OVERVIEW OF COST ACCOUNTING

Chapter 1

CLASSIFICATION OF ACCOUNTING

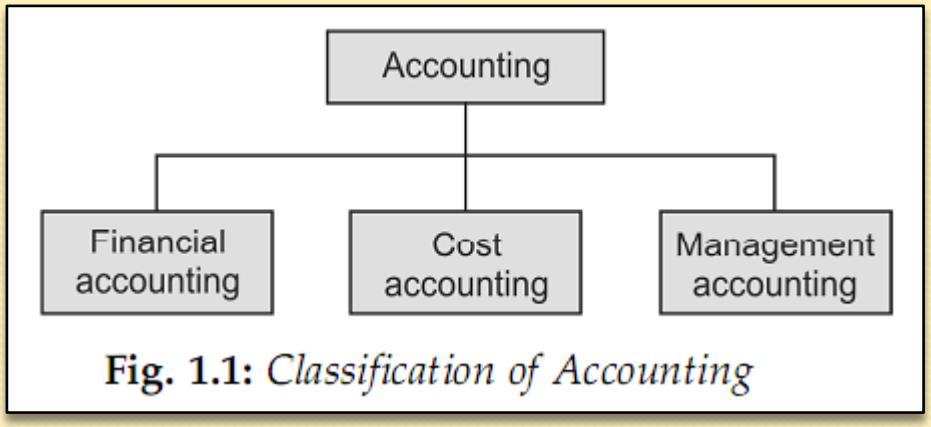


Fig. 1.1: *Classification of Accounting*

1. **Financial Accounting:** It is defined as 'the art of recording, classifying and summarizing in a significant manner and in terms of money, transactions and events, which are in part at least, of a financial character and interpreting the results thereof.'
2. **Cost Accounting:** 'Cost accounting is the process of accounting for costs from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units. In its widest usage, it embraces the preparation of statistical data, the application of cost control methods and ascertainment of profitability of activities carried out or planned.'
3. **Management Accounting:** (CIMA), London has defined management accounting as 'the presentation of accounting information in such a way as to assist management in the creation of policy and in the day-to-day operations of an undertaking.'

OBJECTIVES AND FUNCTIONS OF COST ACCOUNTING

Ascertainment of cost:

- In cost accounting, cost of each unit of production, job, process or department, etc., is ascertained. Not only actual costs incurred are ascertained but costs are also pre-determined for various purposes.

Cost control and cost reduction

- Cost accounting aims at improving profitability by controlling and reducing costs. For this purpose, various specialized techniques, like standard costing, budgetary control, inventory control, value analysis, etc., are used.

Guide to business policy

- Cost accounting aims at serving the needs of the management in conducting the business with utmost efficiency. Cost data provide guidelines for various managerial decisions, like making or buying, selling below cost, utilization of idle plant capacity, introduction of a new product, etc.

Determination of selling price

- Cost accounting provides cost information on the basis of which selling prices of products or services may be fixed. In periods of depression, cost accounting guides the firms in deciding the extent to which the selling prices may be reduced to meet the situation.

MEANING OF COST

According to Cambridge International Dictionary of English, cost means 'the amount of money needed to buy, do or make something.' Some other definitions of cost are given below:

1. Cost is 'the amount of expenditure (actual or notional), incurred or attributable to a given thing.' (CIMA, London)
2. A cost is the value of economic resources used as a result of producing or doing the things costed.' (W M Harper)
3. 'Cost is a measurement, in monetary terms, of the amount of resources used for the purpose of production of goods or rendering of services.' (ICWA of India)

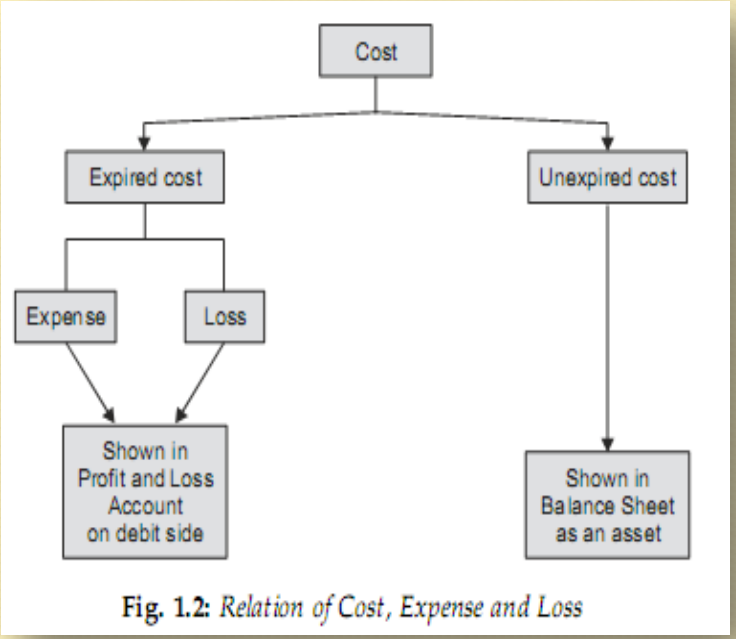


Fig. 1.2: *Relation of Cost, Expense and Loss*

Cost Centre: 'A location, person, or item of equipment (or group of these), for which costs may be ascertained and used for the purpose of control.' (CIMA)

Cost Unit: 'Unit of product or service in relation to which costs are ascertained.'(CIMA)

Cost Object: 'Anything for which a separate measurement of cost may be desired.'

