SYLLABUS

Class – B.Com IV Sem. (All)

Subject: Cost Accounting

Unit-I	Cost: Meaning, Concept and Classification. Elements of Cost, Nature & Importance, Material Costing. Methods of Valuation of Material issue. Concept and material control and its techniques. Labour Costing, Methods of Wages payments.
Unit- II	Unit Costing, Preparation of Cost Sheet and Statement of Cost (Including calculation of tender price) Overhead costing, (Including calculation of machine hour rate.)
Unit – III	Contract and Job costing, operating costing.
Unit – IV	Process Costing (Including Inter process profit and Reserve). Reconciliation of Cost and Financial Accounts.
Unit – V	Marginal Costing, Profit – Volume Ratio, Break – Even Point, Margin of Safety, Application of Break-even Analysis. Cost Audit – Meaning, Importance and Techniques of Cost Audit, Cost Audit Programme.

UNIT-I

Introduction

Costing - terminology

Costing relates to the determination of cost of a product manufactured or service rendered. In order to ascertain cost, it involves system, methods and techniques of accumulation, classification and analysis of cost.

Cost Accounting: - "The process of accounting for cost from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units.
The term 'cost Accountancy' includes (i) Costing and (ii) Cost Accounting. Its purposes are (i) cost-control, and (ii) profitability-ascertainment and serves as an essential tool of the management for decision-making.

Cost Centre

Cost Centre is defined as "a location or person or place or machine or item of equipment or thing for which cost can be ascertained and used for the purpose of cost control." Cost centre can be classified as:

1. Process cost centre is one in which a specific process or a continuous sequence of operations is carried out on a regular basis.
2. Production cost centre is one in which production activity is carried where the shape of raw material is converted into a finished product.
3. Service cost centre are those which render services to the other cost centres. For examples a maintenance & repair department, store department etc.
4. Impersonal cost centre is one which consists of a location or item of equipment (or group of these).
5. Personal cost centre is one which consists of a person or group of persons.
6. Operation cost centre is one which consists of those machines and/or persons carrying out similar operations.

Profit Centre

It means a centre responsible for adopting ways and avenues to earn maximum possible profit on a product or any other activity of business, by making market surveys, suggests localities for publicity, helps to formulate sales policies and suggests to add more values to the product at the same or cheaper costs.

Cost Unit

Cost unit may be defined as "a quantitative unit of product or service in relation to which costs are ascertained."

NATURE AND CHARACTERISTICS OF COST ACCOUNTING

1. Cost accounting is a special branch of accounting having its own specific significance based on double entry system.
2. It ascertains cost of products and services through the process of accumulation, classification, analysis and recording.
3. It determines the cost of incomplete work or job.
4. The extensive use of this system involves application of statistical data, control methods & techniques and determining profitability.
5. This system provides measures for control and guidance for various levels of management.
6. Helpful in decision making process.

SCOPE OF COST ACCOUNTING

1. Analysis of the profitability of product, service, job or activities.
2. Analysis of profitability of various departments of segments of the organization.
3. Analysis of the type and nature of cost.
4. Explanation of the causes of variances between actual cost and standard cost.
5. Helpful in determination of selling price.
6. Analysis of the change in profit as per the change in level of production.
7. Analysis of the profit or loss of the organization.
8. Assist in management information system.
9. Provides basis for the application of techniques of management accounting.
10. Helpful for manufacturing and service rendering organization.

Difference between cost accounting and financial accounting

S.No.	Cost Accounting	Financial Accounting
1.	Kept by business engaged either in manufacturing either in manufacturing or in rendering services where the cost per unit is to be ascertained.	Kept by all types of business houses, big or small, whether engaged in trading, manufacturing or non-profit making associations.
2.	Maintain full and detailed records pertaining to all the three elements of cost, viz., materials, labour and expenses.	Records all types of expenses and incomes and also items of profit appropriation. However, they do not keep detailed records of elements of cost.
3.	Provide data and reports to management for cost-ascertainment, planning, control and decision-making.	Provide general information to management and outside parties in the form of Profit & Loss A/c and Balance Sheet of the business as a whole.
4.	Ascertain the cost of each product, job or order and then show profit/loss made on each.	Do not show profit/loss on each product, job or order individually.
5.	Provide information to management as and when desired, daily, weekly, monthly, quarterly, etc.	Provide operating net result and financial position at the end of financial year.
6.	To calculate the cost, the indirect expenses include there in are based on estimates.	Show historical costs, i.e., they include expenses having actually been incurred in the financial year.
7.	Greater control is exercised on materials and stores, labour and overhead costs by budgetary control and standard costing. No emphasis is given to cash-in-hand and Bank transactions.	Greater emphasis is laid on cash and financial position. They do not attach that importance to control of materials, labor and overheads.
8.	As the cost is available, it is easier to fix selling price and quote for tenders	No correct tender prices can be quoted.
9.	The production costs of a period can be compared with previous corresponding period and the difference analysed.	Such comparison of costs of individual production is not easy.
10.	Provide information on the relative efficiencies of plant, machinery, labour and departments.	The relative efficiency of workmen, plants, etc., cannot be easily judged.
11.	Stocks are valued at costs.	Stocks are valued at cost price or market price, whichever is lower.
12.	These accounts are for internal transactions and do not form the basis of receipts and payments to outside parties.	They form basis for external transactions also, and record receipts, payments and credit transactions.
13.	The companies Act has made it obligatory for certain industries to maintain Cost	It is almost necessary to maintain this accounting to run business. To meet the requirements of

14	Accounting, otherwise it is voluntary to maintain cost them. Charts, graphs, diagrams, statements, etc. are much used in this system for informatory reports to management.	Companies Act, and Income-tax Act, it is obligatory to keep them. Not much use is made of such presentation in this system.

FUNDAMENTAL PRINCIPLES OF COSTING

1. Cost is related to its cause.
2. Cost is charged after it is incurred.
3. Abnormal costs are excluded from costing.
4. Past costs are not charged to future periods.
5. The concept of conservatism has no place in costing.
6. Accounting for cost is based on Double-entry Principle.

OBJECTS AND FUNCTIONS OF COST ACCOUNTING

i. To ascertain the cost per unit of the different products manufactured by a business concern.
ii. To advise management on future expansion policies and proposed capital projects.
iii. To organize the internal audit system to ensure effective working of different departments.
iv. To help in supervising the working of punched card accounting or data processing through computers.
v. Provide useful data to the management for taking decisions.
vi. To find out costing profit or loss by identifying with revenues the cost of those products or services To provide specialized services of cost audit in order to prevent the errors and frauds and to facilitate prompt and reliable information to the management.
vii. To organize cost reduction programmes with the help of different departmental managers.
viii. To provide requisite data and serves as a guide to price fixing of products manufactured or services rendered.
ix. To help in the preparation of budgets and implementation of budgetary control.
x. To guide management in the formulation and implementation of incentive bonus plans based on productivity and cost savings.
xi. To supply useful data to the management to take various financial decisions such as introduction of new products, replacement of labour by machine etc.
xii. To organize an effective information system so that different levels of management may get required information at the right time in right form for carrying out their individual responsibilities in an efficient manner.

TECHNIQUES AND METHODS OF COSTING

1. Historical Costing. "The ascertainment of costs after they have been incurred." Under this method all the expenses incurred on the production are first incurred and then the costs are ascertained.
2. Standard costing. "The preparation and use of standard costs, their comparison with actual costs and the analysis of variances to their causes and points of incidence."
3. Marginal Costing. "The ascertainment of marginal costs and of the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs."
4. Direct Costing. "The practice of charging all direct costs to operations, processes or products, leaving all the indirect costs to be written off against profits in the period in which they arise."
5. Absorption Costing. "The practice of charging all costs, both variable and fixed, to operations, processes or products."
6. Uniform Costing. "The use by several undertakings of the same costing principles and/or practices."

Methods of Costing

1. Job costing. 2. Contract Costing. 3. Batch Costing. 4. Target Costing. 5. Process Costing. 6. Single or Output Costing. 7. Operation Costing.8.Departmental Costing. 9. Composite or Multiple Costing.

ANALYSIS AND CLASSIFICATION OF COST

MATERIALS COST

Material cost is of two types, viz., (i) Direct Materials Cost, and (ii) Indirect Material cost.

i. Direct Materials Cost. Is one which can be identified with and allocated to cost centres or cost units." E.g., timber in furniture-making; clay in brick-making; cement, stones, etc., in building.
ii. Indirect Materials Cost. Which cannot be allocated but which can be apportioned to or absorbed by, cost centres or cost units. For example, power, fuel, repair and maintenance etc.

