B.Com (Hons.)III[RD] Semester

Cost and Management Accounting(201)

Objectives: The primary objective of the course is to familiarize the students with the basic cost concepts, allocation and control of various costs and methods of costing.

Course Contents:-

Unit I **Lectures: 15**

Meaning and Scope of Cost Accounting: Basic Cost Objectives and scope of cost accounting, cost centres and cost units, Cost classification and elements of cost, Cost behavior pattern, separating the components of semi-variable costs.
Materials Control: Meaning, Steps Involved, Materials and Inventory, Techniques of Material/Inventory Control, Valuation of Inventory.

Meaning of Cost Accounting:-

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

Previously, cost accounting was considered to be a technique for the ascertainment of costs of products or services on the basis of historical data. In time, due to the competitive nature of the market, it was realized that ascertaining of cost is not as important as controlling costs. Cost Accounting started to be considered more as a technique for cost control as compared to cost ascertainment. Due to the technological developments in all fields, cost reduction has also come within the ambit of cost accounting. Cost accounting is, thus, concerned with recording, classifying and summarizing costs for determination of costs of products or services, planning, controlling and reducing such costs and furnishing of information to management for decision making.

Concept of Cost

The term cost means the amount of expenses incurred on or attributable to a specified thing or activity. According to the Institute of Cost and Work Accounts (ICWA) India, cost is the 'measurement in monetary terms of the amount of resources used for the purpose of production of goods or rendering services'.

With reference to production/manufacture of goods and services cost refers to the sum total of the value of resources used like raw material, labour and expenses incurred in producing or manufacturing a given quantity.

Initially, business houses considered factory cost, office cost and cost of sales for determining the cost of a product. Now, business has grown to an extent where selling and distribution expenses cannot be ignored while calculating the cost of a product. Thus, costs include 'prime cost', factory cost, cost of production, cost of goods sold and cost of sales.

Cost accounting is concerned with cost and therefore is necessary to understand the meaning of term cost in a proper perspective. In general, cost means the amount of expenditure (actual or notional) incurred on, or attributable to a given thing. However, the term cost cannot be exactly defined.

Its interpretation depends upon the following factors:
• The nature of business or industry
• The context in which it is used

BASIS C COST OBJECTIVES:-

The objective of the cost is to ascertain, estimate, allocate and apportion the cost to various expenses of the firm thereby aimed at cost reduction of the firm.

1) Cost Ascertainment: - It is concerned with computation of actual costs incurred. It refers to the methods and processes employed in ascertaining costs. It has been seen earlier that in different types of industries, different methods are employed for ascertaining cost.
   Ascertainment of actual cost has very little utility because of the following reasons:-
   i. Actual costs cannot be used for the purpose of price quotations and filling tenders.
   ii. Actual costs have practically no utility for cost control purposes.
   iii. Actual costs are ineffective as means of measuring performance efficiency.
2) Cost Estimation: - It is the process of predetermining costs of goods or services. The costs are determined in advance of production and precede the operations, these are future costs and based on average of past actual costs.
   It is used for all of
   the following uses: -
   i. Cost estimates are used in making price quotations and bidding for contracts.
   ii. It is used in preparation of budgets.
   iii. It helps in evaluating performance.
   iv. It is used in preparing projected financial statements.
3) Cost Allocation:- Allocation of cost to departments or cost centres .Charging of the cost to a cost centre those overheads that result solely from the existence of that cost centre.
   In order that an overheads can be allocated, they should meet both of the following conditions:-
   a) The cost centre must have caused the over cost to be incurred.
   b) The exact amount incurred in a cost centre must be known.
4) Cost Apportionment: - Distribution of overhead costs to various departments is known as apportionment. In other words "division of overheads to more than one cost centre, on some equitable basis." It is charging a fair share of an overhead cost to a cost centre.

SCOPE OF COST ACCOUNTING:-

The scope of cost accounting is very wide and includes the following:

Cost Ascertainment: it deals with the collection and analysis of expenses, the measurement of production of the different products at the different stages of manufacture and the linking up of production with the expenses. In fact, the varying procedures for the collection of expenses give rise to the different systems of costing as Historical or Actual costs, Estimated Costs, Standard Costs, etc. Again the varying procedures for the measurement of production have resulted in different methods of costing such as Specific Order Costing, Operation costing, etc. for linking up of production with the expenses the different techniques of costing such as Marginal Cost Technique, the Total Cost Technique, Direct Cost Technique etc. have been evolved. All the three i.e. systems, methods and techniques can be used in one concern simultaneously.

Cost Accounting: it is the process of accounting for cost which begins with recording of expenditure and ends with the preparation of statistical data. It is formal mechanism by means of which costs of products or services are ascertained and controlled. Cost can be ascertained either by following the historical or predetermined system of costing. Cost can be predetermined either by standard costing or estimated costing. If the cost and financial accounts are kept separately then their reconciliation is also to be done in order to verify the accuracy of both sets of accounts.

Cost Control: Cost Control is the guidance and regulation by executive action of the costs of operating an undertaking. It aims at guiding the actual performance towards the line of targets; regulates the actuals if they deviate or vary from the targets; this guidance and regulation is done by an executive action. The cost can be controlled by standard costing, budgetary control, proper presentation and reporting of cost data and cost audit.

COST CENTER:-

A department within an organization that does not directly add to profit, but which still costs an organization money to operate. Cost centers only contribute to a company's profitability indirectly, unlike a profit center which contributes to profitability directly through its actions. This type of department is likely to be one of the first targets for downsizing because, on the surface, it has a negative impact on profits.

COST UNIT:-

In cost accounting, unit of product or service for which cost is computed. Cost units are selected to allow for comparison between actual cost and standard cost, or between different actual costs. A quantity or unit of a product or service whose cost is computed, used as a standard for comparison with other costs. It is a functional cost unit which establishes standard cost per workload element of activity, based on calculated activity ratios converted to cost ratios.

COST CLASSIFICATION:-

Classification is the process of grouping costs according to their common characteristics or features.

There are various methods of classifying costs on the basis of requirements.

The following are the important bases on which costs are classified:

Classification of Cost on the basis of Nature (or) Elements:

(a) Material Cost
(b) Labour Cost
(c) Other Expenses

Classification of Cost on the basis of Function :

(a) Production Cost
(b) Administration Cost
(c) Selling Cost
(d) Distribution Cost

Classification of Cost on the basis of Variability:

(a) Fixed Cost
(b) Variable Cost
(c) Semi-Variable cost or Semi- Fixed cost

Classification of Cost on the basis of Normality:

(a) Norbmal Cost
(b) Abnormal Cost

Classification of Cost on the basis of Controllability and Decision Making:

(a) Controllable Cost
(b) Uncontrollable Cost
(c) Sunk Cost
(d) Opportunity Cost
(e) Replacement Cost
(f) Conversion Cost

(1)On the basis of Nature or Elements: One of the important classification cost is on the basis of nature or elements. Based on elements, it is classified into Material Cost, Labour Cost and Other Expenses.

They can be further subdivided into Direct and Indirect Material Cost, Direct and Indirect Labour Cost and Direct and Indirect Other Expenses.

(2) On the basis of Function: The classification of costs on the basis of the various function of a concern is known as function-wise classification. Here there are four important functional divisions in the business organization, viz.: (a) Production Cost (b) Administration Cost (c) Selling Cost and (d) Distribution Cost.

(3)On the basis of Variability: On the basis of variability with the volume of production Cost is classified into Fixed Cost, Variable Cost and Semi Variable Cost; Fixed Costs are those costs incurred which remain constant with the volume of production. Rent and rates of office and factory buildings are examples of fixed cost.

Variable costs are those costs incurred directly with the volume of output. For example, cost

of materials and wages to workers are the expenses chargeable with direct proportion to the volume of production.

Semi-Variable Costs are those costs incurred, partly fixed and partly variable, with the volume of production. Accordingly, it has both fixed and variable features. For example, depreciations and maintenance cost of plant and machinery.

(4)On the basis of Normality: Costs are classified into normal costs and abnormal costs on the basis of normality features. Normal costs are those incurred normally within the target output or fixed plan.

(5) On the basis of Controllability and Decision Making: Based on the managerial decision making and controllability the classifications are as follows:

(a) Controllable Cost;

(b) Uncontrollable Cost; (c) Sunk Cost; (d) Opportunity Cost; (e) Replacement Cost; and

(f) Conversion Cost.

(a) **Controllable Costs:** Controllable Costs are the costs which can be influenced by the action of a specified number of an undertaking. Controllable Costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre. For example, direct materials and indirect materials.

(b) **Uncontrollable Costs:** Uncontrollable Costs are those costs which cannot be influenced by the action of a specified number of an undertaking. In fact, no cost is controllable, it is only in relation to a particular individual that may specify a particular cost to either controllable or non-controllable. For example, rent and rates.

(c) **Sunk Cost:** These are historical costs which were incurred in the past and are not relevant to the particular decision making problem being considered. While considering the replacement of a plant, the depreciated book-value of the old asset is irrelevant as the amount is a sunk cost which is to be written-off at the time of replacement. Unlike incremental or decremental costs, sunk costs are not affected by increase or decrease of volume. Example of sunk cost include dedicated fixed assets, development cost already incurred.

(d) **Opportunity Cost:** Opportunity costs mean the costs offorgoing or giving up an opportunity. It is the notional value of going without the next best use of time, effort and money. These indicate the income or potential benefits sacrificed because a certain course of action has been taken. An example of opportunity costs is the market value forgone or sacrificed when an old machine is being used.

(e) **Replacement Cost:** Such expenses may be incurred due to factors like change in method of production, an addition or alteration in the factory building, change in flow of production.

ELEMENTS OF COST

The total costs are classified into three elements: They are material, labour and other expenses. These elements are further analysed into different elements as shown in the following diagram:-

a) Direct material:-

Direct materials are those that can be directly identified in a product. These materials become a major part of the product. These materials can be directly seen. Limestone in chalk pieces, wood in furniture and bricks in houses are examples. The following are considered as direct materials:

(i) all raw materials, (ii) specially purchased material for a special job and (iii) primary packing materials.

In other words, direct materials are materials that can be easily identified and related with specific products, jobs and processes. Timber as a raw material for making furniture, cloth for making garments, sugarcane for making sugar, gold/silver for making jewellery, etc., are some examples of direct materials.

A material that the forms part and parcel of a finished product and that can be assigned to a particular unit is known as a direct material. Direct material is also known as 'process material', prime cost material, 'production material', 'stores material', 'constructional material', etc.

b) Direct Labour:-

It is labour expended/spent in converting raw materials into finished goods. Wages given to workers who are engaged in converting raw material into finished goods comes under direct labour. Direct labour is also known as direct wages, 'productive labour', 'process labour' or prime cost labour. The following are considered as direct labour:

1. Labour engaged in the actual production of a product.
2. Labour engaged in assisting the manufacture by way of supervision, maintenance,tool setting, etc.
3. Inspectors and analysts specially needed for production

In other words, direct labour is labour that is directly involved in the production of a commodity. It can be easily identified and related with a specific product, job, process and activity. Direct labour cost is easily traceable to specific products. Direct labour varies in direct proportion with the volume of output. It is also known as process labour, productive labour, 'operating labour', direct wages, 'manufacturing wages', etc. Examples for direct wages are as follows: cost of wages paid to a sculptor for making a statue, cost of wages paid to a carpenter for making furniture, cost of a tailor producing readymade garments, and cost of a washer in dry cleaning.

c) Direct Expenses:-

Expenses that can be directly identified and allocated to cost centres or cost units are called direct expenses. They include expenses other than direct material and direct labour, which are incurred in manufacturing a product.

Direct expenses are also known as 'chargeable expenses', prime cost expenses, 'productive expenses' or 'process expenses'. The following are considered direct expenses:

Cost of special□□ drawings, design or layout
Hire charge,□□ repairs and maintenance of special equipments hired
Experiment expenses□□ of a job
Excise duty□□
Royalty□□
Architect fees□□
Cost of rectifying□□ defective work

These are the expenses that can be directly, conveniently and wholly allocated to specific cost centres or cost units. Examples of such expenses are as follows: hiring some special machinery required for a particular contract, cost of defective work incurred in connection with a particular job or contract, etc.

d) Indirect Material:-

Materials that cannot be identified as part of a product are called indirect materials. The following are considered indirect materials: (i) cotton waste, (ii) brooms, (iii) lubricants, (iv) cleaning materials and (v) materials for repairs and maintenance.

An indirect material is a material that cannot be easily and conveniently identified and related with a particular product, job, process and activity. Consumables stores, oil and waste, and printing and stationery are some examples of indirect materials. Indirect materials are used in the factory, office, or the selling and distribution departments.

The material that is used for purposes ancillary to business and that cannot be conveniently assigned to specific physical units are termed indirect material.

e) Indirect Labour:-

Wages that cannot be directly identified with a product are called indirect labour. The following are considered indirect labour: wages paid to those workers who assist in production, namely, who are indirectly involved in production, including (i) salary for supervisors, (ii) salary for storekeepers and (iii) salary for clerical staff.

Labour employed for the purpose of carrying out tasks that are indirectly related to goods produced or services provided is indirect labour. Such labour does not alter the construction,composition or condition of a product, although they form part of the product. It cannot be practically traced to specific units of output.

Wages of storekeepers, foremen and timekeepers; directors' fees; salaries of salesmen and works manager; etc., are examples of indirect labour costs. Indirect labour is used in the factory, office or the selling and distribution divisions.

f) Indirect Expenses:-

Expenses that are not directly identified with a product are called indirect expenses. The following are considered indirect expenses: (i) factory rent; (ii) factory insurance; (iii) factory depreciation; and (iv) plant repair, maintenance and insurance. All indirect materials, indirect labour and indirect expenses are called overheads. Overheads in general refer to all expenses incurred in connection with the general organization of the firm. Overheads are broadly lassified into (i) factory overheads, (ii) administration overheads and (iii) selling and distribution overheads.

These are the expenses that cannot be directly, easily and wholly allocated to specific cost centres or cost units. All indirect costs other than indirect material and indirect labour are termed indirect expenses. Thus, indirect expenses = indirect cost – indirect material – indirect labour.

g) Overheads:-

The term overhead includes indirect material, indirect labour and indirect expenses. Thus, all indirect costs are overheads. A manufacturing organization can be divided broadly into the following three divisions:

Factory or works,□□ where production is done

Office and□□ administration, where routine as well as policy matters are decided

Selling and□□ distribution, where products are sold and finally dispatched to customers

Overheads may be incurred in a factory, an office or the selling and distribution divisions.

Thus, overheads may be of three types.

The term overhead has a wider meaning than the term indirect expenses. Overheads include the cost of indirect material, indirect labour and indirect expenses. This is the aggregate sum of indirect material, indirect labour and indirect expenses.

COST BEHAVIOUR PATTERN:-

Cost behavior is associated with learning how costs change when there is a change in an organization's level of activity. The costs which vary proportionately with the changes in the level of activity are referred to as variable costs. The costs that are unaffected by changes in the level of activity are classified as fixed costs.

Cost behavior is not required for external reporting under U.S. GAAP. However, the understanding of cost behavior is very important for management's efforts to plan and control its organization's costs. Budgets and variance reports are more effective when they reflect cost behavior patterns.

The understanding of cost behavior is also necessary for calculating a company's break-even point and for any other cost-volume-profit analysis.

PERFORMA OF COST-SHEET:-

Particulars	Amount
Opening Stock of Raw Material	xxx
Add: Purchase of Raw materials	xxx
Add: Purchase Expenses	xxx
Less: Closing stock of Raw Materials	xxx
Raw Materials Consumed	xxx
Direct Wages (Labour)	xxx
Direct Charges	xxx
Prime cost (1)	xxx
Add :- Factory Over Heads:-	
Factory Rent	xxx
Factory Power	xxx
Indirect Material	xxx
Indirect Wages	xxx
Supervisor Salary	xxx
Drawing Office Salary	xxx
Factory Insurance	xxx
Factory Asset Depreciation	xxx
Works cost Incurred	xxx
Add: Opening Stock of WIP	xxx
Less: Closing Stock of WIP	xxx
Works cost (2)	xxx

Add: - Administration Over Heads:-	
Office Rent	xxx
Asset Depreciation	xxx
General Charges	xxx
Audit Fees	xxx
Bank Charges	xxx
Counting house Salary	xxx
Other Office Expenses	xxx
Cost of Production (3)	xxx
Add: Opening stock of Finished Goods	xxx
Less: Closing stock of Finished Goods	xxx
Cost of Goods Sold	xxx
Add:- Selling and Distribution OH:-	xxx
Sales man Commission	xxx
Sales man salary	xxx
Traveling Expenses	xxx
Advertisement	xxx
Delivery man expenses	xxx
Sales Tax	xxx
Bad Debt	xxx
Cost of Sales (5)	xxx
Profit (balancing figure)	xxx
Sales	xxx

Separating the components of Semi-Variable Costs:-

Separating Semi-Variable Costs

Semi-variable costs, also known as "mixed costs," include both fixed and variable rates. An easy way to understand these costs is to consider a cell phone bill: consumers pay a fixed rate for their plan each month, but that bill may increase with additional text messages or long distance calls. This bill, then, would constitute a semi-variable expense.

Common Semi-Variable Expenses

The most common semi-variable expense for manufacturers is electricity. Manufacturing companies rely heavily on machinery to complete production tasks, but the frequency with which that technology is actually put to use will vary with consumer demand and volume of production. Thus, a company will pay a certain amount of money each month to keep a warehouse open (this

sum will likely include lighting costs, for example), but portions of this electric bill (i.e. those reflecting the cost to run machines) will increase during particularly busy periods and decrease in downturns.

Materials Control:

The term material may be defined as "anything that can be stored, stacked or stockpiled." It refers to all commodities that are consumed in the process of manufacture. Material is classified in direct material and indirect materials. Ni cost accounting system can become effective without proper and efficient control of material. This is so because quite often material is the largest single element of cost and as such an efficient systems of material control leads to a significant economy in the total cost. Material control is as much cash as cash itself and any theft, waste and excessive use of materials are immediate and direct financial losses, where slack methodsexist, it is easy for such losses to pass unnoticed. The planning and control of the functions supporting the complete cycle (flow) of materials, and the associated flow of information. These functions include (1) identification, (2) cataloging,(3) standardization, (4) need determination, (5) scheduling, (6) procurement, (7) inspection,(8) quality control, (9) packaging, (10) storage, (11) inventory control, (12) distribution, and (13) disposal.

Materials or inventory control may be defined as "systematic control and regulation of purchase, storage and usage of materials in such a way so as to maintain an even flow of production and at the same time avoiding excessive investment in inventories. Efficient material control cuts out losses and wastes of material that otherwise pass unnoticed. Thus an efficient system of material control should be comprehensive enough to cover purchase systems, storage system, issue to production and determining stock levels for each item of material.

Inventory control involves the optimal procurement, care and disposition of material required in a manufacturing or retailing process. The three kinds of inventory that are of concern to any business are raw material, work-in-process and finished goods.

Why is inventory control important?

o Helps maintain stock in line with market demand or sales trends.

o Reduces carrying and holding costs.

o Improves stock turnover rates.

o Builds your business reputation for always having adequate stock of merchandise in demand.Controlling inventory is not a difficult job. The following is a 5 step process that will help you bring this potential problem under control.

Plan your inventory: Obviously, inventory control requires you to plan beforehand. Organize the movement of new goods and work-in-process as per a well thought out schedule. Ideally, new goods should come onto the shelves, just as the last piece is being sold, but that is neither feasible, nor free of risk. Therefore see to it that you neither hold several months' stock nor sport empty shelves in your store. An optimal order quantity minimizes total variable costs required to hold inventory. Software Programs like "Premier Manufacturing & Wholesale Edition 2006" will help you track this better.