METHODS OF COSTING

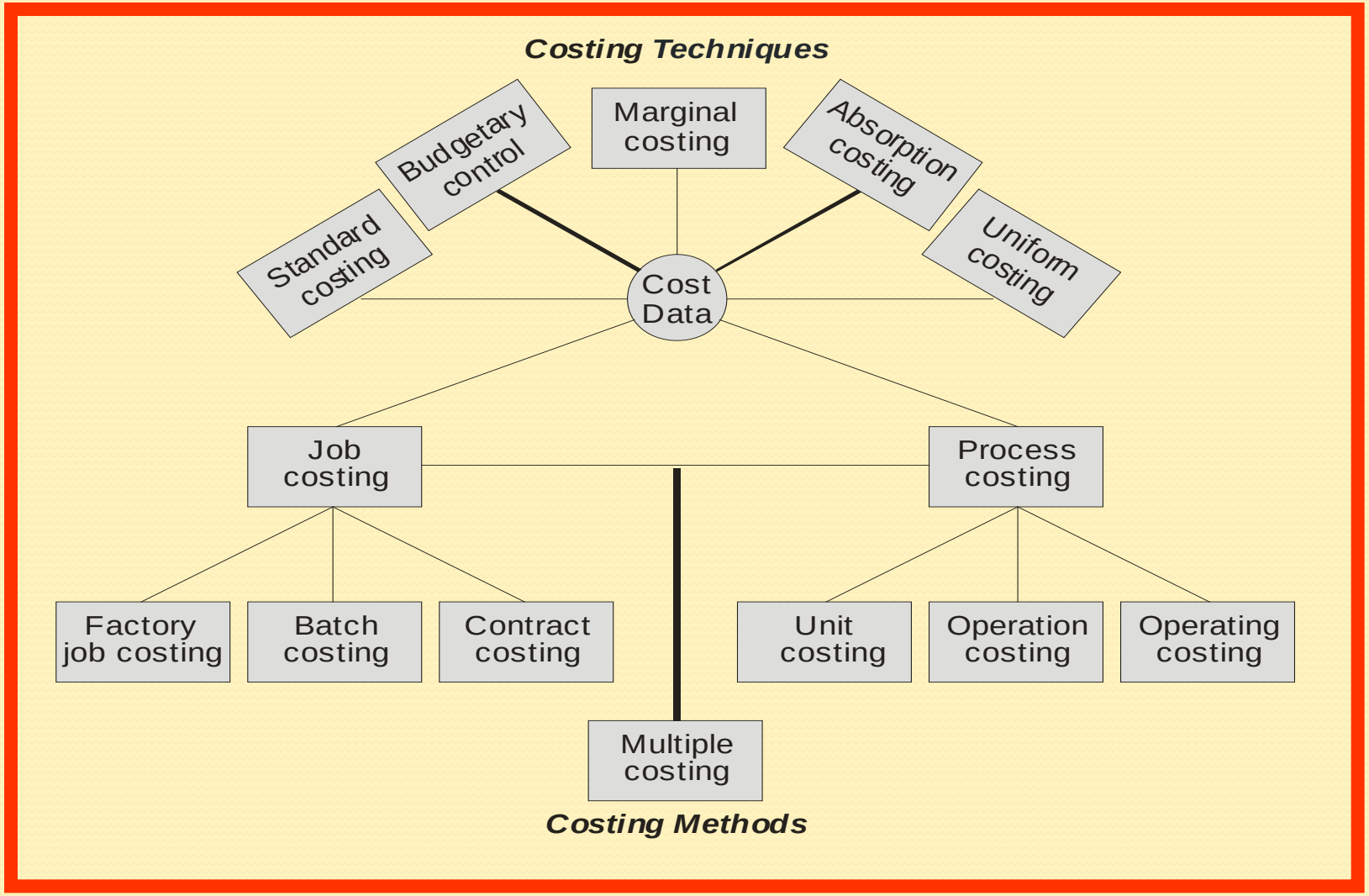
Job order costing: Cost unit in job order costing is taken to be a job or work order for which costs are separately collected and computed.

Contract costing or terminal costing: The cost unit here is a 'contract' which is of a long duration and may continue over more than one financial year.	**Batch costing:** In this, cost of a batch or group of identical products is ascertained and therefore each batch of products is a cost unit for which costs are ascertained.

Process costing: This method is used in mass production industries manufacturing standardized products. Costs are accumulated for each process or department.

Operation costing: A process may consist of a number of operations and operation costing involves cost ascertainment for each operation instead of a process.	**Single, output or unit costing:** This method is used when production is uniform and consists of a single or two or three varieties of the same product.	**Operating or service costing:** It is used in undertakings which provide services instead of manufacturing products.

METHODS OF COSTING(Contd.)



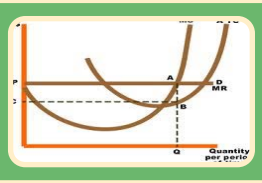
TECHNIQUES OF COSTING

Standard costing

- In this technique, standard cost is predetermined as target of performance, and actual performance is measured against the standard.

Budgetary control

- It is a technique applied to the control of total expenditure by comparing actual performance with planned performance.



Marginal costing

- In this technique, separation of costs into fixed and variable (marginal) is of special interest and importance.

Total absorption Marginal costing

In this technique, separation of costs into fixed and variable (marginal) is of special interest and importance. It is a traditional method of costing whereby total costs (fixed and variable) are charged to products.

Uniform costing

In this technique, separation of costs into fixed and variable (marginal) is of special interest and importance.

COST ASCERTAINMENT AND COST ESTIMATION

Cost Ascertainment: Cost ascertainment is concerned with computation of actual costs incurred. It refers to the methods and processes employed in ascertaining costs.

The ascertainment of actual cost has very little utility because of the following reasons:
1. Actual costs cannot be used for the purpose of price quotations and filling tenders.
2. Actual cost has practically no utility for cost control purposes.
3. Actual costs are ineffective as means of measuring performance efficiency.

Cost Estimation: Cost estimation is the process of predetermining costs of goods or services. The costs are determined in advance of production and precede the operations. Cost estimates may have the following uses:

1. Cost estimates are used in making price quotations and bidding for contracts.
2. Cost estimates are used in the preparations of budgets.
3. They help in evaluating performance.
4. They are used in preparing projected financial statements.
5. Cost estimates may serve as targets in controlling the costs.

CLASSIFICATIONS OF COST

Classification into Direct and Indirect Costs

Direct costs: Costs which are incurred for and conveniently identified with a particular cost object.

Indirect costs These are general costs and are incurred for the benefit of a number of cost object.

Classification into Fixed , Variable and Semi-variable Costs

Fixed costs : These remain constant over a specific range of activity for a specified period of time.

Variable costs : Cost that tend to vary in direct proportion to the volume of output.

Semi-variable or semi-fixed costs (mixed costs): These costs include both a fixed and a variable component.

Classification into Com mitted and Discretionary Costs

Committed costs: These are those costs that are incurred in maintaining physical facilities and managerial set up.

Discretionary costs: Costs which can be avoided by management decisions. Such costs are not permanent.

CLASSIFICATIONS OF COST(Contd.)

Classification into Product Costs and Period Costs

Product costs: These costs include all such costs that are involved in acquiring or making a product.

Period costs: These are those costs which are not necessary for production and are incurred even if there is no production.

Classification into Controllable and Non- controllable Costs

Controllable costs: Costs which may be directly regulated at a given level of management authority.

Non-controllable costs: Costs which cannot be influenced by the action of a specified member of an enterprise.

Classification into Historical Costs and Predetermined Costs

Historical costs: Costs which are ascertained after these have been incurred.

Predetermined costs: Future costs which are ascertained in advance of production.

