quantity for which the purchase price will be the same per unit.
- ii. Which supplier should be chosen for the following order quantities?
(a) 20000 units (b) 30000 units.

6. After inviting tenders, two quotations are received as follows:

Supplier A –rs 1.20 per unit.

Supplier B- rs 1.10 per unit.

Fixed charges to be added irrespective of units ordered. Calculate the order quantity for which the purchase price will be the same.

The purchase manager wants to place an order for 15000 units which supplier would you select?

MIXED LOTS

7. A lorry load of materials of different grades was purchased for rs 300000, materials are sorted into the following grades whose market price is shown against each of them.

Grade	Units	Selling price per unit.
I	20000	12
II	15000	10
III	10000	6

Find out the purchase price per unit of each grade of the material assuming that are the grades yield the same rate of profit.

8. A lorry load of material of mixed goods were purchased for rs 9000, these were sorted into the following grades whose market rate is shown against each.

Grade A-5000 units selling rate @rs 12

Grade B-3000 units selling rate @ rs 10

Grade C -2000 units selling rate @rs 5

Find the purchase rate per unit on each grade of, materials assuming that all grades yield same rate of profit.

9. A company purchase a wage on load of Kashmir apples for rs 40000 and they were sorted into four different grades keeping the market in mind. The sale prices of the grades with relevant quantities were as follows.

I- 1000 dozen at rs 20/dozen.

II – 3000 dozen at rs 15/ dozen

III -2000 dozen at rs 12/ dozen.

IV -1000 dozen at rs 11/Dozen.

Ascertain the purchase rate per dozen of each grade of apples, assuming the profit on sale is uniform on all grades.

INVENTORY TURNOVER RATIO

10. From the following figures calculate the inventory turnover ratio.

Stock as on 1st January 98-25000

Stock as on 31st December 98-35000

Purchase during 98-250000.

11. The following information is available from the books of a company for the year ended 31st dec90

Particulars	Material A	Material B
Opening stock	25000	87500
Closing stock	15000	62500
Purchase	190000	125000

Determine fast moving material.

12. From the following information obtained from the books of Ajay&co for the year ended 31st dec 98 calculate.

Material	Opening	Closing	Purchase
J	75000	200000	25000
K	25000	400000	50000

ECONOMIC ORDER QUANTITY

13. Calculate EOQ from the following

Annual requirement – 1600 units.

Cost of material per unit- rs 40

Cost of placing and receiving one order-rs 50
Annual carrying cost of inventory-101% of inventory value.

14. From the following information,determine the EOQ.

Annual consumption-90000 units.

Cost per unit –rs 50

Buying cost per order –rs 10

Cost of carrying inventory – 10% of cost.

15.find out the economic order quantity from the following particulars.

Annual usage- rs 120000

Cost of placing and receiving one order – rs 60

Annual carrying cost -10% of inventory value.

16.You are required to calculate the economic order quantity with the help of the details given below.

Material usage per month-rs 1600

Buying cost per month –rs 40

Storage &carrying cost -15% of inventory.

EOQ AND ORDERING SCHEDULE

17. From the following particulars calculate the economic order quantity and number of order per annum.

Annual requirement-1600 units.

Cost of material per unit –rs 40

Cost of placing and receiving one order –rs 50

Annual carrying cost of inventory -10%

Of inventory value. Also calculate frequency.

18. The following data pertain to ac omponent pert number-107 purchase price per unit –rs 60

Purchase order cost –rs 240.

Total requirement for a 45 week year 9000 units.

Carrying cost-20% on the average inventory value .what is the EOQ? What is the frequency of placing the order?

EOQ –WITH DETAILS OF COST:-

19. A manufacturer buys certain equipment from outside supplier at rs 30 per unit. Total annual needs are 8000 units. The following further data are available.

Annual return on investment-10%.

Rent,insurance ,taxes per unit per year rs 13.

Cost of placing an order rs 100

Determine the EOQ.

EOQ & INVENTORY COSTS.

20. A publishing house purchases 4000 unitsof a particular item per year at a unit cost of rs 20 the order cost per order is rs 50 and the inventory carrying cost is 25%. Find the optimal order quantity and the minimum total cost including the purchase cost.

VARIOUS STOCK LEVELS:-

21. From the following particulars relating to part no 108 calculate different stock levels.

Total cost of purchasing relating to the order-rs20

Number of units to be purchased-11250

Purchase price per unit, including transport cost –rs 50

Annual cost of storage of one unit-5

Reorder quantity -300 units.

Lead time:

Maximum- 20 days.

Mimimum - 6 days.

Average- 10 days.

Maximum for emergency purchases- 5 days.

Rate of consumption average 15 units per day, Maximum 20 units per day.

22. From the following information calculate (a) maximum stock level (b) minimum stock level.

(c) Re-order level (d) average stock level

Minimum consumption-240units per day.

Maximum consumption -420 units per day

Normal consumption-300 units per day.

Re-order quantity -3600 units,

Re-order period- 10to15 days.

Normal re-order period -12 days.

23. Calculate re-order level, minimum stock level, maximum stock level and average stock level from the following information.

Normal usage-300 units per week.

Maximum usage -450 units per week.

Minimum usage -150 units per week.

Reorder period -4 to 6 week.

Reorder quantity – 2400 units.

STOCK LEVEL FOR TWO OR MORE MATERIAL

24. Two components X and Y are used as follows:-

Normal usage-600 units per week each.

Maximum usage-900 units per week each.

Minimum usage -300 units per week each.

Reorder quantity X-4800 units, Y-7200 units.

Reorder period X-4 to 6 week, Y- 2 to 4 week.

Calculate for each component

Reorder level, minimum level, maximum level, average stock level.

25. Two components X and Y are as follows

Minimum usage :50 units per week each.

Maximum usage :150 units per week each.

Normal usage :100 units per week each.

Ordering quantities –X-600 units, Y -1000 units.

Delivery period –X-4 to 6 weeks, Y-2 to 4 weeks.

Maximum reorder period for emergency purchasing X-2 weeks, Y-2 weeks.

Calculate for each component.

(a) Reordering level (b) maximum level (c) minimum level (d) danger level.

PRICING OF MATERIAL ISSUES:-

FIFO METHOD

26. Record the following transactions in the stores ledger ,pricing of the material under FIFO method.

May 1st balance 500 units at rs 25 per unit.

May 3rd received 300 units at rs 30 per unit.

May 5th issued 200 units.

May 7th issued 120 units.

May 8th received back 10 units(issued on may 7th.)

27. From the following details, prepare the stores ledger account by adopting FIFO method .what would be the value of stock at the end of the period.

December 1st opening stock 1000 units @ rs 2.00 each

December 3rd purchased 800 units @rs2.10 each.

December 5th issued 1200 units.

December 10th purchased 1600 units at rs2.10 each..

28. From the following particulars, prepare stores ledger adjustment under FIFO method.

Aug 2nd purchase 200@200

4th issued 150

6th purchase 200 @ 220

10th issued 100

16th purchase200 @ 210

18th issued 220

24th purchase 150 @ 230

25th issued 190

28th issued 30

LIFO METHOD

29. Ravi who newly set up a factory uses cost price as the basis for charging out material to jobs. The receipt side of the store ledger Account shows the following particulars.

500 articles bought at rs 3.00 each.

700 articles bought at rs 3.10 each.

Successive issues of 300 and 600 articles are made. At what price should each of these issues be made under the LIFO method?

30. The following is the record of receipts and issues of material A in a factory during the month of January ascertain at what price should each of these issues be made under the LIFO method and FIFO Method.?

Date	Particulars	Kg	Rate /kg
1	Opening balance	100	10
1	Issued	60	
2	Received	120	11
3	Issued	50	
	Stock verification showed a loss of 5 kg		
4	Received back from orders	20	(issued at rs 9 per kg)
6	Issued	80	
7	Received	45	12

10	Issued	50	
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31. Details of receipt and issues of material in a factory during March are as follows.

Date	Particulars	Quintals	Rate/quintal
March 1	Opening balance	500	25
3	Issued	70	
4	Issued	100	
8	Issued	80	
13	Received from vendor	200	24.50
14	Return of surplus from a work order	15	24
16	Issued	180	
20	Received from vendor	240	26
24	Issued	280	
25	Issued	140	
27	Return or surplus from a work order	12	24.50
28	Received from vendor	100	25
29	Returned to vendor	50	

The stores inspector noted a shortage of 5 quintal on the 15 th and shortage of 8 quintal on the 27th.

SIMPLE AVERAGE AND WEIGHTED AVERAGE METHOD

32. Prepare stores ledger account, pricing the issues at (a) simple average method. (b) weighted average method

Date	Receipts	Issues
15.03.09	200@2.00	-
18.03.09	300@ 2.40	-
25.03.09	-	250
28.03.09	250 @ 2.60	-
30.03.09	-	200

33. From the following details , write stores ledger account using simple average method.

1982 dec	Particulars	kg	Rate/kg
1	Opening balance	100	5
5	Received	50	5.20
8	Issued	120	
10	Issued	10	
15	Received	80	5.40
18	Issued	50	
20	Received	100	5.60
25	Issued	40	
29	Issued	60	

The Stock Verifier Found a Shortage of 10 Kg On 16.12.82 And Another shortage Of 10 Kg On 26.12.82

34. Prepare a Store Ledger Account by Adopting the Weighted Average Method of Pricing

98	Particulars	Units	Rate /unit
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Sep			
1	Opening Balance	50	3
4	Issued	3	
8	Purchased	48	4
9	Issued	20	
15	Purchased	76	3
22	Received back into stores 19 units out of 20 units issued on 9 th		
30	Issued to production	10	

BASE STOCK METHOD

35. From the following particulars, prepare store ledger account using the base stock method in conjunction with (a) FIFO (B) LIFO base stock 200 units.

Date	Particulars	Units	Rate / unit
Jan 1	Purchase	500	4.00
10	Purchase	300	4.20
15	Issues	600	-
20	Purchase	400	4.40
25	Issues	300	-
27	Purchase	500	4.20
31.	Issue	200	

Reference books:-

1. Cost accounting- Murthy and Gurusamy

2. Cost accounting- Reddy and Hariprasad Reddy.

Unit-II completed

Unit-III

LABOUR COST CONTROL

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 organizations 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.

WHAT ARE THE TYPES OF LABOUR?/ EXPLAIN THE TYPES OF LABOUR IN DETAIL. 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 sweepers, helpers, watchmen, machanics 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. Accounting 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 becomes indirect. Direct labour cost forms part of prime cost, whereas indirect labour cost forms part of overheads.

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

WHAT ARE THE IMPORTANCE OF LABOUR COST?/ WHAT ARE THE MAIN OBJECTIVES OF LABOUR COST?

OBJECTIVES/ IMPORTANCE OF 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 of labour, damage of material by labour on account of inefficient supervision, etc., will result in increase of labour cost. Moreover if labour is not properly utilized the idle time and overtime will increase which will further increase the cost of production. Proper utilization of labour will reduce the labour cost and production cost. Every organization 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.

DISCUSS THE TECHNIQUES OF EFFECTIVE LABOUR COST CONTROL/ WHAT ARE THE TECHNIQUES USED IN LABOUR COST CONTROL?

GENERAL TECHNIQUES:-

- (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 schedules labour budgets have 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 variances are probed and remedial actions are taken.
- (d) Labour reports: Frequent labour reports are obtained from various departments 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.

WHAT DO YOU MEAN BY MERIT RATING? / WRITE THE MEANING OF MERIT RATING. WHAT ARE THE IMPORTANCE LIMITATIONS OF MERIT RATING?

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
- (7) Integrity
- (8) Reliability
- (9) Qualities like leadership, initiative, self confidence and sense of judgment
- (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 the 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.

LIMITATIONS 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

WHAT DO YOU MEAN BY IDLE TIME? / WRITE SHORT NOTE ON IDLE TIME

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.

(Unit-III contd....)

- (a) Normal Idle time
- (b) Abnormal Idle time.

(A) NORMAL IDLE TIME: This is 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 is called setting up time.
- Treatment of Normal Idle Time Normal idle time is unavoidable and its cost is charged to production. There are two ways of charging normal idle time to dictions.

- (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 occurred 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 of shortage of materials;
- (4) Time wasted due to lack of instructions;
- (5) Time lost on account of strikes and lock outs.

