COST ACCOUNTING

For the Fourth Semester B.com Cooperation and Finance

BCM4B05 COST ACCOUNTING

Lecturer Hours per week: 6, Credits: 4 Internal: 20, External: 80, Examination 2.5 Hours

Objectives:

> To familiarize the students with the various concepts and elements of cost. > To create cost consciousness among the students.

Module I Introduction : Definition - Meaning and scope - Objectives - Functions -Merits and Demerits - Cost Accounting and Financial Accounting - Cost classification - Elements of cost - Cost units - Cost centre - Types - Methods and Techniques of Costing . (10 Hours, 5 marks)

Module II Materials : Importance of Material cost control - Purchase Procedure - Store control - Types of Store - Stores Records - Perpetual Inventory-ABC Analysis - VED Analysis-JIT Inventory- - Stock levels - EOQ - Issue of materials - FIFO , LIFO , Simple and Weighted Average methods.

Module III Labour and Overheads: Importance of Labour cost control - Time Keeping and Time Booking - Idle Time - Over Time - Computation of Labour cost - Remuneration Systems and Incentive Schemes. Overheads : Definition - Overhead Allocation - Apportionment - ReApportionment -Direct distribution - Step Ladder - Reciprocal Service methods - Repeated Distribution and Simultaneous Equation methods - Absorption of overheads - Methods of Absorption - Labour Hour Rate and Machine Hour Rate . (25 Hours, 20 marks)

Module IV Methods of Costing: Specific order costing: Job costing - Contract costing – Continuous operation costing: Unit Costing - Process Costing (with adjustments of normal and abnormal losses and gains only) - Service costing (only Transport costing) (30 Hours, 30 marks)

Module V Cost control Techniques: A. Budgetary Control: – Budget – Budgeting – Budgetary control - Importance – Need for the preparation of budgets - Types of budgets –Preparation of Cash budget only – ZBB B. Standard costing – Standard cost and actual cost – Variance analysis– Types of variances – Cost control by the use of standard costing (only theory – no problems expected).

(Theory and Problems may be in the ratio of 40% and 60% respectively).

MODULE 1

Chapter 1

INTRODUCTION TO COST ACCOUNTING

The total cost can be found out from financial accounting. But, problem arises when the manufacturer produces more than one type of product. When more than one type of product is manufactured, it becomes necessary to split up the total cost among the various products. Then only the cost per unit of each category of product can be ascertained. Only now the manufacturer can fix the selling price of each category of product. As already stated, from financial accounts, we get only the aggregate cost of all categories of products. Here arises the need for cost accounting. Cost accounting helps in splitting up the aggregate cost (especially indirect cost) among the various categories of products. Thus, a manufacturing enterprise requires cost accounting in addition to financial accounting.

Limitations of Financial Accounting

1. It provides only past data (historical). It is simply a post-mortem of the past events.
2. It does not show profit or loss of each product, job, process etc.
3. It fails to exercise control over resources.
4. It does not measure organisational efficiency.
5. It fails to provide adequate data for price fixation.
6. It does not provide data for comparison of cost.
7. It provides only limited information to management for decision making.

Meaning and Definition of Costing

Costing simply means finding out the cost of a product or service by any method or technique. CIMA, London defines costing as, the technique and process of ascertaining the cost" Thus, costing is the procedure to measure the cost.

Meaning and Definition of Cost Accounting

Cost accounting is the process of accounting for costs. It is the accounting for cost for preparing statements and reports for the purpose of managerial decision making.

According to the latest terminology published by CIMA, "Cost accounting is that part of management accounting which establishes budgets and standard costs and actual costs of operations, processes, departments, or products and the analysis of variances, profitability or social use of funds"

Thus, cost accounting may be defined as a formal accounting system set up for recording analysing, and estimating costs. In short, cost accounting is the formal system for recording costs.

Difference between Costing and Cost Accounting

Costing	Cost Accounting
1. It is concerned with ascertainment of cost. 2. It has narrow scope (includes only cost ascertainment). 3. It involves classification of expenses according to cost elements. 4. It is done by cost accountant.	1. It is concerned with recording of cost. 2. It has broader scope (includes cost ascertainment and cost recording). 3. It involves analysis of cost for the preparation of necessary information. 4. It is done by cost clerks.

Meaning and Definition of Cost Accountancy

CIMA, London defines cost accountancy as the application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability as well as presentation of information for the purpose of managerial decision making". According to this definition, the term 'cost accountancy includes costing, cost accounting, budgetary control, cost control, and cost audit.

Scope of Cost Accounting

1. Cost Recording or (Cost Book-keeping)
2. Cost classification
3. Cost Ascertainment
4. Cost Allocation
5. Cost Analysis
6. Cost Comparisons

7. Cost Control
8. Cost Audit
9. Cost Reporting

Objectives (Purposes) of Cost Accounting

1. To ascertain cost per unit of each product / service.
2. To control cost.
3. To determine selling price.
4. To ascertain the profit of each activity.
5. To prepare financial statements
6. To assist management in decision-making.
7. To ascertain the profitability of different products, jobs or work orders.
8. To measure efficiency
9. To control and reduce wastages.

Functions of Cost Accounting

1. Ascertaining actual cost of each product, job or process.
2. Providing cost data for the purpose of pricing, policy formulation, decision-making etc
3. Controlling costs by setting standards and comparing them with the actuals.
4. Measuring efficiency of each product, process or department:
5. Serving as a tool for planning and budgeting.
6. Helping in the selling price fixation,
7. Helping in the preparation of tenders or quotations.

Merits / Importance / Advantages of Cost Accounting

A. Merits to Management

1. Cost accounting system identifies profitable and unprofitable activities. This helps to reduce or eliminate unprofitable activities.
2. Cost accounts furnish cost data to management for decision continue or shut down, accept or reject etc. Making such as make or buy
3. Cost accounting system helps to exercise control on material, labour and overhead costs through standard costing, budgetary control etc.
4. Cost accounting system helps in minimising losses and wastages relating to materials,idle time, idle capacity etc.

5. Cost accounting helps the management in fixing the selling price.
6. Cost accounting system enables to measure organisational efficiency.
7. Cost accounting helps in appraising the performance of each division, department etc. on the basis of cost comparisons,

B. Merits to Employees

1. Cost accounting facilitates the introduction of incentive schemes and bonus plans. In this way it offers better wages to employees.
2. Cost accounting helps in introducing a good wage system.
3. A good costing system helps in increasing the productivity, profitability and prosperity of firms. On account of this, workers get better wages, job security etc.
4. Cost accounting minimizes the possibilities of misunderstanding between workers and employers.

C. Merits to Creditors and Investors

1. Cost data helps the creditors to ascertain the solvency, profitability and future prosperity of an enterprise before they lend.
2. Cost accounting enables the creditors to ascertain whether the capital employed effectively utilised in the business.
3. Cost data helps the creditors to ascertain the solvency, profitability and future prosperity of an enterprise before they lend.
4. Cost accounting enables the creditors to ascertain whether the capital employed effectively utilised in the business.

D. Merits to Government

1. Cost accounting helps government in formulating policies relating to export, import, taxation, price control measures, wage fixation etc.
2. Cost information helps in preparing national plans and budgets.
3. Cost accounting helps in levying excise duty, sales tax etc.
4. Government can run public sector enterprises efficiently with the help of cost accounts.

E. Merits to Society

1. Cost accounting conducts a war against all kinds of waste. Therefore, consumers get quality products at reasonable prices.
2. Cost accounting brings stability by improving managerial and operating efficiency.
3. Cost saving and cost reduction efforts carried out by various organisations help in curbing inflationary tendencies in the economy.

4. Cost accounting provides continuous employment opportunities to various sections of society.

Demerits / Disadvantages of Cost Accounting

1. Cost accounting lacks uniformity. Different organisations prepare cost records and reports in different methods and forms.
2. Cost accounting provides data for arriving at decisions. It does not offer solutions to a problem.
3. it requires heavy expenditure.
4. Cost computed for one purpose may not be suitable for some other purposes.
5. Cost accounting is not suitable to trading concerns. It is not applicable to small enterprises.
6. Cost accounting is based on assumptions and presumptions. Hence, it is not an accurate or an exact science.

Difference between Financial Accounting and Cost Accounting

Financial Accounting	Cost Accounting
1. Financial accounts are accounts of the whole business. 2. Financial accounts disclose the net results of the business as a whole. 3. Financial accounts deal with all commercial transactions. 4. Financial accounts record only actual (historical) costs. 5. Financial accounts deal with external transactions (between business and outsiders) 6. The main object of financial account is to ascertain correct profit/loss of the business and to show a true and fair view of the state of affairs of business. 7. Financial accounts are guided by generally accepted accounting principles	1. Cost accounts are only a part of the whole accounts. 2. Cost accounts disclose the net profit or net loss of each department, job, product etc. 3. Cost accounts deal with transactions relating to manufacturing and sale of products and services, 4. Cost accounts record both actual costs and estimated costs. 5. Cost accounts deal with internal transactions 6. The main object of cost account is to ascertain the true cost of production. 7. Cost accounts are tailor-made to suit the needs of specific organisation, division, department etc. 8. In cost accounts, stock is always valued at

8. In financial accounts, stock is valued at cost price or market price whichever is less	cost price.

Methods of Costing

1. Job Costing
2. Batch costing
3. Batch costing
4. Process costing
5. Single or unit costing
6. Operating costing
7. Operating costing
8. Multiple costing

Types or Techniques of Costing

1. Absorption Costing; It is the process of charging all costs (both variable and fixed to products, services, jobs or processes. It is also called full costing
2. Marginal Costing: It is the process of charging only variable costs to products, operations and process. It is also known as variable costing.
3. Direct Costing: It is the process of charging all direct costs (all variable costs and some fixed costs) to products, services, jobs etc. The indirect costs are excluded and written off against the profit of the period in which they arise.
4. Differential Costing: It is the technique of comparing cost of two alternatives for the purpose of deciding which alternative is the best.
5. Uniform Costing: It is the use of same costing principles, practices and methods by several undertakings for a common control or comparison of costs.
6. Historical Costing: It is the ascertainment of costs after they have been incurred.
7. Standard Costing: It is a system of comparing actual cost with standard cost, analysing variances and taking remedial action, if necessary.

MODULE 2

Chapter 2

COST CLASSIFICATION & ELEMENTS OF COST

Meaning and Definition of Cost

The term 'cost' has variety of meanings. It is defined by different people differently. In the Oxford Dictionary cost means "the price paid for something". It means anything which is given or sacrificed to obtain something. But in cost accounting, it has a specific meaning. A cost is incurred when a resource is used for some purpose. In other words, when a business enterprise produces or sells goods or services, it incurs costs. Thus, in cost accounting, the term cost refers to the resources consumed to produce a product or service.

ICMA London defines cost as the amount of expenditure incurred on a given thing. Thus, cost is the expenditure incurred to secure an economic benefit. In short, cost refers to the total expenses incurred on the production and sale of products and services.

Expense

Cost provides a benefit. If the benefit is received immediately, then the cost becomes an expense, such as salary expense. If the cost gives future benefits, then the cost is known as asset or expenditure, such as machinery. As the asset is used, an expense such as depreciation arises. Thus, cost includes expense and expenditure.

The AICPA defines expense as "all expired cost which is deductible from revenue". In short, expense is an expired cost with a matching economic benefit.

Loss

If no benefit is received from the cost incurred or it is sure that no benefit will accrue, the cost becomes lost. This lost cost is known as loss.

Classification of Cost (or Types of Costs)

1. Classification According to Functions:
   (a) Manufacturing cost (Production cost), (b) Administrative cost, (c) Selling cost,
   (d) Distribution cost, (e) Financing cost.
2. **Classification According to Behaviour or Variability:**
   a. Fixed cost
   b. Variable cost
   c. Semi variable cost
   d. Step cost
3. **Classification According to Identifiability or Traceability:**
   a. Direct costs
   b. Indirect cost
4. **Classification by Association with Time and Period:**
   a. Historical Cost
   b. Product cost
   c. Period cost
   d. Pre-determined
5. **Classification on the Basis of Managerial Decisions:**
   a. Sunk costs
   b. Opportunity costs
   c. Differential costs
   d. Imputed cost
   e. Out of pocket cost
   f. Shut down cost
   g. Marginal cost
   h. Conversion cost

i. Relevant cost

Cost Units

Cost unit is the unit in which the cost is expressed and ascertained. CIMA, London defines cost unit as "a unit of quantity of product, service or time (or a combination these) in relation to which costs may be ascertained or expressed" it is a device for the purpose of breaking up costs into smaller subdivisions. For example, in the case of steel industry. Its output is measured in terms of tonnes. In this case 'tonne is the cost unit. Therefore, cost per ton of steel is to be computed.