Classification into Normal and Abnormal Costs

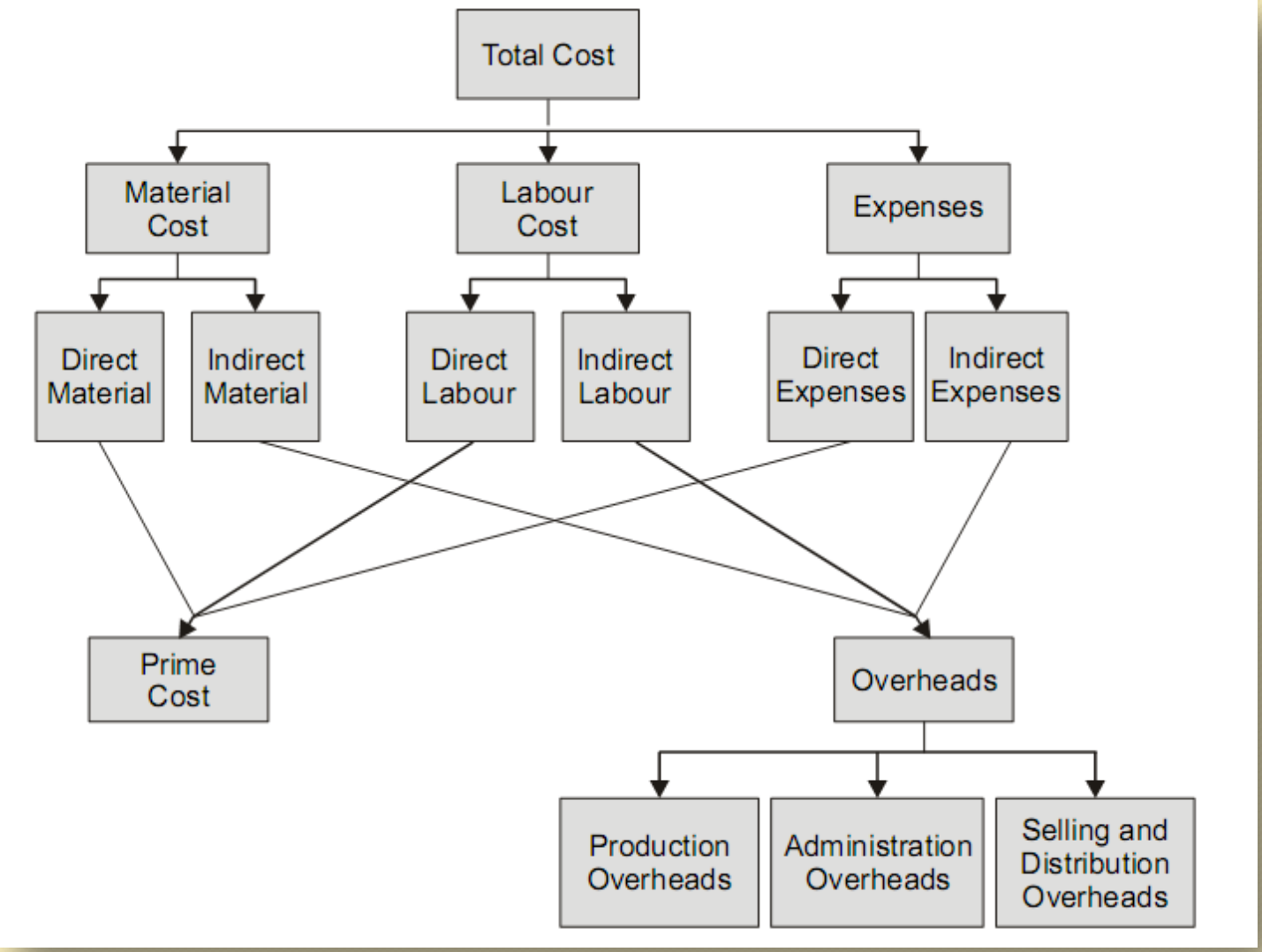
Normal cost: Cost which is incurred on expected lines at a given level of output.

Abnormal cost: Cost which is not normally incurred at a given level of output.

SPECIAL COSTS FOR MANAGEMENT DECISION MAKING

1. **Relevant costs:** Cost whose magnitude will be affected by decision being made.
2. **Irrelevant costs:** These are those costs that will not be affected by a decision.
3. **Sunk Costs:** A sunk cost is an expenditure made in the past that cannot be changed and over which management no longer has control.
4. **Differential (or Incremental) Cost:** This cost may be regarded as the difference in total cost resulting from a contemplated change.
5. **Marginal Cost:** Marginal cost is the additional cost of producing one additional unit. Marginal cost is the same thing as variable cost.
6. **Imputed Costs:** These are hypothetical costs which are specially computed outside the accounting system for the purpose of decision making.
7. **Opportunity Cost:** It is the sacrifice involved in accepting an alternative under consideration.
8. **Replacement Cost:** This is the cost at which there could be purchased an asset identical to that which is being replaced.
9. **Out - of - pocket Cost (Explicit Cost and Implicit Cost):** These are those costs that involve cash outlays or require the utilization of current resources.
10. **Future Cost:** Relevant costs for decision making are predetermined or future costs.
11. **Conversion Cost:** It is the total cost of 'converting' a raw material into finished product.

ELEMENTS OF COST



ELEMENTS OF COST (Contd.)

Material Cost: 'The cost of commodities supplied to an undertaking.'(CIMA)

- **Direct material cost** is that which can be conveniently identified with and allocated to cost units.
- **Indirect materials cost** are those materials which cannot be conveniently identified with individual cost units.

Labour Cost: This is 'the cost of remuneration (wages, salaries, commissions, bonuses, etc.) of the employees of an undertaking' (CIMA).

- **Direct labour cost** consists of wages paid to workers directly engaged in converting raw materials into finished products.
- **Indirect labour cost** It is of general character and cannot be conveniently identified with a particular cost unit.

Expenses: 'The cost of services provided to an undertaking and the notional cost of the use of owned assets' (CIMA).

- **Direct expenses** According to CIMA, London, 'direct expenses are those expenses which can be identified with and allocated to cost centres or units.'
- **Indirect expenses** All indirect costs, other than indirect materials and indirect labour costs, are termed as indirect expenses.

Prime Cost: Aggregate of direct material cost, direct labour cost and direct expenses.

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ELEMENTS OF COST(Contd.)

Overheads: These are the aggregate of indirect material cost, indirect labour cost and indirect expenses. Thus,

Indirect material + Indirect labour + Indirect expenses = Overheads

Production overheads: Also known as factory overheads, works overheads or manufacturing overheads, these are those overheads which are concerned with the production function.

Office and administration overheads: These are the indirect expenditures incurred in general administrative function, i.e., in formulating policies, planning and controlling the functions, directing and motivating the personnel of an organization in the attainment of its objectives.

Selling and distribution overheads: Selling overheads are the costs of promoting sales and retaining customers. They are defined as 'the cost of seeking to create and stimulate demand and of securing orders.' Distribution cost includes all expenditure incurred from the time the product is completed until it reaches its destination.

STEPS OF INSTALLATION OF A COSTING SYSTEM

1. Preliminary investigations should be made relating to technical aspects of the business.
2. The organization structure should be studied to ascertain scope of authority.
3. Methods of purchase, storage or issue of materials should be modified as required.
4. Methods of remunerating labour should be examined to introduce any incentive plans.
5. Forms and accounting records should be designed to involve minimum clerical labour.
6. The size and layout of the factory should be studied.
7. The system should be effective in cost control and cost reduction.
8. Costing system should be simple and easy to operate.
9. The installation and operation of the system should be economical.
10. The system should be introduced gradually.