EXPLAIN IN DETAIL ABOUT OVERTIME AND ITS TREATMENT. OVERTIME

Employees are expected to work during a fixed schedule of hours of a day or 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 in a day or calculated at single rate up to 48 hours and at double the normal rate 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.

Labour

- (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 plant 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 overtime is one 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 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 overtime 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 still is fixed for each worker.
- (4) Frequent and periodical reports are to be prepared and forwarded to the management relating to hours of overtime and its cost. This will enable the management to take corrective action.

WHAT ARE THE METHODS OF MEASUREMENT OF LABOUR TURNOVER

There are three methods of measuring labour turnover which are explained below:

(1) LABOUR TURNOVER UNDER SEPARATION METHOD:

The basis of calculating labour turn over 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 during a period is taken as basis for calculating labour turnover. This

does not consider expansion programmes.

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

(3) LABOUR TURNOVER UNDER FLUX METHOD:

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

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

CAUSES FOR LABOUR TURNOVER:

The causes for labour turnover can be broadly classified under three head

- (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 the 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.

(3) **AVOIDABLE CAUSES:** Some of the employees may leave the organisation on account of the following reasons :

- (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
- (h) Lack of stability of Tenure,

EFFECTS OF LABOUR TURNOVER:

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 reasons:

- (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 may 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

EXPLAIN THE VARIOUS METHODS OF LABOUR COST CONTROL

JOB EVALUATION:

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, requirements and condition of work and qualities required for each job.
- (c) Job evaluation forms the basis for training schemes.

ADVANTAGES OF JOB EVALUATION:

(I) 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 minimizing 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.

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.

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 recognized
 - (a) Education
 - (b) Experience and Skill
 - (c) Complexities of duties
 - (d) Responsibilities
 - (e) Effort

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 few factors.

FACTOR COMPARISON METHOD:

This is similar to that of 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 of values of all the factors is the cash rate for each job.

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TIME-KEEPING DEPARTMENT.

INTRODUCTION:-

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

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 organization, 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 payments of wages are on the basis of time spent by the workers, accurate time recording is essential.

WHAT ARE THE ESSENTIALS OF GOOD TIME KEEPING SYSTEM?

ESSENTIALS OF A GOOD TIME-KEEPING SYSTEM

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

METHODS OF TIME KEEPING:

There are two methods of time keeping.

- (1) Manual Methods
- (2) Mechanical Methods

MANUAL METHODS OF TIME KEEPING ARE AS FOLLOWS:

- (a) Attendance register method
- (b) Metal Disc method.

(a) Attendance register 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 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, overtime, etc. The arrival and departure times 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 discs or tokens are hung in board with pegs. Board may be maintained separately for each I 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 a possibility of time keeper including dummy or ghost workers in the muster roll.

MECHANICAL METHODS:

Time recording clocks are used to maintain accuracy *nd reliability. There are two types of such devices:

- (a) Time recording clocks
- (b) Dial time records

REMUNERATION AND VARIOUS INCENTIVE SCHEMES:

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

Labour 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.

ESSENTIALS OF A GOOD WAGE SYSTEM

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 legislations 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.

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 wages on the basis of production or work done irrespective of time taken by the worker.
- These methods of wage payment are respectively called time wages and e wages.)

(A) TIME RATE SYSTEM:

Under this method the workers are paid on the basis of hourly daily, 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

FLAT TIME RATE:

Under this method workers are paid at a single rate on IT basis of the time they are employed. The flat rate may be per hour, per day or 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 is the under mentioned types of work.

- (1) Where high quality goods are being produced

- (2) Where production is mechanized and involves high speed.
- (3) Situations where output cannot be measured.
- (4) Where effective and close supervision is possible.
- (5) Where incentive schemes cannot be introduced as the workers may not be directly involved with the final 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 wages 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 slowly on work to create scope for overtime which doubles the labour cost.
- To conclude the flat time rate does not recognize effort and it is not helpful in increasing output.

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 draw backs 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 over head 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.

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.

Graduated time rate:

Under this method the wage rate is fixed by linking it 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 as they are compensated for increased prices.

Differential time rate:

This method recognizes 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.

WRITE IN DETAIL ABOUT THE VARIOUS METHODS OF PIECE RATE SYSTEM.

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 unit 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) Gantt's task and bonus plan

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.

ADVANTAGES:

- 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.
- Piece rate acts as incentive to induce the workers to produce more. Higher output brings down the cost per unit and increases the profit margin of employees.
- Under this method employer has no worries about payment for idle time and more over it reduces idle time, thus ensuring effective usage of available time.
- Submitting of tenders does not create any difficulty as the labour cost per unit is constant.
- Machinery and tools are taken care of by the workers as they are aware that the defects or breakdown will reduce their chances of higher production and higher wages.
- The supervision cost is low. It is in the workers' interest to work sincerely and close supervision is not required.
- There is inducement or encouragement to average workers also to produce more and earn more wages.

DISADVANTAGES:

- 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.
- Flat piece rate being uniform piece rate paid to the employees irrespective of level of output, it may not induce efficient workers to produce more and reach higher levels of effectiveness.
- The wages of employees may reduce considerably due to the fault of employer or co-workers in many instances.
- In situations of declining demand for goods, the production may go on increasing, embarrassingly.
- 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.
- The workers' anxiety for higher production may lead to more defectives, spoilage, and wastage of raw materials.

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

TAYLOR'S DIFFERENTIAL PIECE RATE SYSTEM

The 'Father of Scientific Management' F.W. Taylor has introduced this method. There are two different piece rates applicable to the workers.

- (a) Lower piece rate for the workers with below standard performance. The lower piece rate applicable is 80% of straight piece rate.
- (b) Higher piece rate for the workers with performance above the standard or at the standard. The higher piece rate applicable is 120% of straight piece rate.

MERRICK'S MULTIPLE OR DIFFERENTIAL PIECE RATE SYSTEM

This method is an improvement over Taylor's method. This method has three rates for different level of performance. Wages are paid at ordinary piece rate to those workers whose 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.

GANTTS 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 the standard time.
- (2) Time wages and 20% of time wages as bonus are paid to those workers who take standard time to complete the job (whose performance is at 100%)
- (3) Wages at high piece rate on the whole output are paid to the workers who take less than standard time (whose efficiency is above 100%)

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

PREMIUM AND BONUS PLANS

ENUMERATE THE VARIOUS PREMIUM AND BONUS PLAN IN DETAIL.

Premium plans are introduced to enhance the individual performance of workers. The workers are induced to show efficiency by performance of job in less than the standard time. Under the premium plans, a standard time is fixed for a specific job or operation and the worker is paid for the actual time taken by him at hourly rate plus wages 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

- (1) The plan should be simple and easy for workers to understand.
- (2) The plan 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 performance level.
- (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 scheme should be minimum.

Premium bonus systems:

The following are some of the popular premium bonus systems

- (1) Halsey premium plan
- (2) Halsey - Weir premium plan
- (3) Rowan system
- (4) Barth variable sharing plan
- (5) Emerson's efficiency plan
- (6) Bedaux point premium system
- (7) Accelerating premium plan, etc.

THE HALSEY PREMIUM PLAN:

This system is known as fifty fifty plan. It was introduced by F.A. Halsey, 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 hourly rate plus 50% of time saved as bonus:

Total earnings = Hours worked x Rate per hour + 50/100(Time saved x Rate per hour)

Advantages:

- (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 provides incentive for efficient workers. At the same time below average workers are not penalized.
- (6) The time saved has the effect of reducing labour cost and overhead.

Demerits:

- (1) Fixation of standard time, which is to be uniform, is very difficult
- (2) If wage rates are low incentive value may be low
- (3) Earnings are reduced at high level of efficiency.

HALSEY-WEIR SCHEME:

Under this method the worker gets a bonus at 30% of time saved unlike 50% under Halsey plan. Except for this change. Halsey and Halsey-weir plans are similar.

ROWAN SYSTEM OR ROWAN PLAN:

This scheme was introduced in 1901 y David Rowan of Glasgow, England. The wages are calculated on the basis of hours worked where as the 'bonus is that proportion of the wages of time taken which the time saved bears to the standard time allowed.

Total earnings under rowan plan= hrs worked * rate per hour + time saved /standard time * hrs worked * rate per hour

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

BARTH'S VARIABLE SHARING PLAN:

Under this scheme wages are not guaranteed. The earnings in calculated by multiplying the rate per hour by the geometric mean of standard hour and actual hours worked. Thus

$$\text{Earnings} = \text{Rate per hour} \sqrt{\text{standard time} \times \text{Actual time}}$$

EMERSON'S EFFICIENCY 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 efficiency reaches 66 2/3% of the standard, he becomes eligible to get bonus at given rate. The rate of bonus increases gradually when efficiency percentage goes up from 67% to 100% of the basic time rate/For every additional 1% efficiency beyond 100%, additional bonus is 1% of the time rate.

Schedule of bonus

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

BEDEAUX'S POINT PREMIUM SYSTEM:

It is a combination of time and bonus schemes. Standard time for a job is determined by time study. Standard production per 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.

Earnings – hours worked * rate per hour + 75/100 (BS * RH /60)

Where B.S. = Number of points saved, i.e., number of points actually earned less the standard number of points for the job. R.H. - Basic Rate per hour

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 increased 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.

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 subsidized 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.

Labour turnover ratio:-

1. From the following particulars supplied by the personnel department of a firm . calculate labour turnover ratio.

Total number of employees at the beginning of the month -2010

Number of the employees who are recruited during the month-30

Number of the employees who left during the month-50

Total number of the employees at the end of the month-1990

2.Following are the details of the records of the company for the month of the October 1998.

Number of the employees at the beginning of the month- 950
 Number of the employees at the end of the month -1050
 Number of the employee's resigned-10
 Number of the employee's discharged-30
 Number of the employees replaced in the vacancies- 20
 Number of the employees appointed due to the expansion scheme-120
 Calculate labour turnover.

3. From the following information calculate the labour turnover rate.

Number of workers at the beginning of the period-3800.

Number of the workers at the end of the period-4200.

During the year, 40 workers left while 160 workers are discharged. 600 workers are recruited during the year; of these 150 workers are recruited to fill up vacancies and the rest are engaged on account of an expansion scheme.

Computation and the treatment of the labour cost:-

Rajan a worker in a manufacturing unit is paid at the rate of rs 10 per hour. His working constitutes 42 hours over a 5 days week. Time allowed per day as approved absence for personal needs etc, is 24 minutes.

Rajan job cards for the week ended 30th September 98 show that his time during the week is chargeable as under:

Job no-A -42 -15 hrs.

Job no-k -12-20 hrs

Job no -R-3 -2 hrs.

The time unaccounted for is due to a power failure. You are required to show rajan's wages for the week and how they would be dealt with in cost accounts.

Normal and overtime wages:-

4. The time card of a worker reveals in a normal week of 48 hours, he worked for 52 hours at the rate of rs 15 per hour .taking overtime premium as 100% at the time wages. Calculate gross wages.

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

Days	hrs worked
Monday	8
Tuesday	10
Wednesday	9
Thursday	11
Friday	9
Saturday	4

Normal working hours-8 hours per day.

Normal rate-rs 2 per hr.

Overtime rate- double the usual rate.

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

Days	hrs worked.
Monday	8
Tuesday	10.
Wednesday	09
Thursday	11
Friday	09
Saturday	04
Total	51

Normal working hours : 8 per day , normal rate-re0.50 paise per hour. Overt time :upto nine hr in a day at single rate and overtime hrs in a day at double rate (or) upto 48 hrs in a week at single rate over 48 hrs at double rate, whichever is more beneficial to the work men.

Cash required for wage payment:-

7. From the following particulars find the cash required for payment of wages

Gross wages -400000

Contribution to ESI – 6000

Contribution to PF-10000

Additional information:

- i. Employees are also require contributing equal amount to words state insurance and provident fund.
- ii. Employees has provided accommodation for which rent reduceable is rs 50 per employee for total of 100 employees.
- iii. Festival advances recoverable at the rate of rs 200 per employees from 120 employees.

8. From the following details ,ascertain the amount of cash required for payment of salaries in a firm for the month of January.

a. Normal time salaries-rs 65000.

b. dearness allowance :20% of (a)

c. leave wages 5% of (a) and (b)

d. employees contribution to ESI and PF 3% and 5% respectively on (a) and (b)

e. income tax deduction at source rs 4000.

f. deduction for insurance premium rs 5000

g. festival advance to be recovered from 60 employees at rs100 per employee.