Types of Cost Units

1. Simple cost unit: A simple cost unit measures just one characteristic such as length or volume or weight. Examples of simple cost unit are per tonne, per kg. per 1000 etc.
2. Composite cost unit: The composite cost unit is a combination of two simple cost units. Examples are patient day, tonne km, passenger km. etc.

Cost Centre

For the costing of products or services, an organisation should be divided into departments or branches or sections. Each department or branch or section is known as cost centre. In simple words, cost centre means a section (department) of the business to which cost can be charged. Each cost centre is headed by a responsible person for controlling the cost in his cost centre. Thus, a cost centre is a unit of the organisation in respect of which a manager is responsible for costs under his control

CJ.MA, London defines cost centre as "a location, person, or item of equipment (or group of these) for which costs may be ascertained and used for the purpose of cost control". Thus cost centre is the smallest part of an organisation or area of responsibility for which the costs are collected.

Types of Cost Centre

1. Operation cost centre: Operation cost centre consists of those machines and/or persons carrying out similar operations.
2. Process cost centre: A process cost centre is a cost centre in which a specific process or a continuous process of operation is carried out.
3. Production cost centre: A production cost centre is one which is engaged on regular production.
4. Service cost centre: A service cost centre is one which is engaged in rendering services to production cost centres

5. Personal cost centre: Personal cost centre consists of a person or group of persons. For example, departmental foreman, salesman, supervisor, factory manager etc…
6. Impersonal cost centre: An impersonal cost centre consists of a location or item of equipment or a group of these. For example, machines, departments, vehicles etc…

Difference between Cost Unit and Cost Centre

Cost Centre	Cost Unit
1. Cost centre is a segment of an organisation for which costs are accumulated. 2. The concept of cost centre is used for accumulation and control of costs. 3. Different cost centres may be involved in the production of a product. 4. Cost centres are created for assisting the management in the functions of budgeting and controlling 5. Formulation of cost centres depends upon the nature and techniques of production processes, size of the organisation and the structure of the organisation	1. Cost unit is a unit of measurement of cost. 2. The concept of cost unit is used to ascertain costs. 3. A product will have only one cost unit. 4. Cost units are determined not for budgeting and controlling. 5. Determination of cost units depends upon the nature of the final product and the prevailing trade practices.

Elements of Cost

1. Material
   a. Direct material
   b. Indirect material
2. Labour
   a. Direct labour
   b. Indirect labour
3. Expenses

a. Direct expenses
b. Indirect expenses

Overheads

Overheads are indirect charges. These are the aggregate of indirect material cost, indirect labour cost and indirect expenses. These are operating expenses. Overheads cannot be conveniently and directly charged to specific cost centre or cost unit. These are to be apportioned or absorbed. Overheads are also called oncost. They are sometimes called "burden'.

According to function, overheads can be classified into four, namely, factory overheads, office overheads, selling overheads and distribution overheads.

1. Factory overheads
2. Office overhead
3. Selling overhead
4. Distribution overhead

Divisions or Components of Cost

1. Prime cost
2. Factory cost
3. Cost of production
4. Total cost

Prime cost:

Prime cost = Direct material + Direct labour + Direct expenses

Factory cost:

Factory cost or Works cost Prime cost + Factory or Works overhead

Cost of production:

Cost of production or office cost = Factory cost + Office and administration overheads

Total cost:

Total cost or cost of sales = Cost of production + Selling and distribution overheads

MODULE 3

CHAPTER- 3

MATERIAL

Meaning of Materials

Production of any article will require some form of materials. Material is the substance from which the product is made. Materials are the basic substances that are transformed into finished goods. Materials include the following: (a) Raw materials, (b) Components, (c) Consumable stores, (d) Maintenance materials, (e) Tools, and (f) Primary packing materials.

Stores

Stores include not only raw materials used in production but also other items held in stock in the store room such as components, tools, patterns, maintenance materials, consumable stores etc. It also includes stock of work-in-progress and finished goods.

Inventory

For the smooth running, every enterprise needs inventory. The term inventory is derived from the French word "inventaire" and the Latin word "inventariom". Both mean a list of things found. The dictionary meaning of inventory is stock of goods or list of goods.

Classification of Materials

1. Direct materials
2. Indirect material

Material Control (Inventory Control)

In almost all manufacturing concerns, materials constitute a large proportion of total cost. Material is equal to money. Therefore, there should be a proper system of material control to minimise the cost of production.

Material control process

1. Purchasing
2. Receiving
3. Storge
4. Issue

Purchasing

Types of purchasing

1. Centralized Purchasing
2. Indirect Purchasing

Types of Stores

There are mainly three types of stores. They are:

(1) Centralized stores,
(2) Decentralized stores, and
(3) Central stores with sub stores.

Bin

Bin means a place or section of the stores where materials or goods are kept. The store will be divided into different sections, each meant for storing a particular type of materials. Each section is called a bin. The bin should be appropriately numbered for easy identification.

Stores Records (Material Records)

it is essential to keep proper records relating to materials. Two sets of material records are generally maintained. One set is maintained by the storekeeper in the stores and the other set is maintained by the costing department in the costing office.

Records Maintained by the Storekeeper

1. Bin card
2. Stores material control record

Records Maintained by the costing Department

1. Stores ledger
2. Material abstract

Techniques / Methods of Material/inventory/Stores Control

1. Classification and codification of materials
2. Double bin system
3. Stores stock levels
4. Economic order quantity
5. Material turnover ratio
6. Stock verification system
7. Imprest system
8. Selective inventory control methods:
    a) ABC analysis
    b) VED analysis
9. JIT inventory technique.

Stores stock Levels

1. **Maximum Level**

    Maximum level = Reorder Level + Reorder quantity – (Minimum consumption x Minimum reorder Period

2. **Minimum Level**

Minimum Level = Reorder level – (Normal Consumption x Normal reorder period

$$Normal\ or\ average\ reorder\ peroid = \frac{max.reorder\ period + min.reorder\ period}{2}$$

3. **Reorder Level**

$$Reorder\ level = Max\ consumption * Max.reorder\ period$$

Or

$$Minimum\ level + avg\ consumption * average\ reorder\ period$$

4. **Average Stock level**

$$averge\ stock\ level = minimum\ level + \frac{1}{2} reorder\ quantity$$

5. Danger level

$$danger\ level = avg\ consumption * maximum\ reorder\ period\ for\ emergency\ purchses$$

Or

$$minimum\ consumption * minimum\ reorder\ period$$

6. **Economic order quantity**

While purchasing the materials an important question arises as to what quantity should be purchased or ordered. The quantity of materials that is ordered should be neither too large nor too less. If it is large, holding cost of inventory will be larger. If it is less, ordering cost will be larger. So the size of the order must be economic. This means that only optimum or most favourable or economic quantity should be purchased at a time. This quantity is called economic order quantity.

Determination of EOQ

1. Algebraic method
2. Graphical method
3. Tabular method

4. Cost comparison method

Algebraic method

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

C= Annual consumption

O= Cost of placing order

I= Annual carrying or storage cost

Material Inventory Turnover Ratio

$$Stock\ turnover\ ratio = \frac{Cost\ of\ mterial\ consumed}{Average\ stock}$$

$$cost\ of\ material\ consumed = opening\ stock + purchases - closing\ stock$$

$$average\ stock = \frac{opening\ stock + closing\ stock}{2}$$

$$Material\ turnover\ ratio\ (days) = \frac{365}{materil\ turnover\ ratio\ in\ times}$$

Stock Verification (Inventory System)

Generally the materials purchased for production are not fully consumed. There is some quantity of stock at any time. To check the material losses, it is necessary to verify properly the material in stock. There are mainly two methods of verification of materials (inventory systems) -periodic inventory system and perpetual inventory system.

Periodic Inventory System

Under periodic stock verification the entire stock is verified at a time at periodic intervals, usually once a year (at the close of the accounting period). Thus stock taking at the end of the year (or half year) is called periodic stock taking or periodic inventory system.

Perpetual Inventory System

This is another system of verification of materials. The system of material control on a continuous basis while the material is in storage is called perpetual inventory system. Under this system the actual stock is taken continuously and is compared with the stock as shown by the material records.

Selective Inventory Control

The various selective inventory control techniques are: ABC Analysis, VED Analysis, SAP Analysis, FSN Analysis, HML Analysis, SDE Analysis, SOS Analysis, GOLF Analysis, XYZ Analysis etc. Only ABC Analysis and VED Analysis may be discussed here.

ABC Analysis (Always Better Control or Alphabetic Control)

In the case of large concerns large number of items are kept in the stores. Therefore, it is practically impossible to concentrate on each and every item. In such situations, ABC analysis is used with a view to exercise better control over materials. It is one of the best and popular techniques of inventory control. Under ABC analysis all materials are classified into three categories - A, B and C according to value. Category A includes high value materials (costlier materials). Category B includes medium or moderate value of materials (neither expensive nor cheap). Category C includes lower value materials (least costly materials). According to this technique a greater or strict control is exercised over Category A materials, a moderate control is exercised over Category B materials and relatively lesser degree of control over Category C materials. Thus ABC analysis is an analytical technique of material control that divides materials into three categories and uses different degrees of control over each category.

VED Analysis

One disadvantage of ABC analysis is that it gives priority to usage value and ignores the criticality of items. In real life, there are many items which do not have high usage value but are critical. For example, an important spare part of a machine may not be in 'A' or 'B' category but may bring the production process to stoppage. VED analysis is an important technique for solving this problem. Under this technique, inventories are classified into three catogories in the decreasing order of their criticality. Accordingly, inventories are classified into Vital, Essential and Desirable. Vital items are those which are very critical for production. If these are out of stock, it will lead to immediate production stoppage and heavy production los. Essential items are those which are very important. They are essential, but their absence (for few days) would not do much harm in production.

JIT (Just In Time) Inventory Technique

JIT is a modern technique of inventory control. It was first used by the Japanese Mo Company, Toyota. It was advocated by Taichi Ohno, Vice President of Toyota. The system aims at minimising inventories of raw material and work-in-progress. It also aims at eliminating waste from every aspect of manufacturing and its related activities.

Material Requisition

Materials will be issued by the storekeeper only on presentation of a duly authorised document called "Materials Requisition Note" it is also known as Stores Requisition Note. It is a formal request by the user department to the storekeeper for issue of materials. It is defined as a document which authorises and records the issue of material for use.

Bill of Materials

As soon as an order is received the engineering or planning department prepares "Bill of Materials'. Bill of materials is a list of materials required for executing the order. It gives the details of materials required and the quantity of each item. It is also called Specification of Materials.

Methods of Pricing Material Issues (Methods of Valuing Materials)

Materials are purchased not at one time but at different times in different quantities at different prices. Thus stock consists of materials purchased in different quantities in different dates at different prices.

Methods of Pricing Material Issues

A. Cost Price or Actual Cost methods

1. First In First Out (FIFO)

2 Last In First Out (LFO)

3. Base Stock

4. Specific Price

5. Highest In First Out (HIFO)

6. Next in First Out (NIFO)

B. Average Price (Cost) Methods

1. Simple Average

2. Weighted Average

3.Periodic Simple Average

4. Periodic Weighted Average

5 Moving Simple Average

6. Moving Weighted Average

C**. Notional Price Methods**

1 Standard Price

2 Inflated Price

3. Market Price

4. Re-use Price

First-In First-Out (FIFO) Method

Under this method materials are issued in the order in which they are received in the stores. This means that materials received first are issued first. After completion of the first lot, the second lot is issued and so on. Automatically, closing stock will be valued at the latest prices. This method is also known as original cost method.

In times of falling prices, FIFO method is found to be useful. This is because the cost of materials issued to different jobs will be high and profit will be lower. This reduces the tax liability.

Last-in First-out (LIFO) Method

This method is the just reverse of FIFO method. Under LIFO method, materials received last are issued first. After the latest consignment is exhausted, the price of the previous batch is used and so on. Thus, materials are issued at the latest consignment prices. So closing stock is valued at the oldest consignment prices. In times of rising prices, LIFO method is particularly useful. Production is charged at the prices of latest purchases which are same as or close to current market price. Thus the material cost will be high and profit will be lower. This reduces the tax liability.

Average Price Methods

Average cost methods are based on the assumption that the materials purchased in different lots are stored together and an issue cannot be made from any specific lot. Therefore, materials are issued at the average cost price irrespective of the date and price of purchase Important methods are simple average method, weighted average method, periodic simple average method, periodic weighted average method, moving simple average method and moving weighted average method.

Simple Average Price Method

Under this method, the issue price is calculated by dividing the total of unit prices of materials in the stock from which materials are issued by the number of prices entering in the calculation. The average price changes when a new consignment is received.