ADVANTAGES OF COST ACCOUNTING

Advantages to Management: Reveals profitable and unprofitable activities, Helps in cost control, Helps in decision making, Guides in fixing selling prices, Helps in inventory control, Aids in formulating policies, Helps in cost reduction, Reveals idle capacity, Checks the accuracy of financial accounts, Prevents frauds and manipulation.

Advantages to Workers: Workers are benefited by introduction of incentive plans which are an integral part of a cost system bringing higher productivity and higher earnings for them.

Advantages to Society: An efficient cost system is bound to lower the cost of production, the benefit of which is passed on to the public at large, in the form of lower prices of products or services.

Advantages to Government Agencies and Others: A cost system produces ready figures for use by government, wage tribunals, chambers of commerce and industry trade unions, etc., for use in problems like price fixing, wage level fixing, settlement of industrial disputes, policy matters, etc.

LIMITATIONS OR OBJECTIONS AGAINST COST ACCOUNTING

It is unnecessary

- **It** is argued that maintenance of cost records is not necessary and involves duplication of work. It is based on the premise that a good number of concerns are functioning prosperously without any system of costing.

It is expensive

- **It** is pointed out that installation of a costing system is quite expensive which only large concerns can afford. It is also argued that installation of the system will involve additional expenditure which will lead to a diminution of profits.

It is inapplicable

- Another argument sometimes put forward is that modern methods of costing are not applicable to many types of industry.

It is a failure

- The failure of a costing system in some concerns is quoted as an argument against its introduction in other undertakings.

ESSENTIALS OF A GOOD COST ACCOUNTING SYSTEM

Suitability	• The method of costing adopted should be suitable to the industry and serve the objectives of installing the system.
Specially designed system	• A readymade costing system cannot be suitable for every business. The cost accounting system should be tailor-made according to the requirements of a business.
Support of executives	• If a costing system is to be successful, it must be fully supported by executives of various departments and everyone should participate in it.
Cost of the system	• The cost of installing and operating the system should be justified by the results produced.
Clearly defined cost centres	• In order to derive maximum benefits from a costing system, well-defined cost centres and responsibility centres should be identified within the organization.

ESSENTIALS OF A GOOD COST ACCOUNTING SYSTEM (Contd.)

Controllable costs	• Controllable and non-controllable costs of each responsibility centre should be separately shown.
Integration with financial accounts	• There should be cooperation and coordination between cost accounting and financial accounting departments. In order to avoid duplication of accounts, cost and financial accounts may be integrated.
Continuous education	• Well-trained and educated staff should be employed to operate the system. In order to educate the costing staff, written manuals and meetings, etc. should be arranged on a continuous basis.
Prompt and accurate reports	• The cost accounting department should prepare accurate reports and promptly submit the same to appropriate level of management so that action may be taken without delay.
Avoid unnecessary details	• Resources should not be wasted on collecting and compiling cost data that is not required.

MATERIAL COST

Chapter 2

MEANING OF MATERIAL

The term 'material' refers to all commodities that are consumed in the process of manufacture. It is defined as 'anything that can be stored, stacked or stockpiled.' Materials are classified into:

Direct materials are those whose consumption may be identified with specific production units and which usually become a part of the finished product.	**Indirect materials** are those which cannot be conveniently identified with individual cost units.

The term 'inventory' is used to cover the stocks of raw materials, components, work-in-progress and finished goods. It has been defined by the Accounting Principles Board as 'the aggregate of those items of tangible personal property which (i) are held for sale in the ordinary course of business; (ii) are in the process of production for such sales; or (iii) are to be currently consumed in the production of goods or services to be available for sale.'

MATERIAL CONTROL (Inventory Control)

Material or inventory control may be defined as 'systematic control and regulation of purchase, storage and usage of materials in such a way so as to maintain an even flow of production, at the same time avoiding excessive investment in inventories. Efficient material control cuts out losses and wastes of materials that otherwise pass unnoticed.'

ESSENTIAL REQUIREMENTS OR PRINCIPLES OF INVENTORY CONTROL

1. There should be proper coordination and cooperation between various departments dealing in materials, viz., Purchasing Department, Stores Department, Receiving and Inspecting Department, Accounting Department, etc.
2. There should be a central purchasing department under the control of a competent and expert purchase manager.
3. There should be proper classification and codification of materials.
4. Material requirements should be properly planned.
5. The perpetual inventory system should be operated so that up-to-date information is available about the quantity of material in stock.

ESSENTIAL REQUIREMENTS OR PRINCIPLES OF INVENTORY CONTROL

6. • Adequate records should be introduced to control materials during production and the quantities manufactured for stock.

7. • The storage of all materials should be well planned, subject to adequate safeguards and supervision.

8. • The various stock levels like minimum, maximum, etc., should be fixed for each item of material.

9. • Purchases of materials should be controlled through budgets.

10. • An efficient system of internal audit and internal check should be operated so that all transactions involving materials are checked by reliable and independent persons.

11. • There should be regular reporting to management regarding purchases, issues and stock of materials. Special reports should be prepared for obsolete items, spoilage, returns to suppliers, etc.

TECHNIQUES OF INVENTORY CONTROL

- ABC technique
- Stock levels-Minimum, maximum and reorder levels
- Economic order quantity (EOQ)
- Proper purchase procedure
- Proper storage of materials

TECHNIQUES OF INVENTORY CONTROL

- Inventory turnover ratio to review slow and non-moving materials
- Perpetual inventory system
- Fixation of material cost standards (Used in Standard Costing)
- Preparation of material budgets (Used in Budgetary Control

ABC TECHNIQUE (Selective Control)

ABC technique is a value based system of material control. In this technique, materials are analysed according to their value so that costly and more valuable materials are given greater attention and care.

'A' Items: These are high value items which may consist of only a small percentage of the total items handled. On account of their high cost, these materials should be under the tightest control and the responsibility of the most experienced personnel.

'B' Items: These are medium value materials which should be under the normal control procedures.

'C' Items: These are low value materials which may represent a very large number of items. These materials should be under simple and economical methods of control.

The point of classifying stock into A, B and C categories is to ensure that material management focuses on A items where sophisticated controls should be installed. B items may be given less attention and C items least attention.

STOCK LEVELS

In order to guard against under-stocking and over-stocking, most of the large companies adopt a scientific approach of fixing stock levels. These levels are: (i) maximum level; (ii) minimum level; (iii) reorder level; and (iv) reorder quantity. By adhering to these levels, each item of material will automatically be held within appropriate limits of control.

Maximum Level

$$\text{Maximum level} = \text{Reorder level} + \text{Reorder quantity} - (\text{Minimum consumption} \times \text{Minimum reorder period})$$

Minimum Level

$$\text{Minimum level} = \text{Reorder level} - (\text{Normal consumption} \times \text{Normal reorder period})$$

Reorder Level or Ordering Level

$$\text{Reorder level} = \text{Maximum consumption} \times \text{Maximum reorder period}$$

Danger Level

$$\text{Danger level} = \text{Normal consumption} \times \text{Max. reorder period under emergency conditions}$$

Average Stock Level

$$\text{Average stock level} = \tfrac{1}{2}\,(\text{Minimum level} + \text{Maximum level})$$

REORDER QUANTITY (Economic Order Quantity Or EOQ)

Reorder quantity is the quantity for which order is placed when stock reaches reorder level. By fixing this quantity, the purchaser doesnít have to recalculate the quantity to be purchased each time he orders for materials. Reorder quantity is known as Economic Order Quantity because it is the quantity which is most economical to order. While setting economic order quantity, two types of costs should be taken into account:

1. **Ordering cost** This is the cost of placing an order with the supplier.