LABOUR COST

"The Labour Cost is the cost of remuneration (wages, salaries, commissions, bonus, etc.) of the employees of an undertaking."

i. Direct Labour Cost. Direct Labour Cost are the cost which can be identified with and allocated to cost centres or cost units.
ii. Indirect Labour Cost. is one which cannot be allocated but which can be apportioned to, or absorbed by, cost centres or cost units."e.g. Wages of indirect labour; Wages of idle time.

OVERHEADS

Overheads are the aggregate of the cost of indirect material, indirect labour and such other expenses, which cannot be conveniently charged direct to specific cost centre or cost units.

ANALYSIS OF TOTAL COST

1. Prime Cost.- The aggregate of Direct material Cost, direct Labour Cost and Variable Direct expenses (or chargeable expenses) is the prime Cost.
2. Factory Cost.- Factory Cost is the total of Prime Cost + Factory Overheads,
3. Cost of Production.- The total Factory Cost and Office and Administration Overheads is the office Cost or Cost of Production.
4. Total Cost.= Cost of Production + Selling & Distribution Overheads.

CLASSIFICATION OF COST AND COST CONCEPT

The cost-classification is the process of grouping costs according to their characteristics.

1. **According to Elements**. The cost is classified into (i) Direct cost, and (ii) Indirect cost according to elements, viz., materials, Labour and Expenses.
2. **According to Functions**. The cost is classified into the following:

i. Production Cost, or Manufacturing Cost, or Factory Cost,
ii. Administration Cost,
iii. Selling Cost, and
iv. Distribution Cost.

3. **According to Nature**. The cost is classified into the following:

i. Fixed Cost is "a cost which tends to be unaffected by variations in volume of output.
ii. Variable Cost is "a cost which tends to vary directly with volume of output.
iii. Semi-fixed or Semi-variable Cost is 'a cost which is partly variable.'

4. **According to Controllability**.

i. Controllable cost. This is a cost which can be influenced by the action of a specified member of an undertaking.
ii. Uncontrollable Cost. It is the cost which cannot be influenced by the action of a specified member of an undertaking, such as fixed costs.

5. **According to Normality**. The cost is classified into (i) Normal cost, and (ii) Abnormal cost.

i. Normal cost. It is the cost at a given level of output in the condition at which that level of output is normally attained.
ii. Abnormal cost. It is a cost which is beyond normal cost.

6. **According to Relevance to Decision-making and Control**.

i. Shut-down Cost. A cost which will is required to be incurred even though a plant is closed or shut-down for a temporary period, e.g., the cost of rent, rates, depreciation, maintenance expenses etc.
ii. Sunk cost. A cost which has been incurred in the past or sunk in the past and is not relevant to the particular decision-making. E.g. written down book value of the plant.
iii. Opportunity Cost. The costs which are related to the sacrifice made or the benefits foregone are opportunity costs.
iv. Imputed Cost. It is a hypothetical cost required to be considered to make costs comparable. Interest on one's own capital.
v. Out-of-Pocket cost. A cost which will have to be paid to outsiders as against costs such as depreciation, which do not require any cash payment.
vi. Replacement Cost. It is the cost of replacing a material or assets, by purchase from the current market.
vii. Marginal Cost. Marginal cost refers to the increase or decrease in total cost caused due to increase or decrease in output by one single unit.
viii. Differential Cost. The change in total cost due to the change in method or technique of production or charged in level of production is called differential cost.
ix. Standard Cost. Standard cost is a predetermined cost or estimate which is compared with the actual cost in order to determine variance and carry out an analysis of variance for cost control.
x. Relevant Cost. The relevant costs are those cost which aids to makes specific management decisions.

7. **Product Cost & Period Cost**

The product cost is the total of cost that is associated with a unit of product. The cost in forming the product viz., direct material, direct labor, factory overhead constitute the product cost.
Period cost, on the other hand, are costs that tends to be unaffected by changes in level of activity during as given specific time period. E.g., Selling & distribution cost

SIGNIFICANCE OF COST ACCOUNTING

i. It discloses the profitable and unprofitable activities in a concern and hence necessary adjustments are done.
ii. It enables the concern to measure its efficiency and then maintain or improve.
iii. It is helpful to the consumer by ensuring lower prices.
iv. It is useful to the government in the form of duties paid.
v. It discloses the relative efficiency of different workers in a concern.
vi. Through it the exact causes of decrease or an increase in profit or loss can be detected.
vii. It provided information upon which estimates and tenders are based.
viii. It guides future production policies.
ix. It helps in increasing profits by disclosing the sources of loss or waste and by suggesting such controls so that the same may not be repeated.
x. It enables a periodical determination of profits or losses without restoring to stock taking.

ADVANTAGES OF COST ACCOUNTING

To the Management

1. Action against unprofitable Activities 2. Facilities Decision Making 3. Inventory Control
4. Budgetary Control 5.Facilitations cost control 6. Prevents Fraud 7.Tool of Management Control
8. Measuring rods 9.Future Prospects

B. To the Employees
   1. Sound Wage Policy
   2. Security of Job
   3. Distinction between Efficient and Inefficient Workers
C. To the Creditors
   Bankers, creditors, investors etc., can have a better understanding of the firm as regard the process and prosperity, before they offer financial leading.
D. To the Government
   1. For government wage tribunals, for deciding the state subsidy to industry.
   2. In the preparation of national plans, economic development etc.
   3. Cost audit is important and industries have to keep books of accounts to show the utilization of materials, labour and other costs.
E. To the Public
   1. Removes all types of wastages and inefficiencies.
   2. Facilities the customers to pay fair price.
   3. Development and prosperity of industries will create employment opportunities.

CHARACERTISTICS OF A GOOD COSTING SYSTEM

1. Accuracy
2. Equity
3. Simplicity
4. Elasticity
5. Comparability
6. Promptness
7. Observation and Resulting
8. Periodical Result
9. Reconciliation with Financial Accounts

Material Costing

Material or inventory cost control is defined as a systematic control and regulation of purchase, storage and usage of materials in such a way as to maintain an even flow of production at proper times and valued at right prices at the same time avoiding excessive investment in inventories.

Objectives of Material control

i. No under stocking or over stocking
ii. Economy in purchasing
iii. Proper Quality
iv. Minimum wastage
v. Information about material availability

Principles or Essentials of Material Control

i. Proper co-ordination and Co-operation between various departments- Purchase, Stores, Inspection, Accounting etc.
ii. Proper classification and codification of materials
iii. Proper scheduling of material requirements.
iv. Perpetual inventory system should be operated
v. Various stock levels to be fixed
vi. Proper system of internal check to be introduced for adequate safeguards and supervision
vii. Regular reporting to management regarding purchase, issues and stock of materials.
viii. Proper storage and usage of materials to avoid theft and wastages.

Functions of purchasing department:

i. Determination of quality to be purchased
ii. Determination of ordering point.
iii. Determination of price at which to be purchased.

Purchase Procedure: -

i. Initiating the purchase
ii. Receiving of the purchase requisitions.
iii. Deciding important factors relating to purchase.
iv. Inviting tenders and selecting suppliers.
v. Preparation and execution of purchase orders
vi. Receipt of materials
vii. Inspection and testing of materials received
viii. Debit note upon the supplier in respect of rejected materials.
ix. Passing invoices for payment.

Stores Organization and control

Objectives

i. Receive materials, check them and place them properly
ii. To issues the materials to jobs on the basis of store requisitions
iii. To enter all the receipts and issues in the bin card and show the balance
iv. Avoiding overstocking and under stocking by checking the ordering points of different materials.
v. Maintain, preserve and protect the materials during storage
vi. Maintain up-to-date stores records
vii. To report on obsolete and slow moving materials, waste, scrap, etc.
viii. Requisitioning further supplies from purchasing department.

Stores Records

i. Perpetual Inventory Records are those which show movement of stores, i.e. receipt and issues. Eg. Bin Card and stores ledger
ii. Documents are those which authorize movement of materials into or out of stores e.g. Goods received Note, Bill of materials, material requisition note, materials return note, etc.

Techniques of Inventory Control

1. **ABC Technique: -** It is a value based system of material control where materials are classified according to their value, A, B and C, so that costly and valuable materials are given greater attention and care.

   'A' items are high value items which consist of only a small percentage of total items handled and hence require tight control.

   'B' items are medium value materials which should be under normal control procedures

   'C' items are low value materials which represent a large number of items and require economical control procedures, and least attention.
2. **Stock Levels: -** To avoid under stocking and overstocking, maximum, minimum and reorder levels are fixed.

Factors which influence stock levels are

a. Anticipated rate of consumption
b. Account of capital available
c. Availability of storage space
d. Storage/ warehousing cost
e. Procurement cost
f. Reliability of suppliers
g. Minimum order quantities imposed by suppliers
h. Risk of loss due to obsolescence, deterioration, evaporation and fall in market prices
   i. Maximum Level: - It indicates the maximum quantity of inventory item which can be stored at any given time

Maximum Level = Minimum Stock + Economic Order quantity

Or

= Reorder Point + Reorder quantity –
[Minimum Consumption x Minimum reorder Period]

ii. Minimum Level: - It indicates the minimum quantity of stock that should always be maintained so that there is no risk of stoppage of production.