Weighted Average Price Method

Under weighted average method issue price is calculated by dividing the value of material in stock by the quantity of material in stock. Thus this method takes into account both the quantity and price of materials in stock. The same issue price is applied to all issues until a new consignment is received, This method is suitable when there are wide fluctuations in the prices of materials.

MODULE 3

LABOUR AND OVERHEAD

Meaning of Labour

Labour represents human contribution to production. It is the physical or mental effort expended in manufacturing a product. In other words, the human effort required for the conversion of raw material into finished goods is called labour. Labour cost is the price paid for using human resources in an enterprise. It represents any remuneration paid to the employees in the form of wages, salaries, commission, bonus, perquisites, etc.

Types of Labour

From the cost accounting (or controlling) point of view, labour is classified into

1. Direct labour and
2. Indirect labour.

DIRECT LABOUR	INDIRECT LABOUR
1. It can be identified with finished product.	1. It cannot be identified with finished product.
2. It can be directly charged to a particular cost Centre or cost unit.	2. It cannot be directly charged to a particular cost centre or cost unit but can only be apportioned.
3. It is primary in production.	3. It is secondary or subsidiary to production
4. It is a part of prime cost.	4. It is a part of overhead.

5. It varies according to change in output.	5. It remains fixed.

What is Included in Labour Cost?

(a) Current monetary benefit: This includes:

(1) Basic wages (ii) DA (i) Production bonus etc.

(b) Deferred monetary benefits: These include: (i) Employer's contribution to PF (1) Employer's contribution to state insurance (iii) Gratuity (iv) Profit bonus (v) Pension etc.

(c) Fringe benefits (Non-monetary benefits): These include: (i) Subsidised food (canteen) (n) Clothing (iii) Medical facilities (iv) Education (v) Housing (vi) Transport facilities etc.

(d) Labour - related costs: These include: (i) Holiday pay (ii) Leave pay (iii) Premium pay (iv) Idle time pay (v) Overtime pay.

Labour Cost Control

The efficiency of production to a large extent depends on the proper utilization of labour force. Hence there is a need to have a control over labour cost. Labour cost control may be defined as a system which ensures proper employment of labour and its effective utilization Labour cost control involves employment of efficient workers, proper training of workers, proper time keeping and time booking and proper accounting for the wages paid to them.

Time Keeping

In large enterprises there is a separate time keeping department. It is under the control of a time keeper. He is engaged in time keeping. When a worker enters a factory, his attendance is recorded at the factory entrance. Similarly, when a worker leaves the factory after the work, his departure time is also recorded. This process of recording the time of arrival and departure is known as time keeping.

Objectives or Purposes of Time Keeping

1 To facilitate preparation of payroll if wages are paid on time basis.

2 To meet statutory requirements.

3. To maintain discipline in attendance.

4. To calculate overtime.

5. To provide a basis for apportionment of overheads (if based on wages or labour

6. To control labour cost.

7. To introduce incentive plans of wage payment.

Methods of Time Keeping

Manual methods: Under this method the attendance time of workers is recorded either by the time keeping officer or by the employees themselves. The manual methods are: (a) attendance register method, and (b) disc or token method.

(a) **Attendance register method.** Under this method, an attendance register (muster-roll) is maintained for recording the attendance time. It is usually kept at the time office (generally located at the factory gate) or in each department where workers are working. In the register there are two separate columns for 'in' and 'out' corresponding the names of each employee.

(b) **Disc or token method:** Under this method a separate metal disc is allotted to each worker. The metal disc bears the identification number of an employee. These metal discs or token are placed on the hooks on a board kept either at the factory gate or at the department entrance. Whenever a worker enters into factory gate he has to take the token bearing his identification number and put it into a box or tray kept for this purpose. After a short while of the scheduled time of the factory the original box or tray is removed and in its place a later box or tray is kept. The purpose is to know the late comers.

Mechanical methods: To overcome the defects of manual methods, today many organisations use mechanical methods for time keeping. The various methods are:

(a) Time recording clock method,

(b) Dial time recorder, and

(c) Key recorder.

Time Booking

In addition to recording the time of arrival and time of departure, it is also necessary to record the time spent by a worker on various jobs. Recording of time spent by worker on different jobs carried out by him during his period of attendance in the factory is called time booking. In short, time booking is concerned with recording of work time of a worker.

Objectives or Purposes of Time Booking

1. To ascertain labour cost of each job.

2. To ensure that time paid for is fully utilised on production.

3. To disclose idle time (wastage of time) so as to control it.

4. To apportion overheads to different jobs or work orders when it is based on labour hours.

5. To ascertain the level of efficiency of workers.

6. To compare labour costs of different jobs.

7. To control labour cost.

Time Keeping	Time Booking
1. It records attendance time of workers.	1. It records work time of workers.
2. It records the time spent by the workers in the factory.	2. It records time spent by workers on various jobs.
3. It is the first step in time recording.	3. It is the second step in time recording.
4. Its purpose is to enable preparation of pay	4. Its purpose is to ascertain labour cost of job.

roll. 5. It is done at the time keeping office.	5. It is done at various production departments.

Methods of Time Booking

1. **Daily time sheet:** In small firms, a daily time sheet is given to every worker. The daily time sheet contains the worker's name, code number, starting and closing time of each job. The worker records the time spent on every work order or job in this daily time sheet. The worker hands over this sheet every day to the foreman.

2. **Weekly time sheet:** In order to reduce clerical work, each worker may be given a weekly time sheet. In this sheet the worker has to record the time spent on all jobs in a week. The only difference between daily time sheet and weekly time sheet is that in the case of weekly time sheet it records the details of one week's work and in case of daily time sheet it records only a day's work. Weekly time sheet is a consolidation of the total hours worked during a week. The total hours spent can be checked with the attendance register.

3. **Job card:** This is another method of recording the time spent by the workers on the job. Under this method, a separate card is maintained for each job. This card is known as job card or job ticket. When a worker starts work on a job, he will be allotted the job card. In that card he records the time of starting the job. When he completes the job, he will record the time of completion of the job. Thus the time spent on the job can easily be ascertained.

Advantages of Job Card

The advantages of job card are as follows: (a) It is simple to operate, (b) It is easy to calculate labour cost of a job, (c) It reduces considerable amount of clerical work, (d) It serves as an authority to worker to start the work, (e) It facilitates to keep a close watch on the time spent by the workers on each job.

Wages Abstract

Wages abstract is an analytical statement of labour cost of each job. It is a document showing the distribution of wages by job, department etc. It is prepared by the costing department. It is also known as wages analysis sheet.

Time Wage System

Time wage system is the oldest system of wage payment. It is the most simple and common method of wage payment. Under time wage system wages are paid to workers on the basis of time they work. Output produced by the workers is not considered. A time rate is fixed which may be hourly rate, day rate, weekly rate or monthly rate. Under this method, wage is calculated by the following formula:

Earnings Hours worked x Rate per hour

Advantages of Time Wage System Time rate method has the following advantages:

1. It is easy to understand and simple to operate.

2.Every worker is guaranteed a minimum wage irrespective of the efficiency.

3. Quality of production is generally maintained because workers do not work in a hurry.

4. Defective products and breakage of tools are minimum.

5. It is suitable to beginners and learners.

Disadvantages of Time Wage System

Time rate method has the following disadvantages:

1. It does not provide any incentive to work hard.

2 It ignores the efficiency of workers.

3 Idle time is more.

4. It requires close supervision.

5. Workers tend to work slow. Hence, production will suffer and labour cost per unit will increase

Piece Wage System

Under this method wages are paid on the basis of the number of articles produced by the workers. Thus, in this case wages are determined on the basis of quantity of work done. Time spent on production or on jobs is not considered at all. Rate per unit is fixed and workers are paid for the total units produced. This system is also known as payment by result. Earnings are calculated as follows:

Earnings = Number of units produced x Piece rate

Types of Piece Rate System

(a) Straight piece rate: In this system payment is made on the basis of fixed amount per unit produced

Earnings = Number of units produced x Rate per unit.

Here rate per unit is the straight piece rate.

(b) Piece rate with guaranteed weekly wage: Under this system minimum wages equal to time wages are guaranteed. If the piece wage is less than the time wage, the worker gets the time wages. On the other hand, if piece wage is more than the time wages, the worker gets piece wages.

(c) Differential piece rate: In this system there are two or more piece rates. For different levels of output different piece rates are applicable. Output below a certain level (below standard) is paid at a lower piece rate. Output at or above a certain level (at or above standard) is paid at a high piece rate. In short, efficient worker is paid at a high piece rate and inefficient worker is paid at a low piece rate.

(d) Group piece rate: Under this system a group of workers as a whole is paid wages on group basis for the number of units produced by the group. The group then divides the earnings of the group amongst its members on some mutually agreed basis, e.g., on the basis of hours spent by individual workers in the group.

Different between Time Wage System and Piece Wage System

Time wage system	Piece wage system
1. Wages are paid on the basis of time worked.	1. Wages are paid on the basis of quantity of work done.
2. Efficiency is not rewarded.	2. Efficiency is rewarded.
3. It requires more supervision.	3. It requires less supervision.
4. Its emphasis is on quality of product.	4. Its emphasis is on quantity of product.
5. Minimum wage is guaranteed.	5. Minimum wage is not guaranteed.
6. It is favored by trade unions.	6. It is not favored by trade unions.

Incentive Schemes (Premium Bonus Plans)

Both time wage system and piece wage system have their own merits and demerits. Time wage system is not profitable to the employer. In piece rate system minimum wages are not guaranteed to workers. Bonus plans attempt to overcome the limitations of both time wage system and piece wage system and to combine their advantages. Florence defines incentive plans as, "giving a worker an opportunity to earn something in exchange for more productivity.

Features of Incentive or Premium Plans

The main characteristics of bonus plans are outlined as below:

1. Minimum wages are guaranteed to all workers.

2. Standard time is fixed and the workers are to complete the job within the standard time.

3. A Bonus etc. are given to efficient workers for the time saved.

4. Both employer and employees share the benefit of time saved.

5. Wages per hour increases but not in the same proportion as the output.

6. Labour cost per unit decreases.

Individual Incentive Plans

1. Halsey premium plan.

2. Rowan premium plan.

3. Merrick's multiple piece rate system.

4. Emerson's efficiency plan.

5. Haynes plan.

6. Halsey - Weir plan.

7. Taylor's differential piece rate system.

8. Gantt task and bonus plans.

9. Bedeaux point scheme.

10. Accelerated premium plan.

Halsey Premium Plan:

This plan was introduced by F.A Halsey (American engineer) in 1891. Under this system a standard time is fixed for a job. Workers are required to complete the task within the standard time. The worker is paid wages for the actual time taken. In addition, he is given bonus for the time saved (if he completes the job in less than the standard time) The amount of bonus is 50% of time saved. Halsey

plan is called Fifty-Fifty Plan. It is also called Split Bonus Plan. In this method earnings are calculated as follows:

Wage = TxR

T= Actual time taken

S = Standard time or time allowed

R = Rate of wage payment(or rate per hour)

Total earnings = Wages + Bonus

Halsey- Weir Plan:

It is similar to Halsey plan, but the rate of bonus is 33 1/3 % of time saved.

Rowan Premium Plan: This plan was introduced by David Rowan in 1901 in Glasgow. Under this plan, the worker gets wages for actual hours worked and a bonus for the time saved. Under this method the bonus is that proportion of the wages for the time taken which the time saved bears to standard time. The bonus is calculated as follows:

$$\frac{time\ saved}{std.\ time} * time\ taken * hourly\ rate$$

Time saved = Standard time - Time taken

Advantages of Rowan Plan

1. It guarantees minimum wage and provides incentive for efficiency.

2. It is more liberal than Halsey plan.

3. Overhead cost per unit decreases with increase in efficiency.

4. It provides more bonus up to 50% of the standard time, thereafter the incentive gradually declines.

Taylor's Differential Piece Rate System:

This plan was introduced by F.W Taylor, the father of scientific management, in 1880. Under this system a standard output (or standard time) is fixed on the basis of time and motion study. Two piece rates are also determined. One is high piece rate and the other is low piece rate. If a worker produces standard output or more than standard output (or completed the work within the standard time) he will be given high piece rate. If a worker produces less than standard output (or takes more than standard time to complete the work) he will be given a low piece rate. Thus the significant feature of Taylor's plan is that there are two piece rates. One is a low piece rate for output below the standard. The second is a high piece rate for output at or above the standard.