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

i. wages for normal working hours-200000

ii. wages for overtime worked -5000.

iii. leave wages -4000

iv. Deduction for employees state insurance-3000

v. Employees contribution to provident fund-2000

House rent to be recovered from 20 employees at rs 50 per month .employees also contribute on an equal amount towards ESI and PF.

Labour cost to the employer.

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

(a) Monthly basic salary plus DA rs 200.

(b) Leave salary 5% of (a).

(c) Employer's contribution to pf 8% of (a)&(b).

(d) Employer's contribution to ESI 2.5% of (a)&(b).

(e) pro rata expenditure on amenities to labour rs 17.95 per head ., per month.

(f) Number of working hours in a month 200.

11. From the following particulars prepare a statement showing the labour cost per man day of 8 hours.

(a) basic salary –rs 2 per day.

(b) dearness allowances -25 ps for every point over 100 (cost of living index for working class) current cost of living index is 700 points.

(c) leave salary-10% of (A)&(b)

(d) employer's contribution PF -8% of a.b.& C.

(e) employer's contribution to state insurance 2.5 of a., b., and c.

(f) Expenditure on amenities to labour rs 20 per head per month.

(g) number of working days in the month -25 days of a 8 hours each.

12. From the following particulars calculate the labour cost per man day of 8 hours.

- i. basic salary –rs 5 per day.
- ii. Dearness allowances of 20 paise per every point over 100 (cost of living index for workers) current cost of living index is 800 points .
- iii. Leave salary 5% of i,ii.
- iv. Employer’s contribution to PF 8% of i,ii,iii.
- vi. Employers contribution to ESI 5 % of i,ii,iii.
- vii. Number of working hours is 8 hrs per day and 25 days per month.

13. From the following particulars prepare a statement of labour cost showing the cost per day (8 hours).

- i. monthly salary -900.
- ii. Leave salary -5% of i.
- iii. Employer’s contribution to PF- 8.5 % of i & ii.
- iv. Employer’s contribution to ESI – 3 % of i & ii.
- v. Pro rata expenditure on amenities to labour rs 112 per head per month.
- vi. Number of working hours in a month of 25 days .8 hours per day.

14. Calculate the earnings of two employees “M” and “N” from the following particulars for a month allocate the earnings to each to job I II and III.

s.no	Particulars	M	N
1	Basic wages	1000	1500
2.	Dearness allowances	80%	80%
3.	PF (on basic wages)	6%	6%
4.	ESI (on basic wages)	4%	4%
5.	Overtime		20hrs
6.	Idle time & leave	18 hrs.	

The normal working hours for a month are rs 200 .overtime is paid at double the normal wages and dearness. Employer’s contribution to state insurance & PF are at equal rate with the employees contribution .the month contains 25 working days and one paid holiday.the two workers were employed on job I,II and III in the following proposition .

Job	I	II	III
Worker M	40	120	40
Worker N	110	40	50

Over Time Was Done on JOB III

Methods of remuneration and incentive schemes:-

Time and piece wages:-

15. A company employs workers on time wages cum piece wage basis. Workers get payment as per the method more beneficial for them. During a week of 44 hours, production was as under. Gopu -100units, somu -140 units time rate rs 2.5 per hour, piece rate rs 1 per unit.

16. A company has set 5 units per hour as the standard output, each unit having a piece rate of rs 3. In a normal day of 8 hours, Raman produces 35 units and Krishnan produces 50 units .the usual hourly rate applicable to the worker is

- rs15. Find out earnings of Raman and Krishnan
- (a) if only time rate system is used.
- (b) if only piece rate is used.
- (c) if piece rate with guaranteed time rate is applied.

Taylor’s differential piece rate system.

17. Rajan Ltd., follows Taylor's differential piece rate system 80 and 120 being the differentials for below standard and above standard work. From the following ascertain the earnings of workers X and Y .
Standard time 15 mins per unit.
Time worked 8 hours.
Units produced X:28 Y: 35
Normal piece rate per unit –rs 2.

18. From the following particulars ,calculate the earnings of workers A&B under piece rate system and Taylor's differential piece rate system.
Standard time allowed-rs 10 units per hour.
Normal time rate per hour –rs1.
Differential to be applied.80 % of piece rate when below standard . 120% of piece rate at or above standard
In a day of 8 hours A produced 75 units. B produced 100 units.

19.calculate the earnings of workers A&B under straight piece rate system and Taylor's differential piece rate system from the following particulars, normal rate per hour –rs 1.80. Standard time rate per unit -20 seconds. Differentials to be applied.
80 % of the piece rate below the standard.
120 % of the piece rate at or above standard. Worker A produces 1300 units per day and worker B produces 1500 units per day.

20. Merricks differential piece rate system:-

Calculate the earnings of workers of 3 workers A,B and C under the Merricks differential piece rate system given the following.
Standard production-120 units, production of A -90 units, production of B -100 units, production of C-130 units, ordinary piece rate rs0.10.

21. On the basis of the following information , calculate the earnings of A,B,C and D under the Merricks differential piece rate system
Standard production per hour -12 units, Normal rate per hour-rs 0.60 in a day of 8 hours A produced 64 hours, B produced 96 units, C produced 84 units, D produced 100 units.

22. Calculate the earnings of 3 workers A,B & C under Merrick's multiple piece rate system ,given the following.
Standard production per day – 50 units , normal piece rate : 0.50 per unit, production of workers on a particular day A -120 units B -140 units , C -160 units.

23. Gantt's task bonus plan:-

The following are the particulars applicable to a work process: Time rate rs 5 per hour, high task 40 units per week, piece rate above the high task rs 6.5 per unit. In a 40 hour week, the production of the workers was as follows:
A-35 units, B-40 units, C-41 units, D -52 units. Calculate the wages of the workers under Gantt's task bonus plan.

24. The following are the particular applicable to a work process time rate –rs 5 per hour. High rate – 40 units per week .piece rate above high task – rs 6.50 per unit. In a 40 hour week each of the following workers produced, A – 35 units, B-40 units, C -41 units, calculate the wages of the workers under Gantt's task bonus plan.

25. from the following information given below. Calculate the earnings of X,Y and Z under the Gantt's task bonus plan time rate – rs 15 per hour, high task per day of 8 hours- 80 units , high piece rate –rs 2 per unit, days output- 70units, Y-80units, Z-90 units.

26. Halsey, Halsey weir, rowan.

Calculate the earnings of a worker under Halsey premium plan & B. Rowan plan time allowed-48 hours, time taken-40 hours, rate per hour-rs 1.

27. Standard time allowed for a job is 20 hours and the rate per hour is 20 plus a dearness allowance of rs 5 per hour worked. The actual time taken by a worker is 15 hour. Calculate the total earnings and the hourly earnings under (a) time rate (b) Halsey (c) Rowan.

28. From the following data calculate the total wages of a worker under
(a) Halsey: hourly rate – rs 3, standard time- 16 hours, time taken -12 hours.
(b)Halsey Weir: time allowed: 48 hours, rate per hour –rs 3.

29. Bedeaux's point system:-

Ascertain wages of a worker under bedeaux's point premium system from the following details:-
Standard output per day of 8 hours-160 units.
Actual output during a day of 8 hours -200 units.
Rate per hour is rs.5.00

30. In a 10 hour working day, standard output is fixed as 100 units. The bedeaux's point system is under operation. A worker produced 120 units during the day. The normal time rate is rs 20 per hour. Ascertain the earnings of the worker for the day under bedeaux's point system.

31. Barth's variable sharing plan:-

From the following details, calculate the earnings of a worker under the Barth's variable sharing plan:
Standard time -25 hours, actual time- 20 hours, standard rate per hour- rs 12

32. Standard time for a job- 50 hours, actual time taken- 40 hours, standard rate per hour-rs 10. Calculate wages as per Barth's variable sharing plan.

33. Emerson's efficiency plan:-

From the following information, calculate the bonus and earnings under the Emerson's efficiency bonus plan. Standard output in 12 hours-192 units.
Actual output in 12 hours- 168 units
Time rate – rs 0.75 per hour.
If the actual output, is 240 units, what will be the amount of bonus and earnings. 0.6 % as bonus for every additional 1% efficiency between 66 2/3% and 100%.

1. Cost accounting- Ramachandran and srinivasan.

2. Cost accounting- Reddy and Hari prasad Reddy.

Unit-III completed

Unit-IV

Overheads

Meaning and Definition:-

Cost relating to a cost centre or cost units consists of direct cost and indirect cost. Direct costs can easily be identified with cost units. Direct cost is the aggregate of direct material, direct labour and direct expenses. The indirect cost constitutes the 'overhead' which is the total of indirect material indirect labour and indirect expenses Indirect cost cannot be traced specifically to any units of production CIMA defines indirect - cost

as "expenditure on labour materials or services which cannot be economically identified with a specific saleable cost unit".

According to Whelden "overhead may be defined as the cost of indirect material indirect labour and such other expenses including services as cannot conveniently be charged to a specific unit. Alternatively overheads are all expenses other than direct expenses." Blocker and Weltmer define overhead as follows: "Overhead costs are operating costs of a business enterprise which cannot be traced directly to a particular unit of output. Further such costs are invisible or unaccountable".

The indirect costs, thus, are costs which are incurred for the benefit of number of cost centres and cost units and cannot be specifically identified with any one of them.

Importance of overhead cost:-

In these days of rapid technological innovation, heavy expenditure is being incurred on plant modernization which cannot be directly allocated to any particular cost unit because it is incurred as common cost to all units of production. The overhead expenses, now a days, represent significant portion of total cost and assume greater importance. Overhead requires detailed analysis for ascertaining accurate cost for pricing and control purposes.

Overheads cannot be traced to any particular cost units, but they can be apportioned and absorbed by different methods.

EXPLAIN SOME OF THE CLASSIFICATION OF THE OVERHEAD COSTS

CLASSIFICATION OF OVERHEAD COSTS

Cost classification is

- (1) The process of grouping of costs according to their common characteristics and
- (2) Establishing a series of special groups according to which costs are classified.

The former refers to determination of various groups according to which costs are to be classified. The latter refers to the process of actually classifying the costs and accumulating according to the groups. In the above context, overhead classification involves two steps, viz.

- (1) Identification of groups in which overheads are to be grouped.
- (2) The process of classification of various items of overheads into one or another of the groups.

Determination of classifying groups

The method of classification of overheads depends on nature and size of the business. The various bases for classification are as under:

(A) Function-wise classification:- Function-wise classification is done according to major activity divisions of an organization. The major groups under function-wise classification are:

- (1) Manufacturing overhead
- (2) Administration overhead
- (3) Selling overhead
- (4) Distribution overhead
- (5) Research and development cost

(1) MANUFACTURING OVERHEAD

This is the total of indirect costs in production function of an organization. It includes all the expenses incurred for the time of receipt of raw material until the production is completed and the finished product is kept ready for dispatch except the direct wages and expenses. Manufacturing overhead is also known as production overhead or factory overhead or works overhead or works on cost, etc.

Examples of production overheads are depreciation of plant and machinery, power costs, factory rent, lighting, stationary, supervision charges, insurance of plant and machinery, works manager's salary, unproductive wages, repairs of plant and machinery, consumable stores, etc

(2) ADMINISTRATION OVERHEAD

These are the expenses incurred for management of an organization. It is the sum of those costs of general management, secretarial, accounting and administrative services, which cannot be directly related to the production.

Examples of administration overheads are office rent, salaries, directors' fees, office lighting, bank charges, legal expenses, depreciation and repairs of office furniture, etc.

(3) SELLING AND MARKETING OVERHEAD COSTS

Marketing costs: Marketing costs are defined by I.C.M.A., London as "the cost incurred in publicizing and presenting to customers the products of the undertaking in suitably attractive forms and acceptable prices, together with the costs of all relevant research work the securing of orders and usually delivery of goods to customers. In certain cases, after-sales service and/or order processing may also be included"

Selling costs: It has been defined by I.C.M.A., London as "that portion of marketing costs which is incurred in securing orders".

Thus, marketing and selling overhead refer to indirect costs which are incurred for creating and stimulating demand, securing orders and retaining the customers.