2. **Cost of carrying stock** This is the cost of holding the stock in storage.

REORDER QUANTITY (Economic Order Quantity or EOQ)

Mathematical Formulae of EOQ

$$EOQ = \sqrt{\frac{2.A.B}{C.S}}$$

where
EOQ = Economic Order Quantity
A = Annual consumption in units
B = Buying or ordering cost per order
C = Cost per unit
S = Storage or carrying cost as a percentage of average inventory

Alternatively,

$$EOQ = \sqrt{\frac{2.A.B}{S}}$$

where
S = Storage cost per unit per annum

INVENTORY TURNOVER

Inventory or stock turnover ratio tells us how many times in a year stock is used up and replaced. The greater the stock turnover, the more efficient is the stock policy. Stock turnover rate is the ratio which the cost of materials consumed per annum bears to the average stock of raw materials. Thus,

$$\text{Stock Turnover Ratio} = \frac{\text{Cost of materials consumed during the period}}{\text{Average stock of materials during the period}}$$

Stock turnover ratio is an indicator of the rate of consumption, i.e., whether materials are moving fast or slowly. A high stock turnover ratio indicates fast moving materials and a low ratio indicates slow moving materials. Stock turnover rate may also be calculated in terms of days. This is done by dividing 365 days by the inventory turnover ratio. Thus:

$$\text{Stock Turnover in terms of days} = \frac{\text{Days of the period}}{\text{Stock turnover rate}}$$

PURCHASE OF MATERIALS

Just-in-time (JIT) Purchasing

Just-in-time purchasing is the purchase of materials immediately before these are required for use in production. According to CIMA, London JIT purchasing is 'matching receipts of materials closely with usage so that raw material inventory is reduced to near zero level.'

Centralized and Decentralized Purchasing

Broadly speaking, purchase function may be organized in two ways, i.e., centralized purchasing and decentralized purchasing.

Centralization

Centralization of purchasing means that all purchases are made by a single purchase department. Head of this department is designated as Purchase Manager or Chief Buyer.

Decentralization

In decentralized purchasing, each branch or department makes its own purchases. If the branches or plants are located at different places, the decentralized purchasing can better meet the situation by making purchases in the local market by plant or branch managers

PURCHASE PROCEDURE

1. **Purchase Requisition**: Purchases of materials are initiated through purchase requisitions. It is a formal request by the head of a department or an authorized officer to the purchase manager to purchase the specified materials.

2. **Selection of Suppliers:** When the purchasing department receives a duly authorized purchase requisition, a source of supply has to be selected.

3. **Purchase Order and Fol l ow – up:** The purchase order is the form used by the purchasing department authorizing the suppliers to supply the specified materials at the price and terms stated therein.

4. **Receipt of Materi als:** All incoming materials should be received by the Receiving Department which performs the functions of unpacking the goods received and verifying their quantities and conditions.

PURCHASE PROCEDURE(Contd.)

5. **Inspection and Testing of Materials:** Goods received should be inspected for quality to ensure that they comply with the specifications stated.

6. **Return of Rejected Materials:** Where materials received are damaged or are not in accordance with the specifications, these are usually returned to the supplier along with a Debit Note, informing him that his account has been debited with the value of materials concerned.

7. **Passing Invoices for Payment:** When the invoices are received, the process of assembling the business papers connected with each purchase and preparation of voucher begins. Invoices are numbered serially and entered in the Invoice Register. The following documents are assembled in support of the invoice: (a) Purchase Order; (b) Goods Received Note; (c) Inspection Report, if not incorporated in the Goods Received Note and (d) Debit or Credit Note.

PURCHASE PRICE

The invoice received from the supplier provides a base figure of purchase price. The following adjustments have to be made in this figure to arrive at the real material cost.

Quantity discount	• This is an allowance made by the supplier to the purchaser to encourage large orders.
Trade discount	• This is an allowance made by the supplier to a purchaser who has to re-sell the material, e.g., discount allowed by the manufacturer to the wholesaler.
Cash discount	• This discount is allowed by the supplier to a purchaser to encourage prompt payment of invoice.
Sales tax and other levies	• Items, like sales tax, excise duty, customs duty and octroi, should be added to the purchase price.
Transport charges	• These include sea, land and air freight, dock charges, insurance, etc. on materials purchased.
Cost of containers	• If containers are separately charged, all such costs should be included in the purchase price i.e. (i) the cost of containers if these are not returnable; and (ii) the difference between the cost of container and the amount refunded when container is returned, where containers are returnable.

STOREKEEPING

Storekeeping is the function of receiving of materials, storing them and issuing these to workshops or departments.

Stores Organization

There are mainly two types of stores organization, i.e., central stores and departmental sub-stores. From control point of view, it is ideal to have one central store for receiving and issuing all materials. However, this is not always practicable because in large factories, where there are many production departments, the location of the central store may not be convenient to all such departments. Thus, where it is not advantageous to keep central stores, departmental sub-stores should be maintained.

Imprest System

Under this system, a number of sub-stores exist, each drawing their supplies from the central store. Each sub-store is given, as a commencing stock, sufficient supplies for a little more than the re-stocking period. At the end of the period, the storekeeper of each sub-store will requisition from the central stores the number of articles required to bring the stock upto the predetermined quantity.

CLASSIFICATION AND CODIFICA TION OF MATERIALS

Classification of materials refers to grouping of materials according to their nature in suitable categories. Codification is the procedure of systematic assignment of symbols for each item of store. Such codes may be either numeric, alphabetic or a combination of numerical and alphabetical symbols.

Basic Principles of Coding: While assigning codes, the following principles should be kept in mind:

1. **Exclusive** Each code number should relate to only one type of material.
2. **Clear** Code must be clear and should identify materials without any ambiguity.
3. **Brief** Codes should be brief because long codes are prone to error.
4. **Elastic** Code should be such that new materials can be added easily.
5. **Mnemonic** As far as possible, codes should be easier to remember.

Systems of Coding

1. Numerical and Decimal In this method, a number is allotted to each item. Sub-groups are indicated by decimals.	2. Alphabetical or Mnemonic In this method, each item of store may be denoted by a combination of alphabets. As alphabets represent the first sound of description of materials, it becomes easy to remember the codes.	3. Alpha-numerical This is a combination of numerical and alphabetical methods.

STORES RECORDS

The stores records are of two types:

1. **Perpetual Inventory Records** These records show the movement of stores, i.e., the receipt of materials, issues of materials to production department and also balance in stock. Bin card and stores ledger are the two basic perpetual inventory records.