Advantages of Taylor's Differential Piece Rate System

1. It rewards efficiency.

2. It gives incentive to produce more. Hence it increases production.

3. Increased output reduces the cost per unit.

4. It is a systematic and scientific method.

Disadvantages of Taylor's Differential Piece Rate System

1. It severely penalizes the workers who just fail to attain the standard.

2. It does not guarantee minimum wages.

3. It makes a discrimination between efficient workers and less efficient workers.

4. The difference between the two piece rates is very high.

Merrick's Multiple Piece Rate System:

This plan was developed by M.D.V Merrick. This method is similar to Taylor's plan. But there are three piece rates (instead of two as in Taylor's system). The three piece rates are as follows.

Gantt task and bonus plan:

This system of wage payment was developed by H.L. Gantt, a close associate of FW Taylor. This plan is a combination of time rate, piece rate and bonus. Under this system a standard output (or standard time) is fixed. Workers are required to produce the standard output (or complete the task within the standard time). If a worker fails to attain the standard, he will be given time wages. Thus time wages are guaranteed. If a worker attains the standard (i.e., produces the standard output or completes the task within the standard time i.e., 100% efficiency), he will be paid time wages plus bonus which is 20% of time wages. If a worker produces more than the standard output (or takes less than the standard time i.e., above 100% efficiency), he will be paid at a high piece rate.

Emerson's Efficiency Plan:

This plan was originated by Harrington Emerson in USA. Under this plan a standard output per unit of time or standard time for a task/job is fixed. On the basis of standard output or standard time, workers' efficiency is measured. If the worker's efficiency is below 66 2/3%, he will get time wages only (no bonus). Thus time wages are guaranteed.

Accelerated premium plan:

Under this system a standard output or time is fixed. The actual output or time taken is compared with standard output or time and level of efficiency is determined. For different levels of efficiency bonus is paid at different rates. Bonus increases at a faster rate as production or efficiency increases. This plan is also known as sliding scale bonus system.

Group Bonus Plans

In all the schemes discussed so far, bonus is calculated on the basis of workers' individual performance. However, there are certain operations which are required to be performed collectively by a number of workers. The ultimate production depends on the collective effort of the group as a whole. For example, assembly type of work such as automobiles, radio, T.V, refrigerators etc. In this case the efficiency of an individual worker cannot be identified. Hence bonus is paid to the group. When bonus is paid collectively to a group of workers, it is called group bonus system. The amount of bonus is shared by the group either equally or according to an agreed proportion.

Advantages of Group Bonus Schemes

1. Output can be increased due to team spirit and co-operation.

2. Fixed cost can be reduced.

3. Time wages are guaranteed to all the members of a group.

4. It does not require strict supervision and inspection.

5. It eliminates waste, defectives and spoilage.

6. Indirect workers can also be brought under incentive schemes.

Disadvantages of Group Bonus Plans

1. An efficient worker is penalized for the inefficiency of other members of the group.

2. It does provide any incentive to efficient workers.

3. It creates some problems in the distribution of bonus to the individual workers.

4. It creates rivalry, jealousy and misunderstanding among the members.

5. The share of bonus to individual workers is insignificant.

Method of Wage Payment (or Incentive Plan)

A sound system of wage payment (or incentive plan) should have the following features:

1. Simplicity: The method of wage payment should be easy to understand by the workers and simple to operate.

2 Fairness: The system of wage payment should be fair and equitable both to the employer and employees.

3. Flexibility: The plan of wage payment should be flexible to make necessary changes which may arise.

4. Acceptability: The wage system should be acceptable to the workers, trade unions, management and other related parties.

5. Economical: The cost of operation of the system must be low.

6. Incentive: The system should provide sufficient incentive to workers to work hard.

7. Minimum wage: The system should guarantee a minimum wage to every worker.

8. Quality output: The system must encourage the workers not only to increase quantity of output but also to improve quality of output.

9. Capacity to pay: The method of wage payment must be such that the wages should be in accordance with the capacity of the organisation to pay.

10. Merit: Wages should be paid according to merit. Efficient workers should be rewarded.

Prevention of Fraud in Wage Payment

1. Badge number

2. Verification.

3. Certify.

4. Internal check.

5. Presence of executive

6. Payment to person concerned

7. Envelops

8. Unclaimed wages.

9. Payment to ou workers

10. Payment to casual workers.

Idle Time

Idle time arises in those factories where workers are paid wages on time basis. In such factories a difference is likely to arise between the gate time (as per time keeping records) and the time actually spent on production (time booked as per time booking records). This difference of time (unproductive time) is the idle time.

Causes of Idle Time

1. Productive causes

(a) Machine breakdown

(b) Power failure

(c) Waiting for work

(d) Waiting for tools

(e) Waiting for materials.

2. Administrative causes:

(a) Poor planning

(b) Poor factory layout

(c) Poor work schedules

(d) Poor decisions

(e) Lack of supervision

(f) Unusual tea breaks

(g) Distance between factory gate and place of work

(h) Interval between one job and another

3. Economic Causes:

(a) Low demand for products

(b) Strikes or lockouts

(c) Under-utilization of capacity

(d) Seasonal nature of industries.

Types of Idle Time

Idle time is of two types-normal idle time and abnormal idle time.

Normal idle time

Normal idle time refers to loss of time arising in the normal or routine course of manufacture. It is inherent in the production process. It is natural and unavoidable. It can be estimated in advance. In short, time wasted due to unavoidable reasons is called normal idle time.

Abnormal idle time

Any loss of time in excess of normal idle time is abnormal idle time. It refers to waste of time which occurs due to abnormal or unanticipated reasons. It is avoidable to a great extent if proper supervision and control over labour is maintained. It is irregular and unexpected arises only occasionally. In short, time wasted due to avoidable or abnormal reasons is called abnormal idle time.

Causes of abnormal idle time

1. Machine break down
2. Power failure
3. Strikes, lockouts
4. Non-availability of materials, tools etc.
5. Lack of instructions
6. Fire, flood, earthquake, accident etc.

Treatment of Idle Time in Cost Accounts

Treatment of normal idle time:

(**a) Inflated wage rate method**: Under this method wage rate is inflated proportionately and spreading the cost of idle time over the effective hours. In this case direct labour cost per hour is increased to cover the cost of idle time.

(b) Overhead method: Under this method idle time cost is treated as works overhead and wages for effective hours should be charged to production as direct labour cost.

Treatment of abnormal idle time:

Being controllable, abnormal idle time cost should not form a part of cost of production. It should be excluded from cost. Accordingly abnormal idle time wage should be debited to Costing, P/L A/C.

Overtime

In every organisation normal working hours per day and per week would be fixed. Sometimes workers will have to work beyond the normal working hours. Work done beyond the normal or regular working hours is called overtime. According to Indian Factories Act, 1948, any worker who works for more than 9 hours a day or 48 hours a week is said to have worked overtime and overtime is to be paid at double the normal rate. In short, any time worked over and above the normal time is called overtime. The additional amount paid on account of overtime is known as overtime premium.

Effects of Overtime

Idle time is different from overtime. The following are the major differences between the two;

1. Idle time refers to the difference between the time for which worker is paid and the time actually spent by him on production. Thus it is the time lost or the time a worker does not work. On the other hand, overtime refers to the extra time worked beyond the normal time.

2. Idle time is unproductive in the sense that the employer gets no production. But overtime is productive in the sense that the employer gets production.

3. Normal idle time is unavoidable, while overtime is avoidable to a large extent.

4. Idle time involves the loss of normal time rate (for the hours lost). But overtime involves the additional rate over and above the normal rate (i.e., overtime premium).

MODULE 4

Chapter 5

OVERHEADS

Meaning and Definition of Overheads

According to Blocker and Weltmer, "Overhead costs are the operating cost of a business enterprise which cannot be traced directly to a particular unit of output".

Difference between Overhead and Indirect Expenses

Generally overhead and indirect expenses are used synonymously. But in reality, these are not one and the same. Theoretically, overhead is much wider than indirect expenses. This is because apart from indirect expenses, indirect material and indirect labour also are included in overheads.

Steps in Overhead Accounting

1. Classification of overheads

2 Codification and collection of overheads

3. Allocation and apportionment of overheads (Departmentalization of overheads)

4. Re-apportionment of overheads

5 Absorption of overheads.

Classification of Overheads

1 Classification according to function

2 Classification according to elements

3. Classification according to behaviour

4. Classification according to controllability.

Classification according to Function

According to function overheads are classified into five: (a) Factory overheads, (b) Office and administrative overheads, (c) Selling overheads, (d) Distribution overheads, and (e) Research and development overheads.

Classification according to Elements

According to elements overheads can be classified into three, namely, indirect material, indirect labour and indirect expenses.

Classification according to Behaviour or Nature

According to nature or behaviour, overheads are classified into three: fixed overheads, variable overheads and semi-variable overheads.

Fixed overheads: Fixed overheads are those overheads which do not vary directly with volume of output. These remain fixed for a given range of activity and within a given period of time. The main characteristic of fixed overhead is that the total fixed overhead remains constant but fixed overhead per unit changes.

Variable overheads: Variable overheads are those overheads which vary in direct proportion to production or activity level. When production increases variable overheads will also increase and vice versa. The main feature of variable overhead is that the total variable overhead changes but variable overhead per unit remains constant.

Semi-variable overheads: Semi-variable overheads are those overheads which are neither fully feed nor fully variable. They are partly fixed and partly variable. These overheads vary with activity level but not in direct proportion. Semi-variable overheads are also known as semi-fixed overheads.

Classification according to Controllability:

According to controllability, overheads are classified into two - controllable overheads and uncontrollable overheads.

Controllable overheads: Controllable overheads are those which can be controlled effectively if proper management control is exercised. Variable overheads are controllable.

Uncontrollable overheads: Uncontrollable overheads are those which are beyond the control of the management. Fixed overheads are uncontrollable.

Codification and Collection of Overheads

After grouping, a code number is allotted to each head of expense. Such a procedure of allotting number or symbol is called codification. Thus, codification of overhead is the process of allotting number or symbol to each sub group of overhead for easy identification. Codes are helpful and useful in classification, accounting and control.

Departmentalization of Overheads (Allocation and Apportionment of Overheads):

After classification, codification and collection of various items of overheads, the next step is allocation of overheads to different cost centers or departments.

Meaning of Departmentalisation of Overheads

For the smooth and efficient working, a factory is divided into a number of subdivisions. These subdivisions or sections are known as departments (or cost centres). There are two types of departments, namely, production departments and service departments. Production departments are engaged in production of goods.

Advantages or Purposes of Departmentalisation

1. It helps in accurate ascertainment of cost.

2. It helps in controlling of overheads by comparing actuals with budgeted overheads.

3. It helps in exercising control over service departments.

4. Responsibility can be fixed over various departmental Heads for the efficient functioning of departments.

5. It helps in accurate forecasting and estimation.

6. It facilitates correct ascertainment of work in progress.

Steps in Departmentalisation of Overheads

Process of departmentalisation of overheads can be divided into the following stages:

1. Allocation of overheads.

2 Apportionment of overheads.

3. Re-apportionment of overheads of service departments.

Allocation of Overheads

Allocation of overhead is the process of charging full amount of the overhead costs to a particular department or a cost center. Allocation of overheads is possible only when the nature of expense is such that it can be easily identified with a particular department or cost center.

Apportionment of Overheads

Those overheads which cannot be fully identified with a particular department or cost centre are to be apportioned to various departments or cost centres. The process of charging proportionate amount of overheads to various departments on suitable basis is known as apportionment of overheads.

Cost Allocation	Cost Apportionment
1 it deals with the allotment of whole items of cost. 2 It is a direct process. 3 There is no need to choose a base.	1. It deals with allotment of proportions of items of cost. 2. It is an indirect process. 3. It is done on some suitable basis.

4. It is a simple process.	4. It is a complicated process.
5. It is accurate.	5. It is only approximate.

Stages of Apportionment (or Distribution) of Overheads)

1 Primary distribution: When overheads are apportioned to all departments (i.e., both production and service departments), it is called primary distribution.

2 Secondary distribution: When the total of overheads allocated and apportioned to service departments (as per primary distribution) are apportioned again to the production departments, it is called secondary distribution.

Bases of Apportionment of Overheads (Primary Distribution)

1. Floor area: Floor area is used for apportionment of certain expenses like rent, rates, employed for overhead apportionment: taxes etc. for building, lighting, heating, air conditioning etc.

2 Direct wages: Expenses which directly vary with the wages paid can be apportioned on this basis. For example, workmen compensation, contribution to P.F, contribution to ESI, insurance of workers etc. can be distributed on this basis.

3. Number of employees: Canteen expenses, welfare expenses, salaries of time keepers, medical expenses etc. can be apportioned on the basis of number of workers.

4. Number of labour hours: This basis is adopted for the apportionment of salaries of inspector, salaries of supervisors, and other office expenses.

5. Capital value of assets: This base is used for the apportionment of depreciation, repairs and maintenance, insurance, rates and taxes etc.

