SYLLABUS

Class – B.Com II Year

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. (Transport Cost).
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. Standard Costing and variance Analysis (Material and labour only)

UNIT-I

COST ACCOUNTING-AN INTRODUCTION

Introduction:-

cost accounting is the branch of accounting. It has been developed due to the limitations of financial accounting. In these days of cut throat competition, it is vital that a business concern should conduct its activities with the least chance of being kicked out of business. Those concern which don't take such precautions and which dnt try to continuously improve, their products and service and bring down cost and prices will sooner or later find themselves out of business. Cost accounting plays a big role in the case.

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
(ii) Cost Accounting.
Its purposes are
(i) Cost control,
(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."

The main objective of overhead accounting is to ascertain the total cost of production and per unit. Therefore it is necessary to understand the meaning of unit. The quantify of production on which cost and selling price are based is called unit. In other words unit of cost is the quantity analysis of the product or service on the basis of which cost is ascertain. Unit refer to the quantity of product for example pound, meter, centimeter etc.

Types of unit of cost

1. *Simple unit:- by simple unit we mean that unit which can be ascertained only in one unit and the meaning is also simple like kilogram, per meter, per ton, per dozen, per quantial.*
2. *Composite unit:- it means that unit which is a combination of two words of a simple unit. For example per patient per day, per ton kilometer, per passenger kilometer, per kilowatt hour, etc.*

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.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.*	*Show historical costs, i.e., they include expenses having actually been incurred in the financial year. Greater emphasis is laid on cash and financial position. They do not attach that importance to control of materials, labor and overheads.*
7.	*As the cost is available, it is easier to fix selling price and quote for tenders*	*No correct tender prices can be quoted.*
8.	*The production costs of a period can be compared with previous corresponding period and the difference analyse.*	*Such comparison of costs of individual production is not easy.*
9.	*Provide information on the relative efficiency of plant, machinery, labour and departments.*	*The relative efficiency of workmen, plants, etc., cannot be easily judged.*
10.	*Stocks are valued at costs.*	*Stocks are valued at cost price or market price, whichever is lower.*
11.	*These accounts are for internal transactions and do not form the basis of receipts and payments to outside parties.The companies Act has made it obligatory for certain industries to maintain Cost*	*They form basis for external transactions also, and record receipts, payments and credit transactions.*
12.		*It is almost necessary to maintain this accounting to run business. To meet the requirements of*
13.		

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 centers 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 centers or cost units.*

ii. *Indirect Labour Cost. is one which cannot be allocated but which can be apportioned to, or absorbed by, cost centers 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

It discloses the profitable and unprofitable activities in a concern and hence necessary adjustments are done.

i. *It enables the concern to measure its efficiency and then maintain or improve.*
ii. *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

A. To the Management

1. *Action against unprofitable Activities*
2. *Facilities Decision Making*
3. *Inventory Control*
4. *Budgetary Control*
5. *.Facilitation 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 ac materials, labour and other costs.*

E. *To the Public*

1. *Removes all types of wast ages 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. *Promptness*
3. *Equity*
4. *Observation and Resulting*
5. *Simplicity*
6. *Periodical Result*
7. *Elasticity*
8. *Reconciliation with Financial Accounts*
9. *Comparability*

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
v. Maintain up-to-date stores records
vi. 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

iiFinished Stock Turnover Ratio = Value of Finished Stock sold in the periodii. 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

Input Units

× 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: -
v. *Simple Average Method*
vi. *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)

$$EOQ = \sqrt{\frac{2AB}{CC}}$$

Where, A = Annual consumption

B = Ordering cost / Procurement cost/ buying cost/ set up cost

CC = Carrying cost / Holding cost/ Storage cost

$$CC = \text{Cost per unit} \times \frac{\text{Rate of inventory carrying cost}}{100}$$

- *Economic Order Quantity (EOQ)*

$$EOQ = \sqrt{\frac{2AB}{CC}} \times = \sqrt{\frac{P}{P-D}}$$

Where, D = Demand of item or Consumption

P = Production of item or Procurement rate

- *Economic Order Quantity (EOQ)*

$$EOQ = \sqrt{\frac{2AB}{CC}} \times = \sqrt{\frac{CC+CS}{Cs}}$$

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 = $\frac{\text{Annual Usage}}{EOQ}$ 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*

$$\text{Number of orders} = \frac{\text{Annual Usage}}{EOQ}$$

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. *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*
vi. *Change of job for better opportunities*
vii. *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: -

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

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: -

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

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 equipment, 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

Bonus = [Time Rate x Time Taken x Time saved

Time Allowed

3. ***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.

Merrick 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*

4. *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 66²/3%	*Time wages (No bonus)*
66²/3% 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

5. *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: -*

When output is below standard – payment at time rate

When output is at standard – payment at time rate plus 20% bonus

iii.When output is above standard: - payment at higher piece rate

6. *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.*

$$\text{Total Earnings} = \text{Time rate} \times \text{Time Taken} + \frac{\text{No. of B's Saved}}{60} \times \text{Hourly rate} \times$$

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*

Nunn-Bush Scheme

Scanlan Scheme

Rucker Acheme

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)*

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