Examples of selling and marketing expenses are advertisement cost, salesmen's salaries, commission on sales, sales office rent, sales office expenses, cost of marketing information system, costs of catalogues and price lists, etc.

(4) DISTRIBUTION OVERHEADS

It is that portion of marketing costs incurred in warehousing saleable products and in delivering products to customers. It includes all expenses incurred from the time product is made in the factory until it reaches its destination. The examples of distribution expenses are carriage outward, warehouse staff salaries, warehouse rent, warehouse lighting delivery van expenses, packing required for transport and insurance, etc.

(5) RESEARCH AND DEVELOPMENT COSTS

Research cost is the indirect cost incurred in searching for new products, new uses of existing products, new materials and new methods of production, etc. Developing cost is the cost incurred for implementing or introducing new products, methods and new applications or uses for existing products. Examples are raw materials used for research, depreciation of equipment used for research, research staff salaries, depreciation of building used for research, lighting expenses, etc.

HOW WILL YOU ALLOCATE OVERHEAD COST/ WRITE SHORT NOTE ON ALLOCATION, APPORTIONMENT

ALLOCATION OF OVERHEAD COSTS

I.C.M.A., London has defined cost allocation as "the allotment of whole items of cost to cost centres or cost units. In other words allocation is allotment of overhead incurred for a particular cost centre to that specific cost centre. To the extent possible it is better to allocate overheads. The main conditions for allocation of costs are:

- (1) The cost centre should be responsible for incurring such costs.
- (2) The amount of overhead to be allotted should be specific.

APPORTIONMENT OF OVERHEAD COSTS

Charging a fair share of overhead to each cost centre is termed as apportionment. I.C.M.A., London defined it as "the allotment to two or more cost centre's of proportions of common items of cost on estimated basis of benefit received".

If an item of overhead cost cannot be allocated to cost centres, it has to be apportioned. For apportionment suitable basis has to be selected so that overheads are equitably distributed between various cost centre's.

DISTINCTION BETWEEN ALLOCATION AND APPORTIONMENT

There is clear distinction between cost allocation and apportionment. It is necessary to understand the difference clearly so that the terms are not loosely used. No doubt the objective of both allocation and apportionment is to identify the overhead costs with different cost centres and cost units. But they differ in several aspects.

- (1) Allocation deals with whole items of cost while apportionment deals with 'parts or portions' of items of cost.
- (2) Allocation is directly attributing the items of overheads to cost centres and units. Apportionment takes recourse to the indirect method of equitable subdivision of items of cost.
- (3) Allocation does not need any basis. Apportionment is mainly dependent on suitable 'Bases' for subdivision of items of overhead.
- (4) Sometimes apportionment starts when allocation ends. For example factory rent is allocated fully to the factory. But, it has to be apportioned to different departments or divisions in the factory

Distribution of overhead consists of apportioning and allocation of overhead to the different departments. The distribution is followed by redistribution of the costs assigned to certain departments the distribution is of two types:

- (1) Primary distribution and
- (2) Secondary distribution.

WHAT DO YOU MEANT BY PRIMARY DISTRIBUTION OF OVERHEAD **PRIMARY DISTRIBUTION OF OVERHEADS**

Primary distribution of overheads is the process of allocating and apportioning the costs on suitable basis to all the departments or cost centre's. Primary distribution is done without distinction between production and service departments.

Bases of apportionment:-

In order to ascertain the correct cost of cost centre's and cost units, suitable bases have to be adopted for allocation and apportionment of overhead. The under mentioned are some of the bases adopted for apportionment of manufacturing overheads.

- (1) **Direct allocation:** Wherever traceable, overheads are to be directly allocated to particular departments. Examples are power, overtime premium of particular departments.
- (2) **Labour hours:** Overheads are apportioned on the basis of direct labour hours of different departments.
- (3) **Machine hours:** Overheads are distributed on the basis of machine hours worked in each department.
- (4) **Value of direct material consumed:** This basis is used for apportioning indirect materials, and material handling charges.
- (5) **Direct wages:** Direct wages is used as basis to apportion indirect wages and general overheads.
- (6) **Number of staff:** Number of employees in each department is taken as basis to apportion overheads cost incurred for the welfare of workers.
- (7) **Floor Area of departments:** The area occupied by different departments is taken as basis to apportion expenses like rent, property tax, lighting, heating and building maintenance expenses.
- (8) **Capital value of assets:** Capital value of assets of different departments is taken as basis to apportion depreciation, repairs and maintenance, insurance of assets, etc.
- (9) **Light points:** The light points of various departments is taken as basis to apportion lighting expenses.
- (10) **Kilowatt hours:** The kilowatt hours of various departments is taken as basis to apportion power expenses.

WHAT ARE THE PRINCIPLES FOR APPORTIONMENT OF OVERHEADS

PRINCIPLES OR CRITERIA FOR APPORTIONMENT OF OVERHEADS

The following are the methods of apportionment, based on the principles or criteria.

(1) Service or use method: Under this method the service or benefit rendered to different departments is the basis of apportionment of overhead. The service rendered to various departments can be measured and it is fair and equitable to use. Since benefit received is the criterion for apportionment. For example rent charges are apportioned on "area occupied" basis.

(2) Analysis or survey method: For some items of overhead it may not be possible to measure the proportion of benefit derived. In such a case a survey or analysis is made to reveal the extent of overheads to be charged to different departments. Examples are foreman's salary, power expenses when meters are not maintained separately, etc.

(3) Ability to pay method: Under this method overhead costs are apportioned on the basis of capacity to bear, i.e., sales volume or profits of different departments. Higher the profits/sales value of the job more is the overhead charged. This method is generally not used since it is considered inequitable. It penalizes the efficient and profitable units of a business to the advantage of the inefficient ones.

(4) Efficiency or incentive method: This is a scientific method of apportionment. Under this method the output is budgeted and efficiency is measured by comparing actual with budgets. If the actual output exceeds the budget the incidence of overhead cost is reduced and the cost per unit is lowered.

If the targets are not achieved the unit cost goes up revealing the inefficiency of the department

Expenses	Basis of Apportionment
Factory rent	Area in sq meters sq feet
Power	Kilowatt hours (K.W.H.)
Indirect material	Direct material
Indirect wages	Direct wages
Repairs to plant	Plant value
Depreciation	Plant value
Lighting	Light points/Floor area
Supervision	(former preferable)
Fire insurance of stock	No. of employees
Fire insurance of capital assets	Stock value
ESI/PFcontributionof employer	Value of capital assets.
Labour welfare expenses	Wages of each department
General factory overheads	Number of employees
	Labour hours/Direct wages

SECONDARY DISTRIBUTION OF OVERHEADS:-

Secondary distribution is the process of redistribution of service department costs to production departments.

This is done as output or jobs pass through one or more production cost centres only. This kind of distribution is called secondary apportionment. Suitable bases have to be adopted for redistribution of service department cost to production departments.

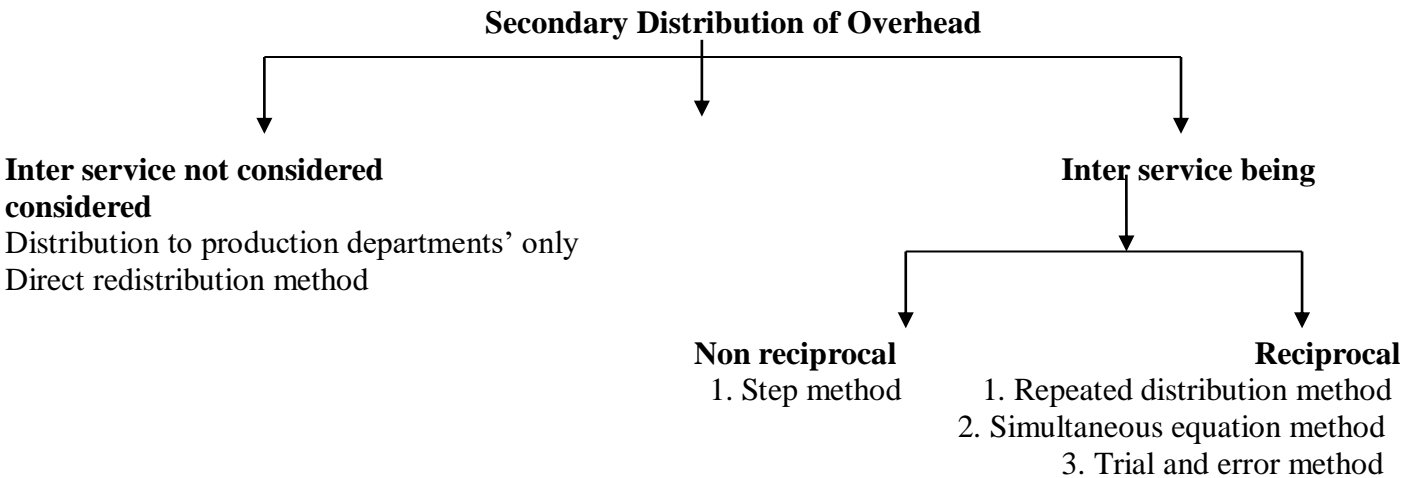
The basis to be selected depends on the nature of service rendered by service department. The following are some of the general bases selected for

<i>Service cost centre</i>	<i>Basis of apportionment among the production departments</i>
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Stores department	No. of material requisitions, direct material of each department
Labour welfare department canteen service, recreation facility.	No. of employees in each department
Building maintenance department	Relative area of each department
Internal transport service department Personnel department. Time keeping department. Payroll department.	Weight, weight and distance traversed No. of employees in each department labour/machine hours.

METHODS OF SECONDARY DISTRIBUTION

Once the basis of apportionment of service department costs has been finalised the apportionment can be done by using any of the following methods of secondary distribution.



Direct reapportionment method (without considering inter service):-

Under direct redistribution method overhead of service departments are apportioned to production departments only while inter service by service departments to each other is ignored. This method fails to obtain correct cost of each service department as service cost from other cost centres is not included. Control of costs of service cost centres is ineffective as the full cost of service departments is not available.

Apportionment, considering inter service:-

Here service rendered by service departments to each other is considered. Therefore service department costs are redistributed to other service departments and production departments. This may be either (a) Non reciprocal (b) Reciprocal.

Non reciprocal apportionment:-

Under this method service departments are arranged in the descending order of serviceability. The service department which renders service to all or maximum number of the other service departments and production departments is taken up for distribution. Then the second service cost centre is taken up and this process is repeated till costs of all the service cost centres have been distributed to production departments. This method is also called step method (or) step ladder method because the tabulation of the distribution resembles a step ladder.

Reciprocal apportionment methods

These methods consider mutual service rendered by service departments among themselves along with the service rendered to production departments.

These method recognise service rendered by service departments to each other to arrive at correct cost of each department and finally accurate production costs. Costs arrived at are more accurate but voluminous clerical work is involved. The following are the reciprocal apportionment methods.

- (1) Repeated distribution method
- (2) Simultaneous equation method
- (3) Trial and error method

Repeated Distribution or Attrition Method

Under this method the overheads of service departments are distributed to production and service departments on the basis of the percentages agreed upon as reasonable. The process is repeated till the service department overhead cost becomes negligible. In other words the process of apportionment of service department overheads is repeated till the balance of service departments becomes nil and the service department costs are fully transferred to production departments.

Simultaneous Equation Method

In this method the service rendered by each service department to other departments is estimated. One service department may render service to another service department and also receive its service in return. Based on the percentage of service estimates, simultaneous algebraic equations are formed, assuming the total overhead of one service department as V and that of another service department as ty>. The simultaneous equations are solved for the values of V and y. Based on these values, the overhead of each service department is directly transferred to production departments.

Trial and Error Method

Under this method the process of repeated distribution is used in respect of service departments only. It is done on the basis of agreed percentages for the mutual service. After several divisions, the overhead balance for each department becomes negligible. At this stage further division is stopped and the total amounts of each department at this stage are ascertained. These total overheads of the service departments are then distributed to the production departments

ABSORPTION OF OVERHEAD

The last step is the process of accounting for manufacturing overhead is 'Absorption' of the overhead. The process of charging the overhead cost of a cost centre to the cost units is called overhead absorption. According to I.C.M.A, overhead absorption is "the allotment of overhead to cost units by means of rates separately calculated for each cost centre." The terms 'overhead absorption', 'recovery', 'charge' and 'application of overheads' are used interchangeably. Allotment of overhead to cost units is of great importance as each unit of output should share a reasonable portion of overhead, besides bearing the cost of direct material and wages. Overhead absorption is accomplished by overhead rates.