2. **Documents** The documents are used to authorize movement of materials into and out of stores. These documents include Goods Received Note, Bill of Materials, Materials Requisition Note, Materials Return Note and Material Transfer Note.

Bin Card (Stock Card): A bin card is attached to the bin, drawer or any other container in which material is stored. An entry is made at the time of each receipt or issue and the new balance in stock is calculated. All these entries of receipts and issues are supported by documents, such as Goods Received Note, Materials Return Note, Stores Requisition Note, etc.

Stores Ledger: The stores ledger is maintained in the cost accounting department and is one of the basic records for material accounting in a cost system. This record gives the same information regarding stores as bin card and in addition, it gives the monetary values of materials. Separate ledger folios are maintained in it for each item of material. There are mainly three sections in this ledger, i.e., receipts, issues and balance, each of these with appropriate sub-divisions showing date, quantity, unit price and total cost.

STORES RECORDS(Contd.)

Goods Received Note

- A copy of Goods Received Note is sent to the storekeeper along with the materials for his records. The storekeeper uses this document for posting on the receipt side of the bin card.

Stores Requisition Note (or Materials Requisition Note)

- It is a document which is used to authorize and record the issue of materials from store.
- It is a key document in virtually all costing systems and serves the dual purpose of:
- (a) authorizing the storekeeper to issue material
- (b) providing a written record of usage of materials

Bill of Materials (Specification of Materials)

- It is a master requisition which lists all the materials required for the completion of a job. So, a bill of materials is a special form of stores requisition note which is generally used by departments having standard materials requirements or a comparatively fixed list of materials.

Materials Return Note

- When materials issued are in excess of requirements, the unused materials are returned to stores together with a Materials Return Note.

Materials Transfer Note

- Materials may have to be sometimes transferred from one job to another. Where such transfers are permitted, these should be supported by a special document known as a Material Transfer Note.

INVENTORY SYSTEMS

There are mainly two inventory systems, viz., Periodic Inventory System and Perpetual Inventory System. There are mainly two inventory systems:

Periodic Inventory System: Under this system, stock-taking is undertaken at the end of the accounting year.

Perpetual Inventory System: A perpetual inventory system is defined as 'the method of recording stores balances after each receipt and issue to facilitate regular checking and obviate closing down for stock-taking.' Perpetual inventory system is operated by taking the following steps:

1. **Reconciliation of bin cards and stores ledger accounts:** The records of each item of store are kept simultaneously at two places i.e., bin card and stores ledger, which are the perpetual inventory records. The balance of an item of store as shown in the bin card should agree with that shown in the stores ledger.

2. **Continuous stock-taking:** In any perpetual inventory system, the book balances as shown by bin cards and stores ledger should agree with actual physical balance in store. Under this system, a few items of stores are counted daily or at frequent intervals and compared with the bin cards and stores ledger by the stores auditor.

Materials Abstract (Materials Issue Analysis Sheet): This is 'a document which is a classified record of material issues, returns and transfers.' In other words, all materials requisitions, materials return notes and material transfer notes are analysed periodically by the cost accounting department to ascertain the material cost of each job.

METHODS OF PRICING MATERIAL ISSUES

Methods of Pricing

Important Methods:

1. First-in, First-out Price (FIFO)
2. Last-in, First-out Price (LIFO)
3. Simple Average Price
4. Weighted Average Price
5. Replacement Price
6. Standard Price

Other Methods:

(*i*) Highest-in, First-out (HIFO)
(*ii*) Next-in, First-out (NIFO)
(*iii*) Specific Price
(*iv*) Base Stock Method
(*v*) Periodic Simple Average
(*vi*) Moving Simple Average
(*vii*) Periodic Weighted Average
(*viii*) Moving Weighted Average
(*ix*) Inflated Price

METHODS OF PRICING

First-in, First-out (FIFO) Method: This method is based on the assumption that materials which are purchased first are issued first. It uses the price of the first batch of materials purchased for all issues until all units from this batch have been issued. After the first batch is fully issued, the price of the next batch received becomes the issue price.
Three important effects of using FIFO method are:
(a) Materials are priced at the actual cost
(b) Charge to production for material cost is at the oldest prices of materials in stock
(c) Closing stock is valued at the latest price paid

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

METHODS OF PRICING

AVERAGE COST METHODS: These methods are based on the assumption that when materials purchased in different lots are stored together, their identity is lost, and therefore, issues should be charged at an average price.

Simple Average Method

- Simple average price is calculated by adding all the different prices of materials in stock, from which the materials to be priced could be drawn, by the number of prices used in that total.

Weighted Average Method

- This method gives due weight age to the quantities held at each price when calculating the average price. The weighted average price is calculated by dividing the total cost of material in stock, from which the material to be priced could have been drawn, by the total quantity of material in that stock. The simple formula is that weighted average price at any time is the balance value figure divided by the balance units figure.

Replacement Price Method

- Replacement price is the price at which materials would be replaced, i.e., the market price on the date of issue. This method is used when it is desired to reflect the current prices in cost.

Standard Price Method

- Standard price is a predetermined price which is fixed for a definite period, such as a year. Under this method, all receipts are posted in the Stores Ledger Account at actual cost and issues are priced at standard price. The difference between actual and standard prices, is transferred to Material Price Variance Account.

OTHER METHODS OF PRICING

Highest-in, First-out (HIFO) Method	• In this method, materials issued are charged at the rate of the highest priced materials in stores. This highest rate is continued to be used until material at that highest price is exhausted, after which the next highest price is used.
Next-in, First-out(NIFO) Method	• Here materials are not charged at a price which has been paid, but rather at a price at which an order has been placed, i.e., the price of materials that will be next received.
Specific Price or Identifiable Cost Method	• Special materials purchased exclusively for specific jobs or work orders should be charged to those specific jobs at the specific (actual) price. This method can always be used where materials are purchased and set aside for a particular job or work order until required for production.
Base Stock Method	• This method assumes that minimum (base) stock is always held in stock and is not issued. This is in the nature of a fixed asset and is carried at original cost. Any quantity in excess of base stock is valued according to one of the other methods, i.e., FIFO, LIFO, Average, etc.
Periodic Simple Average Method	• This method is similar to simple average method except that the issue price here is computed periodically (normally at the month-end) and not at the time of each issue of material.

OTHER METHODS OF PRICING(Contd.)

Periodic Simple Average Method: This method is similar to simple average method except that the issue price here is computed periodically (normally at the month-end) and not at the time of each issue of material.

$$\text{Periodic simple average price} = \frac{\text{Total of purchase prices during the period}}{\text{No. of prices during the period}}$$

Periodic Weighted Average Method: Like periodic simple average method, in this method also average price is calculated at the end of a given period (which is usually one month).

$$\text{Periodic weighted average price} = \frac{\text{Total cost of materials purchased}}{\text{Quantity purchased}}$$

Moving Simple Average Method: In this method, the periodic simple average is further averaged. For this purpose, a number of periods (or months) is decided first and then the total of the periodic average prices of the given periods is divided by the number of periods taken.