Establish order cycles: If you can predict demand for your products, then establish a regular ordering pattern. Remember to consider the costs of preparing an order, the aggregate shipping cost and the economic order cost while setting up the order cycle. This allows you to minimize expenses. Spend some time to develop a system tailored to your business needs.

Balance stock levels: Inefficient management of inventory could easily dampen profits.
Consider market and budget related issues while determining ideal stock levels. Optimizing inventory such that it does not result in excessive carrying costs, yet satisfies market demand, is a fine skill.
Inventories consist of raw materials, stores, spares, packing materials, coal, petroleum products, works-in-progress and finished products in stock either at the factory or deposits.
The maintenance of inventory means blocking of funds and so it involves the interest and opportunity cost to the firm. In many countries specially in Japan great emphasis is placed on inventory management. Efforts are made to minimize the stock of inputs and outputs by proper planning and forecasting of demand of various inputs and producing only that much quantity which can be sold in the market.
The inventory cost is not only interest on stocks but also cost of store building for storage, insurance and obsolesce and movement of inputs from place of storage to the factory where the materials have to be finally used to convert them into finished goods. In japan industries have adopted concept of JIT (Just in Time) and components, materials are received when required for which detailed instructions are given to suppliers.

STEPS INVOLVED IN MATERIAL CONTROL:-

1. Proper coordination and cooperation between various departments dealing in materials,viz., Purchase Department, Receiving Department, Inspection Department, Accounts Department.
2. Central purchase department should monitor the control of competent and expert purchase manager.
3. Proper classification and codification of materials.
4. Material requirements should be properly planned.
5. Perpetual Inventory system should be operated so that up-to-date information is available about the quantity of material in stock.
6. Adequate records should be introduced to control materials during production and the quantities manufactured for stock.
7. The storage of all material should be well planned, subject to adequate safeguards and supervision.
8. Various stock levels like minimum, maximum, etc., should be fixed for each item of material.
9. Purchase of materials should be controlled through the budgets.
10. An efficient system of internal audit and internal check should be operated so that all transactions involving materials are checked by reliable and independent persons.
11. Regular reporting to management regarding purchases, issues and stock of materials. Special reports should be prepared for obsolete items, spoilage, return to suppliers, etc.

Inventories Control Techniques:-

1. **ABC Analysis of Inventories**

The ABC inventory control technique is based on the principle that a small portion of the items may typically represent the bulk of money value of the total inventory used in the production process, while a relatively large number of items may from a small part of the money value of stores. The money value is ascertained by multiplying the quantity of material of each item by its unit price.

According to this approach to inventory control high value items are more closely controlled than low value items. Each item of inventory is given A, B or C denomination depending upon the amount spent for that particular item. "A" or the highest value items should be under the tight control and under responsibility of the most experienced personnel, while "C" or the lowest value may be under simple physical control.

It may It may also be clear with the help of the following examples:

"A" Category – 5% to 10% of the items represent 70% to 75% of the money value.

"B" Category – 15% to 20% of the items represent 15% to 20% of the money.

"C" Category – The remaining number of the items represent 5% to 10% of the money value.

The relative position of these items show that items of category A should be under the maximum control, items of category B may not be given that much attention and item C may be under a loose control.

Advantages of ABC Analysis

It ensures a closer and a more□□ strict control over such items, which are having a sizable investment in there.

It releases working capital,□□ which would otherwise have been locked up for a more profitable channel of investment.

It reduces inventory-carrying□□ cost.

It enables the relaxation of□□ control for the 'C' items and thus makes it possible for a sufficient buffer stock to be created.

Fixation of Norms of Inventory Holdings

Either by the top management or by the materials department could set the norms for inventories. The top management usually sets monitory limits for investment in inventories.

The materials department has to allocate this investment to the various items and ensure the smooth operation of the concern. It would be worthwhile if norms of inventories were set by the management by objectives, concept. This concept expects the top management to set the inventory norms (limit) after consultation with the materials department. A number of factors enter into consideration in the determination of stock levels for individual items for the purpose of control and economy. Some of them are:

1. Lead time for deliveries.
2. The rate of consumption.

3. Requirements of funds.
4. Keeping qualities, deterioration, evaporation etc.
5. Storage cost.
6. Availability of space.
7. Price fluctuations.
8. Insurance cost.
9. Obsolescence price.
10. Seasonal consideration of price and availability.
11. EOQ (Economic Order Quantity), and
12. Government and other statuary restriction

Any decision involving procurement storage and uses of item will have to be based on an overall appreciation of the influence of the critical ones among them. Material control necessitates the maintenance of inventory of every item of material as low as possible ensuring at the same time, its availability as and when required for production. These twin objectives are achieved only by a proper planning of inventory levels. It the level of inventory is not properly planned, the results may either be overstocking or understocking. If a large stock of any item is carried it will unnecessarily lock up a huge amount of working capital and consequently there is a loss of interest. Further, a higher quantity than what is legitimate would also result in deterioration. Besides there is also the risk of obsolescence if the end product for which the inventory is required goes out of fashion. Again, a large stock necessarily involves an increased cost of carrying such as insurance, rent handling charges.

Under stocking which is other extreme, is equally undesirable as it results in stock outs and the consequent production holds ups. Stoppage of production in turn, cause idle facility cost.Further, failure to keep up delivery schedules results in the loss of customers and goodwill.

These two extreme can be avoided by a proper fixation of two important inventory level viz,the maximum level and the minimum level. The fixation of inventory levels is also known as the demand and supply method of inventory control.

An efficient inventory management, therefore, requires the company to maintain inventories at an optimum level where inventory costs are minimum and at the same time there is no stock out which may result in loss of sale or stoppage of production. This necessitates the determination of the minimum and maximum level of inventories.

a) Minimum Level:-

The minimum level of inventories of their reorder point may be determined on the following bases:

Consumption during lead-time.

Consumption during lead-time plus safety stock.

Stock out costs.

Customers irritation and loss of goodwill and production hold costs.

To continue production during Lead Time it is essential to maintain some inventories. Lead Time has been defined as the interval between the placing of an order (with a supplier) and the time at which the goods are available to meet the consumer needs.

Formula:-

Minimum Level=Reorder Level-(Normal Usage X Normal Reorder period)

b) Maximum Level:-

The upper limit beyond which the quantity of any item is not normally allowed to rise is known as the "Maximum Level". It is the sum total of the minimum quantity, and ECQ. The fixation of the maximum level depends upon a number of factors, such as, the storage space available, the nature of the material i.e. chances of deterioration and obsolescence, capital outlay, the time necessary to obtain fresh supplies, the ECQ, the cost of storage and government restriction.

Formula:-

Maximum Level=Reorder Level+Reorder Quantity-(Minimum Usage x Minimum Reorder Period)

c) Re-Order Level:-

Also known as the 'ordering level' the reorder level is that level of stock at which a purchase requisition is initiated by the storekeeper for replenishing the stock. This level is set between the maximum and the minimum level in such a way that before the material ordered for are received into the stores, there is sufficient quantity on hand to cover both normal and abnormal circumstances. The fixation of ordering level depends upon two important factors viz, the maximum delivery period and the maximum rate of consumption.

Formula:-

ROL=Maximum Usage x Maximum Reorder Period

d) Re-Order Quantity:-

The quantity, which is ordered when the stock of an item falls to the reorder level, is know as the reorder quantity or the EOQ or the economic lot size. Although it is not a stock level as such, the reorder quantity has a direct bearing upon the stock level in as much as it is necessary to consider the maximum and minimum stock level in determining the quantity to be ordered. The re-order quantity should be such that, when it is added to the minimum quantity, the maximum level is not exceeded. the re-order quantity depends upon two important factors viz, order costs and inventory carrying costs. It is, however, necessary to remember that the ordering cost and inventory carrying cost are opposed to each other.

Frequent purchases in small quantities, no doubt reduce carrying cost, but the ordering costs such as the cost inviting tenders of placing order and of receiving and inspection, goes up. If on the other hand purchases are made in large quantities, carrying costs, such as, the interest on capital, rent, insurance, handling charges and losses and wastage, will be more than the ordering costs. The EOQ is therefore determined by balancing these opposing costs.

ROQ or EOQ= : $\sqrt{2AB/C}$

Where A=Annual Demand/Consumption

B=Ordering Cost

C=Carrying Cost

2. Economy Order Quantity:-

The **Economic Order Quantity (EOQ)** is the number of units that a company should add to inventory with each order to minimize the total costs of inventory—such as holding costs, order costs, and shortage costs. The EOQ is used as part of a continuous review inventory system in which the level of inventory is monitored at all times and a fixed quantity is ordered each time the inventory level reaches a specific reorder point. The EOQ provides a model for calculating the appropriate reorder point and the optimal reorder quantity to ensure the instantaneous replenishment of inventory with no shortages. It can be a valuable tool for small business owners

who need to make decisions about how much inventory to keep on hand, how many items to order each time, and how often to reorder to incur the lowest possible costs.

The EOQ model assumes that demand is constant, and that inventory is depleted at a fixed rate until it reaches zero. At that point, a specific number of items arrive to return the inventory to its beginning level. Since the model assumes instantaneous replenishment, there are no inventory shortages or associated costs. Therefore, the cost of inventory under the EOQ model involves a tradeoff between inventory holding costs (the cost of storage, as well as the cost of tying up capital in inventory rather than investing it or using it for other purposes) and order costs (any fees associated with placing orders, such as delivery charges).

Ordering a large amount at one time will increase a small business's holding costs, while making more frequent orders of fewer items will reduce holding costs but increase order costs. The EOQ model finds the quantity that minimizes the sum of these costs.

Formula:-

ROQ or EOQ= : $\sqrt{2AB/C}$

,Where A=Annual Demand/Consumption

B=Ordering Cost

C=Carrying Cost

MATERIAL LOSSES:-

Generally, difference exists between the input of material in production process and the output. Such difference arises due to loss of materials in a process, which are in the form of scrap, waste, spoilage or defectives.

Material losses are of four types :

(a) Wastes

(b) Scrap

(c) Spoilage

(d) Defective

Ques:-From the following details given below,calculate:-

i. Reorder Level
ii. Maximum Level
iii. Minimum Level
iv. Danger Level

Cost of placing an order is Rs20

Number of units to be purchased during the year is 5,000

Purchase Price per unit inclusive of transportation cost is Rs50

Annual storage cost per unit is Rs.5

Details of Lead Time: Average 10 days, Maximum 15 days, Minimum 6 days

For emergency purchase 4 days

Rate of consumption:-Average 15 units per day, Maximum 20 units per day.

Solution:-

Reorder Quantity=$\sqrt{2AB/C}$

$=\sqrt{2 \text{ X } 5000 \text{ X } 20/5}$

=200 Units

i. Reorder Level=Maximum Consumption X Maximum Reorder Period

= 20 x15

=300 Units

ii. Maximum Level=ROL+ROQ-(Minimum Consumption x Minimum Reorder Period)
=300+200-(10 x 6)
=440 Units

iii. Minimum Level=ROL-(Average Consumption x Average Reorder Period)
=300-(15 x 10)
=150 Units

iv. Danger Level=Average Cosumption x Reorder Period in emergency conditions
= 15 x 4
=60 Units

VALUATION OF INVENTORY:-

Inventory of the firms are valued according to the following:

a) Periodic Inventory System
b) Perpetual Inventory System

a) Periodic Inventory System:-This method of inventory is carried out at the end of the accounting period after making a physical verification of the quantity in hand. Under this system, inventory is ascertained by physically counting the stock at the end of the year.
Following steps are taken to ascertain and value the inventory:
- Individual items of the inventory are taken one by one and weighed, measured or counted.
- All the items are listed, priced and added so as to get the figure of inventory.

b) Perpetual Inventory System:- This system of recording inventory is undertaken after each receipt and issue. Stock registers give the balance of inventory at any time desired. This system aims at providing a running record of inventories in hand, and stock verification takes place as and when there is a receipt or issue of materials.
Under this system, inventory is valued by the following methods:

1) First in ,First Out Method(FIFO):-
The basic underlying motive on which this method is based is that materials which are purchased first are issued first. It uses the price of the first batch of materials purchased for all issues until all units from this batch have been issued. After the first batch is fully issued, the price of the next batch received becomes the issue price. In other words, materials are issued at the oldest cost price listed in the stores ledger account and thus, the materials in stock are valued at the price of the latest purchases.
Three important effects of using FIFO method are:
- Materials are priced at the actual cost.

- Charge to production for material cost is at the oldest prices of materials in stock.
- Closing stock is valued at the latest price paid.

2) Last In, First Out Method (LIFO):- This method operates in just the reverse order of FIFO method. It is based on the assumption that the last materials purchased are the first materials to be issued. Thus, the price of the last batch of the materials purchased is used first for all issues until all units from this batch have been issued, after which the price of the previous batch of materials purchased is used. Three points should be noted regarding this method:-
   - Materials issues are priced at actual cost.
   - Charge to production for material cost is at latest prices paid.
   - Closing Stock valuation is at the oldest prices paid and is completely out of line with the current prices.

3) Simple Average Method: - This method calculates the inventory by adding all the different prices of materials in stock, the materials from which the materials to be priced could be drawn, by the number of prices used in that total. The method does not take into account the quantities of materials in stock while calculating the average.
4) Highest In, First Out Method(HIFO):- In this method, materials issued are charged at the rate of the highest priced materials in the stores. The highest rate is continued to be used until material at that highest price is exhausted, after which the next highest price is used. Thus, in HIFO method, the production absorbs the high cost of materials and closing stock is valued at lower rates. This method is used in "cost plus contracts" with advantage.
5) Next In, First Out Method (NIFO):- Here materials are not charged at a price which has been paid but rather at a price at which order has been placed,i.e., the price of the materials that will be next received. For example, in stock there are two batches of materials, one at Rs.15 and the other at Rs.16.There is a further batch of materials on order at Rs.16.50 which has not yet been received. If materials were to be issued now, these will be charged at Rs.16.50.
6) Weighted Average Method: - In this method average price is calculated at the end of a given period (usually one month). The weighted average price is calculated at the end of a given period by dividing the total cost of purchases during the period by the quantity purchased.

Weighted Average Price =Total cost of materials purchased/Quantity purchased

Unit II **Lectures: 20**

Labour Cost: Attendance and payroll procedures, overview of statutory requirements, overtime, idle time and incentives, Utilisation of labour, direct and indirect labour, charging of labour cost, remuneration systems and incentive schemes;

Overheads: Functional analysis – factory, administration, selling, distribution, research and development, fixed, variable, semi variable and step cost; Factory overheads. Administration overheads and Selling and distribution overheads.

Attendance and Payroll Procedures:-

- Attendance Register:- In this method, attendance of each worker is recorded in the register maintained for this purpose. This register provides sufficient number of columns for attendance of each worker. This method is quite simple and cheap, but it can be used only when the number of workers is small.
- Token or Disc Method: - Each worker is allotted identification number is suitably painted or engraved on a round metal token (or disc) with a hole in it. All such tokens are hung in serial order on a board at the factory gate. The time office records attendance on the basis of tokens in the box. The absentees are indicated by the missing tokens. Similar procedure is followed at the departure time in the evening.
- Time –Recording Clocks: - It is the method of recording attendance and proves quite useful when the number of workers is fairly large. Each worker is allotted a clock Card which bears his identification number, name, department, etc. These are kept in a rack in a serial order. "In" rack and "Out" rack are kept to maintain the records of the workers.
- Biometric Time Clock:-An electronic device to record the attendance of employees. It is a new generation technique which is replacing the typical time clock used to track employee attendance.

Main features and advantages of biometric system are that it can:-

a) Eliminate time card
b) Automatic payroll processing
c) Eliminate buddy-punching
d) Eliminate early punch hours

e) Eliminate unauthorised overtime
f) Eliminate time spent on payroll calculations
g) Accurately report employee time.

Payroll Department:-

This department is responsible for the important task of computation and disbursement of wages payable to workers. It records hours worked and wages earned, makes payroll deductions, determines the net amount due, maintains a permanent earnings record for each employee and provides the treasurer's office with necessary records to make payments.

Functions:-

I. To maintain a record of job classification, department, and wage rate for each employee.
II. To verify and summarize the time of each worker as shown on the daily time records.
III. To prepare the payroll and compute the wages earned by each employee.
IV. To compute the payroll deductions.
V. To maintain permanent payroll record of each employee.
VI. To make wage payments.

Wages Sheet:-

The main function of payroll department is to prepare payroll sheet, also known as Wages Sheet. It is a statement which lists the worker's wages showing gross wages earned by them for a particular period and actual wages payable to them after making necessary deductions.

Pay Slip:-

Some companies have a practice of preparing a pay slip of each worker, which may be handed over to the worker in advance of the actual payment of wages. It shows the basic wages and details of various allowances like house rent allowance, dearness allowance and other payments like bonus, overtime pay, etc., and various deductions on the amount of PF contribution, inc;-ome tax, recovery of loans, and any other deductions.

OVERVIEW OF STATUTORY REQUIREMENTS:-

"Board" means the Labour Board established under the *Labour Board Act*;

(a) "construction industry" means the on-site constructing, erecting, altering, decorating, repairing, demolishing of buildings, structures,

roads, sewers, water mains, pipe-lines, tunnels, shafts, bridges, wharves, piers, canals or other works;

(b) "Director" means the Director of Labour Standards or other officer of the Department of Labour and Advanced Education designated by the Minister to administer this Act, and any person acting under the control and direction of the person designated by the Minister to administer this Act and includes, for the purpose of any activities prescribed by regulation in relation to licencing [licensing] and registration under this Act and the regulations,any government department or agency of the Province prescribed by regulation and any person acting under the control and direction of the department or agency so prescribed;

(c) "discharge" means a termination of employment by an employer other than a lay-off or suspension;

(d) "employee" means a person employed to do work and includes a deceased employee but does not include a teacher employed by Her Majesty, the Minister of Education, a school board as defined in clause.

(c) of Section 2 of the *Education Act*, or other employer, to teach, supervise or administer in a public school, a school established or maintained under the *Education Act* or in a school system;

(e) "employer" means a person, firm, corporation, agent, manager, representative, contractor or subcontractor having control or direction of or being responsible, directly or indirectly, for the employment of any employee;

(f) "establishment" means a place or places at or in which all or any part of a business or undertaking of an employer is or has been carried on;

- "foreign worker" means an individual who is not

(i) a Canadian citizen, or

(ii) a permanent resident within the meaning of the *Immigration and Refugee Protection Act* (Canada), and who is recruited to become employed in the Province, regardless of whether the individual becomes so employed;

(g) "forest industry" means all operations in or incidental to the production or manufacture of articles produced from wood;

(h) "industrial undertakings" includes mines, quarries and other works for the extraction of minerals from the earth, undertakings in which articles are manufactured, altered, cleaned, repaired, ornamented, finished, adapted for sale, broken up or demolished, or in which materials are transformed, including ship building and the generation, transformation, transmission and distribution of electricity or motive power of any kind, and undertakings in the construction industry;

(i) "lay-off" means temporary or indefinite termination of employment because of lack of work and includes a temporary, indefinite or permanent termination of employment because of the elimination of a position, and "laid off" has a corresponding meaning; "licensee" means a person who holds a licence under this Act;

(j) "minimum wage" means the amount of wages fixed by order of the Governor in Council pursuant to Section 50;

(k) "Minister" means the Minister of Labour and Advanced Education;

(l) "officer" means a person appointed for the purposes of this Act and who is under the control and direction of the Minister;

(m) "pay" means wages due or paid to an employee and compensation paid or due to an employee under Sections 32, 33 and 34, but does not include deductions from wages that may lawfully be made by an employer;
(n) "period of employment" means the period of time from the last hiring of an employee by an employer to his discharge by that employer and includes any period on lay-off or suspension of less than twelve consecutive months and "employed" has a corresponding meaning;
(o) "recruitment" means, for the purpose of this Act, the following activities, whether or not they are provided for a fee:
(i) finding or attempting to find an individual for employment,
(ii) finding or attempting to find employment for an individual,
(iii) assisting another person in attempting to do the things described in subclause (i) or (ii), or
(iv) referring an individual to another person to do any of the things described in subclause (i) or (ii);
(p) "regulations" means regulations made by the Governor in Council.