Overhead Rates

Absorption of overheads is the 'charging' of overheads of a department or a cost centre to the cost units which pass through the department or cost centre. In order to equitably charge the overhead expenses to cost units a suitable base must be adopted. The base selected is used to calculate a uniform Rate' to absorb the overheads which is called 'Absorption Rate'. The absorption rate is calculated by dividing the overhead by the units of base selected such as units of production, labour hours, machine hours, etc. The overhead cost of products or jobs is arrived at by multiplying the rate by units of base contained in the job product or process, etc.

METHODS OF ABSORPTION OF OVERHEAD

The following are the various methods of absorbing manufacturing overhead: (a) Direct material cost method: Under this method direct material is the basis for absorption. Direct material percentage rate is calculated by dividing the predetermined production overhead by direct material. The formula is given below:

This method is suitable:

- (1) When material cost forms the major part of total cost;
- (2) When the price of material does not fluctuate;
- (3) When the quantity of material used is uniform for all units of output;
- (4) Where only one kind of article is produced.

Advantages

- (1) It is simple to calculate.
- (2) The information is readily available to calculate the rate.

(3) Overhead cost items in the form of upkeep and handling of material can be fairly absorbed only by this method.

Disadvantages

(1) Fluctuations in material prices may affect the overhead absorbed. Overhead may be stable but absorption rate may not be appropriate as the basis is not suitable, when the raw material prices fluctuate.

(2) The time factor is not taken into account in this method which is very important for absorbing overhead cost.

(3) Expensive materials may result in less overhead expenses than cheap materials. Thus, overhead cost has nothing to do with direct material cost of a product.

(4) Variable expenses vary with volume of production, whereas fixed expenses remain constant. This is totally ignored in this method.

(b) Direct labour cost (or direct wages) method: Actual or predetermined direct labour cost method is calculated by dividing the overhead cost apportioned by the wages paid or expected to be paid and expressed as a percentage. The formula for calculating the percentage rate is

MACHINE HOUR RATE METHOD

Machine hour rate method of absorption is used in those industries where machines are extensively used for production and manual labour is negligible or plays very minor role. The I.C.M.A.. London, defines machine hour rate as "an actual or predetermined rate of cost apportionment or overhead absorption, which is calculated by dividing the cost apportioned or absorbed by the number of hours for which a machine is operated or expected to be operated". It is not desirable to calculate a blanket rate or one single rate for the entire factory, since the cost, horse power, capacity of machines differ. It is appropriate to calculate multiple rates.

Computation of machine hour rate

The machine hour rate may be calculated for a specific machine or group of machines. The particulars required for computing machine hour rate are:

(1) Expenses chargeable to each machine

(2) The total hours worked by each machine or group of machines The following is the procedure for computing machine hour rate

(1) Each machine or group of machines are treated as a cost centre to identify the overhead cost.

(2) The overhead expenses of machines are classified under two heads i.e.,

(a) Fixed or standing charges, which remain constant irrespective of use of the machine. Examples of fixed expenses are:

Supervision Rent, Insurance, Lighting and heating Consumable stores, etc.

(b) Machine expenses: These expenses vary with use of the machine.

Examples are power, depreciation and repair expenses.

(3) Fixed expenses being period costs are accumulated for the period and divided by the number of machine hours during the period to obtain the fixed charges per hour. **(Unit-IV contd...)**

(4) The machine expenses are estimated separately and then divided by the number of working hours to give hourly rate for each item.

(5) The total of standing charges per hour and machine expenses per hour is the ordinary machine hour rate.

<i>Expenses</i>	<i>Basis</i>
1. Rent and rates	Floor area occupied by each machine
2. Lighting and heating	Floor area or number of points
3. Insurance	Value of assets, machines
4. Supervision	Time spent on each machine
5. Consumable stores and lubricating oil	As per stores requisition slips.
6. Depreciation	
7. Power	Value of machines

8. Repair	Horse power of machines Value of machines
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Comprehensive machine hour rate

If machine operator's wages are also added to the ordinary machine hour rate it is called comprehensive machine hour rate. Generally machine operator's wages are a part of direct wages. But to provide a "comprehensive" idea of the cost of operating machines, some experts on costing include the operators' wages also in the computation of machine hour rate and call it 'comprehensive machine hour rate'. But other costing experts object to such a procedure because it makes a direct cost into an overhead item.

The bases used for apportionment of different expenses for the computation of machine hour rate are as under:

Machine hour rate method is suitable when machines are extensively used in production.

Merits

- (1) It is a scientific method of absorption, since time factor is taken into account.
- (2) Cost of operating different machines is computed and efficiency of different machines is compared.
- (3) The difference between machine work and manual work, cost wise and quality wise can be ascertained.
- (4) Machine hour rate reveals idle time.

Demerits

- (1) It involves additional cost in ascertaining working hours of machines.
- (2) Expenses not connected to machine operation are ignored.
- (3) It is inaccurate when manual labour plays an equally important role in production.

UNDER ABSORPTION AND OVER ABSORPTION OF OVERHEADS

Overheads are absorbed on the basis of actual rate or predetermined rate. If actual rates are used, the overhead absorbed and incurred will be equal. But in practice due to the "time" limitation of actual overhead, overheads are generally charged on the basis of predetermined overhead rates. This may result in a difference in overhead absorbed and overhead incurred. Such a difference is called under/over absorption of overheads. Over absorption or over-recovery of overhead

When expenses absorbed are more than actual expenses incurred it is known as over absorption.

Over absorption = Actual expenses < Expenses absorbed

Under absorption or under recovery

When expenses absorbed are less than the actual overhead incurred it is known as under absorption.

Under absorption = Actual Expenses - Expenses absorbed.

I.C.M.A., London defined under or over absorption of overhead as "the difference between the amount of overhead absorbed and the amount of overhead incurred".

Causes for over - or under-recovery (absorption) of overheads are as follows:

- (1) Actual hours may be more or less than budgeted hours*.
- (2) Actual output may be more or less than budgeted output.
- (3) Actual overhead incurred may be less or more than budgeted overhead.
- (4) Expenses which were not anticipated may be incurred.
- (5) Mistake in estimation of overhead expenses or bases of calculating predetermined rates.
- (6) Seasonal fluctuations in level of production.
- (7) Under utilisation of capacity.
- (8) Changes in the techniques and methods of production.

Treatment of over-or under-absorbed overhead

Three methods of disposal of under or over absorption of overhead are used:

- (1) Use of supplementary rate.
- (2) Write off to costing profit and loss account.
- (3) Carry forward to subsequent year's account.

Unit-IV problems

Primary distribution of overheads:-

1. K ltd has 3 production departments A,B and C and the two service departments D and E. The following are the records of the company.

Rent and wages – 5000

Indirect wages – 1500

Depreciation of machinery- 10000

General lighting -600

Power -1500

Sundries – 10000

Following are further details

Particulars	Total	A	B	C	D	E
Floor space in sqft	10000	2000	2500	3000	2000	500
Light points	60	10	15	20	10	50
Direct wages	10000	3000	2000	3000	1500	500
H.P of machines	150	60	30	50	10	-
Value of machine	250000	60000	80000	100000	5000	5000

Apportion the cost by preparing the primary distribution summary.

2. The following are the data obtained from the books of run engineering company for the half year ended 30th September. Prepare an overhead distribution summary.

Particulars	A	B	C	X	Y
Direct wages	7000	6000	5000	1000	1000
Direct material	3000	2500	2000	1500	1000
Number of workers	200	150	150	50	50
Light points	10	15	15	5	5
Value of machine	50000	30000	20000	10000	10000
Area occupied	800	600	600	200	200

The expenses are the following

Store overhead -400

Motive power – 1500

Lighting -200

Labour welfare – 3000

Depreciation – 6000

Repairs and Maintenance – 1200

General overheads – 10000

Rent and rates -600

3. Shiva industries ltd., has four departments A,B,C are the production department and D is the service department. the actual expenses for a month were as follows.

Rent – 6000

Repairs to plant – 3600

Depreciation – 2700

Lighting charges – 600

Supervision – 9000

Insurance of stock – 3000

Power – 5400

Employees Insurance - Employer's Liability – 900

The following information is also available.

Particulars	A	B	C	D
Total wages	8000	6000	4000	2000
Value of stock	15000	9000	6000	----
Number of workers	48	32	24	16
Value of plant	24000	18000	12000	6000
Area occupied	300	220	180	100

Apportion the costs to four department on the most equitable method.

Secondary distribution summary:-

Direct reapportionment method:-

4. Calculate the overhead allocable to production department A and B from the following

There are two service departments X and Y ,X renders to A and B renders in the ratio of 3:2and Y renders service to A and B in the ratio 9:1 overhead as per primary overhead distribution is

A-49800, B 29600,X-15600, Y-10800

5. Bulls and bears ltd has three production department A,B&C in its factory. they are served by two service departments. D and E D is purchasing department and E is time keeping department.

The following are the departmental overheads after primary distribution is completed.

A-22650,B-21600,C -28950, D -13875, E -4725.

The following additional details

Particulars	A	B	C
Number of employees	75	30	45
Material purchased	10000	8000	7000

Prepare a secondary overhead distribution summary, showing the total overhead of the production departments.

Step ladder method:-

6. A Factory has 3 service departments L, M and N and two production departments X and Y. The following are the expenses allocated and apportioned to the departments as per the primary distribution summary.

L	M	N	X	Y
10000	8000	12000	30000	40000

The following additional information is also available on the basis of a detailed analysis made.

Particulars	Service departments			Production department	
	L	M	N	X	Y
L's service used	-	20%	30%	30%	20%
M's service used	-	-	40%	30%	30%
N's service used	-	-	-	60%	40%

Prepare a statement showing apportionment of service department overheads under the step method.

7. Bombay industries has two production department and there service departments. The total overheads of the department are production department . the total over heads of the departments are

Production department

A -24000

B -16000

Service department

Time office -8000

Stores- 10000.

Maintenance – 6000

Details relating to the departments are

Particulars	Time office	Stores	Maintenance	A	B
No of workers	7	20	10	40	30
No of stores required	-	-	6	24	20
Machine hours	-	-	-	2400	1600

Prepare the overhead distribution summary by stepladder method.

Reciprocal services method:-

Simultaneous equation method:-

8. A company has 3 production and two service department and their respective expenditures are given below.

Production department

A-800, B-700, C-500,

Service department

X-234, Y-300

Service department give service in the following to various departments

Service departments	A	B	C	X	Y
X	20	40	30	-	10
Y	40	20	20	20	-

You are required to show the distribution of service department over heads under the simultaneous equation method.

9. You are supplied with the following information and are required to work out the secondary distribution of service department overheads under simultaneous equation method.

Particulars	A	B	C	P	Q
Total over head as per primary	7810	12453	4547	4000	2000

Expenses of service department P and Q are apportioned as under.

Particulars	A	B	C	P	Q
P	30	40	20	-	10
Q	10	20	50	20	-

Repeated redistribution method:-

10.A manufacturing concern has three production department and two services department nad two service department .in july 1995 the departmental expenses were as follows.

Production department
A-16000,B -13000,C – 14000
Service departments
X-4000,Y-6000

The service department expenses are charged out on a percentage basis

Particulars	A	B	C	X	Y
Expenses of department X	20%	25%	35%	--	20%
Expenses of department Y	25%	25%	40%	10%	---

11. A manufacturing company has three production department and two service department the departmental overheads were as follows.

Particulars	D	E	F	X	Z	Total
Expenses	10000	8000	12000	2000	3000	35000

Particulars	D	E	F	X	Z
Expenses of department X	25%	20%	30%	--	25%
Expenses of department Z	15%	30%	25%	30%	---

Prepare a statement showing the apportionment of the overhead of the two service departments to the production departments.

Trial and error method:-

12. P H ltd is a manufacturing company having three production departments A,B,and C and two service department X and Y .the following is the total of overheads as per primary distribution.
A-4100,B-2700 , C-6200, X-4200, Y-5300.

A technical assessment for apportionment of service department is as under.