6. Number of light points: Lighting expenses are apportioned on this basis.

7. Horse Power (HP) of machines: Power expenses are apportioned on the basis of HP of machines

8. Technical estimates: There are certain expenses which cannot be apportioned on any of the above bases, e.g., internal transport, steam, water, sundry expenses, directors fees, works manager's salary etc.

Item (overheads)	Bases of apportionment
1. Rent, rates, taxes	Floor area
2. Repairs and maintenance of building	Floor area
3. Depreciation	Asset value
4. Repairs and maintenance of plant & machinery	Asset value
5. Insurance (asset)	Asset value
6. Lighting	Number of light points or number of employees or floor area.
7. Power	HP of machine or HP x Hrs. or KWh.
8. Supervision	Number of workers/employees
9. Canteen expenses	Number of workers
10. Time keeping expenses	Number of workers
11. Welfare expenses	Number of workers / direct wages
12. Workmen compensation	Direct labour hours
13. Overtime cost	Direct wages
14. ESI, PF etc.	Direct wages

15. General overheads	Direct wages
16. Stores overhead	Value of direct material
17. Material handling charges	Weight, numbers etc.
18. Internal transport	Technical estimate
19. Managerial salaries	Technical estimates
20. Audit fees	Sales

Re-apportionment of Service Department Cost (Secondary Distribution)

Under primary distribution, all overheads are allocated and apportioned to all departments both production and service departments (as done in Example 1). Service departments do not produce goods. But they help production departments to produce. They indirectly contribute to production. Therefore, overheads of service departments (as per primary distribution) are to be shared by production departments on the basis of benefits received from the service departments. This process of apportionment of overheads of service departments to production departments is known as secondary distribution or reapportionment.

Bases of Re-apportionment

The service department costs are apportioned to production departments generally on the basis of the benefits derived by the production departments from the service department.

Methods of Secondary Distribution / Redistribution / Reapportionment

1. Apportionment of service department costs to production departments only

2. Apportionment of service department costs to the production departments as well as service department.

Apportionment to Production Departments only (Direct Method)

Under this method service department costs are directly apportioned to production departments only. This method is called direct redistribution method. This method does not consider the services rendered by one service department to the other.

Apportionment to Production and Service Departments

Under this method, cost of a service department is distributed over all the departments. This can be either on reciprocal basis or non-reciprocal basis.

Non Reciprocal Basis (Step Ladder Method)

This method is used when various service departments are not interdependent. This means a service department provides its services to other service departments but does not receive any service from that service department. In this case the cost of most serviceable department is first apportioned to other production as well as service departments. After this the cost of the next serviceable department is apportioned to other departments excluding the first one.

Reciprocal Service Methods

These methods are used when different service departments render services to each other, in addition to rendering services to production departments. In such cases various service departments have to share overheads of each other to determine the total overhead cost of each service department. For instance, power house of a factory gives power to the repair departments and in turn repair departments also carries out repairs for the power house.

Simultaneous equation method:

In case of reciprocal services the problem is that total overheads of one service department, say X, includes a share from the total overheads of other department, say. Therefore, to ascertain total overheads of X we should know total overheads of Y and to attain total overheads of Y, we should know the total overheads of X. This problem is solved with the help of simultaneous equations.

Trial and error method:

This method is more useful when there are two or more service Departments. Under this method the cost of first service department is apportioned to other service department(s) only, at a given

percentage. Then the cost of second service department (plus cost from the first service department) is apportioned back to the first service department this process is repeated till the amount for apportionment becomes nil or negligible.

Absorption of Overheads

After allocation and apportionment of overheads, we come to know the total overheads of production departments. The next stage is to distribute the overheads of production departments to the units produced or jobs carried out in the department. This process is known as absorption of overheads.

Meaning of Absorption of Overhead

Absorption of overheads simply means charging overheads of a cost centre (production department) to different cost units (products, jobs etc). According to ICMA, London, "Overhead absorption means the allotment of overhead to cost units". It is the charging of overheads to the individual products or units. Through overhead absorption, each unit or job of the cost centre gets a share of overhead of the total overhead of that cost centre.

Types of Overhead Rates

Actual overhead rate: This rate is obtained by dividing the overhead expenses incurred during the accounting period by the actual quantity or value of the base selected.

Pre-determined rate: This rate is determined in advance of the actual production. It is computed by the budgeted overheads for the accounting period by the budgeted base for the period. Single or blanket rate: When a single rate is computed for the factory as a whole, it is called single or blanket rate.

Separate or departmental rate: When different rates are applied for different cost centres departments) it is known as separate rates or multiple rates.

Difference between Apportionment of Overhead and Absorption of Overhead

Apportionment	Absorption
1. tis the allotment of proportion of cost to cost centres	1 It is the allotment of overheads to cost units. 2. It starts after apportionment.

2 It starts before absorption. 3. Suitable or equitable bases are used.	3. Percentage rates of overheads are used.

Methods of Absorption of Factory Overhead

1. Production unit method: Under this method overheads are absorbed on the basis of number of units produced. The overhead absorption rate (i.e., overhead per unit of output) is calculated by dividing total factory overhead of a department by total number of units of output of the department. The rate may be actual or pre-determined. This method is also known as cost unit rate method or rate per unit of output method.

For example, the factory overhead is ? 16,000 and the total number of units produced are 80,000, then the overhead rate will be 0.20 (i.e., 16,000/80,000). Suppose 1,000 units are produced then 1,000 x 0.20 = 200 will be charged to products.

2. Percentage on direct material cost method: In this method the cost of direct materials used in the manufacture of a product is used as the base of absorption of factory overhead. The overhead rate (application or recovery or absorption rate) is calculated as follows:

Factory overhead Direct Material Cost/ Direct Material Cost x100

3. Percentage on direct labour cost (wage) method:

Under this method, direct wages are taken into account for calculation of the absorption rate. Overheads are charged as a percentage the direct wages incurred on products or jobs. The overhead absorption rate (percentage of direct wages) is computed as follows:

$$\frac{Factoryoverhead}{Direct\ wages} * 100$$

4 Percentage of prime cost method: Under this method prime cost is taken as the base for the absorption of overhead. Prime cost is the total of direct material cost and direct wages.

The overhead rate is computed as follows:

$$\frac{Factoryoverhead}{Prime\ cost} * 100$$

5. Direct labour hour rate method: Under this method overheads are absorbed on the basis of direct labour hours worked. The overhead rate is obtained by dividing the overheads to be absorbed by the number of direct labour hours. It is calculated as follows:

$$\frac{Factoryoverhead}{Direct\ labour\ hours} * 100$$

6. Machine hour rate method: This method is used in those factories where machines are important. In this method, the overheads are charged to production on the basis of number of machine hours spent on a job. Machine hour rate is calculated by using the following formula:

$$\frac{Factoryoverhead}{Machine\ hours} * 100$$

7. Dual hour rate method: This method is used where manual Labourers and machines are equally important. In such cases overheads are classified into two - overheads related to manual labour, and overheads related to machine. The overheads related to machines are absorbed on the basis of machine hour rate and the overheads related to manual labour are absorbed on the basis of labour hour rate. Thus it is a combination of direct labour hour rate and machine hour rate.

Machine Hour Rate

Machine hour rate is an important method of absorption of factory overhead. It is used running and operating a machine per hour. In simple words, it is obtained by dividing the amount of overhead related to a machine by the number of machine hours (or working hours of the machine). A separate machine hour rate is calculated for each machine.

Types of Machine Hour Rate

There are three types of machine hour rate. They are as follows:

1 Simple or ordinary machine hour rate: This machine hour rate does not take into account the wages. In this case only indirect expenses directly relating to running a machine are included.

2. Composite or comprehensive machine hour rate: This machine hour rate takes into consideration both direct expenses (eg, wages) and indirect expenses. Thus in a comprehensive machine hour rate, factory overhead and direct wages are absorbed in a single rate

3. Group machine hour rate: Where overhead rate is determined for a group of machines, it is known as group machine hour rate.

Advantages of Machine Hour Rate Advantages of machine hour rate are as follows:

1 It is a scientific, accurate and logical method of overhead absorption.

2 The relative efficiencies of various machines can be found out easily.

3. It helps in knowing idle time of machines.

4. It is useful for the estimation of cost of a job.

5. It helps to compare the operating cost of each machine.

6. It gives importance to the time factor.

7. It helps to quote more accurate selling price for jobs.

Calculation of M.H.R.

The following points should be borne in mind while calculating machine hour rate:

1. Divide overheads relating to the machine into two - standing charges (fixed) and machine expenses (variable).

2 Rent, rates, lighting, insurance, supervision, wages of operators, lubricating oil and consumable stores etc. may be treated as standing charges.

5. Estimate the total standing charges for the machine (one machine) for a period (day, or week or month or year) and divide this total by the working hours of the machine (effective working hours) for that period. This gives the standing charges per machine hour.

6. The machine expenses are to be estimated separately. These are divided by the normal working hours (effective working hours). It gives hourly rates for each item.

7. The total of standing charges per hour (as per 5) and the machine expenses per hour

8. (Separately calculated as under 6) will give the M.H.R. If ordinary MHR is to be computed direct wages (of operators, machine men, machine attendant etc.) should be excluded.

Calculation of Depreciation per Machine Hour

$$\frac{Cost\ +\ Installation\ charges -\ Scrap\ value}{Life\ (years)}$$

This gives depreciation per year. Depreciation per hour is calculated as follows:

$$\frac{Depreciation\ p.a}{Machine\ Hours\ p.a}$$

Alternatively, depreciation per machine hour can be directly calculated as follows:

$$\frac{Cost + Installation\ charges\ -\ Scrap\ Value}{Effective\ working\ life\ in\ hours}$$

Absorption of Office and Administrative Overheads

Office and administrative overheads are of a general nature. These overheads include office rent, rates and insurance, office lighting, heating and cleaning, depreciation and repairs of office building, furniture and fitting. Legal charges, printing and stationery used in office, bank charges and so on.

Methods of Absorption of Office and Administrative Overheads

1. Percentage of factory cost method:

$$Admn.\ OH\ rate = \frac{Administrative\ OH}{Factory\ overhead} * 100$$

2. Percentage of factory overhead method:

$$Admn.\ OH\ rate = \frac{Administrative\ OH}{Factory\ overhead} * 100$$

3. Percentage of sales method:

$$Admn.\,OH\ rate = \frac{Administrative\ OH}{Sales} * 100$$

4. Percentage of conversion cost method:

$$Admn.\,OH\ rate = \frac{Administrative\ OH}{Conversion\ cost} * 100$$

5. Percentage of gross profit method:

$$Admn.\,OH\ rate = \frac{Administrative\ OH}{Gross\ Profit} * 100$$

Absorption of Selling and Distribution Overheads

Selling and distribution overheads may be classified into two fixed and variable. Advertising, samples, sales office rent, showroom expenses, market research expenses etc. are examples of fixed expenses. Carriage outward, commission, bad debts, discounts etc. are examples of variable expenses.

Methods of Absorption of Selling and Distribution Overheads

There are four methods of absorption of selling & distribution overheads. They are follows:

1. Rate per article: Under this method the total estimated selling overhead is divided by the total number of estimated units to be sold and thus selling and distribution rate per unit is determined

2. A percentage of sales: In this method, on the basis of the previous year's figures a percentage of selling and distribution overhead on the total sales is calculated. This rate is applied to recover the overheads from the selling price.

3. A percentage of factory cost: A percentage of selling and distribution overheads on factory cost is arrived at from past records. This percentage is applied to factory cost to add the selling and distribution overheads.

4 A percentage of cash collected: This method is suitable for charging the credit and collection costs such as bad debts, legal expenses etc.

Module 4

Methods of Costing

UNIT COSTING

It is an important method of costing. It is also known as output costing or single costing. It is used to ascertain the cost of producing a unit of output.. This method is called 'unit' costing since every unit of production is identical in all respects and the cost unit is a standard product.

According to J.R Batliboi, "Single or output cost system is used in business where a standard product is turned out and it is desired to find out the cost of a basic unit of production."

Features:

1. It is used where output can be measured in convenient physical unit 2. It is followed in concern s engaged in the production of a single product 3. It is followed in industries where manufacturing process is continuous 4. It is followed where all units of production are identical

Cost sheet:

Cost sheet is a device used to determine and present the cost under unit costing. It is a statement of costs incurred at each level of manufacturing a product or service. In a Cost sheet all the elements of cost is taken into consideration. It includes Prime cost, Factory/manufacturing cost, cost of production, cost of sale Profit/loss etc.