Moving Weighted Average Method: In this method, the moving average price is calculated in exactly the same way as the moving simple average price except that periodic weighted average prices are taken for averaging.

Inflated Price Method: This method is used where materials are subject to some inevitable losses that may arise from evaporation, breaking the bulk, etc. The issue price is slightly inflated to ensure that the loss is covered and the full cost of the material concerned is recovered.

MATERIAL LOSSES

Losses of materials may arise during handling, storage or during process of manufacture. Such losses or wastages are classified into two:

1. **Normal Loss** This is that loss which has necessarily to be incurred and thus is unavoidable.
2. **Abnormal Loss** This is that loss which arises due to inefficiency in operations, bad luck, mischief, etc.

Control of Material Losses

- Proper storage conditions should be provided, mainly for perishable materials.
- Store room should be well guarded to avoid the risks of fire or theft, etc.
- To reduce obsolescence, materials should be issued on first-in, first-out basis.
- Accuracy of weighing instruments should be periodically checked.
- A systematic procedure should be developed regarding movement of materials from one place to another.
- Specialized material handling equipment should be employed so as to minimize losses in materials handling.

Accounting Treatment: In order to absorb normal material losses in cost, the rates of usable materials in stock are inflated so that such losses are covered. Alternatively, normal material loss is transferred to factory overhead. Abnormal material losses, such as those due to breakage, theft, fire, flood and abnormal evaporation, are charged to Costing Profit and Loss Account.

WASTE, SCRAP, SPOILAGE AND DEFECTIVES

Waste: It is defined as 'that portion of a basic raw material lost in processing, having no recovery value.' Waste has the effect of reducing the quantity of output.. If waste is a part of the normal process loss, the cost will be absorbed by the good production. On the other hand, if it is a part of the abnormal process loss, it is transferred to Costing Profit and Loss Account.

Scrap: As per Cost Accounting Standard-6 (CAS-6) 'scrap is the "discarded material having some value in a few cases and which is usually either disposed of without further treatment (other than reclamation and handling) or re-introduced into the process in place of raw materials." ' Scrap is treated as (a) As other income credited to Profit and Loss Account (b) Credit to overheads (c) Credit to job or process

WASTE, SCRAP, SPOILAGE AND DEFECTIVES

Spoilage: Spoiled work results when materials are damaged in manufacturing operations is such a way that they cannot be rectified. For accounting purposes, spoiled work should be divided into normal and abnormal. The cost of normal spoilage should be borne by good production. Abnormal spoilage, caused due to inefficiency and treated as controllable should be transferred to Costing Profit and Loss Account.

Defectives: It is defined as 'that production which is below standard specifications or quality and can be rectified by incurring additional expenditure (of material, labour, etc.) known as rectification costs.' Where defective work is easily identifiable with specific jobs, the rectification costs should be debited to the jobs concerned. Where, however, such work cannot be conveniently identified with jobs, the rectification costs may be debited to overheads.

EMPLOYEE COST (Labour Cost)

Chapter 3

EMPLOYEE COST

According to Cost Accounting Standard-7 (CAS-7) issued by ICWA of India, employee cost is 'the aggregate of all kinds of consideration paid, payable and provision made for future payments, for the services rendered by employees of an enterprise (including temporary, part time and contract employees). Consideration includes wages, salaries, contractual payments and benefits, as applicable, or any payment made on behalf of the employee. This is also known as labour cost.' Labour cost is of two kinds:

Direct labour cost is 'the cost of employees which can be attributed to a cost object in an economically feasible way.' Direct labour is expended in altering the construction, composition or condition of the product.

Indirect labour cost is the wages paid to those workers who are not directly engaged in converting raw materials into finished products.

Organization for Accounting and Control of Labour Cost

Personnel department	Engineering department	Time-keeping department	Payroll department	Cost accounting department
• This is a service department and is mainly concerned with the proper selection and training of workers and placing them on jobs best suited.	• It prepares specifications of jobs makes job analysis, conducts time and motion studies, makes provision for safe working conditions.	• This department is concerned with recording of workers's time.	• This department maintains a record of job classification and wage rate of each employee and performs the function of computation of wages.	• It classifies all cost data including labour.

PERSONNEL DEPARTMENT

This department is concerned with recruitment, discharge and transfer, etc., of labour. On engaging a new worker, the personnel office will prepare an Employee's Record Card. This card will show full personal details of the employee, particulars of previous employment, wage rate payable and his medical category.

The following departments are notified about the engagement of a new employee:

(a)

- The department where the worker has to report for duty, a notification is made that the worker is expected to report on a certain date.

(b)

- The payroll department is informed about the new employee's name, the name of the former employee whom he replaces, clock number, rate of pay, date of commencement, etc.

(c)

- The time office, for recording the employee's attendance.

LABOUR TURNOVER

Labour turnover is thus defined as 'the rate of change in the composition of the labour force in an organization.'

Measurement of Labour Turnover

1. **Separation method** This method takes into account only those workers who have left during a particular period. Its formula is:

$$\text{Labour Turnover Rate} = \frac{\text{No. of workers who have left during a period}}{\text{Average no. of workers during the period}} \times 100^*$$

$$\text{Average Number} = \frac{\text{No. of workers in the beginning} + \text{No. of workers at the end of the period}}{2}$$

2. **Replacement method** This method takes into account only those new workers who have joined in place of those who have left. Its formula is:

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

3. **Flux method** This shows the total change in the composition of labour force due to separations and replacement of workers. Its formula is:

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

Cost of Labour Turnover

Preventive costs: These costs are those which are incurred to keep the work force satisfied and to prevent or discourage them from leaving the organization. These include:

1. Cost of personnel management-only that portion of this cost which can be attributed to the efforts of the personnel department in maintaining good relations between management and workers
2. Cost of welfare activities and services, e.g., canteen meals, co-operative stores, educational and transport facilities and housing schemes
3. Cost of medical services
4. Pensions schemes-to provide security and retirement benefits
5. Extra bonus and other perquisites (in excess of those given by other similar concerns) to discourage their defecting to other undertakings

Replacement costs These costs include all such losses and wastages arising because of the inexperienced new labour force replacing the existing one as well as the cost of recruitment and training of the new workers. These include:

1. • Cost of recruitment and selection of new employees
2. • Cost of training of new workers
3. • Loss of output due to some time gap in recruiting new workers
4. • Loss due to inefficiency of new workers
5. • Cost of accidents due to lack of experience of new workers
6. • Cost of extra scrap and defective work of new workers
7. • Cost of tools and machine breakdown due to faulty handling by new workers

ENGINEERING DEPARTMENT

This department helps in maintaining control over working conditions and production methods for each job, process or department. It performs functions like:

1. Preparation of plans and specifications for each job
2. Conducting time and motion studies
3. Making job analysis and setting piece rates

4. Providing safe and efficient working conditions
5. Supervising production activities in various production departments

WORK STUDY AND WORK MEASURMENT

Work Study: Work study may be defined as a technique of management which involves analytical study of jobs/operations with the object of determining the exact operations to be performed and measuring the work content of jobs. It consists of two techniques:

Methods Study: Methods study aims at determining the correct and more effective ways of doing jobs so that methods of production may be improved and effective use of existing resources may be made. This involves study of operations, tools and equipment, movements, etc. Methods study helps in the following ways:

(a) It improves methods in general and establishes correct methods for jobs and processes.