OVERTIME:-

Overtime work is represented by any work beyond 9 hours in a day or 48 hours in a week & is paid at double the normal rate. Even where the Act is not applicable, on the basis of the agreement between the workers & the employer, overtime work is paid at a rate higher than the normal wages rate.
Overtime wage consists in 2 parts: - (a) payment made at normal rate, & (b) payment made at extra rate over the normal rate i.e. the overtime premium.
The treatment of overtime wages depends upon the circumstances in which it arises:-
(a) Where due to general pressure of work overtime is caused, the payment made at normal rate should be debited to the job order or standing order number on which the worker has been employed & the premium should be debited to the overhead account of the department.
Alternatively & where appropriate, after taking into consideration the estimated direct wages at normal wages & overtime premium, calculation of a comprehensive rate may be done & throughout the period all jobs may be charged to that rate.
(b) Where specifically at the customer's request the overtime is worked to expedite delivery, in that case total payment should be charged to the job as direct wage.
(c) Where due to delay of work in another department, overtime work has to be undertaken in a department, the overtime premium should be charged to the department by which delay had been caused.
(d) Where a seasonal industry undertakes overtime work so that it can cope with busy season work, the overtime premium should be charged to general overhead or alternatively, may be debited to deferred overhead account & throughout the cycle gets absorbed by the production.
(e) Where in order to avail special market opportunity, overtime work has to be undertaken, because the market price which will be received shall be high, the total payment should be charged to production as direct wage.
(f) Where due to abnormal conditions like major breakdown, prolonged power cut, natural calamity etc., overtime job has to be undertaken, it should not be considered for cost accounts. On the contrary, in that case, the overtime wage should be charged to costing profit & loss account.

(g) Where for the purpose of utilizing the surplus perishable materials which are obtained from one job for utilization in another job, overtime work is undertaken, in that case, to the job in which the material is utilized, the normal payment is to be debited & to the general overhead, the premium should be charged.

IDLE TIME:-

Idle time is the simply the time for which labour has been paid for but no work has been done.

Idle time may arise out of normal or abnormal situations and it is the situation that will tell whether it is a normal idle time (unavoidable idle time) or abnormal idle time (avoidable idle time).

Normal idle time, as the name is suggesting arises due to such reasons which are considered:
either part of the□□ process e.g. in paint industry labour has to wait for certain time to apply the second layer of paint over the first one
or simply out of□□ control of the entity e.g. delays in receiving orders of raw material due to war etc.

Abnormal idle time is such idle time that given the situation is considered controllable and should have been avoided if due care was taken. In other words abnormal idle is most of the time result of mismanagement.

Accounting treatment of idle time depends on whether:
idle time is normal□□ or abnormal
idle time relates□□ to direct or indirect labour

If **normal idle time relates to direct labour** then it will form part of direct labour cost or simply direct cost. Usually while planning for labour, provision for normal idle time is made in the labour cost budget.

If **normal idle time relates to indirect labour** then it will considered as overheads cost and will be absorbed in the cost of units produced or services provided as indirect cost.

However, in case of **abnormal idle time** irrespective of the labour i.e. whether it relates to direct or indirect labour, abnormal idle time will be reported separately as a loss in the profit and loss account and will not form part of the cost of units produced or services rendered. In other words costs related to abnormal idle time are neither direct production cost or indirect production costs they are simply losses to be written of as expenses in the income statement of the entity.

INCENTIVES:-

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

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

(3) **Rowan Plan:** This plan was introduced by James Rowan of England. It was similar to the Halsey Plan in many respects except that it differs in calculation of bonus. Under this system bonus is determined as the proportion of the time taken which the time saved bears to the standard time allowed. Under this system the following formula is applied to calculation of bonus.

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

Ques:-calculate the earnings of a worker under Halsey Plan and Rowan Plan from the following particulars:-

Hourly Rate of wages guaranteed 0.50 paise per hour
Standard Time for producing one dozen articles is 3 hours
Actual Time taken by the worker to produce 20 dozen articlesis 48 hours

Solution:-

Standard Time to produce 20 dozen @3hrs. =60 hrs
Actual Time =48 hrs
Time Saved =12 hrs

a. Halsey Plan
   Bonus=1/2 of the time saved x time rate
   =6hrs x 0.50
   =Rs.3
   Total Earnings=48 hrs x 0.50 + Bonus
   =24+3
   =Rs.27

b. Rowan Plan
   Bonus=Time saved/Time Allowed x time taken x time rate
   =12/60 x 48 x 0.50
   =Rs.4.80

Total Earnings=48 hrs x 0.50 + Bonus
=24+4.80
=Rs.28.80

UTILISATION OF LABOUR:-

Most businesses continually try to improve their efficiency. One of the ways that a business analyzes its efficiency is by examining expenses, such as payroll, to determine whether to make changes. If certain payroll analysis calculations aren't satisfactory, the business may alter its policies. One of these calculations is the direct labor utilization rate.

Manpower or labor utilization within maintenance departments continues to fall far behind its production counterpart. Statistically, only 24.5 percent of a typical craftsperson's day is spent on productive tasks. The remaining 75.5 percent is consumed with unproductive activities. Figure 1 illustrates typical losses.

Travel time

Having to move around unnecessarily represents 20.9 percent of the wasted time. Proper planning in both distributing maintenance personnel and organizing preventive and corrective maintenance task routes could eliminate most, if not all, of these losses. Maintenance resources should be positioned as close as possible to the where the work is to be performed, and task routes configured to minimize travel distance and time.

Personal time

It's hard to justify a workforce stretching breaks, making telephone calls and exploiting a variety of other personal reasons for not working. Proper supervision would eliminate most of these losses, but company policies must be enforced universally on every worker, plant and office before the losses can be eliminated totally.

Acquired sick leave privileges are often abused. Workers earn or acquire sick days based on length of service. In many cases, the accrued time can represent more than six weeks of paid leave. While this is earned leave, a growing number of maintenance workers are using it as additional vacation time. The result is a dramatic reduction in the net available workforce. As a result, needed maintenance isn't performed.

Waiting for instructions

No craftsperson should waste 19.8 percent of any day waiting for instructions! A full day's work should be assigned to each craftsperson before the shift starts. Ideally, assignments for the next day should be made before the end of today's shift, but certainly no later than the beginning of the next shift.

Late/early

Employees who arrive late or leave early lose at least thirty minutes each day. In extreme cases, these losses can represent an hour or more per person. Proper supervision would capture these losses, but everyone must be held accountable for adhering to company policies on the matter.

Obtaining materials

Time is wasted when workers must fetch permits, materials, tools, reference materials and other documentation required for completing an assigned task. Proper planning will eliminate these delays by having the necessary materials, including permits, on hand at the work site as part of the work package. Repair parts and tools should be "kitted" and delivered to the work site. Permits, drawings and other documentation should be linked to the appropriate preventive maintenance task list or work order and distributed to the craftsperson with the work package.

Each of these drains may be small in itself, but, together, they have a dramatic impact on maintenance productivity, especially when one considers the other losses that are a part of manpower utilization. For a typical workforce of 100 workers, each having a burdened labor rate of $75,000 per year, these losses represent a substantial economic drain equal to 67 full-time equivalent people each year, more than one-half of the payroll workforce.

FTE = (6.04 hr/person-day) x (100 persons) x (5 day/wk) x (46 wk/yr) x (yr/2,080 hr) = 66.79

In addition, there is a financial loss of $5,009,250 per year for non-productive time.

Loss = (66.79 FTE) x ($75,000/FTE) = $5,009,250

Neither of these losses is acceptable and could be resolved with effective resource planning and supervision.

Effective planning

In a world-class organization, maintenance activities are planned and scheduled fully. Doing so ensures that each craftsperson has a full day's work and that little time is wasted looking for parts, tools and documentation. Preventive maintenance routes are configured to minimize travel time and are "load-leveled" to match work requirements with net available workforce. In addition, maintenance tasks are sequenced to minimize the mean-time-to-repair or mean-time-to-inspect for each planned task or work order.

Effective supervision

The maintenance workforce will perform work that gets "inspected," not necessarily what management needs to have done. So frontline supervisors must monitor work performance

directly. They should structure their time so that they spend at least sixty percent of their day on the floor inspecting work performance.

Effective labor-hour utilization

With effective planning and supervision, the labor-hour utilization should be at least 85 percent, based on net available workforce. This level assumes that work is fully planned and that effective supervision, company policies and procedures are applied universally across the plant. Regardless of what you think, "time is money" and lost time, no matter how trivial each instance may seem, is unacceptable.

Direct and Indirect Labour:-

Direct labour is production or services labor that is assigned to a specific product, cost center, or work order. When a business manufactures products, direct labor is considered to be the labor of the production crew that produces goods, such as machine operators, assembly line operators, painters, and so forth. When a business provides services, direct labor is considered to be the labor of those people who provide services directly to customers, such as consultants and lawyers. Generally, a person who is charging billable time to a customer is working direct labor hours.

The cost of direct labor is generally considered to be the cost of regular hours, shift differentials, and overtime hours worked by employees, as well as the related amounts of payroll taxes. An expanded version of direct labor, known as fully-burdened direct labor, also includes an allocation of the benefit costs earned by direct labor employees.

Direct labour is considered to be a direct cost, which means that it varies directly with revenue or some other measure of activity. This is not necessarily the case in a production environment, where the manufacturing area typically requires a certain amount of staffing, irrespective of the number of units produced. The direct cost concept is more applicable in a professional billings environment, where the cost of direct labor usually varies with changes in revenue.

Indirect Labour:-

Indirect labour is the cost of any labor that supports the production process, but which is not directly involved in the active conversion of materials into finished products. Examples of indirect labor positions are:

- Production supervisor
- Materials handling staff
- Quality control staff

The cost of these types of indirect labor are charged to factory overhead, and from there to the units of production manufactured during the reporting period. This means that the cost of indirect labor related to the production process end up in either ending inventory or the cost of goods sold.

Indirect labor also refers to many types of administrative labor positions, such as:

- Any accounting position
- Any marketing position
- Any engineering position

The cost of these positions cannot be traced to production activities, and so are charged to expense as incurred.

The cost of both types of indirect labor can be fully loaded with the costs of benefits and payroll taxes for financial analysis or cost accounting purposes, since these additional costs are closely associated with the indirect labor positions.

CHARGING OF LABOUR COSTS:-

The sum of all wages paid to employees, as well as the cost of employee benefits and payroll taxes paid by an employer. The cost of labor is broken into direct and indirect costs. Direct costs include wages for the employees physically making a product, like workers on an assembly line. Indirect costs are associated with support labor, such as employees that maintain factory equipment but don't operate the machines themselves.

When manufacturers set the price of a good they take the cost of labor into account. This is because they need to charge more than that good's total cost of production. If demand for a good drops or the price consumers are willing to pay for the good falls, companies must adjust their the cost of labor to remain profitable. They can reduce the number of employees, cut back on production, require higher levels of productivity, reduce indirect labor costs or reduce other factors in the cost of production.

REMUNERATION SYSTEMS & INCENTIVE SCHEMES:-

Following are the methods of remuneration and incentive schemes of laour:-

1. Time Wage System

Under this system, wages are paid on the basis of time spent on the job irrespective of the amount of work done. The unit of time may be a day. A week, a fortnight or a month. In the past, daily wages have been the most common basis and, therefore, it came to be known as the 'Day Wage System'.

Time wage system has the following advantages:
1. It is the simplest and the oldest method. It is easy to understand and workers can easily compute their own remuneration.
2. Earnings of workers are regular and fixed and they do not suffer from temporary loss of efficiency.
Time wage system is suitable under following conditions:
1. Where units of output are non-measurable an in case of office work and mental work is involved as in policy working.
2. When quality of work is especially important, e.g., artistic furniture, fine jewelry, etc.
3. When supervision is good and supervisors know what constitutes a "fair day's work".
4. When workers are new and learning the job.
5. When collective efforts of a group of persons are essential for completing the job.

2. Piece Wage System:-

Under this system, remuneration is based on the amount of work done or output of a worker.One unit of output is considered as one piece and a specific rate of wage is paid per piece.
Greater is the number of pieces produced by a worker, higher is his remuneration. Thus, a workman is paid in direct proportion to his output. It is called payment by results.
Piece wage system has the following advantages:
1. There is a direct relation between effort and reward; workers who work hard and produce more get more wages. This provides an incentive to increase productivity.
2. Ambitious and efficient workers are provided ample opportunity to utilize their talent and increase their earnings and thereby improve their standard of living and morale.
Piece wage system is suitable under the following conditions:
1. When work done by an individual worker can be measured accurately, e.g., production of standardized goods in the factory.
2. When the quantity of output depends directly upon the skill and efforts of the worker.
3. Where the flow of work is regular and interruptions are minimum i.e., repetitive jobs.
4. Where quality and workmanship are not very important.

3.TAYLOR'S DIFFERENTIAL PIECE RATE SYSTEM:-

F.W. Taylor, founder of the scientific management evolved this system of wage payment.
Under this system, there is no guarantee of minimum wages. Standard time and standard work is determined on the basis of time study. The main characteristics of this system are that two rates one lower and one higher are fixed. Those who fail in attaining the standard, are paid at a lower rate and those exceeding the standard or just attaining the standard get higher rate.

4.Marrick Multiple Piece Plan:-

No guarantee time rate is set. Those who could attain only upto 83 % of the standard output are entitled wages at lowest rate. Those who output exceed 83 % of the standard by does not reach the standard are paid the second higher rate, which includes an increase of 10 %. Those who attain or exceed the standard get the wages at third and the highest rate which includes a further increase of 10 % of the basic wage.

5.Gantt Bonus Plan:-

A standard of performance is also ascertained. If a worker fails in completing the standard work in standard time, he is paid only the minimum wages and no bonus but if he attains the standard, he will get minimum wages plus a fixed percentage of bonus decided beforehand.

Te rate of bonus usually varies from 25 % of the time taken on the job. If a worker completes the job in lesser time, he will be paid wages at piece rate.

Casual workers & Out workers:-

A **casual worker** is a worker who is employed when somebody is on leave or there is an emergency of work. These are not regular employees of a factory.

They are paid as soon as the work is completed or on a daily basis.

Out workers are those who work outside the factory premises on behalf of the organization.

They are classified in two categories:

(a) Those who work at their homes with their own tools or tools given by the company.

(b) Those who go to the site to perform the tasks.

Labour turnover:-

The ratio of the number of employees that leave a company through attrition, dismissal, or resignation during a period to the number of employees on payroll during the same period.

CAUSES

Causes of Labour Turnover: The main causes of labour turnover come under 2 heads:

1. **Avoidable Causes:**

a) Lack of job satisfaction
b) lack of scope for training & promotion
c) Bad working condition.
d) long hours of work
e) lack of facilities for recreation, children's education etc.
f) inadequacy of welfare measures
g) inhumane attitude of management
h) lack of understanding amongst the workers etc.

2. **Unavoidable Causes:**

a) Unhealthy atmosphere of the locality
b) Retirement & death
c) Leaving for a better chance
d) In case of seasonal industries, retrenchment during off-season
e) Social unrest
f) Marriage of female workers

OVERHEADS:-

"Overhead is the aggregate of indirect materials, indirect wages, indirect expenses."

~CIMA, London

"Overhead may be defined as the cost of indirect materials, indirect labour and such other expenses, including services as cannot conveniently be charged direct to specific cost units. Alternatively, overheads are all expenses other than direct expenses."

~Wheldon

Classification of Overheads:-

Classification of overheads is the process of grouping of costs based on the features and objectives of the business organization. The following are the important methods on which the overheads are classified: '

a) On the basis of Nature.
b) On the basis of Function.
c) On the basis of variability.
d) On the basis of Normality.
e) On the basis of Control.

1. On the Basis of Nature :

One of the important classifications is on the basis of nature or elements. Based on nature the aggregate of all indirect material cost, indirect labour cost and indirect other expenses are known as overheads.

Accordingly, overheads are grouped into (a) Indirect material Cost (b) Indirect Labour Cost and (c) Indirect Expenses.

a) Indirect material Cost: Indirect materials do not form part of the finished products. Indirect materials are indirectly or generally used for production which cannot be identified directly.

For example, oil, lubricants, cotton waste, tools for repairs and maintenance etc. are indirect materials.

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

c) Indirect Expenses: Any expenses that are not specifically incurred for or can be readily charged to or identified with a specific job. These are the expenses incurred in general for more than one cost centre. Examples of indirect expenses are rent, insurance, lighting,telephone, stationery expenses etc.

2) On the Basis of Function :

The classification overheads on the basis of the various function of the business concern are known as function wise overheads. Here, there are four important functional overheads such as:

a) Production Overhead b) Administration Overhead
c) Selling Overhead d) Distribution Overhead

a) Production Overhead: Production overhead is also termed as manufacturing overhead or works overhead or factory overhead. It is the aggregate of all indirect expenses which are incurred for work in operation or factory. These costs are normally incurred during the period when the production process is carried on. For example, factory rent, factory light, power, factory employees' salary, oil, lubrication of plant & machinery, etc.

b) Administrative Overhead: Administrative expenses are incurred in general for management to discharge its functions of planning organizing, controlling, co-ordination and directing. These expenses are not specifically incurred and cannot be identified with the specific job. It is also termed as office cost. For example, office rent, rates, printing,stationery, postage, telegram, legal expenses etc. are the office and administrative costs.

c) Selling overheads: Selling expenses are overheads which are incurred for promoting sales, securing orders, creating demand and retaining customers. For example, salesmen's salaries, advertisement, rent and rates of show room, samples, commission etc.

d) Distribution Overhead: Distribution overhead are incurred for distribution of products or output from producers to the ultimate consumers. For example, warehouse staff salaries,expenses of delivery van, storage expenses, packing etc.

3) On the Basis of Variability :

One of the important classifications is on the basis of variability. According to this, the expenses can be grouped into (a) Fixed Overhead (b) Variable Overhead and (c) Semi-Variable Overhead.

a) Fixed Overheads: Fixed cost or overhead incurred remain constant due to change in the volume output or change in the volume of sales. For example, rent and rates of buildings, depreciation of plant, salaries of supervisors etc.

b) Variable Overheads: Variable overhead may be defined as "they tend to increase or decrease in total amount with changes in the volume of output or volume of sales."

Accordingly the change is in direct proportion to output. Indirect materials, indirect labour, repair and maintenance, power, fuel, lubricants etc. are examples of variable overhead costs.

c) Semi-variable Overheads: Semi-variable overheads are incurred with a change in the volume of output or turnover. They neither remain fixed nor do they tend to vary directly with the output. These costs remain fixed upto a certain volume of output but they will vary at other part of activity. Semi-variable overheads are mixed cost, i.e. partly fixed and partly variable. For example, power, repairs and maintenance, depreciation of plant and machinery,telephone etc.

4) On the Basis of Normality :

Overheads are classified into normal overheads and abnormal overheads on the basis of normality features. According to this normal overheads are incurred in achieving the target output or fixed plan. On the other hand, abnormal overhead costs are not expected to be incurred at a given level of output in the conditions in which the level of output is normally produced. For example, abnormal idle time, abnormal wastage etc. Such expenses are transferred to Profit and Loss Account.

5) On the basis of Control

It is one of important classifications of overhead on the basis of control. Based on control it is grouped into controllable overhead and uncontrollable overhead. Controllable overhead which can be controlled by the action of a specified number of undertaking. For example, idle time, wastage etc. can be controlled. Uncontrollable overheads cannot be controlled by the action of

the executive heading the responsibility centre. For example, rent and rates of building cannot be controlled.