Items excluded from Cost Sheet:

1. Pure financial expenses like interest on capital, interest on loan, discount on debentures, loss on sale of fixed asset provision for bad debts and doubtful debts, writing off goodwill, copyright, preliminary expenses etc. 2. Pure financial incomes like interest received, profit on sale of investment, dividend received, rent received, commission received, discount received etc. In addition to the above, no appropriation items will include in cost sheet

Treatment of Stock:

While preparing a cost sheet we have to consider the opening and closing stocks of the following three items

1. Stock of Raw materials 2. Stock of finished goods 3. Stock of work in progress

Stock of Raw materials: In order to get the cost of material consumed, opening stock of material is added to the cost of raw materials purchased and closing stock of raw materials is deducted from it.

Opening stock of raw materials	xxx
Add Purchase of RM	xxx
	---
	xxx
Less closing stock of RM	xx

Cost of materials consumed	xxx
	=====

Stock of Work – in – progress: The Cost of work in progress are adjusted at the work cost stage

Prime cost	xxx
Add works OH	xxx

	Xxx
Add opening stock of WIP	xx
	---
	xxx
Less closing stock of WIP	xx

Works cost	xxxx
	=====

Stock of finished goods: It is adjusted immediately after ascertaining the cost of production.

Cost of production	xxx
Add opening stock of FG	xx

	Xxxx
Less closing stock of FG	xxx

Cost of Goods sold	xxxx
	=====

Tenders or Quotations:

A tender or quotation is an offer made by a person to supply certain goods at a specified price. It is an estimated price which is determined in advance of production. A reasonable margin of profit is added to the estimated cost to get the tender price. A tender has to be prepared very carefully as the receipts of orders depend upon the acceptance of quotations or tenders supplied by the manufacturers. It requires information regarding Prime cost, works cost, administration and selling overhead cost and profit of the preceding period

Computation of Tender price

I. Calculation of Tender price on the basis of Percentages of Overheads

In this case a cost sheet is prepared for the past period with the total amount of different elements of cost. Here Indirect or overhead costs are charged on a percentage basis. The percentage is calculated on the basis of the past year's cost sheet. These are calculated as follows:

a. Factory OH is charged as a percentage if direct wages.

$$= \frac{\text{Factory OH} \times 100}{\text{Direct wages}}$$

b. Administration OH is charged as a percentage of Factory cost

$$= \frac{\text{Administration OH} \times 100}{\text{Factory Cost}}$$

c. Selling and Distribution OH is charged as percentage of Factory cost

$$= \frac{\text{Selling and Distribution} \times 100}{\text{Factory cost}}$$

Profit may be calculated either as a percentage of cost or selling price. If the given percentage of profit is on selling price, the percentage of profit on selling price should be converted into percentage of profit on cost.

Computation of Tender price on the basis of Previous year's per unit cost:

Under this situation , previous periods cost and output figures are available. Tender price is fixed by multiplying the quantity with previous periods per unit cost and adding the required percentage of profit. There are three different situations under this method.

a. When there is no change in past cost and past percentage of profit. In this case a detailed probable cost sheet is prepared by multiplying previous period's cost of each unit with the quantity of tender. Profit is added at the same percentage of profits of the past period.

b. When there is change in past cost, but no change in past percentage of profit: Here the cost of the tender is calculated by making necessary adjustments in the elements of cost. Same percentage of cost is added as profit to get tender price.

c. When there is change in past cost and past percentage of profit: - Here the total cost tender is calculated by making necessary adjustments in the cost and the tender price is then calculated by adding the required percentage of profit.

Calculation of Tender price based on fixed and variable costs: Here, costs are classified according to variability into three types,, fixed, variable and semi variable. Tender price is calculated on the basis of degree of variability

JOB COSTING

It means ascertaining costs of an individual job, work order or project separately. According to ICMA London, "job costing is that form of specific order costing which applies where work is undertaken to customer's specific requirements and each order is of comparatively of short duration." Under this method of costing, each job is considered to be a distinct cost unit. As such, each job is separately identifiable.

In the case of a job, work is usually carried out within the factory or workshop. Sometimes, a job is accomplished even in the customer's premises. This method of costing is applicable to ship building, printing, engineering, machine tools, readymade garments, shoes, hats, furniture, musical instruments, interior decorations etc.

Features:

1. Each job has its own characteristics, depending up on the special order placed by the customer.

2. Each job is treated as a cost unit.

3. A separate job cost sheet is made out for each job on the basis of distinguishing numbers.

4. A separate work in progress ledger is maintained for each job.

5. The duration of the job is normally a short period.

6. Profit or loss is determined for each job independently of others

Advantages of Job costing:

1. It helps to distinguish profitable jobs from unprofitable jobs 2. It helps to identify defective work and spoilage with a department or person 3. Selling price of special orders can easily be fixed. 4. It helps to prepare estimates of cost for submitting quotations and tender for similar jobs 5. It helps to control future cost.

Requisites of Job costing system:

1. A sound system of production control

2. An effective time booking system

3. Clearly defined cost centre

4. Appropriate overhead absorption rate, and

5. Proper material issue pricing method.

Procedure for Job order costing system:

The Procedure for job order costing system may be summarized as follows:

1. Receiving an enquiry from the customer regarding price, quality etc

2. Make an estimation of the price of the job after considering the cost incurred for the execution of similar job in the previous year

3. Receiving an order, if the customer is satisfied with the quotation price and other terms of execution.

4. If the job is accepted, a production order is made by the Planning department.

5. The costs are collected and recorded for each job under separate production order Number, and a Job Cost Sheet is maintained for that purpose.

6. On completion of job, a completion report is sent to costing department

CONTRACT COSTING

Meaning

It is a special form of job costing and it is the most appropriate method to be adopted in such industries as building and construction work, civil engineering, mechanical fabrication and ship building. In other words, it is a form of specific order costing which applies where the work is undertaken to customer's requirements and each order of long duration as compared to job costing. It is also known as terminal costing. The official CIMA terminology defines contract costing as " a form of specific order costing in which costs are attributed to individual contracts."

Basic features:

1. Each contract itself a cost unit.

2. Work is executed at customers site

3. The existence of sub contract

4. Most of the expenses incurred upon the contracts are direct.

5. Cost control is very difficult in contract costing.

Types of contracts

Generally there are three types of contracts:

1. Fixed price contracts: Under these contracts both parties agree to a fixed contract price.

2. Fixed price contract with Escalation clause

3. Cost plus contract: Under this contract no fixed price could be settled for a contract.

Contract Account

A contract account is a nominal account in nature. It is prepared to find out the cost of contract and to know profit or loss made on the contract. A contractor may undertake a number of contracts at a time. For each contract a separate account is opened. In the contract account all direct cost such as material, labour and other direct expenses incurred during an accounting period are debited and the indirect expenses are apportioned on an equitable basis. The differences between the two sides are known as Notional profit or notional loss.

SPECIAL TERMS IN CONTRACT ACCOUNT

1. Work in Progress: It is the unfinished contract at the end of the accounting period and it includes amount of work certified and amount of work uncertified. Work in progress is an asset, shown in the balance sheet by deducting there from any advance received from the contractee.

2. Work certified: The sales value of work completed as certified by the architect is known as 'work certified'. In the case of contracts of long duration, the amount payable by the customer to the contractor is based on the sales value of work done as certified by the architect. At the end of the financial year, the total sales value of work done and certified by the architect is credited to the contract account.

SPECIAL TERMS IN CONTRACT ACCOUNT

1. Work in Progress: It is the unfinished contract at the end of the accounting period and it includes amount of work certified and amount of work uncertified. Work in progress is an asset, shown in the balance sheet by deducting there from any advance received from the contractee.

2. Work certified: The sales value of work completed as certified by the architect is known as 'work certified'. In the case of contracts of long duration, the amount payable by the customer to the contractor is based on the sales value of work done as certified by the architect. At the end of the financial year, the total sales value of work done and certified by the architect is credited to the contract account.

3. Work Uncertified: It means work which has been carried out by the contractor but has not been certified by the architect. Sometimes, work which is complete remains uncertified at the end of the financial year. The reasons for the same may be

a. Work not sufficient enough to be certified

b. Work has not reached the stipulated stage to qualify for certification

It is always valued at cost and credited to the contract account.

4. Retention money: - Regardless of the amount of work certified, the contractor is paid a specified percentage of the same and the balance is held or retained by the contractee. This is because of the fact that the contractee has to safe guard himself against any contingency arising from the non-fulfillment of the terms of the contract by the contractor. The unpaid balance of work certified or the amount held back or retained by the contractee is known as 'retention money'.

5. Sub contract: Sometimes the contractor enters into contracts with another contractor to give a portion of work undertaken by him. In such cases the work performed by the subcontractor s forms a direct charge to the contract concerned. Sub contract cost will be shown on the debit side of the contract account.

6. Escalation clause: This is clause which is provided in the contract to cover up any increase in the price of the contract due to increase in the prices of raw material or labour or in the utilization of any other factors of production. If material and labour utilization exceeds a particular limit, the customer agrees to bear the additional cost occasioned by excessive utilization. Here, the contractor has to satisfy the customer that excessive utilization is not the result of decreased efficiency.

SPECIMEN FORM OF CONTRACT ACCOUNT (Unfinished contract)

Contract A/C

To materials	Xxx	By work in progress:		
To Labour	Xxx	Work	certified	
To Plant	Xxx	xxx		Xxx
To Overheads	Xxx	Work	uncertified	Xxx
To cost of sub contracts	Xxx	xxx		
To Notional Profit c/d(B/F)	Xxx	By material returned		Xxx
		By	plant	Xxx
	Xxx	xxx		Xxx
		Less:Depreciation	xx	
To Profit and Loss A/C	Xxx	By material lying at site		Xxx
To WIP (B/F)	Xxx			
	Xxx			Xxx
	=======	By Notional profit B/d		========

Treatment of Plant and Machinery: One of the distinguishing features of a contract is the use of special plant and machinery. The cost of these is capital expenditure, but yet, the usage of these should be reflected in the form of depreciation.

There are two distinct methods of charging depreciation.

1. At the time of issue of plant to contract the contract account is debited with the full value of the plant. At the end of the period contract account is credited with the depreciated value. This method is used when plant and machinery is used at the contract site for a long period.

2. In the second method, contract account is debited with an hourly rate of depreciation for the number of hours the plant is used on the contract. A cost centre is set up for each machine. An

estimate is made is made of the cost such as maintenance, depreciation, driver's wage etc to be incurred. The total of this cost is divided by the number of hours that the machine is expected to be used.

Profit on Incomplete Contract:

In the case of a small contract extending over the financial period, profit or loss on the same may be ascertained by crediting it with the contract price due by the contractee. This procedure cannot be adopted in the case of contracts extending beyond the accounting period, and taking a long time for completion. If there is any profit upon the incomplete contract, it cannot be taken as actual profit. The profit upon the incomplete contract is called notional profit.

For the purpose of determining the amount of profit to be transferred to profit and loss account and making provision for future contingencies, the following guidelines may be kept in mind.

1. **When the work has not reasonably advanced (1/4 or less than ¼)** : - No profit should be taken to the credit of p/L account in the case of contracts which have just commenced and a small portion of the work is complete.
2. **Where the work is complete more than ¼ but less than ½ of contract price:** In this case 1/3 of the notional profit as reduced by the percentage of cash received may be credited to profit and loss account. The usual formula is

   $$\text{Notional profit} \times 1/3 \times \frac{\text{Cash received}}{\text{Work certified}}$$

   The balance of notional profit shall be kept as reserve till the completion
3. **If the contract completed is more than 1/2 but less than 90%**: Here 2/3 rd of the notional profit should be taken to profit and loss account.

   $$\text{Notional profit} \times 2/3 \times \frac{\text{Cash received}}{\text{Work certified}}$$

   The balance of notional profit shall be transferred to work in progress as reserve. It is to be noted that in order to find out how much portion of contract is completed, work certified should be compared with contract price.
4. **If the contract is nearing completion:** Here, estimated profit may be ascertained by deducting the total cost of contract to date plus estimated additional expenses to complete the contract , from the contract price. It is calculated by using the following formula

   $$\text{Estimated profit} \times \frac{\text{Cash received}}{\text{Contract price}}$$

PROCESS COSTING

Process costing is the method of costing applied in the industries engaged in continuous or mass production. Process costing is a method of costing used to ascertain the cost of a product at each process or stage of manufacturing.

According to ICMA terminology, "Process Costing is that form of operation costing which applies where standardized goods are produced".

So it is a basic method to ascertain the cost at each stage of manufacturing. Separate accounts are maintained at each process to which expenditure incurred. At the end of each process the cost per unit is determined by dividing the total cost by the number of units produced at each stage. Hence, this costing is also called as "Average Costing" or "Continuous Costing". Process Costing is used in the industries like manufacturing industries, chemical industries, mining works and public utility undertakings.