Minimum Level = Reorder Point – [Average Consumption x Average re-order period]

iii. Re-order Level or Re-order Point: - This is that level of material at which purchase requisition is initiated for fresh supplies.

Re-order Level = Maximum consumption x Maximum Re-order period

iv. Danger Level: - It is that level at which normal issued are stopped and materials are issued for important jobs only.

Danger Level = Normal consumption x Maximum re-order period under emergency condition

v. Average stock Level: $\frac{1}{2}$ × [Minimum Level + Maximum Level]

Or

Minimum Level + ½ x [EOQ or re-order quantity]

3. EOQ [Economic or order quantity] or Re-order quantity: - EOCs is that size of the order which gives maximum economy in purchasing any material and ultimately contributes towards maintaining the material at optimum level and at minimum cost. While setting EOQ, two types of costs are considered

i. Ordering cost: - Cost of placing orders.

ii. Carrying Cost: - Cost of holding stock in storage

EOQ = $\sqrt{\frac{2AO}{C}}$, where A= annual consumption in units, O = ordering cost per order,

C = storage or carrying cost as a percentage of inventory.

Control Ratios

4. Inventory turnover Ratios: - This tells us how many times in a year is are used up and replaced. The greater the stock turnover, the more efficient is the stock policy. It indicates the rate of consumption, i.e. whether materials are moving fast or slowly. A high stock turnover ratio indicates fast moving materials and a low ratio indicates slow moving materials.

i. Stock Turnover Ratio = Cost of Materials consumed during the period / Average stock of materials during the period

ii. Finished Stock Turnover Ratio = $\frac{\text{Value of Finished Stock sold in the period}}{\text{Value of Average stock held during the period}}$

iii. Inventory Turnover in terms of days = Days of the period / Stock Turnover Rate

Or

Value of Average x Days of the period / Material consumed

iv. Input – Output Ratio: - This is the ratio of raw material put into manufacture and standard raw material content of the actual output. The formula is

$\frac{\text{Input Units}}{\text{Output units}} \times 100$

5. **Perpetual Inventory system and system of store verification**: - Perpetual Inventory aims at devising the system of records by which the receipts and issues of material stores may be recorded immediately at the time of each transaction and the balance may be brought out so as to show the up-to-date position. This system is operated by: -

i. Reconciliation of stock bin cards and stores ledger accounts

ii. Physical stock verification which is of two types: -
a) Periodic stock verification & (b) continuous stock verification

Advantages of Perpetual Inventory System

i. Records are updated
ii. Materials are within Minimum and Maximum Limits
iii. Purchases are requisitioned at appropriate time
iv. Facilitates preparation of interim P & L Account and Balance Sheet.
v. Acts as moral check on staff of stores Department.
vi. A system of internal check remains in operation all the time.
vii. Discrepancies are readily discovered and rectified.
viii. Slow moving, dormant and obsolete materials are readily notified to purchase department
ix. A detailed and reliable check on stores is obtained.

6. Budgetary Techniques for Inventory standards:-
   i. Fixation of material cost planning
   ii. Preparation of material budget

Pricing of Materials Issued

1. Cost Price Methods: -
   i. First-in-First-Out Methods – FIFO
   ii. Last in first Out Method – LIFO
   iii. Highest in First Out Method – HIFO
   iv. Base stock Method
   v. Specific Price Method.
2. Average rate Method: -
   i. Simple Average Method
   ii. Weighted Average Method
3. Market Price Method: -
   i. Replacement Price Method.
   ii. Realizable Price Method.
4. National Price Method: -
   i. Standard Price Method.
   ii. Inflated Price Method.

Treatment of material Wastage/ Losses

1. Material Losses may be normal as well as Abnormal.
   Normal Loss: - Which has to be incurred and is unavoidable e.g., evaporation in case of liquid materials, loss due to loading and unloading of materials, etc.
   Abnormal Loss: - which arises due to inefficiency in operations or mischief, e.g., theft, pilferage, breakage, fire etc.
   Accounting Treatment: - In order to absorb normal material losses in cost, the rates of usable materials in stock are inflated so that such losses are covered. Normal material loss is transferred to factory overhead.
   Abnormal material losses are charged to Costing profit and loss account.
2. **Waste: -** It is that part of basic raw material which is lost in processing and has no recovery value
   Accounting: - If it is normal, the cost will be absorbed by the good production and if it is abnormal, then it is transferred to Costing profit and loss account.

Formulae

1. **Economic Order Quantity (EOQ)**
   EOQ $=\sqrt{\frac{2\,AB}{CC}}$

Where, A = Annual consumption
B = Ordering cost / Procurement cost/ buying cost/ set up cost
CC = Carrying cost / Holding cost/ Storage cost
CC = Cost per unit x $\frac{Rate\ of\ inventory\ \ carrying\ \ cost}{100}$

- Economic Order Quantity (EOQ)
  EOQ = $\sqrt{\frac{2\,AB}{CC}}$ x = $\sqrt{\frac{P}{P-D}}$
  Where, D = Demand of item or Consumption
  P = Production of item or Procurement rate
- Economic Order Quantity (EOQ)
  EOQ = $\sqrt{\frac{2\,AB}{CC}}$ x = $\sqrt{\frac{CC+CS}{Cs}}$
  Where, CS = Cost of storage
  - Ordering Cost – Per order
  - Carrying cost – Per unit per year
  - Shortage cost – Per unit per year

2. **Total Cost**
   Total Cost = Total Ordering Cost + Total Carrying Cost + Total Purchase Cost
   a. Total Ordering Cost = $\frac{Annual\ \ Usage}{EOQ}$ x Ordering Cost per unit
   b. Total Carrying Cost = $\frac{EOQ}{2}$ x Carrying Cost per unit
   c. Total Purchase Cost = Annual Usage x Ordering Cost per unit

3. **Variable Cost**
   Variable cost = Ordering Cost + Carrying Cost

4. **Number of Orders**
   Number of orders = $\frac{Annual\ \ Usage}{EOQ}$
   Number of orders cannot come in Decimal
5. **Time Between Placing Order**
   Time between placing order = $\frac{No.of\ working\ \ days}{No.of\ orders}$
6. **Cycling Time**
   Cycling Time = $\frac{No.of\ working\ \ days}{No.of\ orders}$
7. **Run Time**
   Run Time = $\frac{EOQ}{Production\ \ in\ a\ day}$
   Note –
   - If Discount is given in question then, cost per units will be changed in all cases.
   - If information is given in months then, all items are converted into months.
   - Carrying cost is changed when % of carrying cost is given on cost.

8. **Re-order Level**
   Reorder Level = Maximum usage Rate x Maximum Reorder Period/Lead time
   OR
   (Lead Time x Average Daily Consumption) + Safety Stock

9. **Minimum Level**
   Minimum Level = Reorder Level – (Average Daily Consumption x Average order Period)
10. **Maximum Level**

Maximum level = Reorder level + Reorder Quantity – (Minimum consumption x Minimum Reordering Period)

OR

Demand (Review Period x Lead Time) + Safety Stock

11. **Average Stock Level**
    Average Stock Level = Minimum Stock Level + ½ of Reorder Quantity
12. **Danger Level**
    Danger level = Average consumption x Maximum Reorder Period for emergency purchases
13. **Inventory Turnover Ratio**
    Inventory Turnover Ratio = $\frac{Material\ \ Consumed}{AverageRaw\ \ Material}$
    - Material Consumed = Opening Stock of Raw material + Purchases – Closing Stock of Raw Material
    - Average Raw Material = $\frac{Opening\ \ Stock + Closing\ \ Stock}{2}$
    - Inventory Velocity = $\frac{Days\ in\ a\ year}{Inventory\ \ Turnover\ \ Ratio}$

ACCOUNTING FOR LABOUR

Labour cost, representing the human contribution to production is an important factor of cost which requires constant control, measurement and analysis.

Classification of Labour Cost

i. Direct Labour: - It is the cost of that labour that is directly engaged in production work and can be conveniently identified or attributed wholly to a particular job, process or cost unit.
ii. Indirect Labour: - It is the cost paid to those workers who are not directly engaged in converting raw materials into finished product and cannot be conveniently identified with a particular job, product or cost unit. E.g. supervisors, cleaners' instructors, peons etc.

Labour Cost Control Factors

i. Production Planning
ii. Setting up of standards
iii. Use of Labour Budgets
iv. Study of the effectiveness of wage policy
v. Labour performance Reports.