Procedure or steps involved in overhead:-

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

1) Classification of Overhead
2) Collection of Overhead
3) Overhead Analysis :

a) Distribution of overhead to production and service departments, i.e. Allocation and apportionment of overhead to cost centre.

b) Re-distribution of overhead from service department to production department i.e., Allocation and Apportionment of Service centres to production centres or departments.

4) Absorption of overhead by cost units, i.e. computation of overhead absorption rates.

We will discuss the above procedures in detail. They are as follows:-

1)CLASSIFICATION OF OVERHEADS

2) COLLECTION OF OVERHEADS

The production overheads or factory overheads are collected and identified under separate overhead code numbers or standing order numbers. These overheads are collected from different sources and documents.

3) OVERHEAD ANALYSIS :

(a) Allocation and Apportionment of Overhead to Cost Centre

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

Absorption and Apportionment.:-

i) Allocation : Cost allocation refers to the allotment of whole item of cost to cost centers.

The technique of charging the entire overhead expenses to a cost centre is known as cost allocation.

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

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

Allocation Vs Apportionment:-

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

2) The item of factory overhead directly allocated and identified with specific cost centers.

Whereas apportionment requires suitable and equitable basis. For example, factory rent may be allocated to the factory and has to be apportioned among the producing and service departments on an equitable basis.

Basics of Apportionment:-

Overhead apportionment depends upon matching with principles. Accordingly, the basis for apportionment should be related to the basis on which the expenditure is incurred. The following are the usual basis adopted for apportionment of overhead :

Basis of Apportionment

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

Methods of Re-apportionment or Re-distribution

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

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

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

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

3) **Reciprocal Service Method : -**This method recognizes the fact that if a service department receives services from other department, the services should be charged in the receiving department. Thus, the cost of inter departmental services is taken into account on reciprocal basis. The following are the three important methods available for dealing with reciprocal distribution :

a) Simultaneous Equation Method.
b) Repeated Distribution Method.
c) Trial and Error Method.

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

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

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

From the following information compute the machine hour rate in respect of machine No.10 for the month of January:-

Cost of the machine is Rs.32,000
Estimated scrap value is Rs.2,000
Effective working Life 10,000 hours
Repairs and maintenance over the life period of the machine is Rs.2,500.
Standing charges allocated to this machine for January is Rs.400
Power consumed by the machine is Rs.0.30 per unit,Rs.600
The machine consumes10 units of power per hour

Solution:-

Computation of Machine Hour Rate

Particulars	Rs (per hour)
Standing Charges:- 400/200	2
Variable Charges:-	
Repairs and Maintenance (2500/10,000)	0.25
Power (10 units @30 paise)	3.00
Depreciation(32000-2000/10,000)	3.00
Machine Hour Rate	**8.25**

Unit III **Lectures: 15**

Cost ledgers: non-integrated accounts, integrated accounts, reconciliation of cost and financial accounts. Costing Systems: Single Output Costing, Job Costing, Batch Costing.
Contract Costing: Progress payments, retention money, escalation clause, contract accounts, accounting for material, accounting for plant used in a contract, contract profit and balance sheet entries; Process Costing (including Joint Products and By-products and Inter-process Profits), Operating/Service Costing. (Transport & Power House only).

Cost Ledgers:-

Non-Integrated Accounts and Integrated Accounts

To operate business operation efficiently and successfully it is necessary to make use of Appropriate accounting system. such a system should clear terms whether cost and financial transaction should be integrated or kept separately(non integrated) where cost and financial account integrated, the system so evolved is known as integrated or integral accounting or cost control system

While non integrated system of accounting necessities reconciliation between finance and cost accounts no reorganization between two set of accounts is required under integrated accounting.

A special feature of non-integrated system of accounting is its ability to deal with notional expenses like rent and interest on capital tied up in the stock.
In cost accounts there are no personal accounts because cost accounts do not show relationship with outsiders. In real accounts only stocks are shown in cost accounts. Thus ,Cost accounting department is concerned mainly with the ascertainment of income and expenditure of the business. It is particularly interested in nominal accounts, to some extent in real accounts but in no way in personal accounts.
Important ledgers to be maintained under non-integrated system:-

- **Cost Ledger:-** this is the principal ledger in cost books which control all other ledgers in costing departament. It contains all impersonal accounts.
- **Stores Ledger:**- this ledger maintains a separate account for each item of stores(raw material component, consumable stores).
- **Work-in-progress Ledger:-** It contains a separate account for each job-in-progress. each account is debited with the material cost, wages and overheads chargeable to the jobs and credited with the cost of work completed.
  Finished Goods Ledger:- It contains an account of each item of finished product as stated above as the cost ledger is the principal ledger. Finished Goods Ledger are referred to as subsidiary ledgers of cost accounting department.

Principal Accounts:-

1) **Store Ledger Control Account:-** It is the summary of the value of the stores received , issued and balance in stores. Receipts are posted from goods received notes or invoices to the debit side of this account. Similarly issue of materials are posted on the credit side of this account

1) **Wages Control Account :**this account records wage transaction in aggregate .posting are made from wage analysis sheet this account is debited with gross wages are closed by Transfer of direct wages to work in progress and indirect wages to factory,admisntration Selling distribution overhead.

2) **Factory Overhead Control Account:** -this account deal factory overhead in aggerate,it is debited with indirect material cost, indirect wages and indirect expensive is credited with overhead absorbed ,transform to work in progress.
3) **Work in progress control Account:-** this account start with opening balance of work in progess and is debited with material,labour and factory overhead is cretied with cost of finshed goods

4) **Finished goods ledger Control Account:-** it start with the opneneing balance of finshished staock it is debited with the cost of finished goods transferred from work in progress control account and the amount of admistration overhead absorbed.it is credited with cost of sale by transferring to cost of sale account.

5) **Administration Overhead Account:** it is debited with the admistration overhead cost incurred and credited with overhead absorbed by finished goods the balance in this

account represents under and over absorption of the overheads transferred to overhead adjustment account or costing profit and loss account.

6) **Cost of sales Account:-** this account is debited with the cost of good sold by transfer from finished goods ledger control account and also selling and distribution overhead absorb this account is closed by transfer to costing profit and loss account

7) **Selling and distribution Account:-** this account is debited with the selling and distribution overhead incurred and is credited with overhead absorb by the cost of sale

8) **Overhead adjustment Account: -**this account is debited with the under absorption of overhead like factory admisntration, selling and distribution overhead is cretied with the over absorbed overheads.

9) **Costing profit and loss Account:** -This account is debited with cost of sale, abnormal loss and under absorbed overhead and it is credited with the sale value of goods, abnormal gain and over absorbed overheads.
10) **Cost Ledger Control Account: -** This account is also known as General Ledger Adjustment Account or financial Ledger Control Account. The purpose of this account is to complete the double entry and make the cost ledger self balancing.

Integrated Accounts: It is a system in which cost and financial accounts are kept in the same set of books. In such a system transaction of both cost and financial accounts are records in one combined set of books based on double entry system. This system eliminates the need for separate set of accounts books for financial and accounting purpose. Accounts are designed in such a way that the full information is required for costing and as well as financial accounting purpose.

Advantages:-

- Economical system it is quite economical as it eliminates the duplication of recording the transactions in two separate set of books .This result in saving of clerical cost.
- No need for reconciliation as only one set of account is maintained, there will be only one profit or loss figure and as such there will be no need for reconciliation between costing profit and loss and financial profit/loss.
- Centralization of accounting work, helps in achieving the greater control and safe administration cost.
- Information available without delay, there is no delay in the availability in the cost information as the cost records are directly written up from the books of original entry.

- Pooling of Knowledge, the knowledge of cost and financial accounting may be combined together to achieve better result.

Disadvantages:-

- Complicated System, a system which is expected to provide costing as well as financial information is quite cumbersome and complicated and require the service of the expert accountant.
- Need of reconciliation, unless there is full integration of cost and financial accounts there may be a need for the reconciliation between the two.

Reconciliation of Cost and Financial Accounts:-

When cost and financial account maintained separately in two different set of books, two profit and loss account will be prepare ie costing books and financial books therefore it become nessacry to reconcile the differences in the profit from both the books.

Need for reconciliation:

1) It helps in checking the difference in the point of profit and loss in both cost and financial books
2) It helps in checking the arithmetic accuracy of the costing data
3) It promotes the coordination and cooperation between the cost and financial accounting.

Reason for difference in the profit and loss

1) Item shown only in financial accounts for eg. financial charges, financial income and appropriation of profits
2) Item shown only in cost account there are few item which are record in cost but not in financial they are notional rent, interest on capital, notional salary, deprecation.
3) Under absorption/over absorption of overhead in coat account overhead are recovered at predetermined rate where as in financial account they are determined at actual cost
4) Different basis of stock evaluation in coat account stock are valued by FIFO, LIFO etc .on the other hand value of stock in financial account is based on the principle of cost or market price whichever is less.
5) Different charges for depression the rate and charges for depreciation may be different in cost and financial account .

Costing Systems:-

1) SINGLE OR OUTPUT COSTING

This method also called 'Single output costing'. This method of costing is used for products which can be expressed in identical quantitative units and is suitable for products which are manufactured by continuous manufacturing activity. Costs are ascertained for convenient units of output. Examples: Brick making, mining, cement manufacturing, dairy, flour mills etc.

ANALYSIS OF COST :-

The collection of costs incurred on material labor and direct expenses is to be carried out in a manner discussed earlier in respective chapters. The total cost is analyzed in terms of prime cost, factory cost or works cost, office cost or cost of production.

The prime cost consists of cost of (1) raw materials, (2) direct labor and (3) direct expenses.

But as per CIMA terminology, "direct expenses" have been excluded from prime cost.

The works cost consists of prime cost PLUS works (factory) overheads.

The cost of production consists of works cost PLUS office and administration overheads.

The total cost (or) cost of sales consists of cost of production PLUS selling and distribution overheads.

Overheads are included in respective accounts based on estimates.

COST SHEET:-

The terminology of CIMA defines cost sheet "as a document which provides for the assembly of the estimated detailed cost in respect of a cost centre or a cost unit". Cost sheet is a periodical statement of cost depicted to show in detail the various elements of cost, namely, prime cost, works cost, cost of production, cost of sales.

Cost sheet can be prepared either based on actual data or on estimated data. Depending on preparation it can be classified into (1) historical cost sheet and (2) estimated cost sheet.

TREATMENT OF SCRAP:-

1. Scrap is residue arising in a manufacturing process.
2. Its quantity is small and value is low.
3. It is mostly recoverable without further processing.
4. Any realization by sale of scrap is deducted from gross works cost or works overheads.
5. Materials found to be defective before undergoing process should be sold and deducted from the cost of such materials.
6. Loss on sale of such materials is to be charged to costing profit and loss account.

Treatment of Spoilage and Defective Work:-

1. Spoilage means goods that are damaged and that cannot be rectified.
2. Defective means goods damaged but can be rectified
3. Normal spoilage: Loss due to normal spoilage is to be spread over good units. The same is the case with normal defectives.

2) JOB COSTING:-

Job costing is one of the methods of costing. It is also known as job order costing. In this system, work is undertaken to customer's specific requirements on the basis of orders. Such orders are of comparatively short duration. The work is carried out within the factory. The work passes through processes or operation activities in such a way as to identify the unit continuously till it reaches finished product. "The term may also be applied to work such as property repairs and the method may be used in the costing of internal capital expenditure jobs." This method of costing is used in industries which are engaged in printing, steel structures,switch gear, heat exchangers, transformers, motors, pumps, pressure vessels, general engineering works, oil well and shipping.

FEATURES OF JOB COSTING:-

1. A job consists of a single order or contract.
2. It is a cost unit by itself.
3. Each job is unique in nature.
4. Products are not manufactured for general consumption.
5. Each order is given a job number.
6. Costs are accumulated with reference to this number.
7. Costs are ascertained for each order.
8. Generally the duration of job order is comparatively short (products).
9. An important feature of job costing is that it is possible to identify a job at each stage of its manufacturing process.

PROCEDURE OF JOB COSTING:-

Step 1**: Pre-production Procedure:-**

It starts from preparing quotations and culminates in the acceptance of quotations by customer. Tenders are floated by customers. After analyzing the specific features, a detailed cost estimate is to be prepared by the design and estimation department with the assistance of costing department to quote the price. An estimation sheet is prepared after scrutinizing the reference job. Once the quotation, thus prepared based on various factors, is accepted by the customer, the manufacturer intimates in advance to the concerned departments.

Step 2: **Allotment of Job Number:-**

Every order received is given a separate distinguishing number which is referred to as job number. Every job or order is to be identified with this number throughout its production process. The main purpose of assigning job number for each job or order is for proper accounting and administrative convenience.

3) BATCH COSTING:-

Batch costing may be defined as "that form of specific order costing which applies when similar articles are manufactured in batches, either for sale or for use within the undertaking.

In most cases the costing is similar to job costing".

The term "batch" means a group of products of similar nature. Under this method of costing, a batch is regarded as a single cost unit.

Costs are□□ accumulated against each batch.

Separate cost□□ sheets are maintained for each batch of products.

4)CONTRACT COSTING:-

Contract costing is essentially a form of job costing. The cost of each contract is calculated separately. The work mainly involves a constructional activity. They are of a long duration.

SPECIAL FEATURES OF CONTRACT COSTING:-

1. **Activity:** In contract, the work mainly involved is construction activity.
2. **Site:** The work is carried out at the customer's site, away from the factory premises.
3. **Duration:** Contract work is generally of a long duration extending beyond an accounting period.
4. **Risk:** It involves risk and uncertainty.
5. **Meet requirements of customers:** Contract work is done as per the tastes and requirements of customers.
6. **Accounting contract:** Like job costing, a job-order member is assigned to each contract. Costs are accumulated and ascertained for each contract.

CONTRACT-COSTING PROCEDURE:-

Just like job costing, the cost of each contract has to be ascertained separately.
Treatment of items of expenses in contract accounts is explained in detail as follows (otherwise, steps in contract-costing procedure):

Step 1: Separate Number: Each contract is assigned a separate job number.
Step 2: Separate Account: A separate contract is to be opened and maintained for each contract.
Step 3: Charging Costs: All costs with respect to a particular contract are charged to respective contract accounts.
Step 4: Collection of Costs.

TYPES OF CONTRACTS:-

Contracts are classified into:
1. Fixed-price contract with escalation clause
2. Cost-plus contract.

GUIDELINES TO ASSESS PROFIT ON INCOMPLETE CONTRACTS:-

Standard costing principles should be adopted for the recognition of profit for each period. In case of incomplete contracts, only a certain portion of the profit can be taken to P&L A/c based on the work completed. The firm must provide for the unforeseen losses and contingencies. The following are the general guidelines that may be followed for the assessment of profit on incomplete contracts:

a. Profit should be completed on the basis of **"work certified"**
b. Uncertified work should be valued at:-

In case the value of work certified is less than 25% or 1/4th of the contract price, then no profit has to be taken into consideration. The entire profit has to be kept as a reserve for meeting the contingencies.

WORK-IN-PROGRESS

In contract accounts, the value of work-in-progress consists of the following two items:
1. Work Certified and
2. Work Uncertified

ACCOUNTING TREATMENT:-

Although there are two approaches to deal with the value of the work certified and the consequent payment, the most common approach is as follows:
A memorandum of work certified is maintained.
The cash received from the contractee is credited to his personal account.
The value of work is debited to WIP account and credited to the contract account.
The WIP is shown as an asset in the Balance Sheet after deducting the amount received from the contractee.
On the completion of the contract, the contractee's personal account is debited and the contract account is credited.

PROGRESS PAYMENTS:-

Under the standard sale and purchase agreement purchasers are required to make the installment payment of the purchase price, typically referred to as the progress payments, as and when the developers complete the different stages of the construction of the contracts /housing projects. All installment payment up to the issue of temporary occupation permit are to be paid into the contract account which the contractor is required to maintain with the bank or financial institution.

RETENTION MONEY:-

It is the usual practice not to pay the full amount of work certified, the contractee may pay a fixed percentage say 80% or 90% of the work certified depending on the contract. This is known as Cash Ratio and the balance amount not paid is termed as retention money. Example ,if cash ratio is 75%,then the retention money is remaining 255.It is the type of security for nay defective work which may be found in the contract later. this also work as deterrent for the contractor to leave the contract incomplete ,if he find the contract unprofitable the retention money willable adjusted against the penalties that become due if the contract is not completed within the given time as per the terms of the agreement.

ESCALATION CLAUSE:-

This clause is often provided in the contract to cover any likely changes in the price or utilization of material and labour. Thus, a contractor is entitled to suitably enhance the contract price if the cost rise beyond a given percentage. The object of this clause is to safeguard the interest of the contractor against the unfavorable changes in the cost, this clause is of particular importance where material and labour are anticipate to increase or where the quantity of material/labour time cannot be accurately estimated.

CONTRACT ACCOUNTS:-

PROFORMA CONTRACT ACCOUNT (WHEN WORK IS INCOMPLETE)

CONTRACT A/C

PARTICULARS	AMT	AMT	PARTICULARS	AMT	AMT
TO WORK IN PROGRESS:			BY RESERVES		xx
WORK CERTIFIED	xx		BY MATERIALS:		
WORK UNCERTIFIED	xx		RETURNED TO STORES	xx	
PLANT AT SITE	xx		TRANSFERRED TO OTHER CONTRACTS	xx	xx
MATERIAL AT SITE	xx	xx			
			BY P&L A/C - LOSS ON SALE		xx
TO MATERIALS :					
FROM STORES	xx		BY P&L A/C - FOR ITEMS STOLEN OR DESTROYED		xx
FROM OTHER CONTARCTS	xx	xx			
			TO WORK IN PROGRESS:		
TO WAGES	xx		WORK CERTIFIED	xx	
(+) OUTSTANDING	xx	xx	WORK UNCERTIFIED	xx	
			PLANT AT SITE	xx	
TO DIRECT EXPENSES		xx	MATERIAL AT SITE	xx	xx
TO PLANT (COST)		xx			
TO OVERHEADS	xx				
(+) OUTSTANDING	xx	xx			
TO SUB CONTRACT COSTS		xx			
TO EXTRA WORK DONE		xx			
TO P&L A/C - PROFIT ON SALE		xx			
TO NOTIONAL PROFIT C/D (BALINCING FIGURE)		xx			
		xx			xx
TO P&L A/C (NOTE)		xx	BY NOTIONAL PROFIT B/D		xx

TO RESERVE	xx		
	xx		xx

NOTE:

CASE 1: WORK CERTIFIED(WC)<25%OF CONTRACT PRICE(CP)---- FULL NOTIONAL PROFIT TO RESERVE

CASE 2: 25%<= WC<50% OF CP ….P&L=1/3* NP* (CASH RECD/WC)

CASE 3: 50%<=WC<100% OF CP ….. P&L= 2/3 *NP * (CASH RECD*/WC)

CASE 4: WC=CP……FULL NOTIONAL PROFIT TO P&L

NOTE: FOR ESTIMATED CONTRACT

A) P&L= ESTIMATED PROFIT * (WORK CERTIFIED/CONTRACT PRICE)

B) P&L =ESTIMATED PROFIT *CASH RECD/CONTRCT PRICE

C) P&L= ESTIMATED PROFIT *(COST TILL DATE/ESTIMATED TOTAL COST)

D) P&L= ESTIMATED PROFIT *(COST TILL DATE/ESTIMATED TOTAL COST) *(CASH RECD/ WORK CERTIFIED)

EXTRACT OF P&L FOR THE YEAR ENDED

PARTICULARS	AMT	PARTICULARS	AMT
TO LOSS BY ACCIDENT	xx		
		BY CONTRACT A/C	
TO DEPRECIATION :			
PLANT AT STORES	xx	BY PROFIT ON SALE OF ASSETS	
BUILDING	xx		
TO GENERAL EXPENSES	xx		
TO LOSS ON SALE OF ASSETS	xx		
TO NET PROFIT	xx		

		xx			xx

EXTARCT OF BALANCE SHEET AS ON

LIABILITIES	AMT	AMT	ASSETS	AMT	AMT
CAPITAL		xx	LAND AND BUILDING		
			(-) DEPRECIATION		
PROFIT &LOSS A/C:					
LAST YEAR BALANCE	xx		PLANT AND MACHINERY		
(+) NET PROFIT FOR THE YEAR	xx	xx	(-) DEPRECIATION		
RESERVES		xx	W.I.P		
			WORK CERTIFIED	xx	
CREDITORS		xx	WORK UNCERTIFIED	xx	
				xxx	
OUTSTANDING EXPENSES		xx	(-) CASH RECD FROM CONTRACTEE	xx	xx
			STOCK OF MATERIALS: AT STORES		xx
			PLANT AT SITE		
			MATERIAL AT SITE		
		xx			xx

ACCOUNTING FOR MATERIAL

To provide direction to university departments on the accounting for stocks of Federal overnment-owned materials furnished by the government and/or purchased by a Department as a direct charge to a Government contract administered by Sponsored Projects Services

Material, as used in this document, means property that may be incorporated into or attached to a deliverable end item or that may be consumed or expended in performing a contract. It includes assemblies, components, parts, raw and processed materials, and small tools and supplies that may be consumed in normal use in performing a contract.