Particulars	A	B	C	X	Y
Expenses of department X	45	15	30	-	10
Expenses of department Y	60	35	-	5	-

You are required to prepare secondary distribution summary under trial and error method and arrive at the overhead finally charged to each production department.

13. Vasanth engg &co has three production department and two service departments .the overhead analysis gives the following overhead costs.

Production department and its amount.

A-1380, B-2190, C-1290

Service department.

D-630, E-510

The overheads of service departments are apportioned as below

Particulars	A	B	C	D	E
Expenses of department D in %	30	40	20	-	10
Expenses of department E in %	10	20	50	20	--

You are required to prepare secondary distribution summary under the trial and error method.

Primary and secondary distribution of overheads:-

14. XYZ ltd., has three production department P,Q and R and two service department X and Y the following pertain to them.

Particulars	Total	P	Q	R	X	Y
Direct wages		3000	2000	3000	1500	195
Worked hours		3070	4475	2419	-	-

Value of machine		60000	80000	100000	5000	5000
H.P of the machines		60	30	50	10	-
LIGHT POINTS		10	15	20	10	5
Floor space		2000	2500	3000	2000	500
Rent	5000					
Lighting	600					
Indirect wages	1939					
Power	1500					
Depreciation of the machines	10000					
Sundries	9695					

Find overhead recovery rate per hour for production department if X'S expenses are distributed to P Q R and Y in the ratio of 2:3:4:1 and y's expenses distributed in the ratio of 4:2:3:1 to P,Q R and X respectively.

15. In a light engg co the following particulars have been collected for the three monthly period ended 31.12.88 .compute the departmental overheads rates for the production departments , assuming that overheads are recovered as a percentage of direct wages.

Particulars	A	B	C	D	E
Direct wages	2000	3000	4000	1000	2000
Direct materials	1000	2000	2000	1500	1500
Staff member	100	150	150	50	50
Electricity	4000	3000	2000	1000	1000
Light points	10	16	4	6	4
Asset value	60000	40000	30000	10000	10000
Area occupied	150	250	50	50	50

The expenses for the period were:

Motive power-550, lighting power-100, stores overhead -400, depreciation -15000 , amenities to staff-1500, repairs and maintenance -3000, general overhead -6000, rent and taxes-275.

Apportion the expenses of service department E proportionate to direct wages and that of service department D in the ratio of 5:3: 2 to departments A,B and C respectively.

Machine hour rate method:-

1. From the following particulars compute the machine hour rate .

Cost of machine- 11000

Scrap value- 680.

Repairs for the effective working life – 1500

Standing charges for 4 weekly period –rs40

Effective working hours- 10000 hours (in life)

Power used – 6 units per hour at 5 paise per unit.

Hours worked in 4 weekly period -120 hours.

2. Work out the machine hour rate for the following machine whose scrap value is nil.

Cost of machine- 360000

Freight and installation- 40000

Working life -20 years .

Repair charges -50% of depreciation.

Working hours – 8000 per year .

Power -10 units per hours@ 10 paise per unit.

Lubricating oil – rs 2 per day of 8 hours .
Consumable stores -@ rs 10 per day of 8 hours.
Wages of operator- rs 4 per day.

3. The following annual charges are incurred in respect of a machine in a shop where manual labour is almost nil and where work is done by means of five machines of exactly same type of specification.

Rent and rates -4800.

Depreciation on each machine- 500.

Repair and maintenance for the five machines-1000

Power consumed @ 5 paise per unit for the shop-3000

Electric charges for light in the shop-540.

Attendants:

There are two attendants for the five machines and they are each paid rs 60 per month.

Supervision

For the five machines in the shop there is one supervisor whose emoluments are 250 per month.

Sundry supplies:- 450

Hire purchase installments payable for the machine (including rs 300 as interest) 1200

The machine uses 10 units of power per hour .calculate the machine hour rate for the machine hour rate for the machine for the year.

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

Cost of machine- 13500

Life of the machine-10 years.

Estimated scrap value –(after 10 years)-rs1980

Working hours -1800

Insurance- (per annum)rs45

Cotton wastes – (per annum)-75

Rent for the dept-(per annum)-975

Foreman's salary – (per annum)-7500

Lighting for the dept –(per annum)-360

Repairs for the entire life -rs 1440

Power -10 units @ 7.5 paise per unit.

Machine X occupies 1/5 of the areas and foreman devotes ¼ th of his time to the machine. The machine has two light points out of the total 12 for lighting in the department.

5. Work out the machine hour rate for the following machine whose scrap value is nil.

Cost of machine- 95000

Freight and installation- 10000

Scrap value- after 10 years- 5000

Repair charges -50% of depreciation.

Working hours – 200 per month

Power -10 units per hours@ rs 10 per100 unit.

Lighting-150 per month.

Rent-200 per month.

Insurance premium- rs 500 per month.

Other standing charge – rs 1000 per month.

Reference:-

1. Cost accounting- T.S Reddy and Y. Hari prasad reddy

**Unit-IV completed
Unit-V
METHODS OF PROCESS COSTING**

What do you mean by process costing?

Meaning of Process Costing

Charles T. Horngren says "Process Costing deals with the mass production of like units that usually pass in continuous fashion through a series of production steps called operations or processes."

According to I.C.M.A., London, "Process Costing is that form of operation costing, where standardised goods are produced."

Processes may be sequential processes where product goes through two or more processes in sequence. Processes also can be parallel processes where two or more processes may have a common prior process (joint process) or they may have common subsequent process. The flow of product through processes depends on the final product.

Give a brief note on features of process costing.

Characteristic Features of Process Costing and the industries where it is employed:

- (1) Production is continuous, in a series of stages called processes.
- (2) Each process is deemed as a cost centre and costs are accumulated for each process separately along with output finished and in progress.
- (3) Products and processes are standardised.
- (4) The output of one process becomes the raw material to the next process, usually till the final product is completed.
- (5) The cost of the previous process is transferred to the next process along with the output. Sometimes, the transfer may be at a transfer price inclusive of profit.
- (6) There may be process losses of the input. They may be normal or abnormal or both.
- (7) Completed and semi-finished outputs have to be expressed in common terms for cost determination.
- (8) Since production is of identical units, the total cost of a process is divided with the units of output to obtain average cost per unit.
- (9) Two or more products may be produced unavoidably in the same process. They may be of equal importance or of disproportionate values.
- (10) It is not possible or necessary to trace or identify specific lots of material inputs with product or output.

What are the types of industry using process costing?

Types of Industries using Process Costing

All the industries where production is not on the basis of specific orders, and the output is identical, process costing method can be used. The most common examples are: Mines, Textiles, Chemicals, Sugar, Oil refining, Paper, Food products, etc.

Describe the advantages and disadvantages of process costing.

Advantages of process costing:-

- (1) Cost of each process and that of the finished product can be computed at short intervals, weekly or daily.
- (2) Cost control and control over production are more effective because of uniform output and usage of predetermined costs as budgeted or standard costs.
- (3) Cost ascertainment is simple and less expensive
- (4) Average cost per unit can easily be obtained
- (5) Indirect expenses can be apportioned and allocated more accurately and reliable data can be obtained.
- (6) Valuation of inventories is easier and accurate.
- (7) Quotations become easier due to standardised processes.

Disadvantages

- (1) Costs obtained at the end of processes are historical costs and their utility for cost control and managerial decision making is not significant.
- (2) Inefficiencies in processes can be concealed.
- (3) Later processes may be adversely affected due to the inefficiency of earlier processes.
- (4) Evaluating the efficiency of individual workers or supervisors is difficult.
- (5) Apportionment of Joint costs to common products may lead to irrational pricing decisions.

Explain the procedure for costing.

Costing Procedure

- (a) **Materials:** Materials are issued to the processes on the basis of material requisitions. Bulk issues also may be made from stores to processes in which case departmental stocks of materials may be maintained. Each process is debited for the output received from the previous process as it is like raw material. Additional materials may also be used by processes which are also debited to them.
- (b) **Labour:** Automation is the order of the day in most of the process industries. Proportion of direct labour is generally very low in the total cost of a process. Remuneration of workers engaged in production in each process is debited to the process as direct wages. If any workers assist in two or more processes, their wages may be allocated on the basis of time-booking.
- (c) **Direct Expenses:** Expenses such as electricity, depreciation, etc., can be easily determined for each process and allocated directly.

(d) **Overheads:** Common expenses can be apportioned to different processes on suitable basis. They may be recovered at predetermined rates also, based on past experience.

Important aspects of process costing

There are four important aspects which require detailed discussion.

- (1) Process Losses,
- (2) Inter process profits,
- (3) Work-in-progress and Equivalent production,
- (4) Joint-products and By-products.

What are all the difference between process costing and job costing?

s.no	Process costing	Job costing
1.	Process costing is applied in the case of mass production of similar units that continuously pass through different processes	Job costing is applicable in situations where the objectives is to identify costs with specific products or job
2.	Products are manufactured for building up stock.	Products are manufactured as per customer's order.
3.	the costs are accumulated by a job or work order regardless of the time taken to complete it.	The costs are accumulated by the process for a particular period regardless of the number of units produced.
4.	Normally There will be an opening and closing work-in –progress for the accounting period.	Here, work in progress may or may not exist at the end of the accounting period

Explain in detail about normal loss, abnormal loss and abnormal gain.

(1) PROCESS LOSSES/NORMAL LOSS

In most of the industries which employ process costing method, process losses of the nature of wastage, scrap, spoilage, etc., occur at different stages of the manufacturing cycle.

(a)**Wastage:** According to terminology of cost accounting, I.CM.A., London, "Waste is discarded substance having no value". Charles T. Horngren says "wastage is material that either is lost, evaporates or shrinks in a manufacturing process or is a residue that has no measurable recovery value". Thus, wastage has neither recovery value nor has any use.

(b)**Scrap:** According to I.CM.A terminology, "Scrap is discarded material having some recovery value which is usually disposed off without further treatment.

Wastage and scrap receive similar accounting treatment. The cost of wastage and scrap are merged with the process cost so that the good units produced bear their cost through averaging. Recovery from scrap reduces the cost of the process.

(c) **Normal process loss or normal wastage:** It is the process loss which is unavoidable and uncontrollable. It is to be expected in normal conditions of the process. As a part of cost control, management estimates such loss in advance on the basis of past experience. The normal loss should be absorbed by good units produced.

Accounting Treatment

The quantity of normal loss is computed and credited to the process account in the units column. If the material scraps has some realizable value that is also credited to the process account in the amount column.

A separate normal loss account is opened in the cost ledger. It is debited with the normal loss of different processes. Cash realized from the normal scrap and the scrap value of abnormal gain units are credited to the account. This is necessary because abnormal gain results in reduction of the normal scrap receipts. The account shows no balance.

(d) Abnormal process loss or abnormal wastage: When process loss is in excess of predetermined loss, such additional loss is called abnormal loss or abnormal wastage. Such loss may be caused by abnormal reasons such as substandard material, faulty tools and equipment, plant breakdown, etc.

Abnormal loss should not be allowed to affect the normal cost of production. Therefore it is valued just like good units produced. The abnormal loss is controllable and not repetitive in nature. The firm should take all the steps to avoid the recurrence of abnormal loss. Computation of Abnormal loss

Quantity of abnormal loss = Normal output - Actual output

Normal output = Input - Normal Loss

If actual output is less than normal output the balance is a positive figure, representing abnormal loss in units.

Value of abnormal loss = normal cost of normal output/ normal output *units of abnormal loss

Normal cost of nonnal output = Expenditure of the process - Scrap value of normal loss

Accounting Treatment of Abnormal Loss:-

The units of abnormal loss and their value are both credited to the account concerned in the respective columns.

A separate account is opened in the cost ledger for abnormal in quantities and values of abnormal loss from different processes are de this account. It is credited with the quantity and amount realized from units of abnormal loss as scrap. To this extent, the abnormal loss is n Balance in abnormal loss account represents total irrecoverable loss transferred to costing Profit & Loss Account.

(e) Abnormal gain or Abnormal Effectives: When process loss is le the predetermined normal loss, the additional output resulting there from is abnormal gain or Abnormal Effectives. Abnormal gain can occur because superior quality material, better workmanship, improved methods, too equipments, etc. As a part of cost control process, the causes for abnormal effectives should also be investigated. Where it is warranted, the normal loss percentage can be revised for future operations.