Organization for Accounting and control of Labour cost

i. Personnel Department
ii. Engineering and work study Department
iii. Time Keeping Department
iv. Payroll Department
v. Cost Accounting Department

Labour turnover

The rate of change in the composition of the labour force in an organization during a specified period is called Labour turnover.

Causes of Labour Turnover

i. Low wages and allowances
ii. Ill health and bad working conditions

iii. Lack of safety measures, medical facilities, transport facility, etc.
iv. Dissatisfaction due to various causes like working hours, improper placement, unfair method of promotion, bad relationship with fellow workers, bad training facilities etc.
v. Inadequate job security and retirement benefits
vi. Marriage in case of female workers
vii. Change of job for better opportunities
viii. Death or retirement.
ix. Seasonal character of the Industry

Reduction and Control of Labour turnover

1. Devising a suitable and satisfactory wage policy.
2. Providing working conditions conducive to health and efficiency.
3. Impartial and sympathetic attitude of personnel management
4. Introducing financial and non financial incentive plans
5. Providing promotional opportunities.
6. Encouraging labour participation in management
7. Introduction of effective grievance procedure
8. Strengthening the welfare measures

Methods of Measurement of labour turnover: -

i. Separation Method: -

$$\text{Labour Turnover rate} = \frac{\text{No. of Workers left during a period}}{\text{Average No. of workers during the period}} \times 100$$

ii. Replacement Method:

$$\text{Labour Turnover Rate} = \frac{\text{No. of workers replaced during the period}}{\text{Average No. of Workers during the period}} \times 100$$

iii. Flux Method: -

$$\text{Labour Turnover Rate} = \frac{\text{No. of workers left + No. of workers replaced}}{\text{Average No. of workers}} \times 100$$

Idle Time:

Idle time is time lost by workers who are paid on time basis. Idle time represents the time for which they are paid but no production is obtained. For example time lost between factory gate and the department, time when production is interrupted due to break down, tea breaks etc.
Causes – Idle time may occur owing to productive, administrative or economic causes.

Over Time – the time worked over and above the normal hour is termed as overtime. The remuneration usually paid for the overtime work is at double the normal rate.
Need of overtime

1. Increase in demand for the products where the production during the normal hours falls short to meet it;
2. Shortage of workers due to absence or non-availability and so it is decided to give overtime work to the existing staff;
3. Utilization of perishable raw material by working overtime;
4. Execution of urgent orders, to complete the work on the same day.
5. Shortage of equipments, machines, or space for the completion of jobs.
6. Lack of administrative control on workers, on account of which the production during normal hours remains less than the standard output and overtime work has to be done by the workers.

Disadvantages of overtime working:-

1. Work efficiency is reduced. It is too much to expect of a tired worker to work as efficiently during overtime as in normal hours;
2. Worker's health is adversely affected;
3. The quality of the output is affected; and
4. The cost of production rises due to increased labour cost.

Methods of Remuneration

1. **Time Rate system: -** Under this system workers are paid according to the time for which they work. Payment may be on hourly basis, daily basis, weekly or monthly.
   Suitability of this method
   a. Where quality of work is more important than quantity
   b. Where output cannot be measured in quantitative terms
   c. Where output is beyond the control of the worker
   d. Where work is done on a small scale so that close supervision is possible
   e. Where the worker is a learner or an apprentice.
2. **Piece Rate system: -** Here wages = Rate per unit x No. of units produced.
   Suitability of this method: -
   a. Where production is standardized and repetitive in nature
   b. When the aim is continuous maximum production
   c. Where output can be measured
   d. Where workers continue at the same job for long periods
   e. Where standard time required completing a job can be measured accurately.

Various Incentive Schemes

1. Halsey Premium Plan: - In this system, a standard time is fixed for each job. Wages are paid for actual time spent on the job and bonus or premium is paid in a fixed proportion to time saved, i.e. 50% or 40%
   Total earnings = Time Rate x Time Taken + 50% of [time saved x Time Rate]
2. Halsey Weir Plan: - Same as above except that the bonus is equal to 30% the time saved.
3. Rowan Plan: -
   Total earnings = [Time Rate x Time Taken] + Bonus
   $$\text{Bonus} = \left[\text{Time Rate} \times \text{Time Taken} \times \frac{\text{Time saved}}{\text{Time Allowed}}\right]$$
4. **Taylor's different Piece Rate Plan: -** In this system
   i. Day wages are not guaranteed
   ii. Standard time is set for each job
   iii. Two piece rates are fixed for each job – Higher and Lower rate
   The lower piece rate is payable where a worker takes longer time than the standard time and higher rate is payable where a worker completed the work within the standards time.

Merricks differential Piece Rate system: - This plan lays down three rates

Percentage of standard Output	**Piece rate**
Up to 83%	normal Piece rate
83% to 100%	110% of Normal Piece Rate
Above 100%	120% of Normal Piece Rate

5. Emerson's Efficiency Plan: - Here the standard of efficiency is start 66 2/3%. A worker gets guaranteed time wages for efficiency up to the standard. Bonus is payable as follows: -

Efficiency	Bonus
Below $66^2/3\%$	Time wages (No bonus)

$66^2/3\%$ to 100%	Bonus increases in steps and rises to 20% at 100% efficiency
Over 100%	20% bonus plus 1% bonus for each increase of 1% inefficiency

6. Gantt's Task and bonus Plan: - In this plan,
   a. Day wages on time basis are guaranteed
   b. A standard is set and remuneration is calculated as follows: -
      i. When output is below standard – payment at time rate
      ii. When output is at standard – payment at time rate plus 20% bonus
      iii. When output is above standard: - payment at higher piece rate

8. Bedeaux Point Premium Plan: - In this plan standard time of each job is determined in minutes known as Bedeaux points or B's. One B unit represents the amount of work which an average worker can do in one minute.

$$\text{Total Earnings} = \text{Time rate} \times \text{Time Taken} + \left[\frac{\text{No. of B's Saved}}{60} \times \text{Hourly rate} \times \frac{75}{100}\right]$$

Group bonus Plans

These may be adopted in the following circumstances:-
a. Where it is not possible to measure the performance of each individual worker
b. Where the workers constituting a group possess the same or equal efficiency and skill.
c. Where the number of workers constituting a group is not very large
d. Where production is dependent on collective effort of a group of workers as a whole.

Types of group Bonus Plans

1. Priestman's Output Bonus Plan
2. Cost Bonus Scheme
   i. Nunn-Bush Scheme
   ii. Scanlan Scheme
   iii. Rucker Acheme
   iv. Towne Gain Scheme

Co-Partnership and Profit sharing

Co-Partnership is a scheme whereby employees are given an opportunity to share in the capital of the business and to receive a part of the profit that accrues to their share of ownership.
Under the profit sharing schemes, the workers are paid in addition to wages a predetermined share of the profits of the undertaking.

Formulae

Measurement of Labour Turnover

1. Separation Method
$$= \frac{No.of\ employees\ \ left\ during\ \ the\ period}{Average\ \ No.of\ employees\ \ during\ \ the\ priod} \times 100$$
2. Replacement Method
$$= \frac{No.of\ employees\ \ replace\ \ in\ the\ period}{Average\ \ No.of\ employees\ \ during\ \ the\ priod} \times 100$$
3. Flux Method
$$= \frac{No.of\ separation\ +No.of\ replacement}{Average\ \ No.of\ employees\ \ during\ \ the\ priod} \times 100$$
4. Average Number of Employees
$$= \frac{No.of\ employees\ \ at\ the\ beginning\ +No.of\ employees\ \ at\ the\ end}{2}$$

Incentive Schemes

1. **Halsey Plan**
   Guaranteed wages = Time taken x Rate per hour
   Actual Wage = Guaranteed Wage + Bonus (Time x Rate per hour x Percentage of bonus)
   [Assume % of Bonus = 50% (if nothing is given)]
2. **Rowan Plan**
   Guaranteed wages = Time taken x Rate per hour
   Actual Wage = Guaranteed Wage + Bonus
   - Bonus = Time x Rate x Rate per hour x $\frac{Time\ saved}{Standard\ \ Time}$
3. **Taylor's Differentiate Price Rate Plan**
   Actual Salary = under standard x Low piece Rate
   OR
   Actual Salary = Standard or more than standard x High Piece Rate
4. Gantt Bonus System
   - (Below Standard)
     Guaranteed wage = Standard Time x Standard Rate per hour
   - (Up to Standard)
     Guaranteed wage = Standard Time x Standard Rate per hour
     Actual Wage = Guaranteed Wages + Bonus Of guaranteed Wage
   - (Above standard)
     Actual Wage = No. of Units x High Piece Rate
5. **Merrick Differentiate/ Multiple Rate Method**
   Guaranteed Wage = Actual no. of units x Normal Piece Rate