The activity on a government contract may involve the stocking of government–furnished materials, and/or material to which title has passed to the Government by reason of purchase by the department on a government contract for use in the fabrication of deliverables or contract activities.

When a Department chooses to establish stocks of Government-owned materials for future use on current or follow-on contracts, the Department is responsible for establishing and maintaining their own accounting procedures that are in compliance with the terms and conditions of the Government contract, these policies, and the procedures setout below.

Departments are directly responsible and accountable for the control, protection, preservation, use and documentation of all Government-owned materials in stock. Departments shall identify all Government-owned materials in stock as Government Property.

Departments are directly responsible and accountable to maintain and make available the records and information required by the Government on the stocking, use and inventory of Government-owned materials.

Departments are directly responsible for shortages, loss, damages or destruction of Government-owned materials, non-contract use of Government-owned materials, and consumption that unreasonably exceeds the allowances provided by the Government.

Departmental records of stocked materials are the Government's and University's official records of Government-owned materials for the contract.

Department's maintaining Government-owned materials in stock may use as a minimum stock record Government invoices or shipping documents, University purchase documents or other evidence of acquisition as adequate property records for stock materials when accompanied with evidence supporting receipt and issue.

Government policy involving contract closeout and residual materials with a fair market value greater than $100 and in returnable quantities is to return these materials to the suppliers for full credit less the cost of restocking charge (not greater than 25%) and the cost of handling and transportation. Any other use or disposition of residual materials must be authorized by the Government in writing.

- When a department decides to establish stocks of Government-owned materials for the performance of their government awards, the department shall notify the Sponsored Projects Services Property Administrator of the Government Contracts applicable to their stocking action.
- Prepare written departmental procedures and maintain stocking records pursuant to the terms and conditions of the applicable government award, which at a minimum shall include basic descriptive information on every item of Government-owned materials, purchase documents, receiving documentation, accounting, storing, identification, protecting and issuing Government-owned materials from stock. These procedures shall insure that Government-owned materials will be used for the purposes authorized in the funding contract.
- All Government-owned materials shall be identified as Government property. Government material shall be kept physically separate from University-owned materials.
- Perform and document at least annually and at closeout, inventories of stocked materials to determine shortages, loses, damage or destruction of Government-owned materials. Report any and all loses to the SPS Property Administrator.
- Maintain stock issuing receipts that includes the Government contract number, UA account number, quantities and date issued, the person name receiving item(s), and signature.
- Submit timely stock materials inventory valuation reports by Government contract to the SPS Property Administrator when requested for required monthly, quarterly, annual and closeout reports to the government.
- Make available and provide all records for purchasing, accounting, receiving, issuing and inventories of Government-owned materials when requested by Federal, State and University Auditors, the Financial Services Office, and Sponsored Projects Services. Maintain these records for 8 years after the contract end date.

- For Government contracts identified (see 1 above) by the Responsible Department as having a Stores stocking activity, provide a schedule of dates for the Responsible Department to submit monthly, quarterly, and annual stock valuation reports to the SPS Property Administrator.
- Submit monthly, quarterly, annual and final property reports on Government contracts with the stocked materials valuation provided by the Responsible Department.
- At contract closeout, request disposition instructions from the Government for contract materials remaining on hand and not used based on the valuation provided by the Responsible Department.

- The Government/Sponsor must approve in writing the transfer and use of all residual materials to a follow-on contract, a different contract, donation to the University, order it sold, returned to the vendor for credit, or delivered to the government.

The responsible department shall not utilize any residual government-owned materials after the completion, expiration or termination of the government contract, for any reason, unless authorized in writing by the government.

PROCESS COSTING:-

Process Costing is one of the methods of costing. The cost of operating each process and the cost of transfer from one process to another are determined under this method. Process costing is a different type of cost procedure for continuous or mass production industries.

In those industries, the output consists of like units, where each unit would be processed in the same manner. It is generally suitable for firms manufacturing products in a continuous flow, without any reference to specific orders or jobs.

FEATURES OF PROCESS COSTING:-

1. Costs Flow From One Process to Another

As in any manufacturing organizations, costs relating to direct material, direct wages and factory overheads are incurred here also, which are charged to process accounts. As manufacturing is continuous, the cost of the finished output of one process becomes the cost of the raw material input of the next process.

2. Average Unit Cost Consumption :An average cost per unit is calculated by dividing the total costs by the output in a period.

3. Not Distinguishable

The products are not distinguishable in the processing stage.

4. Normal Spoilage

The cost of normal spoilage or wastage is included in the cost of the total units produced.

JOINT PRODUCTS AND BY-PRODUCTS

In some industrial concerns two or more products are produced simultaneously. Chemical companies, refineries, flour mills, coal mines, dairies, canners and meat packers produce in their manufacturing or conversion process more than one product having equal importance.

In such concerns, apportionment of costs for all the products has to be carried out. Those products which are produced are classified as (i) Joint Products and (ii) By-Products.

Joint products may be defined as, "Two or more products separated in the course of processing, each having a sufficiently high saleable value to merit recognition as a main product". When two or more products of equal importance are simultaneously produced, they are called "joint products". Example: In petroleum-refining industry, petrol, naphtha, kerosene and fuel oil are obtained simultaneously. The products are not identifiable as separate products until a certain stage of production known as "split-off point".

ACCOUNTING FOR JOINT PRODUCT COSTS

Allocation of Joint Costs Methods

A portion of the total joint costs has to be apportioned to each joint product properly in order to ascertain the unit product cost and P&L A/c.

OPERATING/SERVICE COSTING:-

Service costing involves the method of determination of the cost of services. The cost of providing a service is computed at ease. At the end of specified periods, the expenses (costs) of operating a service are grouped under suitable headings. The aggregate of these costs is to be divided by the quantity of services provided during the specified period to arrive at the cost per unit of service.

TRANSPORT COSTING:-

Service costing method is used to ascertain the cost of services provided by an organization (transport firm) which uses its vehicles for transporting goods or passengers. In motor transport costing, the cost unit is tonne-km or passenger-km.

Objectives of Motor Transport Costing:-

1. Analysis of operating costs, namely, wages, full cost, insurance, repairs and maintenance.
2. Control of operating and running costs and avoidance of waste of fuel and other consumable material.
3. Comparison of cost of running and maintenance of different vehicles.
4. Assignment of costs to services provided by each vehicle.
5. To quote hiring rates.
6. To compute cost of idle vehicle and lost running time.
7. Collection and analysis of cost for cost control.

POWER HOUSE COSTING:-

Power house costing is applied in those undertakings which are engaged in the production of steam and generation of electricity.

It is treated as a separate service cost centre. Operating costing is applied in boiler house undertakings (organizations). Boiler house is a service department providing services to production departments

Collection of Cost Data

In large industrial concerns, the costing department collects costs for the generation and utilization of steam. The collection of costs is done under the following headings:

i. Fuel: Fuel oil, coal, etc.
ii. Labour: Coal handlers, stokers, ash removers.
iii. Supervision: supervisor's salary, foreman's salary, proportionate salary of works/factory managers.
iv. Maintenance: Repairs and maintenance of plant and equipment.
v. Water: Cost, softening expenses.

Unit IV **Lectures: 20**

Marginal Costing: meaning, advantages, marginal costing and absorption costing; Cost-Profit-Volume Analysis: break even point, margin of safety, P/V Ratio, concept of key factor;break-even chart and its types;Decision making: costs for decision making, variable costing and differential
analysis as aids in making decisions – fixation of selling price, exploring new market, make or buy,
product mix, operate or shut down, sell or process further decisions etc.
Budgeting and Budgetary Control: concept of budget, classification of budget,fixed and flexible budgets, Zero Based Budgeting, budgetary control objectives, merits and limitations, performance budgeting; Standard Costing: meaning, advantages, limitation, applications, setting of standards, variance analysis, including material, labour, overhead and sales variances, decomposition of variances, control ratios.

Marginal Costing:-

"Marginal Costing" is ascertainment of the marginal cost which varies directly with the volume of production by differentiating between fixed costs and variable costs and finally ascertaining its effect on profit.
Marginal costing may be defined as the technique of presenting cost data wherein variable costs and fixed costs are shown separately for managerial decision-making. It should be clearly understood that marginal costing is not a method of costing like process costing or job costing. Rather it is simply a method or technique of the analysis of cost information for the guidance of management which tries to find out an effect on profit due to changes in the volume of output.

MARGINAL COST = VARIABLE COST DIRECT LABOUR + DIRECT MATERIAL + DIRECT EXPENSE +VARIABLE OVERHEADS

There are different phrases being used for this technique of costing. In UK, marginal costing is a popular phrase whereas in US, it is known as direct costing and is used in place of marginal costing. Variable costing is another name of marginal costing.
Marginal costing technique has given birth to a very useful concept of contribution where contribution is given by: Sales revenue less variable cost (marginal cost).
Contribution may be defined as the profit before the recovery of fixed costs. Thus,contribution goes toward the recovery of fixed cost and profit, and is equal to fixed cost plus profit (C = F + P).
In case a firm neither makes profit nor suffers loss, contribution will be just equal to fixed cost (C = F). this is known as break even point.
The concept of contribution is very useful in marginal costing. It has a fixed relation with sales. The proportion of contribution to sales is known as P/V ratio which remains the same under given conditions of production and sales.
The basic assumptions made by marginal costing are following:
- Total variable cost is directly proportion to the level of activity. However, variable cost per unit remains constant at all the levels of activities.

- Per unit selling price remains constant at all levels of activities.
- All the items produced by the organisation are sold off.

Features of Marginal costing:

- It is a method of recoding costs and reporting profits.
- It involves ascertaining marginal costs which is the difference of fixed cost and variable cost.
- The operating costs are differentiated into fixed costs and variable costs. Semi variable costs are also divided in the individual components of fixed cost and variable cost.
- Fixed costs which remain constant regardless of the volume of production do not find place in the product cost determination and inventory valuation.

Fixed costs are treated as period charge and are written off to the profit and loss account in the period incurred.

- Only variable costs are taken into consideration while computing the product cost.
- Prices of products are based on variable cost only.
- Marginal contribution decides the profitability of the products.

Features of Marginal Costing:-

The main features of marginal costing are as follows:

1. **Cost Classification:-**

The marginal costing technique makes a sharp distinction between variable costs and fixed costs. It is the variable cost on the basis of which production and sales policies are designed by a firm following the marginal costing technique.

2**. Stock/Inventory Valuation:-**

Under marginal costing, inventory/stock for profit measurement is valued at marginal cost. It is in sharp contrast to the total unit cost under absorption costing method.

3. **Marginal Contribution:-**

Marginal costing technique makes use of marginal contribution for marking various decisions.Marginal contribution is the difference between sales and marginal cost. It forms the basis for judging the profitability of different products or departments.

Advantages and Disadvantages of Marginal Costing Technique:-

Advantages:-

1. Marginal costing is simple to understand.
2. By not charging fixed overhead to cost of production, the effect of varying charges per unit is avoided.
3. It prevents the illogical carry forward in stock valuation of some proportion of current year's fixed overhead.
4. The effects of alternative sales or production policies can be more readily available and assessed, and decisions taken would yield the maximum return to business.
5. It eliminates large balances left in overhead control accounts which indicate the difficulty of ascertaining an accurate overhead recovery rate.
6. Practical cost control is greatly facilitated. By avoiding arbitrary allocation of fixed overhead, efforts can be concentrated on maintaining a uniform and consistent marginal cost. It is useful to various levels of management.
7. It helps in short-term profit planning by breakeven and profitability analysis, both in terms of quantity and graphs. Comparative profitability and performance between two or more products

and divisions can easily be assessed and brought to the notice of management for decision - making.

Disadvantages:-

1. The separation of costs into fixed and variable is difficult and sometimes gives misleading results.
2. Normal costing systems also apply overhead under normal operating volume and this shows that no advantage is gained by marginal costing.
3. Under marginal costing, stocks and work in progress are understated. The exclusion of fixed costs from inventories affect profit, and true and fair view of financial affairs of an organization may not be clearly transparent.
4. Volume variance in standard costing also discloses the effect of fluctuating output on fixed overhead. Marginal cost data becomes unrealistic in case of highly fluctuating levels of production, e.g., in case of seasonal factories.
5. Application of fixed overhead depends on estimates and not on the actuals and as such there may be under or over absorption of the same.
6. Control affected by means of budgetary control is also accepted by many. In order to know the net profit, we should not be satisfied with contribution and hence, fixed overhead is also a valuable item. A system which ignores fixed costs is less effective since a major portion of fixed cost is not taken care of under marginal costing.
7. In practice, sales price, fixed cost and variable cost per unit may vary. Thus, the assumptions underlying the theory of marginal costing sometimes becomes unrealistic. For long term profit planning, absorption costing is the only answer.

Presentation of Cost Data under Marginal Costing and Absorption Costing

Marginal costing is not a method of costing but a technique of presentation of sales and cost data with a view to guide management in decision-making. The traditional technique popularly known as total cost or absorption costing technique does not make any difference between variable and fixed cost in the calculation of profits. But marginal cost statement very clearly indicates this difference in arriving at the net operational results of a firm.

Following presentation of two Performa shows the difference between the presentation of information according to absorption and marginal costing techniques:

MARGINAL COSTING PRO-FORMA

	Rs.
Sales Revenue	xxxxx
Less Marginal Cost of Sales	
Opening Stock (Valued @ marginal cost)	xxxx
Add Production Cost (Valued @ marginal cost)	xxxx
Total Production Cost	xxxx
Less Closing Stock (Valued @ marginal cost)	(xxx)
Marginal Cost of Production	xxxx
Add Selling, Admin & Distribution Cost	xxxx
Marginal Cost of Sales	(xxxx)
Contribution	xxxxx
Less Fixed Cost	(xxxx)
Marginal Costing Profit	xxxxx

ABSORPTION COSTING PRO-FORMA

	Rs	
Sales Revenue	xxxxx	
Less Absorption Cost of Sales		
Opening Stock (Valued @ absorption cost)	xxxx	
Add Production Cost (Valued @ absorption cost)	xxxx	
Total Production Cost	xxxx	
Less Closing Stock (Valued @ absorption cost)		(xxx)
Absorption Cost of Production		xxxx
Add Selling, Admin & Distribution Cost		xxxx
Absorption Cost of Sales		(xxxx)
Un-Adjusted Profit		xxxxx
Fixed Production O/H absorbed		xxxx
Fixed Production O/H incurred		(xxxx)
(Under)/Over Absorption		xxxxx

Adjusted Profit xxxxx

Marginal Costing versus Absorption Costing:-

After knowing the two techniques of marginal costing and absorption costing, we have seen that the net profits are not the same because of the following reasons:

1. Over and Under Absorbed Overheads

In absorption costing, fixed overheads can never be absorbed exactly because of difficulty in forecasting costs and volume of output. If these balances of under or over absorbed/recovery are not written off to costing profit and loss account, the actual amount incurred is not shown in it. In marginal costing, however, the actual fixed overhead incurred is wholly charged against contribution and hence, there will be some difference in net profits.

2. Difference in Stock Valuation

In marginal costing, work in progress and finished stocks are valued at marginal cost, but in absorption costing, they are valued at total production cost. Hence, profit will differ as different amounts of fixed overheads are considered in two accounts. The profit difference due to difference in stock valuation is summarized as follows:

a. When there is no opening and closing stocks, there will be no difference in profit.

b. When opening and closing stocks are same, there will be no difference in profit,provided the fixed cost element in opening and closing stocks are of the same amount.

c. When closing stock is more than opening stock, the profit under absorption costing will be higher as comparatively a greater portion of fixed cost is included in closing stock and carried over to next period.

d. When closing stock is less than opening stock, the profit under absorption costing will be less as comparatively a higher amount of fixed cost contained in opening
stock is debited during the current period.

The features which distinguish marginal costing from absorption costing
are as follows:-

a. In absorption costing, items of stock are costed to include a 'fair share' of fixed production overhead, whereas in marginal costing, stocks are valued at variable production cost only. The value of closing stock will be higher in absorption costing than in marginal costing.

b. As a consequence of carrying forward an element of fixed production overheads in closing stock values, the cost of sales used to determine profit in absorption costing will:

i. include some fixed production overhead costs incurred in a previous period but carried forward into opening stock values of the current period;

ii. exclude some fixed production overhead costs incurred in the current period by including them in closing stock values. In contrast marginal costing charges the actual fixed costs of a period in full into the profit and loss account of the period. (Marginal costing is therefore sometimes known as period costing.)

c. In absorption costing, 'actual' fully absorbed unit costs are reduced by producing in greater quantities, whereas in marginal costing, unit variable costs are unaffected by the volume of production (that is, provided that variable costs per unit remain unaltered at the changed level of production activity). Profit per unit in any period can be affected by the actual volume of production in absorption costing; this is not the case in marginal costing.

d. In marginal costing, the identification of variable costs and of contribution enables management to use cost information more easily for decision-making purposes (such as in budget decision making). It is easy to decide by how much contribution (and therefore profit) will be affected by changes in sales volume. (Profit would be unaffected by changes in production volume).

In absorption costing, however, the effect on profit in a period of changes in both:

i. production volume; and

ii. sales volume; is not easily seen, because behaviour is not analysed and incremental costs are not used in the calculation of actual profit.

Contribution Income Statement:

Separates expenses into□□ variable and fixed.

Sales – Variable Expenses =□□ Contribution Margin.

Contrib□□ution Margin – Fixed Expenses = Net Income (Loss).

Contribution Margin:
_ The amount of sales available to cover fixed expenses with any remaining
_ contribution margin providing profits.
_ If the contribution margin is not sufficient to cover fixed expenses, there will be a net loss for the period.

Contribution Margin Ratio:

1. Sales, variable expenses and contribution margin are all variable, and therefore may be expressed as a percent of revenue.
2. The contribution margin ratio is calculated as the contribution margin dollars as a percent of sales dollars.
3. In a company producing a single product, this relationship applies to either total sales dollars and total contribution margin or per-unit sales dollars and contribution margin dollars.
4. In a company producing multiple products, each product will have its own unique contribution margin ratio, with the contribution margin for the entire company calculated only for total contribution margin dollars as a percent of total sales dollars.
5. The variable expense ratio is the complement to the contribution margin ratio. It represents the percent of sales dollars not included in the contribution margin ratio.