Characteristics of Process Costing

1. Production is continuous

2. Products pass through two or more distinct processes of completion.

3. Products are standardized and homogeneous.

4. Products are not distinguishable in processing stage.

5. The finished product of one process becomes the raw material of the subsequent process.

6. Cost of material, labour and overheads are collected for each process and charged accordingly.

Advantages of Process Costing

1. It is easy to compute average cot because the products are homogeneous in Process Costing. 2. It is possible to ascertain the process costs at short intervals. 3. Process Costing is simple and less expensive in relation o job costing. 4. By evaluating the performance of each process effective managerial control is possible.

Disadvantages of Process Costing

1. Valuation of work in progress is difficult.

2. It is not easy to value losses, wastes, scraps etc.

3. The apportionment of total cost among joint products and by-products is difficult.

4. Process cost are not accurate, they are only average costs

5. Process costs are only historical.

Difference between Process Costing and Job Costing

Process Costing	Job Costing
1. Production is continuous	1. Production is according to customers' orders
2. Production is for stock	2. Production is not for stock
3. All units produced are identical or homogeneous	3. Each job is different from the other
4. There is regular transfer of cost of one process to subsequent processes	4. There is no regular transfer of cost from one job to another
5. Work in progress always exists	5. Work in progress may or may not exist

Specimen of Process Account

Process Account

	Units	Rs.		Units	Rs.
To Direct materials			By Loss in weight (Normal Loss)		
To Direct Wages			By sale of Scrap		
To Direct Expenses					
To Indirect expenses					
To Other Expenses (if any)			By Next Process Account(Transfer)		

Preparation of Process Accounts

The preparation of Process Account depends upon the following situations

1. Simple Process Account

2. Process costing with normal process loss

3. Process costing with abnormal process loss

4. Process costing with abnormal process gains

5. Inter – process profits.

Simple Process Account

Under this case it is very easy to prepare process account. A separate account is opened for each process. All costs are debited to the process account. The total cost of the process is transferred to the next process. At the end of each process the cost per unit is obtained by dividing the total cost by the number of units.

Process losses

The process loss is classified into two- normal process loss and abnormal process loss.

Normal process loss

This is the loss which is unavoidable on account of inherent nature of production process. It arises under normal conditions. It is usually calculated as a certain percentage of input. Normal process los includes either waste or scrap r both. Waste is unsalable and has no value. Loss in weight is an example of waste. Loss in weight should be credited to the concerned process account. It should be recorded only in terms of quantity.

Loss in weight = Opening Stock + output from the preceding process – (output of the Concerned process + closing stock)

Abnormal Process Loss

Any loss caused by unexpected or abnormal conditions such as plant break don, substandard materials, carelessness, accident etc. or loss in exceeds of the margin anticipated for normal process loss can be called as abnormal process loss. It is controllable and avoidable. When actual loss in the process is greater than the estimated normal loss, it is a case of abnormal loss. It may also be determined by comparing actual output with expected or normal output. If actual output is les than the normal output, the difference is abnormal loss.

$$\text{Value of Abnormal loss} = \frac{\text{Normal cost of normal output}}{\text{Normal output}} \times \text{Units of Abnormal loss}$$

Normal cost of normal output = Total expenditure (i.e., total debit of process A/c) – Sale Proceeds of scrap (i.e. Value of normal loss)

Normal output = Input – Units of normal loss

OPERATING COSTING

It is the costing procedure used for determining the cost of per unit of service rendered. It is a method of costing applied to undertaking which provides service rather than production of commodities. The services may be in the form of transport, supply service, welfare service, etc. There is a difference between operating costing and operation costing. Operating costing is a method of costing designed to find out the cost of operating or rendering a service.

Transport costing:

Transport industries include Air, Water, Rail and Road. They render services to the community at large. We have to give utmost care while selecting the cost unit. The cost unit of other forms operation costing is quite different from that of a service undertaking. The cost unit of a service organization is a composite unit. The important factors to be considered includes the number of passengers, tonnage carried, distance covered etc.

Classification of Costs:

Operating costs of a transport undertaking comprising different items, which are classified under the following three groups.

1. Standing or fixed charges: These charges are incurred in spite of the kilometers run. It is fixed in nature. Eg. Insurance, Motor vehicle tax, license fee, rent, salary of operating manager etc.

2. Maintenance charges: It includes semi variable expenses Eg. Tyres and tubes, repairs and paintings etc.

3. Operating and running charges: These charges vary more or less in direct proportion to kilometers. All the variable charges of running vehicles are included in this group. Generally it includes, petrol, oil,, grease etc., wages of driver, attendant if payment is related to time or distance of trip etc.

Selection of Unit:

In transport costing, a composite unit such as passenger mile or passenger kilometer or tone kilometer is often selected. Such unit takes into account both the number of passengers or weight of goods carried and distance run.

Absolute passenger or commercial passenger/ tone km:

It is calculated by multiplying every part of distance travelled/covered with either weight carried or passenger carried.. After getting the product of each journey we add all the products. The total is absolute ton/quintal km

Commercial method:

The following steps are used to find out the commercial tone km

a. Find out average trip load

b. Find out total distance of journey

c. Multiply a and b , the resultant figure is commercial tone km.

Preparation of Operating Cost sheet:

An operating cost sheet is prepared periodically in order to ascertain the cost per unit. Here, the total fixed, maintenance and running costs are collected and allocated under respective heads and these are then divided by total units.

OPERATING COST SHEET

Particulars	Total cost	Cost per unit
A. Fixed or standing charges:		
Garage rent		
License fee		
Insurance		
Motor vehicle tax		
Interest on capital		
Supervision		
Office establishment		
Administrative overheads		
Salary of foreman , manager etc		
Total		
B. Maintenance charges:		
Repairs and renewals		
Tyres and tubes		
Paintings		
Overhauling		
Cleaning		
Gas and electric charges		
Spare parts and accessories		
Total		
C. Operating charges:		
Petrol		
Engine oil		
Lubricating oil, grease etc		
Wages of operators		
Depreciation		
Salaries of running staff		
Water		
Total		

Calculation of Depreciation:

If the rate of depreciation is not given, depreciation is calculated as follows:

$$\text{Depreciation} = \frac{\text{Cost - scrap}}{\text{Life in years}}$$

$$\text{Depreciation per mile, or km} = \frac{\text{Depreciation p.a}}{\text{Kms/miles run p.a}}$$

Module 5

Cost Control Techniques

BUDGET AND BUDGETORY CONTROL

Meaning and definition of budget: A budget is a plan of action for a future period. It simply means a financial plan expressed in terms of money. The budget pertaining to any of the activities of business is always forward looking. The term 'budget' has been derived from the French word, "bougette", which means a leather bag into which funds are appropriated to meet the anticipated expenses.

The CIMA Official Terminology defines a budget as " A quantitative statement, for a defined period of time, which may include planned revenues, expenses, assets, liabilities and cash flows."

Budgeting and Budgetary control:

Budgeting simply means preparing budgets. It is a process of preparation, implementation and the operation of budget. Being a plan of action, a budget guides every manager in the decision making process.

In the words of Rowland Harr, "Budgeting is the process of building budgets". Budgetary control is a system of using budgets for planning and controlling costs. The official terminology of CIMA defines the term 'budgetary control , as " the establishment of budgets relating to the responsibilities of executives to the requirement of a policy, and the continuous comparison of actual with budgetary result, either to secure by individual action the objectives of that policy or to provide a basis for its revision."

Objectives of Budget and Budgetary control:

The following points reveal the objectives of Budget and budgetary control:

1. To aid the planning of annual operations

2. To co ordinate the activities of the various parts of the organization

3. To communicate plans to the various responsibility centre managers

4. To motivate managers to strive to achieve the organizational goals.

5. To control activities

6. To eliminates the wastes of all kinds

7. To provide a yard stick against which actual results can be compared

8. To evaluate the performance of managers.

9. To reduce the uncertainties.

Meaning of Estimate, forecast and Budget:

An estimate is predetermination of future events either on the basis of simple guess work or following scientific principles.

Forecast is an assessment of probable future events. Budget is based on the implication of a forecast and related to planned events. To establish a realistic budget, it is necessary to forecast a wide range of factors like sales volume, sales prices, material availability, wage rate, the cost of overheads etc.

Steps involved in Budgetary Control:

The following steps may be considered necessary for a comprehensive budgetary control programme:

1. Laying down organizational goals or objectives

2. Formulating the necessary plans to ensure that the desired objectives are achieved.

3. Translating plans into budget

4. Relating the responsibilities of executives to the requirements of a policy.

5. Recording and reporting actual performance

6. Continuous comparison of actual with budgeted results

7. Ascertainment of deviations, if any

8. Focusing attention on significant deviations

9. Investigation into deviations to establish causes

10. Presentation of information to management, relating the variations to individual responsibility.

11. Taking corrective action to prevent recurrence of variations.

12. Provide a basis for revision of budgets.

Essentials of a Budgetary Control system:

Successful implementation of a budgetary control system depends up on the following essentials.

1. Support by top management: The wholehearted support of all managerial persons is very necessary for the success of a budgetary control system.

2. Formal organization: The existence of a formal and sound organizational structure is of an absolute necessity for an effective system of budgetary control.

3. Budget centers: For budgetary control purposes, the entire organization will be split into a number of departments, area or functions, known as 'centres', and budgets will be prepared for each such centers

4. Clear cut objectives and reasonably attainable goals:- If goals are too high to be attained, the purpose of budgeting is defeated. On the other hand, if the goals are so low that they can be attained very easily, there will be no incentive to special effort.

5. Participative budgeting: Every executive responsible for the implementation of budgets should be given an opportunity to take part in the preparation of budgets.

6. Budget committee: The work of preparing a budget manual should be entrusted to a Budget committee. The work of scrutinizing the budgets as well as approving of the same should be the work of this committee.

7. Comprehensive budgeting: Budgeting should not be partial, it should cover all the functions .

8. Adequate accounting system: There should be an adequate accounting system for the successful budgetary control system, because those who are involved in the preparation of estimates depend heavily on the accounting department.

9. Periodic reporting: - There should be a prompt and timely communication and reporting system for the effective implementation of a budgetary control system.

Budget manual:

CIMA England, defines a budget manual as " a document , schedule or booklets which sets out; inter alia, the responsibilities of the persons engaged in the routine of and the forms and records required for budgetary control". In other words, it is a written document which guides the executives in preparing various budgets.

Budget period:

This may be defined as the period for which a budget is prepared and employed. The budget period will depend on the type of business and the control aspects. There is no general rule governing the selection of the budget period.

Classification of Budget

1. Classification according to time factor

2. Classification according to flexibility factor

3. Classification according to function.

I. Classification according to time factor: -

On this basis, budgets can be of three types:

1. Long term budget – for a period of 5 to 10 years

2. Short term budgets – Usually for a period of one to two years

3. Current budgets - Usually covers a period of one month or so,

II. Classification according to flexibility: It includes

1. Flexible budgets and

2. Fixed budgets.

Flexible budgets:

It is a dynamic budget. It gives different budgeted cost for different levels of activity. It is prepared after making an intelligent classification of all expenses between fixed , semi variable and variable because the usefulness of such a budget depends up on the accuracy with which the expenses can be classified.

Steps in preparing flexible budgets:

1. Identifying the relevant range of activity

2. Classify cost according to variability

3. Determine variable cost

4. Determine fixed cost

5. Determine semi variable cost

6. Prepare the budget for selected levels of activity.

Fixed Budget

It is a budget which is designed to remain unchanged irrespective of the level of activity attained. It does not change with the change in the level of activity. This type of budget are most suited for fixed expenses. It is a single budget with no analysis of cost.

III. Classification according to function: It includes:

1. Functional budgets and

2. Master budgets.

Operating budgets or financial budget. Operating budgets are those budgets which relate to the different activities or operations of a firm. These are the primary budgets. Financial budgets are those which incorporate financial decisions of an organization. They show in detail the inflow and outflow of cash and the overall financial position.

Different types of functional budgets:

1. Sales budget: It is forecast of total sales expressed in quantities and money. It is prepared by the sales manager. While preparing sales budget we have to consider the past sales data , market conditions, general trade and business conditions etc…

3. Material budget: It shows the estimated quantities as well as cost of raw material required for the production of different product during the budget period.

4. Purchase budget: It shows the quantity of different type of materials to be purchased during the budget period taking into consideration the level of activity and the inventory levels.

5. Cash budget: It is prepared only after all the other functional budgets are prepared. It is also known as financial budget. It is a statement showing estimated cash inflows and cash outflows over the budgeted period.

There are three methods for preparing the cash budget. They are:

a. The receipts and payment method

b. Adjusted Profit and Loss account method

c. Balance sheet method.