   Actual Wage according to % of efficiency
   a. (Up-to 83%) Guaranteed wage = Actual Wage
   b. (Above 83% and up-to 100%)
      Actual Wage = Guaranteed Wage + 10% of Bonus of Guaranteed Wage
   c. (Beyond 100%)
      Guarantees Wages + 20% of Bonus of Guaranteed Wage
   - Percentage of efficiency = $\frac{No.of\ units\ produced}{Standard\ \ Time}$ x 100 [Case I – Units given)
     OR
     $\frac{Standard\ \ Time}{Time\ \ Taken}$ x 100 [Case II – Time given]
6. **Emerson Efficiency Plan**
   Guaranteed Wages = Actual Time x Standard Rate per hour
   OR
   Guaranteed Wage = Standard no. of Units x Normal Piece Rate

   Actual Wage according to % of efficiency
   a. (Up-to 66.66%) Guaranteed wage = Actual Wage
   b. (Above 67 and up-to 100%)
      Actual Wage = Guaranteed Wage + Mentioned or 20% of Bonus of Guaranteed Wage
   c. (Beyond 100%)
      Actual Wage = Guarantees Wages + + Mentioned or 20% of Bonus of Guaranteed Wage + Each 1% increase in efficiency beyond 100%
7. **Bedeaus Point Premium Plan**
   Guaranteed wage = Time Taken x Rate per hour
   Actual Wage = Guaranteed wage + Bonus (Time saved x Rate per hour x Percentage of bonus)
   [Assumed Bonus % = 75% (if nothing is given)]

8. **Barth Method**
   Wages = $\sqrt{Standdard\ time}\ x\ (Actual\ time) x\ Rate$
9. **Time Wage/Rate system**
   Actual Wage = Actual Time x Rate per hour
10. **Piece Rate Wage**
    Actual Wage = No. of piece or standard time x Rate per piece of Rate per hour

Note – Dearness allowance always calculated on actual time. (D.A. = Actual time x D.A. Per hour)

UNIT-II
UNIT COSTING

"Single or Output Cost System is used in business where a standard product is turned out and it is desired to find out the cost of basic unit of Production." - J.R. Batliboi

Unit or output costing is used in those industries or organization where standard products are produced from a common process and all the units produced are more or less similar to each other. This method is also known as single costing method.

Definition of Unit or Output costing

Herold J. Wheldon – "Production cost accounting or unit cost accounting is such a method of cost ascertainment which is based on production unit. It is applicable where the production work is done continuously and the units are of same types of manufactured identical."

From the analysis of the above definition it is clear that generally this method is used in those industries, where following characteristics are found-

1. Production should be uniform or homogeneous and a continuous affair;
2. The units of production should be identical
3. The cost units should be physical and natural
4. Per unit cost has to be determined, for example per, ton metre, per kg, etc.

Objectives of unit or Output costing

The following are the main objectives for its application

1. To know the total cost of production and per unit cost within specific period.
2. To classify cost under related categories such as Prime Cost, works cost, cost of Production, etc. and having its detailed analysis in order to determined per unit cost.
3. To determined the effect of each element of cost on total cost so as to have control over cost.
4. To compare the cost during two or more periods and to make efforts for cost control on the basis of comparative analysis.
5. To determine proposed setting price to earn desired profit
6. To determined tender price on the basis of cost data and future prospects

In this method there is no need of apportionment of cost because all the expenses are made on a similar type of production. But where production is done for a various grades or for various size, their expenses have to be apportioned on the basis of size or grades in detail.

Elements of Cost under unit or output costing

In output costing in order to determined total cost and per unit, collection of various elements of cost is done as follows –

Material – the quantity and value of material consumed is determined by preparing a Material Abstract. The materials which are issued from stock are valued on an appropriate basis.

Labour – As required. Wages Analysis Sheet is prepared so that direct and indirect labour cost cab be determined.

Direct Expenses – In addition to material and labour, there are certain other expenses incurred which are termed as direct expenses.

Overheads – the overheads are debited to production for the period for which the cost us being determined. These overheads expenses' are taken from the financial records. There are certain expenses which cannot be determined before the end of the accounting period.

Methods of determining unit cost

In those industries where production is carried out on mass scale and on a continuous basis and standards products are manufactured, the total cost and per unit cost can e determined by the use of following methods –

1. Cost Sheet
2. Statement of Cost

Cost Sheet

Meaning of Cost Sheet

Coat sheet is a statement which is used to determined the total cost of goods produced or units in a specific period and in which total cost, per unit cost and incurred at various stages from manufacturing a products to the stage of making it saleable are shown. In this way, it can be said that cost sheet is a statement in which the cost of production is presented in an analytical way.

Definition of Cost Sheet

ICMA, Landon – 'Cost sheet is a document which provides for the assemble of the detailed cost of a cost centre or cost unit."

W.W. Bigg – "the expenditure which has been incurred upon production for a period is extracted from the financial books and the records set out in a memorandum statement.

Characteristics and objects of cost Sheet

1. The cost sheets are produced under Unit costing methods of costing because its object is to determined per unit cost.
2. The cost sheet is a periodic document which may be prepared weekly, fortnightly, montly or quarterly.
3. The object of preparing a cost sheet is to ascertain the total cost and the burden of each individual cost on the cost per unit of production for the period.

Difference between Cost Account and Cost Sheet

S.No.	Base	Cost Accounts	Cost Sheet
1	Nature	Cost Account is based on double entry principle and has Dr. and Cr. sides.	Cost sheet is not based on double entry principle.
2	Period	Cost Account shows the costs but only after the end of the year or period when they are closed	Cost sheet are prepared during the continuity of production
3	Comparative Study	The cost account are not helpful to know comparative costs	Cost sheet are helpful to know comparative costs.
4	Reconciliation	The cost accounts are useful in reconciling the profits of financial books with cost books	The cost sheet are not reconcile.
5	Cost per unit	Cost accounts do not show cost per unit in a detailed	Cost sheet ascertain cost per unit
6	Record are prepared	Cost accounts are prepared in the form of accounts	Cost sheets are prepared in form of statement

Indirect Expenses

These are classified into three groups i.e., factory overheads, administration overheads, selling and distribution overheads. They are usually charged at a predetermined rate.

Administration (Office) overheads may include

- Office expenses
- Legal expenses
- Rent and taxes
- Directors fees
- Audit fees
- General expenses
- Printing and stationary
- Bank charges postage and stamp etc.

Factory overheads includes –

- Factory expenses
- Motive power
- Heritage
- Factory light and heat
- Factory rent and rates
- Losses tools written off
- Unproductive wages
- Technical directors salary
- Depreciation on plants etc.
- Stores overheads
- Municipal tax
- Laboratory expenses
- Supervision charges
- Repair
- Fuel and power
- Wages and Foreman
- Light and water
- Fuel and gas
- consumable stores
- Factory lighting
- Oil and water.

Selling and distribution overheads includes –

- Selling expenses
- Unkeep of delivery vans
- Commission on sales
- Warehouse expenses
- Bad debts
- Advertisement expenses
- Carriage outwards
- Travelling expenses
- Expenses of demonstration
- Salaries of commission of salesman
- Sales office expenses
- Cost of free gifts, samples
- Salary of warehouse staff
- Expenses of warehouse
- Van trucks etc.

It will be proper to know the important basic formula to arrive the cost of material consumed is –

Cost of material consumed – value of opening stock of raw material + purchase value of raw material – value of costing stock of raw material.

Below is given a list of typical cost units used in different industries –

Industry	Cost unit
Colliery	Per tone of coal
Sugar	Per quintal
Cotton textiles yarn	Per pound
Cloth	Per meter
Paper	Per kg
Steel	Per tonne
Automobile	Per automobile i.e., number
Power	Per kilo watt hour

Items not included in cost –

- Income tax
- Dividend paid
- Donation
- Cash discount
- Interest on debenture
- Interest on capital
- Goodwill, preliminary expenses written off
- Obsolescence loss from machinery

Methods for finding up unit costing

Following methods are used for finding up unit's soting –

1. Cost Sheet
2. Cost Statement

3. Production Account
4. Trading and profit & loss account and manufacturing account

Cost Sheet

Output……

Particulars	Amount
Opening stock of Direct Material	-----
(+) Purchase of Raw material	-----
(+) Carriage on Purchases	-----
(-) Closing stock of raw material	-----
(-) Sale of Raw material	-----
(-) Abnormal Wastage	-----
Material Consumed	-----
(+) Direct Wages	-----
(+) Direct Expenses	-----
Prime Cost	-----
(+) Factory/work overheads	-----
Gross Factory Cost	-----
(+) Opening stock of work in progress	-----
(-) Closing stock of work in progress	-----
Factory Cost/ Work Cost	-----
(+) Office overhead	-----
Cost of Production	-----
(+) Opening stock of finished goods	-----
(+) Purchase of Finished Goods	-----
(-)Goods stock of Finished goods	-----
Cost of Goods sold	-----
(+) Selling & Distribution Overheads	-----
Total Cost	-----
(+) Profit	-----
Sales	-----

Calculation of Tender Price

The price at which the supplier offers his goods for sale, is known as Quotation or Tender –
The tender price should be calculated carefully in the following way –

1. The cost sheet of the produce being for sale, gives the cost of production. If there is a change in the price of material and cost of labour should be taken into account while quoting a price. s
2. The cost price per unit should be carefully examined.
3. Where quotation is given for a job, the actual material and direct labour costs can be ascertained and overheads are charged by a percentage selected base.
4. All possible changes in costs over the previous period should be taken in view preparing the statement.