COST – VOLUME PROFIT ANALYSIS:-

Cost Volume Profit Analysis (C V P) is a systematic method of examining the relationship between changes in the volume of output and changes in total sales revenue, expenses (costs) and net profit. In other words. it is the analysis of the relationship existing amongst costs, sales revenues, output and the resultant profit.

To know the cost, volume and profit relationship, a study of the following is essential :

(1) Marginal Cost Formula
(2) Break-Even Analysis Marginal Costing and Cost Volume Profit Analysis
(3) Profit Volume Ratio (or) PN Ratio
(4) Profit Graph
(5) Key Factors and
(6) Sales Mix

Objectives of Cost Volume Profit Analysis

The following are the important objectives of cost volume profit analysis:

(1) Cost volume is a powerful tool for decision making.
(2) It makes use of the principles of Marginal Costing.

(3) It enables the management to establish what will happen to the financial results if a specified level of activity or volume fluctuates.

(4) It helps in the determination of break-even point and the level of output required to earn a desired profit.

(5) The PN ratio serves as a measure of efficiency of each product, factory, sales area etc. and thus helps the management to choose a most profitable line of business.

(6) It helps us to forecast the level of sales required to maintain a given amount of profit at different level.

Break Even Point:

At the breakeven point:
Operating Income = 0
Total revenue = total expenses
Fixed Expenses = Contribution Margin

Target Profit:-

_ Rather than setting operating income = 0, target profit calculations assume a certain operating income and calculate the sales dollars and units sold necessary to achieve it.

_ The same equations are used as to calculate the breakeven point, except that a non-zero operating income term is included in the numerator.

Margin of Safety:

The margin of safety is the excess of budgeted or actual sales over the break even volume of sales.It is expressed as both the dollar amount of the difference and as a percent of budgeted or actual sales.

In break-even analysis, margin of safety is the extent by which actual or projected sales exceed the break-even sales. It may be calculated simply as the difference between actual or projected sales and the break-even sales. However, it is best to calculate margin of safety in the form of a ratio. Thus we have the following two formulas to calculate margin of safety:

$$\text{MOS} = \text{Budgeted Sales} - \text{Break-even Sales}$$

$$\text{MOS} = \frac{\text{Budgeted Sales} - \text{Break-even Sales}}{\text{Budgeted Sales}}$$

Margin of Safety can be expressed both in terms of sales units and currency units.

The margin of safety is a measure of risk. It represents the amount of drop in sales which a company can tolerate. Higher the margin of safety, the more the company can withstand

fluctuations in sales. A drop in sales greater than margin of safety will cause net loss for the period.

Example

Use the following information to calculate margin of safety:

Sales Price per Unit	$40
Variable Cost per Unit	$32
Total Fixed Cost	$7,000
Budgeted Sales	$40,000

Solution

Breakeven Sales Units	= $7,000 ÷ ($40 - $32)	= 875
Budgeted Sales Units	= $40,000 ÷ $40	= 1,000
Margin of Safety	= (1000 – 875) ÷ 1,000	= 12.5%

P/V RATIO:-

The Profit Volume (PV) Ratio is the ratio of Contribution over Sales. It measures the Profitability of the firm and is one of the important ratios for computing profitabilty. The Contribution is the extra amount of sales over variable cost. Contribution is also Fixed cost plus profit.

Profit = Sales - Variable Cost - Fixed Cost.

Thus Contribution is:

Profit + Fixed Cost = Sales - Variable Cost.

Therefore PV Ratio = (Contribution/Sales)X100. (This as a percentage of sales)

CONCEPT OF KEY FACTOR:-

Definition :-

A key factor is defined as the factor in activities of an undertaking which, at a particular point of time or over a period, will limit the volume of output.

Purpose of Key Factor

Key Factor is governed by both Internal And External Factors i.e. Actual And Potential.
It helps in calculating the profitability for the product.

Profitability = Contribution/Key Factor

Examples of Key Factors

Sales
Materials
Labour
Financial Resources
Management

BREAK-EVEN CHART:-

Breakeven Charts

These are graphs which show how costs and revenues of a business change with a change in sales. They show the level of sales the business must make in order to break even.

Criticism of break even analysis

Fixed cost is represented as a straight line but in actual fixed costs is likely to change at different levels of output. A stepped line may represent fixed cost more accurately.

Important terms

Fixed cost: all costs which do not change with the change in output. Example rent, interest charges.
Variable cost: all costs which change with the change in output. Example materials, fuel and labour cost.
Total cost**= fixed cost + variable cost**
Revenue: income from sales of goods and services (Quantity sold X Price)

Breakeven point is that level of output where the sales revenue is equal to the total cost. That level of output where there is no profit or loss. If a business is unable to reach this level of output it will suffer a loss from this product. Any output in excess of break even generates profit for the company.

Method of plotting Break even chart

- Calculate fixed cost, total cost and Sales at different levels of output in a table
- Plot the Sales on X axis, Output on Y axis
- Plot fixed cost from the table
- Plot total cost from the table
- Plot sales from the table
- The point at which the sales (total revenue TR) line crosses the total cost (TC) line is the breakeven point.
- Breakeven point can be expressed in Output as well as in Value.

DECISION MAKING:-

Marginal costing is very helpful in managerial decision making. Management's production and cost and sales decisions may be easily affected from marginal costing. That is the reason, it is the part of cost control method of costing accounting. Before explaining the application of marginal costing in managerial decision making, we are providing little introduction to those who are new for understanding this important concept.

Marginal cost is change in total cost due to increase or decrease one unit or output. It is technique to show the effect on net profit if we classified total cost in variable cost and fixed cost. 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. In marginal costing, marginal cost is always equal to variable cost or cost of goods sold. We must know following formulae

a) **Contribution (Per unit) = Sale per unit - Variable Cost per unit**

c) **Total profit or loss = Total Contribution - Total Fixed Costs**

or **Contribution = Fixed Cost + Profit**

or **Profit = Contribution - Fixed Cost**

c) Profit Volume Ratio = Contribution/ Sale X 100 (It means if we sell Rs. 100 product, what will be our contribution margin, more contribution margin means more profit)

d) Break Even Point is a point where Total sale = Total Cost

e) Break Even Point (In unit) = Total Fixed expenses / Contribution

f) Break Even Point (In Sales Value) = Break even point (in units) X Selling price per unit

g) Break Even Point at earning of specific net profit margin

= Total Contribution / Contribution per unit

or = fixed cost + profit / selling price - variable cost per unit

Application of Marginal Costing in Managerial Decisions

By effective use of marginal costing formulae, we can apply marginal costing for managerial decisions with following ways :

1st Application : Managerial Decision Relating to Determination of Optimum Selling Price

To determine the optimum selling price of any product or service is big challenge for a manager of any company because company wants to profit of each unit of any product or service. In marginal costing technique, fixed cost will not be changed at any level of production. Only variable cost is changed for getting optimum selling price where company can achieve expected profit.

2nd Application : To Check the Effect of Reducing of Current Price on profit

We all know, this is the time of competition, customer has become king. He wants product at minimum price. One example, we can see free video on YouTube. Instead of buying costly CDs and DVD, customers of entertainment industry see free films and movies on YouTube. But on the other side, company wants to maintain his current profit. At that time, manager will be in tension because it is not possible to maintain profit even after reducing price. But if manager learns marginal costing techniques and uses it effective way, they can check the effect of reducing of current price on net profit, after this, he can decide to reduce production or increase production. It is the law of economics, variable cost will reduce by reducing units of production in same proportion but when we increase production, fixed cost will fastly decreases due to constant nature.

VARIABLE COSTING AND DIFFERENTIAL COSTING:-

VARIABLE COSTING:-

With Variable Costing, the cost of the inventory produced includes only:
• Direct Labor;
• Direct Material; and
• Variable Manufacturing Overhead.
Under Variable Costing, Fixed Manufacturing Overhead is not treated as part of the cost of the inventory produced. Instead, Fixed Manufacturing Overhead is expensed in the current period. Currently expensing a cost is often referred to as treating it as a "period

cost". Capitalizing a cost as part of the cost of inventory is often referred to as treating it as a "product cost".
The exclusion of Fixed Manufacturing Overhead from the cost of inventory makes Cost of Goods Sold a purely Variable Cost.

DIFFERENTIAL COSTING:-

A cost that varies with every alternative. This is useful in decision-making wherein each alternative has different cost and revenues. For example, a firm wants to change their promotion method, from a billboard which costs $70 to a TV advertisement which costs $100, the differential cost between the two choices is $30. If the expected revenue is higher than $30, then the firm's best choice would be the TV advertisement.

Differential analysis requires that we consider all *differential revenues and costs*—costs that differ from one alternative to another—when deciding between alternative courses of action. *Avoidable costs*—costs that can be avoided by selecting a particular course of action—are always differential costs and must be considered when deciding between alternative courses of action.

Opportunity costs—the benefits foregone when one alternative is selected over another—are differential costs, and must be included when performing differential analysis. *Sunk costs*—costs incurred in the past that cannot be changed by future decisions—are *not* differential costs because they cannot be changed by future decisions.

Direct fixed costs—fixed costs that can be traced directly to a product line or customer—are differential costs and therefore pertinent to making decisions. However, we must review these costs on a case-by-case basis because some direct fixed costs may not be considered differential in spite of being traced directly to a product line. For example, a five-year lease on a warehouse used solely for one product line is a direct fixed cost but not a differential cost because the costs will continue even if the product line is eliminated.

Allocated fixed costs—fixed costs that cannot be traced directly to a product—are typically *not* differential costs. For example, if a product line is eliminated, these costs are simply allocated to the remaining product lines.

he concept of marginal costing is practically applied in the following situations:

- **Evaluation of Performance** : The evaluation of the performance of various departments or products can be evaluated with the help of marginal costing which is based on contribution generating capacity.

- **Profit Planning** : This technique through the calculation of P/V Ratio helps the management to plan the activities in such a way that the profit can be maximised.

- **Fixation of Selling Price** : The technique of marginal costing assists the management to fix the price in such a way so that prices fixed can cover at least the variable cost.

- **Make or Buy decision** : Marginal cost analysis helps the management in making or buying decision.

- **Optimizing Product Mix** : To maximise profits and increase sales volume it is necessary to decide an optimized mix or proportion in which various products of a company can be sold.

- **Cost Control** : Marginal Costing is a technique of cost classification and cost presentation which enable the management to concentrate on the controllable costs.

- **Flexible Budget preparation**: As the marginal costing particularly classifies costs as fixed and variable costs which facilitates the preparation of flexible budgets.

FIXATION OF SELLING PRICE:-

- Under normal circumstances
- In times of competition
- In times of trade depression
- In accepting additional orders for utilizing idle capacity

Fixation Techniques: Cost plus pricing, Marginal cost pricing and Break-even Analysis

(i) Cost plus Pricing:

According to this method price of the product includes cost plus a reasonable margin of profit. This method of pricing is extensively used. A cost sheet is prepared in order to ascertain the cost of production, total cost and selling price.

Results shown by this method sometimes differ from industry to industry. This is because the fact that the basis adopted for the allocation of overheads may differ. For example, in one concern overheads may be allocated as 20% of prime cost (cost of materials and direct labour) and in others it may be just 10%. The main advantage of this method is that, it is easier and safest to apply. It discourages the manufacturers from facing cut-throat competition. The results given by this method are reliable and accurate.

There are certain limitations of this method, which are given below:

(a) Under this method there are certain cases where price bears no relation to the cost of the product e.g., products meant for the use of the rich people. The price charged May not based on the cost. There is a feeling among the richer section that the more they are required to pay, the better is the article. The same is the case with articles purchased for impressing others.

(b) In certain products it is not possible to ascertain the cost of the product produced and in that case cost plus method cannot be used… For example, in a sugar factory or wine factory, it is very difficult to calculate cost of production for each product.

(c) Another limitation of this method is that cost and price are both variables reacting upon each Other, Cost and price affect each other through the volume of sale, for example, if the prices are low, the sales will increase and reduction in cost takes place.

(d) This method does not tell about the competition prevalent in the market.

(e) This method cannot predict the willingness of the customer to pay for the product i.e. how much customer is ready to pay for the product.

(ii) Marginal Cost Pricing:

Marginal cost pricing is another method of price determination. Marginal cost is the cost which includes direct material, direct labour, direct expenses and variable overhead (i.e. prime cost plus variable overheads are known as marginal cost). This is also referred to as direct costing.

Marginal cost is the cost by which the total cost rises or falls by increasing or decreasing one unit to the existing volume of production in a factory. In other words, the cost of a marginal unit of production is known as the marginal cost.

Under this method the production cost is divided into two parts (a) fixed and (b) variable. The increase or decrease in the volume of production up to a certain extent influences only the variable overheads, whereas, the fixed overheads remain unaffected.

The theory of Marginal costing maintains that in relation to a given volume of production additional output can normally be obtained at less than proportionate cost, because, within certain limits, certain expenses remain fixed while certain aggregate expenses only vary with production and in the same way if production decreases the aggregate cost falls by less than proportionate fall in output.

Marginal costing technique is greatly helpful to management taking various managerial decisions. It is very helpful in determining accurate total cost of production and determination of proper sales price of the product. It takes into consideration the nature of the costs involved and in the periods of cut-throat competition this method is of immense utility.

The marginal cost at each production level remains unchanged and so a rise or fall in production beyond the normal capacity does not clearly and directly shows its effect on the cost of production.

Under this method ample use is made of charts and graphs. A little slip in interpretation and study of these charts may lead to wrong conclusion which may be detrimental to the business.

(iii) Break Even Analysis:

Under this method demand of the product and cost of over production are taken into consideration in the process of price determination of the product. Management is interested in determining the volume of sale at which costs are fully recovered, and beyond which profits emerge.

The analysis of cost behaviour in relation to changing volume of sales and its impact on profits is known as break even analysis. Output at any stage below the breakeven point will result in a loss to the seller.

This is clearly indicated in the break even chart. Break even chart shows the profitability or otherwise of an undertaking at various levels of activity and as a result indicate the point at which there will be neither a profit nor loss.

The break even chart is a graphic chart which presents the varying costs along with the changing sales revenue, indicates the sales volume at which costs are fully covered by revenue, and reveals the estimated profits or loss which will be realised at different levels of activity.

Breakeven point refers to the point on the break even chart at which cost is equal to the sales revenue. It is also known as the point of 'no pro/it no loss'. This is clearly illustrated in the diagram given below.

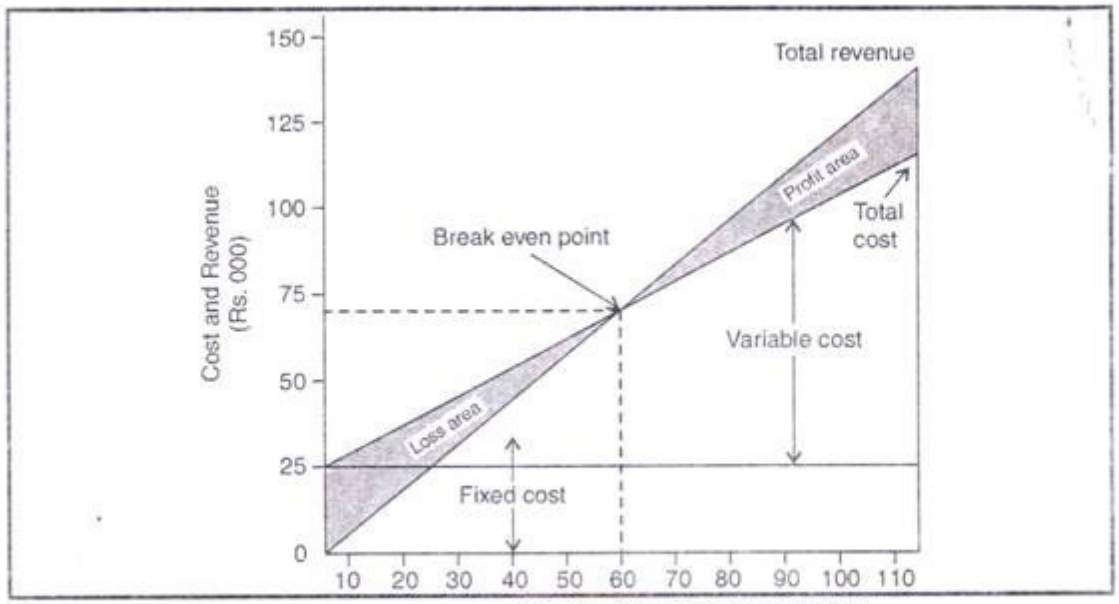

Diagram Showing Break Even Point

In the above diagram sales volume are shown on x-axis and cost and revenue are shown on y-axis. The fixed costs are represented by horizontal line. The total cost of sales is represented by the fixed cost line. It moves upward proportionately with the volume.

The sales revenue is represented by the line moving upward uniformly from the origin of the axes. The point of interaction of the total cost line with revenue line is the breakeven point.

The main advantage of break even analysis is that it tells about probable levels of profits at different levels of output. It clearly indicates the inter-relationship between revenue, cost and profit in graphic form which is easily understood. It also reflects the comparative significance of fixed and variable costs.

The main limitation of this method is that it takes into consideration fixed and variable costs but semi-variable cost and their impact are not considered at all. Scope of break even analysis is limited to cost-volume and profits but it ignores other considerations such as capital amount, marketing aspects and effects of government policy etc, which are necessary in decision making and price determination.

It has been observed under this method that fixed costs remain unchanged, but in reality they do not remain same in the long run and change in response to technological development, size of the concern and other factors.

EXPLORING NEW MARKETS:-

While exploring new markets following points to be kept into consideration:-

1. Selling Price below the Marginal Cost
2. When a new product is introduced in the market
3. When foreign market is to be explored to earn foreign exchange
4. When the concern has already purchased large quantities of materials
5. At the time of closure of business
6. When the sales of one product at a price below the marginal cost will push up the sales of other profitable products
7. When employees cannot be retrenched
8. When the goods are perishable nature

MAKE OR BUY DECISIONS:-

Marginal costing can be applied in the areas like make or buy decisions.

When a company has unused capacity and wants to manufacture some components, it has two alternatives:
(A) to make within the organization or
(B) to buy from the market.
Often, firms face the question whether to outsource production of a component or continue to make it in the factory. Comparison of the relevant costs of both the alternatives in such cases will show whether to continue the existing arrangement or change to buying it, discontinuing the current production. The answer depends upon whether the firm has the option to use the freed capacity, profitably, or not.

PRODUCT MIX:-

Product costs equal the sum of your direct materials costs, direct labor costs and manufacturing overhead costs. Using the actual costing method, you can determine your small business's overall product costs and product costs per unit based on the actual costs you incurred during a period. Knowing your product costs can help you price your products and budget your small business's money.
Direct Materials
Direct materials are the materials your small business uses to manufacture a product that you can trace directly to the product, such as the bicycle tires on a specific bicycle. Add together the costs

of the direct materials you used over a particular period, such as one month, to determine your total direct materials costs. For example, assume you make bicycles. If you used $10,000 in bicycle tires and $5,000 in other bicycle parts during a month, add $10,000 to $5,000 to get $15,000 in total direct materials costs.

Direct Labor

Direct labor costs are the total costs you incur to employ the workers that directly assemble or manufacture your products. These costs include wages, payroll taxes, pension contributions and contributions for life, health and worker's compensation insurance. Add together these costs you incurred for the month to determine your total direct labor costs. For example, if you paid $2,000 in wages, $200 in payroll taxes and $1,000 toward pensions and insurance, add together $2,000, $200 and $1,000 to get $3,200 in total direct labor costs.

Manufacturing Overhead

Manufacturing overhead costs are those necessary to making a product, but that you cannot trace directly to a specific product. Examples include indirect materials, such as masking tape, and indirect labor costs, such as the costs to employ a maintenance worker. Examples of other overhead costs are property taxes, rent and utilities. Add together each manufacturing overhead cost you incurred during the month to determine total manufacturing overhead costs. For example, assume your small business had $5,000 in total manufacturing overhead costs during the month.