Computation of Abnormal gain

Quantity of abnormal gain = Normal output - Actual output

Normal output = Input - Normal loss

If actual output is more, the balance is a negative figure, representing abnormal gain in units.

Value of Abnormal gain = Normal cost of normal output /Normal output* Units of Abnormal gain

Normal cost of normal output = Expenditure of the process - Scrap value of normal loss

Accounting Treatment of Abnormal gain

The units of abnormal gain and their value are both debited to the pro< account concerned in the respective columns.

A separate account is opened in the cost ledger for abnormal gain; account is credited with units and value of abnormal gains in different process It is debited with the loss in scrap value of normal loss which did not materialize because of the occurrence of abnormal gain. The balance in the account is transferred of costing profit and loss account.

JOINT PRODUCTS AND BY PRODUCTS

Introduction:-

Two or more products may be produced simultaneously from a single process .such process such products can be joint products or main products and by- products. The classification of the products either as joint products or as main and the byproducts depends on the relative importance and value of all products involved.

If all the products are almost equal importance ,they can be called joint products .if one product is of more importance and value and all the other products are relatively low importance and value ,the former is called main product and latter the by- products.

For example, edible oil is the main product and oil cake by-product in the vegetable oil industry. Diesel, Petrol, kerosene, etc., are the joint products in petroleum refining.

JOINT PRODUCTS COSTING

According to I.CM.A. (London) Terminology, "Joint products are two or more products separated in the course of processing, each having a sufficiently high saleable value to merit recognition as a main product".

Features of Joint Products

The following are the distinctive features of joint products.

- (a) They are of .equal importance and value.
- (b) They are all produced in the same process out of common raw material or production method.
- (c) They are unavoidably produced together.
- (d) They are separated from each other at a specific point in the process called 'split off-point'.
- (e) They may need further processing.

Objectives of Joint Product Costing

Joint product costing has several objectives. Process costs should be accurately recorded after classifying them suitably. The net result of each product and the pattern of production should be ascertained The optimum production has to be computed. The effect of changes in volume of each product on the overall

cost and profit have to be determined. The ramifications of further processing of each joint product compared to sale at split-off point should also be ascertained.

Accounting Procedure for Joint Products

In the process of their production, joint costs are separated from each other at some specific stage or point. All the costs incurred in the process till that stage are called 'Joint Cost'. Some products may be sold and the others may need further processing. Additional costs for each of the products further processed are called post separation costs or separate expenses.

A joint process account is prepared where the joint costs are debited and the apportioned joint costs are credited. The apportionment is done on some suitable basis. Separate ledger accounts are opened for each product, showing its share of joint cost, separate expenses and selling expenses on the debit side. The sales value and any closing stock at cost are credited, the balance in each product account represents profit or loss of the product which is transferred to the profit and loss account.

The basic problem in joint product costing is the apportionment of joint costs.

Methods of Apportionment of Joint Costs

There are several methods used in different industries, but the following are the important and popular methods.

(1) Average unit cost method: Here the total joint cost is divided with the total number of units produced to get 'Average unit cost'. The units of output of each joint product can be multiplied with the average unit cost to obtain the apportioned joint cost.

The method is very simple and easy to understand and use. The cost per unit is uniform. Since all the products are from the same material, it appears to be logical.

The grades and qualities of different products are ignored. When end products cannot be expressed in common units, the method cannot be used. Prices based on identical cost for different products can be misleading.

(2) Physical units' method: Physical measurements of the products are taken as basis for dividing joint costs. For example, weight of the products, their length, breadth, etc. The method is simple and it is based on physical measurements thus making it objective.

The method cannot be applied if all the products cannot be measured commonly. For example, milk is a liquid and butter and cheese are solids. The method does not distinguish between the quality of the products. Demand based value is also not taken into account.

(3) Survey Method: Different factors affecting the process and products are taken into account like demand, selling price, production aspects, etc. By means of an extensive survey. Points are allotted to each product based on the survey. The points are like weightage. Physical quantities of each product are multiplied with the weightage points to obtain the ratio for dividing joint cost.

This method takes into account various relevant factors. The apportionment is more accurate. The points allotted are not scientific and they may become subjective. Arbitrariness is the real drawback of this method.

(4) Contribution margin method (or) Gross margin method: The marginal or variable portion of the joint cost is apportioned on physical measurement basis. Fixed joint cost is apportioned on the basis of contribution of each product.

The method is simple and easy to use. The market value of the products and the physical measurements have their effect on cost apportionment. Pricing of products becomes more appropriate. Ascertaining variable and fixed costs among the joint costs may be difficult. It can be practised where marginal costing technique is followed.

(5) Standard Cost Method: Standard costs are fixed in advance for all the joint products based on past experience. These costs are the basis for apportioning the joint costs.

It is a simple method and easy to use. It tends to be more accurate because of setting of standards. Setting standards is a precondition. The success of the method is related to the accuracy of the standards.

(6) Market Value Method: Here joint costs are apportioned on the basis of selling prices of the products. However, there can be different kinds of market prices.

(a) Market value at separation point: Market values of the joint products at separation point are obtained. It is not essential that the products should be sold at that point. They can be further processed. However, the ratio of market value at the separation point is the basis for dividing joint cost. Weightage is given to the quantities of each product. This method is more useful when some products are not further processed.

(b) Market value after further processing: Actual sales values after further processing are ascertained: From the sales value the further processing cost is reduced. In the ratio of the balance of value the joint cost is divided.

(c) Net realizable value (or) Reverse cost method: Here estimated net profit and post separation costs are reduced from the sales value of each joint product. If any selling costs are mentioned, they are also reduced. If necessary, selling costs can be apportioned to the products in their sales value ratio.

The balance shown by all the products may be equal to the joint cost. Otherwise, in the ratio of the balances, the joint costs are divided.

Assessment of Market Value method

Market value method is the most popular and widely practised method of dividing joint costs. Profit margins become uniform under this method. 'Ability to pay's the principle for division of joint cost because the market value of the products determines the division of the joint costs.

Market value at separation point may not be available for some products. It is a market based method and not cost based. It is considered to be unfair by many experts. Market value can not reflect cost incurred in manufacturing. Fluctuations in market prices of products can completely alter the cost calculations.

BY-PRODUCTS COSTING

When two or more products are simultaneously produced in a process and one of them has comparatively high value and the other significantly low value, the former is main product and the latter by-products. The following are the main features of by-products.

(1) There may be one or more by-products in addition to the main product from the same process.

(2)By-products are of relatively small value.

(3)They may be sold as and when they are obtained.

(4)They may also be further processed to enhance their value.

(5)Main product is produced in larger quantities and the by-products are usually low in quantity and value.

There is always the possibility that what is considered as by-product at one time may become a joint product or even the main product at a later date due to change in market conditions.

By-product Accounting treatment

Accounting methods for by-products can be classified into two categories:

I. Non cost or sales methods

II. Cost methods

Non cost or Sales methods:These methods ignore the cost aspect of the by-products completely. They are purely dependent on the sale value of the by -products.

(a) Other Income or Miscellaneous Income Method: When sale value of by products is very low and negligible, it is credited to the profit and loss account as an income. In the process account, the by product is ignored. Any stock of the by-product is also not shown in the balance sheet. This method is justifiable only in case of by-products with negligible value alone.

(b) Adding by-product sales to the main product sales: Here the sales value of the by-product is added to the sales value of the main product. Since cost of the process is common, sales are also commonly shown. The effect is that total cost of both main and by-product is reduced from the combined sales of both.

(c)Deducting by-product sales from total cost: Here the sale value of the by-product is credited to the process account or shown as a deduction from the cost of the process. If the by-products have significant value, they can affect the cost structure of the main product.

(d)Crediting net sales value to the process: In cases where some separate expenses are incurred to further process or sell the by-products, such costs are deducted from their sale value. The net sales value after subtracting the separate costs is either credited to the process or reduced from the total cost of the process.

(e)Reverse cost method: When by-products need further processing and they possess reasonably significant sale values, the reverse cost method is followed:

Here estimated profit, selling expenses and after separation expenses are reduced from the sales value of the by-products. The balance is considered as the joint cost of the by-products. To this extent main product gets credit. Thus, effectively the by-product shares a part of the joint cost.

Cost Methods:These methods are useful when the value of by-products is reason significant. These methods apportion a portion of the joint costs to by-product The following are the cost based methods which deal with by-products.

(a) Opportunity cost method (or) Replacement cost method: This method applicable where the by-product is used as raw material in some other process or department in the same firm. Whatever is the market price payable to buy similar product from the market is deemed to be opportunity cost of the by-product. The process account is credited with such opportunity cost.

(b) Standard cost method: Standards may be developed on the basis of p records and the standard cost attributed to the by-product is credited the process account.

(c) Apportionment on suitable basis: If the value of by-products significantly high and they need further processing also, joint costs « apportioned to the main product and by products. The apportionment may involve different bases for different expenses and can involve calculations.

FURTHER PROCESSING DECISION

It may be necessary to decide whether to further process products after s| off or sell them as they are. This situation may apply to the joint product as well by-products. It is a managerial decision termed as 'Further Processing Decision

The decision should be made using the incremental revenue approach. T additional cost to be incurred for further processing should be ascertained which is termed as 'differential cost'. Similarly additional income due to the further processing should also be ascertained which is called 'incremental revenue the difference between the incremental revenue and the differential cost is call 'net increment'. If net increment is positive, furthering processing is advisable when net increment is negative, sale at the split off point is preferable.

Difference between joint and by product

s.no	Joint product	By product
1	Joint products are two or more products separated in the course of processing, each having a sufficiently high saleable value to merit recognition as a main product	When two or more products are simultaneously produced in a process and one of them has comparatively high value and the other significantly low value, the former is main product and the latter by-products.
2.	It uses different types of methods for costing	It is being allied product only few methods namely realizable value method.
3.	It cannot be differentiated like main product and other product	It can be differentiated.

Definition of 'Operating Cost'/ write down the meaning ,features of operating cost

Expenses associated with administering a business on a day to day basis. Operating costs include both fixed costs and variable costs. Fixed costs, such as overhead, remain the same regardless of the number of products produced; variable costs, such as materials, can vary according to how much product is produced.

The main features of operating costing are as following:

(1) The undertaking which adopts service costing does not produce any tangible goods. These undertakings render unique services to their customers.

(2) The expenses are divided into fixed and variable cost . Such a classification is necessary to ascertain the cost of service and the unit cost of service.

(3) The cost unit may be simple or composite. The examples of simple cost units are cost per unit in electricity supply, cost per litre in water supply, cost per meal in canteen etc. Similarly cost per passenger kilometres in transport cost per patient-day in hospital, cost per room-day in hotel etc. are the examples of composite cost unit.

- (4) Total cost is averaged over the total amount of service rendered.
- (5) Costs are usually computed period-wise. However, in the case of utilization of vehicles, use of road-rollers etc., the costs are computed order wise.
- (6) Service costing can be used for service performed internally or externally.
- (7) Documents like the daily log sheet, cost sheet etc. are used for the collection of cost data.

Service Costing – Nature and Problem:

Service or operating cost is the cost of providing services. Service costing is the term applied to describe the system used to find the cost of performing a service such as transport, gas or electricity. Service costs are particularly suitable for the costing of road and rail transport services as they are also utilized by electricity undertaking, hospitals, canteen, boiler house, etc. the method of costing is different from that used in connection with production, and the difference lies chiefly in the manner of assembling the cost data and finally in its allocation to cost units. The principle of service or operating costing is to accumulate costs under suitable headings and to express them in terms of the unit of service rendered.

Service Costing In Different Undertakings:

Service costing is similar to output costing. All costs are suitably classified under fixed and variable. These costs are then collected, analyzed and expressed in terms of an appropriate cost unit. The classification of costs into fixed and variable is very important, as it draws management's attention to the fixed costs to which they are committed regardless of the units of service ultimately given. It also indicates the change in the cost structure due to change in the operating level.

Transport Costing features:

In transport undertakings most of the statistical data required for cost finding and cost control purposes are obtained from Daily Log Report.

All repairing and maintenance work are recorded on repair tickets and are then costed.