Instructions for calculation the tender price –

1. First prepare cost sheet
2. Determine cost per unit
3. In absence of information the percentage is Calculated for factory overhead on direct labour and office overhead on works cost.
4. Percentage of profit is calculated either on cost or on selling price.
5. The tender price is easily calculated when the percentage of profit and cost per unit is determined.

OVERHEAD COSTING

Accounting for overheads

Overheads are those indirect, operating costs of a business enterprise which cannot be traced directly to any specific product, job, or process because they cannot be directly attached or marked to any specific activity or cost centre.

Overhead Accounting involves: -

A. Classification, Codification & Collection of overheads
B. Allocation, Appointment and absorption of overheads.

A. Classification of Overheads

1. Elements wise Overheads
   i. Indirect Material – e.g. Consumable stores, loose tools, etc.
   ii. Indirect Labour – e.g. Salary of foremen, store-keeper, supervisors, etc.
   iii. Indirect Expenses – e.g. Factory rent lighting, heating, insurance, administration, and selling & distribution expenses.
2. Function-wise Classification
   i. Production or Manufacturing Overheads: - E.g. Indirect material Indirect labour & indirect expenses
   ii. Administration overheads: - Audit fees, postage and telephone
   iii. Selling & distribution overheads: e.g. Advertising, showroom expenses, traveling expenses, etc.
3. Classification According to Behaviour or Variability
   i. Fixed Overheads are those which tends to be unaffected by variation in the volume of output.
   E.g. rent and rates, managerial salaries.
   ii. Variable Overheads are those which tends to vary in direct proportion to changes in the volume of output. E.g. indirect material, indirect labour.
   iii. Semi Variable overheads are those which are partly fixed and partly variable? E.g. depreciation, repairs & maintenance, telephone etc.
4. Classification According to controllability
   i. Controllable Cost: - Which Can be controlled by the action of a specified members of the department e.g. variable cost
   ii. Uncontrollable Costs: - Which cannot be controlled by the action of specified members of the undertaking. E.g. fixed cost.

Departmentalization of overheads: -This is the problem of (allocation and apportionment of overheads to production and service department)

Cost allocation: - The allotment of whole items of cost to cost centers or cost units is called cost allocation.

Apportionment of cost: - Where the expense is common and related to various cost centers or units, then it is to be allotted to different cost centers on an appropriate basis. This process is called Apportionment.

Primary distribution of overheads: - This is the process of allocation and apportionment of different items of overheads to all the departments.
Secondary distribution of overheads: - This is the process of re-distribution of the overheads cost of service department among the production department.

Methods: -

i. Direct Redistribution
ii. Simultaneous equation method
iii. Step ladder method
iv. Repeated Distribution method

Objectives of Departmentalization

1. Ensures greater accuracy in cost ascertainment.
2. Control of overhead cost
3. Use of different methods of absorption
4. Valuation of work-in-progress
5. Cost of service departments can be ascertained
6. Accurate forecasting and estimation and decision making.

Common Bases of Apportionment of Overheads

Direct Allocation	**Consumable stores, specific expenses**
Floor Area of Department	Rent and other building expenses, lighting & heating,
Direct Labour hours or Direct wages or No. of workers	Supervision, Administration Compensation to workers, Holiday Pay, ESI & PF contribution, fringe Benefits. Labour welfare expenses, Time Keeping, canteen Expenses.
Capital values of building or plant:-	Depreciation, insurance charges, rent, repairs & maintenance etc.
Light Points	Lightning expenses
Kilowatt hours/ Machine hours	Electric power
Wight or volume of material or value of materials	Material handling, stores overheads
Technical estimates	Power, light, internal transport, managerial salaries etc.

Absorption of overheads
Absorption means distribution of overhead expenses allotted to a particular department over the units produced in that department. So charging of overheads to cost units is called absorption of overheads.

Determination of overhead rates

1. Actual Rate – $\frac{\text{Actual overhead}}{\text{Actual Base}}$
2. Predetermined Rate – $\frac{\text{Budgeted Overheads}}{\text{Budgeted Base}}$
3. Standard Rate – $\frac{\text{Standard Overhead}}{\text{Standard Base}}$
4. Blanket Rate – $\frac{\text{Total overheads for the factory}}{\text{Total quantity of the entire factory}}$

Under Absorption and over Absorption of overheads
Under Absorption: - If the amount absorbed on predetermined rates is less than the overheads actually incurred, it is called under absorption or under recovery.
Over Absorption: - If the amount absorbed is more than the actual overheads, it is known as over absorption or over-recovery.

Causes of Under/Over Absorption of overheads

i. Error in estimating overheads
ii. Error in estimating quantum of production
iii. Actual hours worked may be more or less than those anticipated.
iv. The basis upon which factory overheads are recovered from production may no longer be correct on account of changes in prices of materials or wage rates.
v. WIP may not have been charged with its share of overhead cost accounts.
vi. Seasonal fluctuations in overheads from time to time.
vii. Unanticipated changes in methods of production and production capacity.

According Treatment of Under/Over Absorption

i. **Writing off to costing P & L A/c: -** This is used when account of under or over absorption is quite negligible or when under absorption is due to abnormal factors like idle capacity, defective planning, etc.
ii. **Absorption in the subsequent year: -** Here the under or over absorption amount is transferred to Overhead Reserve Account or Suspense Account for carry over to the next accounting year.
iii. **Application of supplementary Rates: -** Where the amount of under or over absorption is significant, a supplementary overhead absorption rate is calculated by dividing the under or over absorbed amount by the actual base. Adjustment is made in the cost of :

a. Work in progress b. Finished stock c. Cost of sales

In case of under absorption, the over head is adjusted by a positive rate, since the amount is to be added. Over absorption is adjusted by a negative rate, since the amount is to be deducted.

Methods of Absorption of overheads

i. Direct Material Cost Method ii. Direct Labour Cost Method iii. Direct Labour Hour Method iv. Prime Cost Method v. Machine Hour Rate Method vi. Production Units Method or Rate Per Unit of Output.

MACHINE HOUR RATE

Machine hour rate is cost of running a machine for one hour. It is different for different types of machine.

An actual or pre-determined rate of cost apportionment or overhead absorption which is calculated by dividing the cost to be apportioned or absorbed by the number of hours for which a machine or machines are operated or expected to be operated.

Comprehensive machine hour rate – when the direct wages of machine operators are included in machine hour rate, it is known as comprehensive machine hour rate.

Bases of apportionment of different overhead to machines

S.No.	Expenses	Basis
	Fixed Charges	
1.	Rent and Rates	Floor area occupied by each machine including the surrounding space.
2.	Heating and lighting	The number of points used plus cost of special lighting or heating for any individual machine, alternatively according to floor area occupied by each machine.
3.	Supervision	Estimated time devoted by the supervisory staff to each machine.
4.	Lubricating oil and consumable stores	On basis of past experience
5.	Insurance	Insurable value of each machine
6.	Miscellaneous expenses	Equitable basis depending on facts

	Variable Expenses	
1.	Depreciation	Cost of machine less residual value spread over its working life.
2.	Power	Actual consumption as per meter reading
3.	Repairs	Cost of repairs spread over its working life.

Advantages

1. It helps in analyzing the comparative efficiency of machine and comparing the overheads charges in various departments.
2. It expresses the quantitative analysis of time and cost of operating of each machine.
3. Managerial decision making is facilitated regarding use of manual labour in place of machines.
4. This is the most scientifically correct way of analyzing production overheads.
5. The cost analysis prepared here is more reliable for management to make decisions.
6. This method provides necessary information for estimating cost of production, laying down standards and estimating selling price of output.
7. This method can be very effective in valuing the cost of in operational machinery if the costs are bifurcated into fixed and variable.

Disadvantages

1. Those costs are not at all considered which are not in consideration with hours of operation of machinery.
2. If manual labor is also equally important part of cost then the results of cost estimation will be misleading.
3. Because of calculating the hours of operation separately for this method the whole process seems to be costly.
4. If the production programmes is not pre-decided then estimation of operating hours becomes difficult.
5. Blanket overhead rates cannot be used here therefore this method becomes more expensive.