Operate and Shut Down:-

A point of operations where a firm is indifferent between continuing operations and shutting down temporarily. The shutdown point is the combination of output and price where a firm earns just enough revenue to cover its total variable costs.

Explanation to shutdown.

If a firm is operating at its shutdown point, it is usually operating at a loss. The concept is that if a firm can produce revenue greater or equal to its total variable costs, it can use the additional revenue to pay down its fixed costs. This assumes that fixed costs will still be incurred when a firm shuts down, such as lease contracts or other lengthy obligations. In other words, when a firm can earn a positive contribution margin, it should remain in operations, despite an overall loss.

Decision Making in Relation to Shut Down

1. **Shut down point = {(Total fixed cost – Shut down costs) ÷ Contribution per unit}**

Decision Making in Relation to Shut Down Vs. Continue

In case of decision rendering closure or shut down we consider the following points:

1. **Current profit situation has to be maintained, So by analyzing the proposal of shut down or outsourcing if the current income is reduced then shut down will not be allowed unless the product or factory has reached at the end of its life cycle.**

2. **In case of outsourcing proposal we can also apply the differential cost concept i.e. saving in cost must be greater than or equal to out-sourcing fees payment. Here saving in cost i.e. cash inflow is computed from the concept of relevant cost i.e. by closing down we are saving variable cost of production, and discretionary fixed cost or shut down cost. This cash inflow further may be classified into two parts:**

    1. **Saving in variable cost per time period i.e. CIF per annum.**

    2. **One time cash inflow following shut down i.e. sale of machine, sale of current stock of material etc.**

∴Total CIF or saving following shut down = one time CIF + CIF p.a. × life span of the proposal of outsourcing.

If this total is greater than total outsourcing fees then shutdown will take place other production will be continue.

Problem 1

Fixed expenses at 50% activity	Rs.15,000
Fixed expenses when the factory is shut down	10,000
Additional expenses in closing down	1,000

Production at 50% activity = 5,000 units

Contribution per unit Re. 1

Solution

	Rs.
A. If the plant is shut down the sunk costs or fixed expenses	11,000
B. If it is working at 50% activity the fixed expenses	15,000
C. Additional fixed expenses: [(B-A)]	4,000
D. Contribution (5,000 units ×Re. 1 p.u.)	5,000

By working at 50% activity the firm is able to recover the additional fixed expenses of Rs. 4,000 and earn an extra contribution of Rs. 1,000 towards shut down expenses. Hence it is advisable to continue production in the factory instead of closing it down. If, on the other hand, the contribution is Re. 0.75 per unit, the total contribution of Rs. 3,750 being less than the additional fixed expenses, it is not advisable to continue the operations. Hence in the latter case shut down is economically justified.

SELL OR PROCESS FURTHER DECISIONS:-

A decision whether to sell a joint product at split-off point or to process it further and sell it in a more refined form is called a sell-or-process-further decision. Joint products are two or more products which have been manufactured from the same inputs and in a same production process (i.e. a joint process). The point at which joint products leave the joint process is called split-off point.

Some of the joint products may be in final form ready for sale, while others may be processed further. In such cases managers have to decide whether to sell the unfinished goods at split-off point or to process them further. Such decision is known as sell-or-process-further decision and it must be made so as to maximize the profits of the business.

A sell-or-process-further analysis can be carried out in three different ways:

- **Incremental (or Differential) Approach** calculates the difference between the additional revenues and the additional costs of further processing. If the difference is positive the product must be processed further, otherwise not.
- **Opportunity Cost Approach** calculates the difference between net revenue from further processed product and the opportunity cost of not selling the product at split-off point. If the difference is positive, further processing will increase profits.
- **Total Project Approach** (or the comparative statement approach) compares the profit statements of both options (i.e. selling or further processing) separately for each product. The option generating higher profit is chosen.

BUDGETING AND BUDGETARY CONTROL:-

CONCEPT OF BUDGET:-

The Chartered Institute of Management Accountants, England, defines a 'budget' as under: "A financial and/or quantitative statement, prepared and approved prior to define period of time, of the policy to be perused during that period for the purpose of attaining a given objective."
According to Brown and Howard of Management Accountant "a budget is a predetermined statement of managerial policy during the given period which provides a standard for comparison with the results actually achieved."
An analysis of the above said definitions reveal the following essentials of a budget:
1. It is prepared for a definite future period.
2. It is a statement prepared prior to a defined period of time.
3. The budget is monetary and/or quantitative statement of policy.
4. The budget is a predetermined statement and its purpose is to attain a given objective.A budget, therefore, be taken as a document which is closely related to both the managerial as well as accounting functions of an organization.

Forecast Vs Budget:-

Forecast is mainly concerned with an assessment of probable future events. Budget is a planned result that an enterprise aims to attain. Forecasting precedes preparation of a budget as it is an important part of the budgeting process. It is said that the budgetary process is more a test of forecasting skill than anything else. A budget is both a mechanism for profit planning and technique of operating cost control. In order to establish a budget it is essential to forecast various important variables like sales, selling prices, availability of materials, prices of materials, wage rates etc. both budgets and forecasts refer to the anticipated actions and events. But still there are wide differences between budgets and forecasts as given below:

Cost Budget:-

From the above chart we can observe that the chairman of the company is the overall in charge of the functions of the Budgeted Committee. A Budget Officer is the convener of the budget committee, who helps in co-ordination. The Purchase Manager, Production Manager, Sales Manager, Personnel Manager, Finance Manager and Account Manager are made responsible to prepare their budgets.
2. Budget Center: A budget center is defined by the terminology as 'a section of the

organization of an undertaking defined for the purpose of budgetary control'. For effective budgetary control budget centre or departments should be established for each of which budget will be set with the help of the head of the department concerned.

3. Budget officer: Budget officer is usually some senior member of the accounting staff who controls the budgetary process. He does not prepare the budget himself, but facilitates and coordinates the budgeting activity. He assists the individual departmental heads and the budget committee, and ensures that their decisions are communicated to the appropriate people.

4. Budget committee: Budget committee comprising of the Managing Director, the Production Manager, Sales Manager and Accountant. The main objective of this committee is to agree on all departmental budgets, normal standard hours and allocations. In small concerns, the Budget Officer may co-ordinate the work for preparation and implementation of budgets. In large-scale concern a budget committee is setup for preparation of budgets and execution of budgetary control.

5. Budget manual: A budget manual has been defined as 'a document which set out the responsibilities of persons engaged in the routine of and the forms and records required for budgetary control". It contains all details regarding the plan and procedures for its execution. It also specifies the time table for budget preparation to approval, details about responsibility ,cost centers, constitution and organization of budget committee, duties and responsibilities of budget officer.

6. Budget period: A budget is always related to specified time period. The budget period is the length of time for which a budget is prepared and employed. The period may depend upon the type of budget. There is no specific period as such. However, for the sake of convenience, the budget period may be fixed depending upon the following factors:

(a) Types of business
(b) Types of budget
(c) Nature of the demand of the product
(d) Length of trade cycle
(e) Economic factors
(f) Availability of accounting period
(g) Availability of finance
(h) Control operation

Key Factor:-

Key Factor is also called as 'Limiting Factor' or Governing Factor. While preparing the budget, it is necessary to consider key factor for successful budgetary control. The influence of the Key Factor which dominates the business operations in order to ensure that the functional budgets are reasonably capable of fulfilment. The key factors include- raw materials may be in short supply, non-availability of skilled labours, Government restrictions, limited sales due to insufficient sales promotion, shortage of power, underutilization of plant capacity, shortage of efficient executives, management policies regarding lack of capital, and insufficient research into new product developments.

CLASSIFICATION OF BUDGETS:-

As budgets serve different purposes, different types of budgets have been developed. The following are the different classification of budgets developed on the basis of time, functions, and flexibility or capacity.

(A) Classification on the basis of Time:
1. Long-term budgets
2. Short-term budgets
3. Current budgets

(B) Classification according to functions:
1. Functional or subsidiary budgets
2. Master budgets

(C) Classification on the basis of capacity:
1. Fixed budgets.
2. Flexible budgets

(A) Classification on the basis of time

1. Long-term budgets: Long-term budgets are prepared for a longer period varies between five to ten years. It is usually developed by the top level management. These budgets summarise the general plan of operations and its expected consequences. Long-term budgets are prepared for important activities like composition of its capital expenditure, new product development and research, long-term finance etc.
2. Short-term budgets: These budgets are usually prepared for a period of one year. Sometimes they may be prepared for shorter period as for quarterly or half yearly. The scope of budgeting activity may vary considerably among different organization.
3. Current budgets: Current budgets are prepared for the current operations of the business.The planning period of a budget generally in months or weeks. As per ICMA London, "Current budget is a budget which is established for use over a short period of time and related to current conditions."

(b) Classification on the basis of function

1. Functional budget: The functional budget is one which relates to any of the functions of an organization. The number of functional budgets depends upon the size and nature of business.

The following are the commonly used:
(i) Sales budget
(ii) Purchase budget
(iii) Production budget
(iv) Selling and distribution cost budget
(v) Labour cost budget
(vi) Cash budget
(vii) Capital expenditure budget

2. **Master budget**: The master budget is a summary budget. This budget encompasses all the functional activities into one harmonious unit. The ICMA England defines a Master Budget as the summary budget incorporating its functional budgets, which is finally approved, adopted and employed.

(C) Classification on the basis of capacity

- Fixed budget: A fixed budget is designed to remain unchanged irrespective of the level of activity actually attained.
- Flexible budget: A flexible budget is a budget which is designed to change in accordance with the various level of activity actually attained. The flexible budget also called as Variable Budget or Sliding Scale Budget, takes both fixed, variable and semi fixed manufacturing costs into account.

Control Ratios:-

Ratios are used by the management to determine whether performance of its activities is going on as per estimates or not. If the ratio is 100% or more, the performance is considered as unsatisfactory. The following are the ratios generally calculated for performance evaluation.

1. Capacity ratio: This ratio indicates the extent to which budgeted hours of activity is actually utilised.

Capacity Ratio = Actual hours worked production Budget hours × 100

2. Activity ratio: This ratio is used to measure the level of activity attained during the budget period.

Activity ratio = Standard hours for actual production Budgeted hours × 100

3. Efficiency ratio: This ratio shows the level of efficiency attained during the budget period

Efficiency ratio = Standard hours for actual production Actual horus worked × 100

4. Calendar ratio: This ratio is used to measure the proportion of actual working days to budgeted working days in a budget period.

Calendar ratio = Number of actual working days in a period Budgeted working days for the period × 100

Sales Budget:-

Sales budget is one of the important functional budgets. Sales estimate is the commencement of budgeting may be made in quantitative terms. Sales budget is primarily concerned with forecasting of what products will be sold in what quantities and at what prices during the budget period. Sales budget is prepared by the sales executives taking into account number of relevant and influencing factors such as: Analysis of past sales, key factors, market conditions, production capacity, government restrictions, competitor's strength and weakness, advertisement, publicity and sales promotion, pricing policy, consumer behaviour, nature obusiness, types of product, company objectives, salesmen's report, marketing research's reports, and product life cycle.

Production Budget:-

Production budget is usually prepared on the basis of sales budget. But it also takes into account the stock levels desired to be maintained. The estimated output of business firm during a budget period will be forecast in production budget. The production budget
determines the level of activity of the produce business and facilities planning of production so as to maximum efficiency. The production budget is prepared by the chief executives of the production department. While preparing the production budget, the factors like estimated sales,

availability of raw materials, plant capacity, availability of labour, budgeted stock requirements etc. are carefully considered.

Cost of Production Budget:-

After preparation of production budget, this budget is prepared. Production cost budgets show the cost of the production determined in the production budget. Cost of production budget is grouped in to material cost budget, labour cost budget and overhead cost budget. Because it break up the cost of each product into three main elements material, labour and overheads.
Overheads may be further subdivided in to fixed, variable and semi-fixed overheads.
Therefore separate budgets required for each item.

Material Purchase Budget:-

The different levels of material stock are based on planned out. Once the production budget is prepared, it is necessary to consider the requirement of materials to carryout the production activities. Material purchase budget is concerned with purchase and requirement of direct materials to be made during the budget period. While preparing the materials purchase budget, the following factors to be considered carefully:

1. Estimated sales and production.
2. Requirement of materials during budget period.
3. Expected changes in the prices of raw materials.
4. Different stock levels, EOQ etc.
5. Availability of raw materials, i.e., seasonal or otherwise.
6. Availability of financial resources.
7. Price trend in the market.
8. Company's stock policy etc.

Cash Budget:-

This budget represents the anticipated receipts and payment of cash during the budget period.
The cash budget also called as Functional Budget. Cash budget is the most important of the entire functional budget because, cash is required for the purpose to meeting its current cash obligations. If at any time, a concern fails to meet its obligations, it will be technically insolvent. Therefore, this budget is prepared on the basis of detailed cash receipts and cash payments.
The estimated cash receipts include: cash sales, credit sales, collection from sundry debtors, bills receivable, interest received, income from sale of investment, commission received, dividend received and income from non-trading operations etc.
The estimated cash payments include the following:

1. Cash purchase
2. Payment to creditors
3. Payment of wages
4. Payments relate to production expenses
5. Payments relate to office and administrative expenses
6. Payments relate to selling and distribution expenses
7. Any other payments relate to revenue and capital expenditure
8. Income tax payable, dividend payable etc.

Master Budget:-

When the functional budgets have been completed, the budget committee will prepare a master budget for the target of the concern. Accordingly a budget which is prepared incorporating the summaries of all functional budgets. It comprises of budgeted profit and loss account, budgeted balance sheet, budgeted production, sales and costs. The ICMA England defines a Master Budget as 'the summary budget incorporating its functional budgets, which is finally approved, adopted and employed'. The master budget represents the activities of a business during a profit plan. This budget is also helpful in coordinating activities of various functional departments.

Fixed Budget:-

A budget is drawn from a particular level of activity is called fixed budget. According to ICWA London 'Fixed budget is a budget which is designed to remain unchanged irrespective of the level of activity actually attained." Fixed budget is usually prepared before the beginning of the financial year. This type of budget is not going to highlight the cost variance due to the difference in the levels of activity. Fixed budgets are suitable under static conditions.

Flexible Budget:-

Flexible budget is also called variable or sliding scale budget, 'takes both the fixed and manufacturing costs into account. Flexible budget is the opposite of static budget showing the expected cost at a single level of activity. According to ICMA, England defined Flexible Budget is a budget which is designed to change in accordance with the level of activity actually attained."

According to the principles that guide the preparation of the flexible budget a series of fixed budgets are drawn for different levels of activity. A flexible budget often shows the budgeted expenses against each item of cost corresponding to the different levels of activity. This budget has come into use for solving the problems caused by the application of the fixed budget.

Advantages of flexible budget:-

1. In flexible budget, all possible volume of output or level of activity can be covered.
2. Overhead costs are analysed into fixed variable and semi-variable costs.
3. Expenditure can be forecasted at different levels of activity.
4. It facilitates at all times related factor can be compared, which essential for intelligent decision are making.
5. A flexible budget can be prepared with standard costing or without standard costing depending upon what the company opts for.
6. A flexible budget facilitates ascertainment of costs at different levels of activity, price fixation, placing tenders and quotations.
7. It helps in assessing the performance of all departmental heads as the same can be judged by terms of the level of activity attained by the business.

Method of preparing flexible budget

The following methods are used in preparing a flexible budget:

1. Multi-activity method
2. Ratio method

3. Charting method.

1. **Multi-Activity method:** This method involves preparing a budget in response to different level of activity. The different level of activity or capacity levels are shown in Horizontal columns, and the budgeted figures against such levels are placed in the Vertical Columns. The expenses involved in production as per budget are grouped as fixed, variable and semi variable.
2. **Ratio method:** According to this method, the budget is prepared first showing the expected normal level of activity and the estimated variable cost per unit at the side expected level of activity in addition to the fixed cost as estimated. Therefore, the expenses as per budget, allowed for a particular level of activity attained, will be calculated on the basis of the following formula: Budgeted fixed cost + (Variable cost per unit of activity × Actual unit of activity).
3. **Charting method**: Under this method total expenses required for any level of activity,are estimated having classified into three categories, viz., variable, semi variable and fixed. These figures are plotted on a graph. The expenses are plotted on the Y-axis and the level of activity is plotted on X-axis. The graphs will thus, help in ascertaining the quantum of budgeted expenses corresponding to the level of activity attained with the help of this chart.

Zero Base Budgeting (ZBB)

"Zero base budgeting" is a new technique of budgeting. It is designed to meet the needs of the management in order to ensure the operational efficiency and effective utilization of the allocated resources of a concern. This technique was originally developed by Peter A. Phyhrr, Manager of Taxas Instrument during 1969. This concept is widely used in USA for controlling their state expenditure when Mr. Jimmy Carter was the president of the USA. At present the technique has for its global recognition for many countries have implemented in real terms.
According to Peter A. Phyhrr ZBB is defined as an "Operative planning and budgeting process which requires each manager to justify his entire budget in detail from Scratch (hence zero base) and shifts the burden of proof to each manager to justify why we should spend any money at all". In zero-base budgeting, a manager at all levels, have to justify the importance of activity and to allocate the resources on priority basis.

Important aspect of ZBB:-

Zero-based budgeting involves the following important aspects:
1. It emphasises on all requisites of budgets.
2. Evaluation on the basis of decision packages and systematic analysis, i.e., in view of cost benefit analysis.
3. Planning the activities, promotes operational efficiency and monitors the performance to achieve the objectives.

Steps involved in ZBB:-

The following are the steps involved in zero base budgeting:
1. No previous year performance of inefficiencies is to be taken as adjustments in subsequent year.
2. Identification of activities in decision packages.
3. Determination of budgeting objectives to be attained.
4. Extent to which zero base budgeting is to be applied.

5. Evaluation of current and proposed expenditure and placing them in order of priority.
6. Assignment of task and allotment of sources on the basis of cost benefit comparison.
7. Review process of each activity examined afresh.
8. Weightage should be given for alternative course of actions.

Advantages of ZBB:-

1. Utilization of resources at a maximum level.
2. It serves as a tool of management in formulating production planning.
3. It facilitates effective cost control.
4. It helps to identify the uneconomical activities.
5. It ensures the proper allocation of scarce resources on priority basis.
6. It helps to measure the operational inefficiencies and to take the corrective actions.
7. It ensures the principles of management by objectives.
8. It facilitates co-operation and co-ordination among all levels of management.
9. It ensures each activity is thoroughly examined on the basis of cost benefit analysis.

Budgetary control:-

Budgetary control is the process of establishment of budgets relating to various activities and comparing the budgeted figures with the actual performance for arriving at deviations, if any. Accordingly, there cannot be budgetary control without budgets. Budgetary control is a system which uses budgets as a means of planning and controlling.

According to I.C.M.A. England Budgetary control is defined by Terminology as "the establishment of budgets relating to the responsibilities of executives to the requirements of a policy and the continuous comparison of actual with the budgeted results, either to secure by individual actions the objectives of that policy or to provide a basis for its revision". Brown and Howard defines budgetary control is "a system of controlling costs which includes the preparation of budgets, co-ordinating the department and establishing responsibilities, comparing actual performance with the budgeted and acting upon results to achieve maximum profitability."

The above definitions reveal the following essentials of budgetary control:

1. Establishment of objectives for each function and section of the organization.
2. Comparison of actual performance with budget.
3. Ascertainment of the causes for such deviations of actual from the budgeted performance.
4. Taking suitable corrective action from different available alternatives to achieve the desired objectives.