Recent trends in budgeting

1. Zero Base Budgeting (ZBB): According to the official CIMA terminology, zero base budgeting is, " a method of budgeting which requires each cost element to be specifically justified, as though the activities to which the budget relates were being undertaken for the first time. Without approval, the budget allowance is zero" . Under ZBB the programmes and activities get evaluated and ranked from zero base as if these were launched for first time. In this technique of budgeting the unwanted projects and activities get dropped and wanted and desirable activities and projects get included in the budget.

Features:

a. It starts from zero

b. All activities are identified in appropriate decision packages

c. All programmes are considered totally afresh

d. A detailed cost benefit analysis of each programme is undertaken

e. There is an officer responsible for each decision packages

f. Priorities are established and decision packages are ranked

Advantages of ZBB

1. It considers every time alternative ways of performing the same job. It helps the management to get a critical appraisal of its activities.

2. It is helpful to the management in making optimum allocation of scarce resources

3. ZBB is particularly useful for service departments and Governments

4. It ensures active participation of managers in the budgeting process.

5. It promote high level of motivation at the level of unit managers

6. It focuses on output in relation to value for money.

7. It makes managers cost conscious and helps them in identifying priorities in the overall interest of the organization.

Difference between Traditional budgeting and ZBB

Traditional budgeting	ZBB
1. Begins with previous year's budget 2. Focuses on money 3. Produces a single level of expenditure for an activity 4. Resources are allocated not on the basis of cost benefit analysis 5. Prepared annually	1. Begins with zero a based 2. Focuses on goals and objectives 3. Produces alternative level of expenditure and desired result 4. Resources are allocated on the basis of cost benefit analysis 5. Prepared once in every five years

2. Activity base budgeting: The CIMA official terminology defines activity based budgeting as," a method of budgeting based on an activity frame work and utilizing cost driver data in the budget setting and variance feedback processes." In the case of traditional budgeting, budgets are established on the basis of budget centers. In the case of activity based budgeting, however, the

budget centres are activity based cost pools or cost centres in relation to which budgets are prepared. Separate cost pools are established for each type of activity.

3. Performance budgeting: - Performance oriented budgets are established in such a manner that each item of expenditure related to a specific responsibility centre is closely linked with the performance of that centre. The following matters will be specified very clearly in such budgeting

a. Objectives of the organization and for which funds are requested

b. Cost of activities proposed for the achievement of these objectives

c. Quantitative measures to measure the performance

d. Quantum of work to be performed under each activity.

Advantages of performance budgeting:

1. It improves budget formulation process

2. It enhances accountability of the executives

3. It facilitate more effective performance audit

4. It presents clearly the purpose and objectives for which funds are required.

STANDARD COSTING

Meaning of 'standard' and 'standard cost': In the ordinary language, the term 'standard' means a yardstick of measurement. The CIMA terminology defines this term as, "a benchmark measurement of resources usage, set in defined conditions." Standard cost is a pre determined operating cost calculated from management's standards of efficient operation and the relevant necessary expenditure.

Need for Standard Costs: The need for standard cost arises for the following reasons.

1. Cost control
2. Measurement of efficiency
3. Fixation of selling price
4. Economy in cost of costing.

Estimated cost:

Pre determined costs may either be estimated or standard cost. Estimated cost is a pre determined cost for a future period under normal conditions of operations. It is a prospective costing. Cost estimation is made for submitting tenders or quoting price of a product or a unit of services.

Definition of standard costing: Standard costing is a technique of cost control. The CIMA official terminology defines it as " a control technique which compares standard costs and revenues with actual results to obtain variances which are used to stimulated improved performance."

In standard costing the actual costs incurred are compared with the standard costs. The difference between the two is called variance.

Features:

The following are the important characteristics of the standard costing system

1. Standard costs are set for various elements of total cost

2. It makes a comparison of actual cost with standard cost

3. Main objective of standard costing is to control cost

4. Variances are reported to management for the purpose of decision making.

Standard costing and Budgetary control

Both standard costing and budgetary control are similar in principle since both are concerned with setting performance and cost levels for control purposes. Neither of the two techniques can be operated successfully without the other. Budgetary control and standard costing are inseparably linked together.

Distinction between standard costing and budgetary control:

1. Budget is based on past performance, while standard is established on the basis of technical estimates.

2. Budgets consider both income and expenditure whereas standards are for expenditure only.

3. Budgets projects financial accounts, while standard cost project cost accounts

4. In standard costing, variances are analyzed in detail, but such a detailed analysis of variance is not possible in budgetary control.

5. Budget fix minimum limit while standard fix targets.

Objectives of standard costing:

1. Performance measurement

2. Cost control

3. Stock valuation

4. Establishing selling prices

5. Profit planning and decision making

6. Basis of estimating

7. Assisting establishment of budgets.

Basic requirements of standard costing:

a. Organization structure: The existence of a sound organization structure with well defined authority relationship is the basic requirement of a standard costing system.

b. Technical and engineering studies: It is very necessary to make thorough study of the production methods and the processes required for production.

c. Preparation of manual: It is also necessary to prepare a detailed manual for the guidance of staff. The manual should describe the system to be introduced and the benefits thereof.

d. Type of standards: It is very necessary to determine the type of standard to be used, whether current, basic or normal standard.

e. Co-operation of Executives and staff:- Without the co-operation of the executives and staff, it is very difficult to run the standard costing system.

f. Fixation of standards: Standard should be set for each element of cost and it should be scientific.

Steps involved in Standard Costing:

The procedure for establishing standard costing is summarized as follows:

1. Establishment of cost centres: - A cost centre is a location, person or item of equipment for which costs may be ascertained and used for the purpose of cost control. Cost centres are set up for cost ascertainment and cost control.

2. Classification and codification of accounts: - It facilitates quick collection and analysis of cost information.

3. Establishment of standards: The success of the standard costing system depends up on the reliability and accuracy of standards. Standards are always established scientifically.

4. Ascertainment of actual cost: Measuring the actual cost which is incurred in the next step in the standard costing.

5. Comparison of Standard cost and Actual cost.

6. Analysis of Variances

7. Reporting of variance.

Types of standards

1. **Basic standards:** A standard established for use over a long period is known as the basic standard. It remains unaltered over a long period. Its use is to show long term trends, and it operates in a similar way to index numbers. It is also known as the 'bogey, standard. This standard is used for items or costs which are likely to remain constant over a long period.

2. **Current standard:** A standard established for use over a short period of time and related to current conditions, is known as the 'current standard'. This standard shows what the performance should be under current conditions. Conditions during which period the standard is used are known as current conditions.

3. **Ideal standards & Expected standards:-** Ideal standard is that which can be attained under the most favorable conditions, while expected standard is that which is expected to be attained during a specified budget period. It is a target which is attainable and can be achieved if the expected conditions operate during the period for which the standard is set.

4. **Normal standard:** This standard is defined as "the average standard which it is anticipated can be attained over a future period of time, preferably long enough to cover one trade cycle."It is difficult to follow normal standards in practice as it is not possible to forecast performance with a reasonable degree of accuracy for a long period of time.

Analysis of Variances:

Variance is the difference between a standard cost and the comparable actual cost incurred during a period. It is the deviation of actual cost from the standard cost. In other words, the deviation of the actual cost or profit or sales from the standard cost or profit or sales is known as variance. If the actual cost is less than the standard, the difference is known as favourable or positive variance and it is symbol of efficiency. If the actual cost is more than the standard cost, the difference is known as unfavorable variance. Analysis of variance means carrying out the appropriate investigation to identify the reasons for the variance.

Types of variances Analysis of variances may be done in respect of each element of cost and sales. It includes

1. Direct material variance
2. Direct labour variance
3. Overhead variance
4. Sales variance.

MATERIAL VARIANCES

It includes:

a. **Material Cost Variance (MCV)**: It is the difference between the standard cost of materials allowed for the output achieved and the actual cost of materials used. It may be expressed as:
MCV=Standard cost of materials for actual output – Actual cost of materials used
Std. cost of material = std qty x std price per unit
Actual cost of material = Actual qty x actual price

b. **Material Price Variance (MPV)**: It is that portion of the material cost variance which is due to the difference between the standard cost of materials used for the output achieved and the actual cost of materials used.
MPV = Actual qty x (std price – Actual price)

c. **Material Usage Variance or Material Quantity Variance(MQV)**: It is that portion of material cost variance which is due to the difference between the standard quantity of materials specified for the actual output and the actual quantity of materials used.
MUV = Std price per unit (Std qty – Actual qty)

d. **Material Mix Variance (MMV):** It is that portion of the material usage variance which is due to the difference between standard and actual composition of a mixture. It is calculated as the difference between the standard price of the standard mix standard price of the actual mix.

In case of material mix variance, two situations may arise: Actual weight of mix and the A. Standard weight of mix do not differ: - In this case material mix variance is calculated by applying the following formula

MMV= Std price (Std qty x Actual qty)

If the standard is revised due to shortage of a particular type of material, the material mix variance is calculated as follows:

MMV= Std price (Revised std qty – Actual qty)

B. Actual weight of mix differ from standard weight weight of mix:- In such a case, material mix variance is calculated as follows:

$$\frac{\text{Total weight of actual mix}}{\text{Total weight of std mix}} \times \text{Std cost of std mix} - \text{Std cost of actual mix}$$

e. **Material Yield Variance :-** It is that portion of the material usage variance which is due to the difference between the standard yield specified and the actual yield obtained. This variance measures the abnormal loss or saving of material.

Labour Variance: When standard cost of labour differs from actual wage cost, the labour variance arises. The following are the important types of labour variances

1. **Labour cost variance:** It is the difference between standard cost of labour allowed for actual output achieved and the actual cost of labour.
   LCV = Std cost of labour – Actual cost labour
2. **Labour rate variance**: It is that part of labour cost variance, which arises due to the difference between standard rate specified and the actual rate paid.
   LRV = Actual time x (Std rate – Actual rate)
3. **Labour Efficiency Variance:** It is that portion of labour cost variance which arises due to the difference between standard labour hours specified for the activity achieved and the actual labour hours expended.
   LEV = Standard rate x (Standard time for actual output – Actual time)

It arises because of the following reasons:

a. Use of incorrect grade of labour

b. Insufficient training

c. Bad supervision

d. Incorrect instructions

e. Bad working conditions

f. Worker's dissatisfaction

g. Defective equipment and machinery

h. Wrong item of equipments

i. Excessive labour turn over, and

j. Fixation of incorrect standards.

Overhead Variances:

The term overhead, which comprises indirect materials, indirect labour and indirect expenses, may relate to factory, office or selling and distribution. It is the sum of variable overhead variance and fixed overhead variance. In other words, it is the difference between standard overhead cost charged to production and the actual overhead cost incurred.

Variable overhead Cost variance:

This represents the difference between the standard cost of variable overhead allowed for actual output and the actual variable overhead incurred during the period. Variable overhead cost variance is made up of variable overhead expenditure variance and variable overhead efficiency variance.

It is computed by the application of the following formula:

a. When OH rate per unit is used
   VOH Cost Variance = (Actual output x Std variable OH rate per unit) – Actual Variable OH
   Std. VOH rate per unit = Std variable OH

   Std out put
b. When OH rate per hour is used
   VOH Cost Variance =(Std hours for actual output x Std variable OH rate per hour) – Actual VOH
   Std VOH rate per hour = Std VOH

   Std hours

Variable Over head Expenditure Variance:

It is the difference between the standard variable OH rate per hour and the actual variable OH rate per hour, multiplied by the actual hours worked.

Variable OH expenditure Variance = (Actual hours worked x Std Variable OH rate per hour) – Actual variable OH

OR

(Std output for actual hours x Std OH rate per unit) – Actual variable OH

Variable OH efficiency Variance: It is the difference between the variable overhead allowed for production and the variable overhead absorbed through production.

Variable OH Efficiency Variance = Std Variable OH rate per hour (Std hours for actual production – Actual hours)

If actual hours is less, it is favourable variance and vice versa.

Fixed Over head variance:

It is the difference between standard fixed overhead allowed for actual output and the actual fixed overhead incurred. Fixed overhead cost variance is calculated by using the following equation

Fixed OH cost Variance = Std. fixed OH for actual Output – Actual fixed OH

Fixed OH Expenditure variance: It is the difference between budgeted fixed overhead and actual fixed overhead.

Fixed Overhead expenditure variance = Budgeted fixed OH – Actual Fixed OH

Fixed OH volume Variance:

It is the difference between Std fixed OH allowed for actual output and the budgeted fixed overhead for the period.

Fixed Overhead Volume Variance = Std. fixed overhead for actual output – Budgeted fixed Overheads.