UNIT-III
CONTRACT COSTING

It is one of the methods of cost accounting. This method is used in such industries where work is performed on contract basis. Contact costing is a part of specific order costing method where work is performed as per requirement or specification of the customer or contractee. Contract costing is also known as "terminal costing" or construction costing. It is used in civil engineering works such as road making, building construction, dam construction, bridge construction etc. Here the work is not done within the four walls of the factory, but outside the factory which is called site.

Terminology used in contract costing:

1. **Contractor and contractee –** the person under the terms of agreement, promises to complete a particular work is called contractor. The person whom such promise is given is called contractee.
2. **Contract price –** it is the consideration given to contractor for the construction work. Normally contract price of every contract is based on the cost involved in the contract.
3. **Work in progress –** Entire work done before the stage of completion of contract is work-in-progress. In other words when the contract is not completed till the end of accounting year the architect is required to value the work in progress. Such work in progress is classified into two parts – (a) Work certified (b) Work uncertified.
    1. **Work certified –** that part of work-in-progress which has been approved or certified or authenticated and valued by the expert called certifier or a valuer, is known as work certified.
    2. **Work uncertified -** it is that part of work-in-progress which has not been approved by the expert.
4. **Retention money and cash ratio –** payment by the contractee is always linked to the value of the work certified. Generally the monthly, quarterly or annual payments are a percentage of work certified, e.g. 70 or 90 percent or any other percentage agreed upon between the contractor and the contractee. At the completion of contract the entire balance amount is paid to the contractor. Some contractees pay interest on retention money. Retention money serves as a security with the contractee. It may be adjusted against the defective work found later.
5. **Escalation, de-escalation or reserve clause -** This clause is generally provided in long term contracts with a view to protecting both the contract and the contractee against fluctuations in the prices of inputs to the contract mainly material and labour.
6. **Cost plus contracts –** cost plus contact is a contract in which the contract price is not fixed at the time of entering into the contract. The contract price is determined by adding a specified amount of percentage of profit to the cost allowed in the contract.

Contract A/c

Date	Particulars	Amount	Date	Particulars	Amount
	To Material purchased	----------		By Material/Plant transferred to other contract	----------
	To Material issued from stores	----------		By material/plant returned to stores	----------
	To plant issued	----------		By cash a/c [material or plant sold]	----------
	To plant purchased	----------		By P&L a/c Material/plant stolen or destroyed	----------
	To Direct Labour	----------		By material/Plant in hand or at site	----------
	To Indirect labour	----------		**(If contract is completed)**	
	To Direct Expenses	----------		By Contractee's A/c	
	To Indirect Expenses	----------		By P & L A/c (Loss)	----------
	To Supervision Charges	----------		**(If contract is incomplete)**	
	To Sub contract cost	----------		By W.I.P. A/c	
	To cost of extra work done	----------		W.C.	
	To P & L A/c (Profit on sale)			W.U.C	----------
	(If contract is completed)	----------		By P & L A/c (Loss)	----------
	To P & L A/c (Profit)	----------			
	(If contract is completed)	----------			
	To Balance c/d (Total Profit)	----------			
	To P & L A/c				
	To W.I.P. A/c (Reserve)			By Balance b/d	

WORK – IN – PROGRESS A/c

Date	Particular	Amount	Date	Particular	Amount
	To Contract A/c			By Contract A/c (Reserve)	.....
	W.C.			By Bal. C/d	.....
	W.U.C	.....			

CONTRACTEE's A/c

Date	Particular	Amount	Date	Particular	Amount
1st yr Dec.31	To Balance c/d	.....	1st yr Dec. 31	By Cash	.....
	To Contract A/c	.....			.....
2nd yr June 30			2nd yr Jan.01	By Bal. b/d	.....
				By Cash	

		.....	June 30		.....

BALANCE SHEET
As on 31st December x x x 1

		By W.I.P. A/c ------ - Cash Received ------	----------

Rules regarding Transfer of profit – to Profit & Loss A/c

(A) If contract is completed -

The whole amount of Profit or Loss will be transferred to P & L A/c

(B) If contract is incomplete

(i) In case of Loss: The whole amount of Loss will be Trans to P & L A/c

(ii) In case of Profit:-

(a) If the value of W.C. is less than 1/4th of the contract price - Nil

(b) If the value of W.C. is 1/4th or more than it but less ½ of the contract price

= Total Profit × 1/3 × Cash Received / W.C.

C) If the value of W.C. is ½ of the contract price or more than it

= Total Profit × 2/3 × Cash Received / W.C.

In Case of Loss

The excess of debit over the credit items of the contract account is the loss. This loss is to be transferred to Profit & Loss A/c

Important Points while Preparing Contract A/c

1. The expenses incurred on contract are written on the debit side of contract A/c for e.g., Material, Labour, Direct expenses, Indirect expenses, Subcontract cost etc.
2. If any material loss or theft in a contract, it should be recorded in the credit side of Contract A/c as in the name of Profit & Loss A/c.
3. If any material and plant sold in the contract the sales price is written on the credit side of Contract A/c and then calculated the profit of loss and it is transferred to P & L A/c. If profit is there, it should be appeared on the debit side of P & L A/c, and loss should be appeared on the credit side of P & L A/c
4. Material at site, plant at site, stores at site should be written on the credit side of Contract A/c
5. If only depreciation of plant is given in the sum, then depreciation is written on the debit side of Contract A/c
6. If work certified amount is not given in the sum, then, following formula is used for calculating work certified amount –

   Work Certified = $\frac{Cash\ received\ \ x\ 100}{\%\ of\ \ cash\ received}$
7. Depreciation is calculated by following formula when rate of depreciation is not given –

   Per hour Rate = $\frac{Cost\ \ of\ \ plant}{Estimated\ \ working\ \ life\ \ of\ \ plant}$

   Per hour Rate = $\frac{Cost\ \ of\ \ plant\ -Scrap\ \ value}{Estimated\ \ working\ \ life\ \ of\ \ plant}$

Job Costing

Job costing is that part of cost accounting which finds cost of material, produced under a specific order. There goods are produced for immediate delivery for each job costing, the cost is calculated separately for each job order because every work order differs from person to person.

Thus, job costing is that method of cost accounting where cost is determined according to quantity of product, special material equipment, labour and expenses required to fulfill the order.

Job accounting has the following features

1. It differs order to order.
2. It is based on intermittent production and not continuous.
3. In job costing method, each job is treated as a separate cost unit.
4. In job cost, the final cost of production Is ascertained after the completion of the job.

Objects of Job Costing

1. Job costing helps to find out the profit or loss job wise.
2. Job costing helps to management to recognise profitable or non profitable job work.
3. Costing of old job helps to ascertain the cost of same type of new job work.
4. actual cost is compared to standard cost in job costing method which helps to control the cost in case of repeat job order.

PROCEDURE OF JOB COSTING

The following procedure is adopted in case of job costing method –

1. **Job Number -** First of all each job is given a separate number for its identification.
2. **Production order -** Production order is a written order given to for men to start the job. In this order job number, quantity to be produced design, specific requirement time etc. are mentioned.
3. **Job Cost Sheet—** A separate job cost sheet is prepared for each job. This job cost sheet carries the details of expenditure incurred on that particular job.
4. **Completion Certificate -** After completion the job. The production department sends the job completion certificate and a copy of job cost sheet to costing department.

Difference between Contract Costing and Job Costing

The difference between these two may be cleared as follows-

S.No	Bases of Difference	Contract	Job Costing
1	**Nature or work**	It is related to contraction generally	It is related to production process.
2	**Amount and Time**	Contract is having huge amount and longer period	Job is related for shorter period and small amount.
3	**Sub contractor**	In case of contract work	The subcontractor may be contracted and their cost will be part of contract costing.
4	**Industry**	Contract costing method is used in contraction industry e.g., Road	It is applied in industries which manufacture products or provide services against specific orders such as printing press, furniture makers general engineering concerns etc.
5	**Work site**	In the contract work is done out the work shop generally. Place of	Here works is completed in the workshop only

		contraction is the work site/work shop.	
6	**Determination of profit or loss**	In this method profit or loss is also determined on incomplete contract	In this method profit or loss is calculated after the completion of job
7	**Nature of Expenses**	Most of the expenses under contract costing are direct in nature.	In Job costing expenses may be direct and indirect both.

Batch Costing

Meaning

There are some such products whose cost of production can be calculated unit wise (for an individual unit). For example bolts nuts, pins, screw bread, biscuits, etc. In such a case firms which are producing these products, use the batch costing method in batch costing each batch of production is treated as an separate job work and cost is determined accordingly.