Objectives of Budgetary Control:-

Budgetary control is planning to assist the management for policy formulation, planning, controlling and co-ordinating the general objectives of budgetary control and can be stated in the following ways:

1. Planning: A budget is a plan of action. Budgeting ensures a detailed plan of action for a business over a period of time.
2. Co-ordination: Budgetary control co-ordinates the various activities of the entity or

organization and secure co-operation of all concerned towards the common goal.
3. Control: Control is necessary to ensure that plans and objectives are being achieved. Control follows planning and co-ordination. No control performance is possible without predetermined standards. Thus, budgetary control makes control possible by continuous measures against predetermined targets. If there is any variation between the budgeted performance and the actual performance the same is subject to analysis and corrective action.

Merits and Limitations of Budgetary Control:-

The merits of budgetary control may be summarized as follows:
1. It facilitates reduction of cost.
2. Budgetary control guides the management in planning and formulation of policies.
3. Budgetary control facilitates effective co-ordination of activities of the various departments and functions by setting their limits and goals.
4. It ensures maximization of profits through cost control and optimum utilization of resources.
5. It evaluates for the continuous review of performance of different budget centres.
6. It helps to the management efficient and economic production control.
7. It facilitates corrective actions, whenever there are inefficiencies and weaknesses comparing actual performance with budget.
8. It guides management in research and development.

From the above it is clear that the budgetary control is an effective tool for management control. However, it has certain important limitations which are identified below:
1. The budget plan is based on estimates and forecasting. Forecasting cannot be considered to be an exact science. If the budget plans are made on the basis of inaccurate forecasts then the budget programme may not be accurate and ineffective.
2. For reason of uncertainty about future, and changing circumstances which may develop later on, budget may prove short or excess of actual requirements.
3. Effective implementation of budgetary control depends upon willingness, cooperation and understanding among people reasonable for execution. Lack of cooperation leads to inefficient performance.
4. The system does not substitute for management. It is like a management tool.
5. Budgeting may be cumbersome and time consuming process.

Performance Budgeting:-

Performance budget has been defined as a 'budget based on functions, activities and projects.' Performance budgeting may be described as 'the budgeting system in which input costs are related to the performance, i.e., end results.'

According to National Institute of Bank Management, Performance budgeting is, "the process of analyzing, identifying, simplifying and crystallizing specific performance objectives of a job to be achieved over a period, in the framework of the organizational objectives, the purpose and objectives of the job."

From the above definitions, it is clear that budgetary performance involves the following:

1. Establishment of well defined centres of responsibilities:
2. Establishment for each responsibility centre- a programme of target performance is in physical units.
3. Forecasting the amount of expenditure required to meet the physical plan laid down.
4. Comparison of the actual performance with the budgets, i.e., evaluation of performance.
5. Undertaking periodic review of the programme with a view to make modifications as required.

STANDARD COSTING :-

Standard Costing is based upon standard rate that are very carefully developed and set as scientifically as possible. However, both estimated costs and standard costs are related to future period of time but there are some significant differences between them. Some major s features of standard costs are listed below:

1. Standard costs are based upon standard rates that are carefully developed and set as scientifically as possible.
2. Standard costs are used by those organizations that follow standard costing.
3. Standard costs are fixed after scientific analysis of relevant cost elements.
4. Standard costs are based upon specifications.
5. Main purpose of standard costs is to serve as a tool for cost control.

ADVANTAGES OF STANDARD COSTING:-

Standard costing is not only helpful for cost control purposes but it is also useful in Production planning and policy formulation. It derives following advantages:

1. Measurement of Efficiency: It is a tool for assessing the efficiency after Comparing the actual costs with standard costs to enable the management to evaluate Performance of various cost centers. By comparing actual costs with standard costs Variances are determined and management is able to identify the place of Inefficiencies. It can fix responsibility for deviation in performance. A regular check On various expenditures is also ensured by standard costing system. The standards are Being constantly analyzed and an effort is made to improve efficiency. Whenever a Variance occurs the reasons are studied and immediate corrective measures are Undertaken.
2. Production and Price Policy Formulation: It becomes easy to formulate Production plans by taking into account standard costs. It is also supportive for Finding prices of various products. In case, tenders are to be submitted or prices are to Be quoted in advance then standard costing produces necessary data for price fixation.
3. Reduction of Work: In this system, management is supplied with useful Information and necessary information is recorded and redundant data are avoided. The report presentation is simplified and only required information is presented in Such a form that management is able to interpret the information easily and usefully. Therefore, standard costing reduces clerical work to a considerable extent
5. Management by Exception: Management by exception means that Everybody is given a target to be achieved and management need not supervise each And everything. The responsibilities are fixed and everybody tries to achieve his Targets. If the things are going as per targets then the management needs not to bother. Management devotes its time to other important things. So,

management by exception Is possible only when targets of work can be fixed. Standard costing enables the Determination of targets.

LIMITATIONS OF STANDARD COSTING

Besides all the above benefits derived from this system, it has a number of limitations,which are discussed as follows:

1. Standard costing cannot be used in those concerns where non-standard products are produced.
2. The time and motion study is required to be undertaken for the process of setting up standards. These studies require a lot of time and money. Further, the process of setting up standards is a difficult task, as it requires technical skill.
3. There are no inset circumstances to be considered for fixing standards. With the change in circumstances the standards are also to be revised. The revision of standard is a costly process.
4. This system is expensive and small concerns may not afford to bear the cost. For small concerns the utility from this system may be less than the cost involved in it.
5. The fixing of responsibility is not an easy task. The variances are to be classified into controllable and uncontrollable variances. The responsibility can be fixed only for controllable variances not in the case of uncontrollable.
6. The industries liable for frequent technological changes will not be suitable for standard costing system. The change in production process will require a revision of standard. A frequent revision of standard will be costly. So this system will not be useful for industries where methods and techniques of production are fast changing.

PRELIMINARIES FOR ESTABLISHING STANDARD COSTING SYSTEM:-

The establishment of a standard costing system involves the following steps:

1. Determination of Cost Centre: A cost centre may be a department or part of a department or item of equipment or machinery or a person or a group of persons in respect of which costs are accumulated and one where control can be exercised. Cost centres are necessary for determining the costs.
2. Classification of Accounts: Classification of accounts is necessary to meet a required purpose i.e., function, asset or revenue item. Codes can be used to have a speedy collection of accounts. A standard is a predetermined measure of material, labour and overheads. It may be expressed in quantity and its monetary measurements in standard costs.
3. Types of Standards: The standards are classified into three categories:

(i) Current Standard. A current standard is a standard which is established for use over a short period of time and is related to current condition. It reflects the performance which should be accomplished during the current period. The period for current standard is normally one year. It is supposed that the conditions of production will remain unchanged. In case there is any change in price or manufacturing condition, the standards are also revised. Current standard may be ideal standard and expected standard.

(a) Ideal Standard. The standard represents a high level of efficiency. It is fixed on the assumption that favourable conditions will prevail and management will be at its best. The price paid for materials will be lowest and wastages cost of labour and overhead expenses will be minimum possible.

(b) Expected Standard. This standard is based on expected conditions. It is the target which can be achieved if expected conditions prevail. All existing facilities and expected changes are taken into consideration while fixing these standards. An allowance is given for human error and normal deficiencies. It is realistic and an attainable and it is used for fixing efficiency standard.
(ii) Basic Standard: A basic standard is established for use for an indefinite period or a long period. These standards are revised only on the changes in specification of material and technology production.
(iii) Normal Standard: Normal standard is a standard which is anticipated can be attained over a future period of time, preferably long enough to cover one trade cycle. This standard is based on the conditions which will cover a future period, say 5 years, concerning one trade cycle. If a normal cycle of ups and downs in sales and production is 10 years then standard will be set on average sales and production which will cover all the years.
4. Organisation for Standard Costing: In a business concern a standard costing committee is formed for the purpose of setting standards. The committee includes production manager,purchase manager, sales manager, personnel manager, chief engineer and cost accountant. The Cost Accountant acts as a coordinator of this committee. He supplies all information for determining the standard and later on coordinates the costs of different departments. He also informs the committee about the change in price level, etc. The committee may revise the standards in the light of the changed circumstances.
5. Setting of Standards: The standard for direct material, direct labour and overhead expenses are fixed. The standards for direct material, direct labour and overheads should be set up in a systematic way so that they can be used as a tool for cost control easily.

ANALYSIS OF VARIANCES:

The divergence between standard costs, profits or sales and actual costs, profits or sales respectively will be known as variances. The variances may be favourable and unfavourable. If actual cost is less the standard cost and actual profit and sales are more than the standard profits and sales, the variances will be favourable. On the contrary if actual cost is more than the standard cost and actual profit and sales are less than the standard profits and sales, the variances will be unfavourable.

DIRECT MATERIAL VARIANCES

Direct material variances are also known as material cost variances. The material cost variance is the difference between the standard cost of materials that should have been incurred for manufacturing the actual output and the cost of materials that has been actually incurred.

Material Cost Variance comprises of:

- Material Price Variance
- Material Usage Variance
- material Mix Variance
- Material Yield Variance.
- Material sub usage variance.

The following equations may be used for verification of material cost variances.

(i) MCV=MPV+MUV or MPV+MMV+MYV

(ii) MUV=MMV+MYV

(a) Materials Cost Variance: Material cost variance is the difference between standard materials

cost and actual materials cost. Material cost variance arises due to change in price of materials and variations in use of quantity of Material cost variance is ascertained as such:
Standard Material Cost = Standard Price per unit x Standard Quantity of materials
Actual Material Cost = Actual price per unit x Actual quantity of materials.
NOTE-If the standard cost is more than the actual cost, the variance will be favourable and on the other hand, if the actual cost is more than the standard cost, the variance will be unfavourable or adverse.
(b) Materials Price Variance
Materials Price Variance= Actual Quantity (Standard price–Actual price)
NOTE-If the answer is in plus, the variance will be favourable and it will be unfavourable if the result is in negative.
(c) Material Usage Variance.
Materials usage variance= Standard Price (Standard Quantity – Actual Quantity)
NOTE- If the answer from the above mentioned formula is in plus, the variance will be a favourable variance but if the answer is in minus the variance will be unfavourable or adverse.
(d) Material Mix Variance: Materials mix variance is that part of material usage variance which arises due to changes in standard and actual composition of mix.
The variance is calculated under two situations:
(i) When actual weight of mix is equal to standard weight of mix, and
(ii) When actual weight of mix is different from the standard mix.
(i) When Actual Weight and Standard Weight of Mix is Equal
In this case the formula for calculating mix variance is :
Materials Mix variance=Standard unit cost (Standard Quantity – Actual Quantity)
(ii) When Actual Weight and Standard Weight of Mix are Different
When quantities of actual material mix and standard material mix are different,
the formula will be:
Materials Mix variance=Standard unit cost (Revised Standard Quantity – Actual Quantity)
e) Materials Yield Variance. This is the sub-variance of material usage variance. It results from the difference between actual yield and standard yield. It may be defined as that portion of the direct materials usage variance which is due to the standard yield specified and the actual yield obtained. It may arise due to low quality of materials, defective methods of production, carelessness in handling materials, etc. Material yield variance is calculated with the followingformula:
Material Yield Variance=Standard Rate (Actual yield – Standard yield)
.
DIRECT LABOUR VARIANCES
Labour Variances are discussed as follows:
(a) Labour Cost Variance
Labour Cost Variance or Direct Wage Variance is the difference between the standard direct wages specified for the activity and the actual wages paid. It is the function of labour rate of pay and labour time variance. It arises due to a change in either a wage rate or in time or in both. It is calculated as follows:
Labour Cost Variance = Standard Labour Cost – Actual Labour Cost
Or (Standard time standard x Wage Rate) – (Actual Time x Actual Wage Rate)

(b) Labour Rate of Pay or Wage Rate Variance

The wage rates are determined by demand and supply conditions of labour conditions in labour market, wage board awards, etc. So, wage rate variance is generally uncontrollable except if it arises due to the development of wrong grade of labour for which production foreman will be responsible. This variance is calculated by the formula:

Labour Rate of Pay Variance = Actual time (Standard Rate – Actual Rate)

The variance will be favourable if actual rate is less than the standard rate and it will be unfavourable or adverse if actual rate is more than the standard rate.

(c) Labour Efficiency or Labour Time Variance

It is that part of labour cost variance which arises due to the difference between standard labour hours specified and the actual labour hours spent. It helps in controlling efficiency of workers. Labour efficiency variance is calculated as:

Labour efficiency variance = Standard Wage Rate (Standard Time–Actual Time).

NOTE-If actual time taken for doing a work is more than the specified standard time, the X Standard Cost of Standard Labour Mix variance will be unfavourable. On the other hand, if actual time taken for a job is less than the standard time, the variance will be favourable.

(d) Idle Time Variance

This variance is the standard cost of actual time paid to workers for which they have not worked due to abnormal reasons. The Reasons for idle time may be power failure, defect in machinery, and non supply of materials, etc. Idle time variance should be segregated from the labour efficiency variance otherwise it will show inefficiency on the part of workers though they are not responsible for this. Idle time variance is always adverse and needs investigation for its causes. This variance is calculated as:

Idle Time Variance-Idle Hours x Standard Rate

(e) Labour Mix or Gang Composition Variance

This variance arises due to change in the actual gang composition than the standard gang composition. This variance shows to the management how much labour cost variance is due to the change in labour composition.

It may be calculated in two ways:

(i) When standard and actual times of the labour mix are same. In this case the variance is calculated as follows: .

Labour Mix Variance = Standard Cost of Standard Labour Mix – Standard Cost of Actual Labour Mix.

(ii) When standard and actual time of labour mix are different:

In this case the variance will be calculated as follows:

Labour Mix Variance = Standard Cost of Standard Labour Mix – Standard Cost of Actual Labour Mix

5-. Periodic in nature: It only reveals the changes in the working capital position in the concern between to specific dates. It cannot reveal continuous changes.

6- Not a substitute: It is not a substitute of an income statement or a balance sheet, it provide only some additional information as regards changes in working capital.

OVERHEAD VARIANCES:

It is the aggregate of indirect materials,indirect labour and indirect expenses.Analysis of overhead variances is considered the most difficult among the other types of variances.The reasons for the difficulties are:-

a. Standard overhead rate of fixed overheads is difficult to establish because changes in the volume of output will distort this rate,even though there is no change in the amount of fixed overhead cost.Fixed overheads are determined on the basis of normal volume of output.
b. Conflicting terminology and different ways of computing overheads variances.

Overheads Variances are calculated for fixed and variable overheads.

Certain basic terms connected with the Overheads Variances are:-

Standard Overhead Rate:-The formula to compute this rate is as follows:-

Standard Overhead Rate(per hour)=Budgeted Overheads/Budgeted Hours

- In case when Overhead Rate per Hour is Used:-

Standard Hours for actual Output=Budgeted Hours/Budgeted Output x Actual output

- In case when Overhead Rate per unit is Used:-
  Standard Output for Actual Hours=Budgeted Output(in units)/Budgeted Hours x Actual Hours

1) Overhead Cost Variance:-The difference between standard cost of overheads absorbed in the output achieved and the actual overhead cost.
   Formula:-

Overhead Cost Variance=Absorbed Overheads-Actual Overheads

OCV=(std hours for actual output X std overheads absorption rate)-Actual Overheads

Overhead Cost Variance further divided into:-

A. Variable overheads Variances:-
   Variable Overhead Cost Variance:-

- Variable Overhead Cost Variance=(std hours for actual output X std variable overheads rate)-Actual Overheads Cost

Variable Overhead Cost Variance is further sub-divided into two variances:

a) Variable Overheads Expenditure Variance(Budget Variance):-

V.O. Expenditure Variance=(Std variable overhead rate X Actual hours)-Actual Overhead Cost

b) Variable Overhead Efficiency Variance:-

Variable Overhead Efficiency Variance=Variable Overhead Cost Variance-Variable Overhead Expenditure Variance

B. Fixed Overheads Variances:-

Fixed Overhead Cost Variance

- Fixed Overhead Cost Variance=(std hours for actual output X std F.O. rate)-Actual fixed overheads

Fixed Overhead Cost Variance is sub-divided into two variances:-

a) Fixed Overhead Expenditure Variance(Budget Variance):-

F.O. Expenditure Variance=(Budgeted fixed overheads – Actual fixed overheads)

b) Fixed Overheads Volume Variance:-

F.O. Volume Variance=(std hours for actual output-Budgeted hours) X std rate

Sub-Division of Overheads Volume Variance

Volume Variance is further sub-divided into:

A) Efficiency Variance:-the portion of volume variance that reflects the increased or reduced output arising from efficiency above or below the standard which is expected.

Efficiency Variance=Absorbed fixed overheads-standard fixed overheads

B) Capacity Variance:- the portion of volume variance which is due to working at higher or lower capacity usage than the standard.

Capacity Variance=(std fixed overheads-Budgeted Overheads)

C) Calendar Variance:- The portion of the volume variance which is due to the difference between the number of working days in the budget period and the number of actual working days in the period to which the budget is applied.

Calendar Variance=(Actual no. of working days-std no. of working days) X std rate per day

SALES VARIANCES:-

This variance is used to measure the sales performance of an organization.Sales Variance can be used to measure the efficiency and performance of the sales function on similar terms on which the manufacturing costs are measured.If selling price goes high,volume of sales will decline and viceversa.Thus will result in favourable variance with reference to price and unfavourable variance with reference to quntum of sales.

Sales Variance is further divided on the basis of :

1) Turnover
2) Profit

1). Sales Variance on basis of Turnover:-

It is further sub-divided into:-

- Sales Value Variance=Budgeted Sales-Actual Sales
  Where Budgeted Sales=Budgeted sales in units(BU) X Bugeted Price(BP)
  Actual Sales=Actual Units of Sales(AU) X Actual Price(AP)

- Sales Volume Variance=Budgeted Sales-Standard Sales

Or

SVV=SP(BU-AU)

- Sales Mix Variance=SP(Revised Std.Quantity-Actual Quantity)

Or

SMV=Revised Standard Sales-Actual sales

Where Revised Std Qty.=$\frac{\text{Total qty.of Actual Mix}}{\text{Total qty. of Std.Mix}}$ x Std.Qty.

- Sales Quantity Variance=Budgeted Sales-Revised Std.Sales

Or

SQV=SP(RSQ-SQ)

2).Sales Variance on the basis of Profit:-

It is further sub-divided into:-

- Sales Value Variance=Budgeted Profit-Actual Profit
- Sales Price Variance=Standard Profit-Actual Profit

Or

SPV=Actual Qty.Sales X (Std.Profit Per Unit-Actual Profit Per Unit)

- Sales Volume Variance=Budgeted Profit-Standard Profit

Or

SVV=Standard Rate of Profit X (Budgeted Qty.-Actual Qty)

- Sales Mix Variance=Revised Std.Profit-Standard Profit
- Sales Quantity Variance=Budgeted Profit-Revised Std.Profit

DECOMPOSITION OF VARIANCES:-

Splitting the total difference between actual and standard into two parts or more. For variable costs, the usual decomposition splits the difference into a variance driven by input price per unit of input and another driven by quantity of input used for the amount produced. For fixed costs, the decomposition splits the difference into a variance driven by total amount spent and a variance driven by the volume of production.

CONTROL RATIOS:-

Activity Ratio = Standard Hours for Actual Production ÷ Budgeted Hours x 100
Capacity Ratio = Actual Hours Worked ÷ Budgeted Hours x 100
Efficiency Ratio = Standard Hours for Actual Production ÷ Actual Hours Worked x 100

REFERENCES:-

- www.smallbusiness.chron.com
- www.variablecost.net
- www.ventureline.com
- www.dictionary.reference.com
- www.businessdictionary.com
- www.investopedia.com
- www.careerride.com
- www.bms.co.in
- www.answers.com
- www.accountingtools.com
- **M.N.Arora,9th Edition, -A textbook of Cost and Management Accounting**