In order to prepare a Transport Cost Sheet for a transport undertaking the costs may be subdivided as under:-

- a) Wages and running costs: - These include cost of petrol, oil, grease, wages of assistants and drivers, etc.
- b) Maintenance charges: - These include repairs and overhauling of vehicles, garage charges, tyres, etc.
- c) Fixed charges: - These fixed expenses include insurance, license, depreciation, etc.

The statistical data regarding costs, maintenance and performance are helpful in preparing a performance in respect of each vehicle.

In order to compare the operating efficiency for each period, the total costs thus arrived at are divided by the bases such as number of hours or days, number of kilometres run, number of commercial kilometres, etc. Costs per unit thus obtained are compared with the past result. A monthly Vehicle Cost Sheet and Performance Statement are generally used in many transport undertakings. Cost control is always possible by means of comparison of actual performance with the budgeted performance. Various control measures, viz., securing the optimum use of vehicles, regular maintenance as a planned operation, avoidance of

loading and unloading delays prevention of overlapping and duplicated journeys, planned replacement of vehicles, etc., may be instituted. Where transport department is treated as service department all costs are collected and apportioned to other departments on the basis of commercial ton-kms. The haulage of incoming material might be charged as an addition to cost of raw material, and the haulage of fabricated goods to customers becomes a part of distribution overhead.

Operating/Transport cost sheet :-

	Particulars	Total cost	Cost per km
A	<u>Standing charges :-</u> License fees Insurance Premium Road tax Garage rent Driver's wages Attendant-cum-cleaner's wages Salaries and wages of other staff		
	Total		
B	<u>Running charges :-</u> Repairs and maintenance Cost of fuel (diesel, petrol etc.) Lubricants, grease and oil Cost of tires, tubes and other spare parts Depreciation		
	Total		
C	Total charges [(A) + (B)]		

Unit-V problems

1. S & co ltd., produces the product through two process J&K .prepare the process accounts from the following details relating to march 1997

Particulars	Process J	Process K
Material	45000	15000
Labour	60000	25000
Chargeable expenses	5000	10000

The overheads amounting to rs 17000 are to be apportioned on the basis of labour.

2. A product passes through 3 processes namely X,Y and Z to its competition during sep 1998, 5000 units of finished product were produced and the following expenses were incurred .

Particulars	Process X	Process Y	Process Z
Material	5000	10000	5000
Direct wages	25000	20000	15000
Direct expenses	2500	3000	5000

Indirect expenses amounted to rs 30000 which are to be apportioned to the processes on the basis of the direct wages .raw materials worth rs 30000 were issued to process X. Ignore the question of the process stocks and prepare the process accounts showing cost per unit in each process.

3. R ltd., produces a product which goes through three process A,B and C before it is finished and sent to the godown for distribution from the following details, ascertain the cost of the product at the end of each stage of production.

Particulars	Process A	process B	Process C
Raw material	10000	-	-
Other direct material	30000	20000	30000
Direct wages	10000	20000	30000
Over heads	10000	8000	20000
Output in units	15000	14000	17000
Opening stock (units from previous process)		6000	5000
Closing stock(units from previous process)	-	5000	1000

Normal loss with scrap value:-

4. S& Co produces a product through two process R and S .the following details are pertaining to process “ R” and “S” for January 96 are available.

Material (500 units)-10000

Labour -8000

Indirect expenses -7000

Normal loss in the process is estimated at 5% of the input which process a scrap value of rs 31 per unit.

Prepare process account.

5. S industries produces a product which passes through two process I and II and then to finished stock .it is ascertained that in each process 5% of the total weight put in is lost and 10% is scrap which realises rs 5 per ton and rs.15 per ton respectively. The following details are available

Particulars	Process I	PROCESS II
Materials consumed in tons	2000	140
Cost of materials per ton	200	300
Wages	20000	15000
Manufacturing expenses	6000	5000

Prepare process accounts showing the cost of the output of each process and cost per ton.

6. The following details are extracted from the costing records of balaji oil and co for the year ended 31st march 1998.purchase of 500 tons of copra rs 200000.

Particulars	Crushing	Refining	Finishing.
Cost of labour	2500	1000	1500
Electric power	600	360	240
Stream	100	2000	-----
Repairs of machinery	600	450	450
Factory expenses	280	330	140
Cost of casks- 7500			

300 tons of crude oil were produced.

250 tons of oil were produced by the refining process.

248 tons of refined oil were finished for delivery.

Copra sacks sold for rs 400

175 tons of copra residue sold for rs 11000

Loss in weight in crushing- 25 tons, 45 tons of by products obtained from refining process rs 6750. You are required to show the accounts in respect of each of the following stages of manufacturing for the purpose of arriving at the cost per ton of each process and the total cost per ton of the finished oil (a) copra crushing process account (b) refining process (c) finishing process casking.

7. The product of a manufacturing concern passes through three process. In March 1998 the cost of production was as given below.

Particulars	Process A	Process B	Process C
Raw materials in tons	200	71	164
	Rs	Rs	Rs
Cost per ton	100	300	50
Direct wages	8000	3400	2850
Over heads	2520	2400	3820
Sale of scrap per ton	80	60	120

The product of the three processes is dealt with as follows.

Sent to ware houses for sale A -25% B-50% C-100%.

Sent to next process A-75% B-50%.

In each process, 6% of the total weight is lost and 8% is scrap.

Prepare process cost accounts.

8. The product of a company passes through two processes to completion known as A and B. From the past experience that loss is incurred in each process as

Process A-2% ,process B-5%.

In each case the percentage of loss is computed on the number of units entering the process concerned.

The loss of each process processes a scrap value . the loss of process A and B is sold at rs 5 per 100 units.

The output of each process passes immediately to the next process and the finished units are passed into stock.

Particulars	Process A	Process B
Materials consumed	6000	4000
Direct labour	8000	6000
Manufacturing expenses	1000	1000

20000 units have been issued to process A at a cost of rs.10000. The output of each process has been as under:

Process A =19500, process B =18800 prepare process accounts.

9. A product passes through two processes and then to finished stock. The normal wastage of each process is as follows. Process A-3% , process B-5%.

The wastage of process A was sold @ rs 5 per unit and that of process B @ rs 10 per unit .20000 units were introduced into process A at the beginning of January 1998 at a cost at rs 40 per unit.

Other expense was as under:

Particulars	Process A	Process B
Sundry materials	40000	60000
Wages	200000	320000
Manufacturing expenses	30000	28500

The output of process A was 19000 units and that of process B 18200 units. Prepare the process accounts , normal loss account, abnormal loss account, and abnormal gain acocutn.

10. A product passes through three process –A, B and C .the details of expenses incurred on the three process during the year 1998 was as under.

Particulars	Process A	Process B	Process C
Units issued	1000		
Cost per unit issued	50	-	-
Sundry materials	1600	3315	3220

Labour	2600	8000	6392
Sale price of output(per unit)	70	100	200

Actual output of the three processes was A -930 units, process -540 units, process C-210 units.

Two thirds of the output process A and one half of the output of process were passed on to the next process and the balance was sold. the entire output was sold in the process C.

The normal loss of the three processes , calculated on the input of every process was;

Process A-5% ,process B-15% , process C-20%.

The loss of process A was sold at rs 1 per unit ,that of process B at rs 3 per unit and that of process C at rs 6 per unit.Selling expenses were rs 9000. These are not allocable tot eh processes . prepare the three process account and profit and loss a/c.

Joint and by-products

1.Average unit cost method.

A company produces 300 units of product R, 200units of products S and 100 units of product J from a single process .the costs up to the point of separation amounted to rs 30000 .you are required to apportion the joint costs of production among the products, using the average unit cost method.

2.Sujatha industries produces three products X,Yand Z form the following a joint process . the joint processing cost before separation amounted to rs 125000 .the output of X,Y and Z was 5000,6000,and 1500 units respectively. Apportion the joint cost among the products ont he basis of average unit cost method.

3.Physicals units method.

M/s J and co processing material X produces four joint products A,B,C and D cost per tonne of X processed is a sunder.

Material cost -1350

Labour and overhead cost -900

Total -2250

The joint products yielded 540,180,118 and 62 kilo grams respectively, the rest being normal wastage.

Apportion the total cost of X to each one of the joint products.

4.Survey method:-

Two products A and B are produced from a joint process at total cost of rs 88000 till the split off point. The output was A-600 tons and B-400 tons. A technical survey assigns weightage of 1 and 4 respectively for the products. you are required to apportion the joint cost of the process to the products on the basis of survey.

5.Four products M,N and O are produced out of single process their joint cost till spilt of being rs 6000.without any further processing, they are sold at rs 10.rs 3 rs5 and rs 2 respectively. The output during January 1999 was M-500 kgs., N-300kgs, O-200 kgs and P-300kgs. Apportion the joint cost on sales price spilt off point basis (2) sales value at spilt off point basis.

6. A joint process results int he production of three products A,B and C at a total cost of rs.26250.The subsequent costs of the products were rs 8000 ,rs 10000 and rs 12000 respectively.

They were sold as follows with estimated profit on sales.

Product A :rs 20000 ;profit 20%.

Product B : rs 28000 ; profit 25%.

Product C : rs 40000 ;profit 30%

Show the apportionment of joint costs ont he basis of net realisable value.

7.In the manufacturing company the main product A the resulting waste material into two by product B1and B2. During one period of production the following data was compiled.

Particulars	A	B1	B2
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Sales	800000	64000	96000
Cost before separation (rs)	310400	-	-
Cost after separation	80000	12800	14400
Estimated net profit percentage to sales value	-	20%	30%
Estimated selling expenses as percentage of sales value	20%	10%	15%

There are no beginning or ending inventories. Prepare an income statement concerning the period described using reversal cost method for by product.

Transport costing:-

Formulae

Total kms= number of buses * number of days * number of trips*distance

Passenger km= total km * normal passengers transported.

1. A transport service company is running five buses between two towns which are 45 kms apart. Seating capacity of each bus is 50 passenger actual passenger carried were 90% of the seating capacity. All the five buses ran on all the days of the month sep 92. Each bus made one round trip per day.

2. A bus ltd., run the following fleet of buses within the limit of Coimbatore city.

Number of buses	Carrying capacity(passengers)
30	100
20	60

On an average ,each bus makes 12 trips a day covering a distance of 20kms in each trip and 75% of the sales are occupied .the annual records show that 5 buses are generally required to be kept away from the road each day for repairs .calculate the effective passengers kms for the month of march 97.

3. From the following data calculate the cost per km of a vehicle.

Particulars	Amount
Value of vehicle	100000
Road licence fees per year	1500
Insurance charges per year	800
Garage rent per year	1800
Drivers wage per month	800
Cost of petrol per litre	0.10km per litre
Proportionate charge for tyres and maintenance per km	1.00
Estimated life	300000 kms
Estimated annual hrs	1300
Note:-ignore interest on capital.	

4 .Mr.Mathan runs a lorry service in the city and has two vehicles. he furnishes you the following data, wants you to compute the cost per running km.

Particulars	Vehicle A	Vehicle B
Cost of vehicle	20000	10500
Road licence	500	725
Supervision and salaries	4200	2300
Drivers wages per hr	5	5
Cost of fuel per litre	1.00	1.00
Repairs and maintenance	1.50	1.75
Tyre cost per km	1.00	0.70
Insurance premium (yearly)	750	400

Garage rent per year	1650	4150
Kms runs per litre	7	5
Mileage run during the year	13500	----
Estimated life of vehicles (kms)	115000	75000
Tonnes per km (average)	5	4
Estimated kms per annum	11500	7500
Change interest at 10% per annum on cost of vehicle		
The vehicle runs 20 kms per hour on an average		

5. rajan owns fleet of taxi and the following information are available from the records maintained by him:

Particulars	Amount
Number of taxies	10
Cost of each taxi	Rs 15000
Salary of manager	Rs 550 per month
Salary of accountant	Rs 500 per month
Salary of cleaner	Rs 150 per month
Salary of mechanic	Rs 300 per month
Garage rent	Rs 450 per month
Insurance premium	5% per annum
Annual tax	Rs 500 per taxi
Driver's salary	Rs 150 per taxi
Annual repair	Rs 1000 per taxi

Reference books:-

1. Cost accounting- T.S Reddy and Y. Hari Prasad Reddy
2. Cost accounting- Ramachandran and srinivasan.
3. Cost accounting- M.N Arora
4. Cost accounting- S.N Mageswari

Unit-V completed