Procedure of Costing

Batch costing does not differ from job costing in respect of accounting procedure. Like job costing each batch is given a separate number and cost sheet is prepares. The overheads are distributed by a proper method.

In this method cost of plant and its setting is treated as fixed overheads and it is distributed among the batched by the proper methods.

Economic Batch Quantity

In this method that quantity of product is calculated which make the cost of batch economical or least? Thus, economic batch quality is that best possible size of output which gives that minimum cost and maximum product.

To calculate the economic batch quantity the following two types of cost are considered –

1. Setting cost of plant.
2. Cost of shortage – Rent of warehouse, insurance expenses, interest on borrowing

Economic Batch Quantity = $\sqrt{\frac{2 x U x S}{C}}$

U = No. of units to be produced in a year
S = Set up cost per batch
C = Carrying costs per units

OPERATING COSTING

Meaning of Operating Costing –

Operating costing is adopted by those businesses which operate services. These service organizations render services instead of producing & their main feature. The service may be sold by the enterprises to consumers, e.g. Bus companies, tramways, railways, airways & shipping companies, hotels, banking finance and consultancy firms, electricity boards, gas, water and other utility undertakings. The service may also be used within the enterprise e.g. cafeteria, boiler house etc. Operating costing is a method of cost accounting designed to determine the cost of services, and hence justifiably also called services costing.

According to CIMA England "Operating costing applies where standardized services are provided either by an undertaking or by a cost centre within an undertaking".

Normally, operating costs are period costs. Expenses accumulated for a period say, quarterly or monthly are related to the quantum of services rendered during the period. In some cases, however, operating costs could also be sold as terminal costs. When a plane is chartered for a specific trip, its cost would be calculated as if it is an independent job.

Characteristics –

The following characteristics are usually found in industries where operating cost is used –

i) Services rendered to customers are of unique type.
ii) A large proportion of the total capital is invested in fixed assets & comparatively less working capital is required.
iii) The distinction between fixed cost and variable cost is of particular importance because the economics & scale of operations considerably affect the cost per unit of service rendered. For example, fixed cost per passenger will be lower if buses in Transport Company run capacity packs.

This method of costing can be used in the following service undertakings –

i) **Transport services** – Bus, truck companies, Tramways, Railway, Airlines.
ii) **Supply services** – Gas Company, water supply, electricity, boiler House etc.
iii) **Welfare services** – Hospital, Canteen, Hotel, and Public Library.
iv) **Public services** – Road maintenance, Road lights & other public utility services etc.

Cost unit – The selection of suitable cost unit may sometimes prove difficult. The cost units may be of the following two types –

i) Simple cost unit.
ii) Composite cost unit.

Simple cost unit – The unit may be simple as under unit costing as per bed in case of hospital, per 1000, liters in case of water works, per child in one of the schools, per cup of tea or per dish in case of canteen services etc.

Composite cost unit – In this type more than one unit are combined together as per passenger km in case of bus companies.

S.No.	Undertaking/Business	Cost Units
1	Transport Business, Tram, Railways, Roadways	Per-passenger-km, per seat-km.
2	Trucks and other loading vehicles.	Per-tone or quintal-km.
3	Hospital – Indoor - Outdoor	Per bed-day Per patient-day
4	Electricity supply	Per Kwt-hour
5	Water supply	Per Gallon-hour, per 1000-litres
6	Canteen	Meals per-person, per cup-tea etc.
7	Boiler House	Per cub centimeter gas or steam
8	Hotel	Per-room-day, per-passenger-day
9	Cinema, Theater etc.	Per-person per show
10	Road Maintenance	Per-km.

Build-up of Costs –

After determining the unit of cost to which the total expenditure is to be apportioned, the process of collecting the necessary data about costs of operating the service is carried over. The data after collection are classified under two heads –

i) Fixed or standing charges ii) Variable charges.

This is done so that greater control can be exercised over new costs. In whatever quantum the service is rendered, fixed cost or standing cost shall not change and the management should concentrate over such costs.

The expenses which vary according to a change in the operating level are grouped separately and sometimes such expenses are placed in sub-groups like (i) Maintenance charges (ii) Running Expenses. This is done to have a better idea about the cost structure. Costing in some specified undertaking has been explained in detail.

Transport Costing –

Transport is one of the service performed by air, water, railways, tramways roadways, goods carries, etc. such businesses naturally take to the method of operating costing, with a view to finding the total cost of each vehicle and then applying it to the unit cost. The cost information helps not only in charging for the service against departments and outsider customers, but in making comparison between vehicles inter se and alternative modes of transport.

To calculate the operating expenses following work should be done –

i) Collection of service expenses for specified period.
ii) Division of collected expenses between fixed & variable expenses.
iii) Calculation of units for service rendered.
iv) Calculation of per unit cost by dividing total expenses with units.
v) Adding the profit in per unit cost and take the decision as for fixing rates per passenger per kilometer or per ton km. etc.

Collection of operating cost –

For each vehicle or for generator or pumping set etc. a log book is maintained to record various details during a given period of time. Particulars regarding capital, maintenance and running costs, trips made, fuel & oil supplied; worker's time spent and exceptional delays are invaluable for working out the cost services. These enable the management to make suitable allocation of vehicles and thus avoid unnecessary or duplicate trips and waste or idle running capacity.

From following specimen given it will be seen clearly –

Vehicle No. : **Carrying capacity :**	**Operating Cost Statement January 2009**		**Stationed at:** **Route No. :**	
	Budget		**Actual**	
Particular	Total	Per ton Km.	Total	Per ton Km.
A. Standing Charges: 1. License fee 2. Insurance 3. Road tax 4. Administration 5. Depreciation, if charged on time basis 6. Interest	Rs.	Rs.	Rs.	Rs.
Total				
B. Maintenance Charges: 1. Garage expenses 2. Repairs & overhauling 3. Oiling & servicing 4. Spare parts & components	Rs.	Rs.	Rs.	Rs.
Total				

C. Running Charges: 1. Petrol or diesel 2. Oil & greases 3. Running staff salaries 4. Wear & tear of tyres, tubes 5. Insurance of transit goods 6. Vehicle depreciation if charges on mileage run basis				
Total				
D. Total Operating Cost (A+B+C) E. Total Ton-kms. or passenger-km. F. Cost per ton-km or passenger-km. G. Revenue Earned H. Net Profit				
Remarks if any		Cost Accounting		

Classification of Expenses Accumulated

Operating expenses for a specified period are classified into two parts –

i) Fixed charges, & (ii) Variable charges.

i) **Fixed charges** – License fee, insurance, road tax, garage rent, salary of the supervisory and office staff, director's fees, interest on capital, wages of the driver, conductor and cleaner etc. (if paid on time basis).

ii) **Variable charges** – Depreciation of vehicle, cost of petrol, diesel, mobile oil, grease and other lubricants, wages of drivers and cleaners (if paid on mileage run-basis), Repairs and overhauling expenses. Oiling and servicing charges, wear and tear of tyres and tubes, Gas and electricity charges, Insurance on transit goods.

Some authors have allocated these expenses in three parts as under –

i) **Standing Charges (Fixed)** – License fee, insurance, road tax, interest on capital, depreciation of vehicles, and salary of the supervisory and office administration staff.

ii) **Maintenance charges (Semi Variable)** – Repairs and renewals, Garage and terminal office rent, rates etc. staff salaries of garage and terminal office, spare parts, oiling and servicing charges (routine).

iii) **Running Charges (Variable)** – Cost of petrol, diesel, mobile oil, grease and other lubricants, depreciation of tyres, tubes and battery, Insurance of transit goods, wages of drivers and cleaners (if paid on mileages run basis).

Calculation of Ton Kilometers or per Passenger Kilometers

In transport business before calculation of running expenses. It is necessary to know the meaning of the words ton kilometer or passenger kilometer. There meaning is being explained here under –

a. Ton Kilometer – It refers to the calculation of cost of carrying one tone load to one kilometer.
b. Passenger Kilometer – It refers to the estimation of cost incurred on carrying a passenger one kilometer.

Calculation of Operational Cost

Before calculating operation cost fixed and variable expenses are added. Thereafter following formula is used for its estimation –

a. In relation to a transport company carrying passengers –

1. Operating Cost per Km = $\frac{Total\ standing\ and\ Running\ expenses}{Kilometer}$

2. Operating cost per passenger Km = $\frac{Total\ standing\ \ and\ Running\ \ expenses}{Total\ passenger\ \ km}$

b. In relation to a goods carrier transport company –

1. Operating Cost per Km = $\frac{Total\ standing\ \ and\ Running\ \ expenses}{Total\ ton\ km}$

2. Operating cost per ton Km = $\frac{Total\ standing\ \ and\ Running\ \ expenses}{Total\ ton\ km}$