(b) It establishes data from which process layouts and standard time can be produced, wherever required.

Work Measurement: Work measurement is a technique of establishing normal or standard times after standardization of methods and establishment of a measure for the work contents of jobs or operations. This is done by :

Motion study is the study of the movements (motions) of workers and machines in performing the operation. Its objective is to identify and eliminate wasteful motions made by workers and machines operated by them.

Time study follows motion study. It is the art of observing and recording time required to do each detailed element of an industrial operation. Its main objective is to determine the standard time required to carry out a job most efficiently.

JOB ANALYSIS,EVALUATION AND MERIT RATING

Job analysis is the process of determining the tasks which comprise the job and the skills, knowledge, abilities and responsibilities required of the worker for its successful performance. Job analysis helps in fixing wage rates for different jobs and also helps in the right recruitment, selection and placement of workers.

Job Evaluation

Job evaluation is the rating of jobs for the purpose of determining the relative worth of each job. It is a systematic method of appraising the worth of each job in relation to other jobs. The idea behind job evaluation is that jobs which are similar in terms of duties and requirements must carry the same amount of salaries.

Merit Rating

Merit rating which is also known as employee rating or performance rating may be defined as a systematic evaluation of an employee's performance on the job, in terms of the requirements of the job. It rates or grades workers on their jobs on the basis of objective and comparative review of their individual performances. While attempting to rate workers in a workshop, the following factors may be considered: (a) Skill and experience; (b) Educational background; (c) Intelligence; (d) Responsibility; (e) Physical efforts; (f) Supervisory abilities; (g) Leadership qualities.

TIME-KEEPING DEPARTMENT

The main function of this department is to accurately record each Worker's time of arrival and departure in the factory and also the time spent on different jobs or processes. Thus it embraces two functions:

a) Time keeping, i.e., recording arrival and departure time of workers for attendance purpose and for calculation of wages; and

b) Time booking, i.e., recording time spent by workers on different jobs or processes for determining labour cost of jobs/processes.

The purpose of time recording is to provide basic data for:

(i) Preparation of payroll

(ii) Attendance records, to meet statutory requirements

(iii) Computing labour cost of a job or process

(iv) Computing overhead cost of jobs, if based on wages or labour hours

(v) Statistical analysis of labour records for determining productivity and control of labour cost

METHODS OF TIME KEEPING

Attendance register

In this method, attendance of each worker is recorded in the register maintained for this purpose. This register provides sufficient number of columns for attendance of each worker. Entries in the arrival and departure columns may be made by the foreman or the worker himself.

Token or disc method

Each worker is allotted an identification number is suitably painted or engraved on a round metal token (or disc) with a hole in it. All such tokens are hung in a serial order on a board at the factory gate. As the worker arrives, he removes his token from the board and puts it in a box kept nearby or hangs it on another board which is specially kept for this purpose.

Time-recording clocks

Each worker is allotted a Clock Card which bears his identification number, name, department, etc. These cards are kept in a rack in a serial order. There are usually two racks-an 'In' rack and an 'Out' rack. On arrival, the worker will pick up his card from the 'Out' rack, put it in the slot of the clock, press a button and the exact time is printed on the card. After this the card is put in the 'In' rack. An inspection of the 'Out' racks will reveal absentees.

Biometric Time Clock

Biometric time-recording clock is an electronic device to record attendance of employees. Instead of employees punching a time card or logging their attendance by hand, they simply place their finger on the Fingerprint Reading Sensor or place their hand into the Hand Reader and the rest of the work is done by the machine.

METHODS OF TIME-BOOKING

Job Ticket

- Job tickets or job cards are very commonly used for recording the time spent on each job. A card is prepared for each job and is allotted to the worker who takes up that particular job. The worker enters in this card the time of starting as well as finishing the job. After finishing the job, the worker submits his work along with his job ticket. He is then issued another job ticket for the next job.

Combined Time and Job Card

- This card combines the two in one-the clock card and job card, i.e., it records both the attendance time as well as time spent on different jobs.

Daily Time Sheet

- Each worker is daily issued a time sheet in which the time spent on each job during the day is recorded. This sheet must be completed on the same day and handed over to the foreman for signature.

Weekly Time Sheet

- Weekly time sheets record almost the same information as the daily time sheet. The main difference is that instead of recording the work done for a day only, record of work carried out is entered on a weekly basis.

Piece Work Card

- This card is allotted to a worker who is paid on piece basis. This card may be made either for each individual job or for recording the work done on several jobs. If group system of piece work is in vogue, the card may be allotted to each group of workers.

PAYROLL DEPARTMENT

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

Functions

- 1. To maintain a record of job classification, department and wage rate for each employee.
- 2. To verify and to summarize the time of each worker as shown on the daily time cards.
- 3. To prepare the payroll and compute the wages earned by each employee.
- 4. To compute the payroll deductions.
- 5. To maintain permanent payroll record of each employee.
- 6. To make wage payments.

PAYROLL SHEET

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

PAYROLL SHEET/WAGES SHEET

Department ..... Week/Month ending .....

Worker's No.	Worker's Name	Rate	Hours worked	Earnings					Gross Wages	Deductions					Net Wages paid	Remarks
				Regular	Over time	Bonus	D.A.	Other Allowances		PF	PTax	I Tax	Others	Total		
		₹		₹	₹	₹	₹		₹	₹	₹	₹	₹	₹	₹	₹

Fig. 3.8: Payroll Sheet

PAY SLIP

Some companies have a practice of preparing a pay slip of each worker, which may be handed over to the worker in advance of the actual payment of wages. Pay slip shows basic wages and details of various allowances like house rent allowance, dearness allowance and other payments like bonus, overtime pay, etc., and various deductions on account of P.F. contribution, income tax, recovery of loans, and any other deduction.

PAY SLIP

Name of Worker ..... Department .....

Worker's No. ..... Wage period .....

		₹
Basic wages		.....
Overtime pay		.....
Dearness allowance		.....
House rent allowance		.....
Bonus		.....
Other allowances		.....
	Gross wages	.....
Less: P.F. contribution		.....
E.S.I. contribution		.....
Income tax		.....
Other deductions		.....
	Net amount payable ₹	.....

Dated.....

.....

Signature

CASUAL AND OUT-WORKERS

Casual Workers: The casual or 'badli' workers are temporary workers who are not on the regular payroll of the factory. They are appointed on a daily basis to meet additional workload or to stand in for absentee workers. Following steps should be taken for accounting and control of casual workers:

(a) Full records regarding appointment and discharge of such workers should be maintained.

(b) The appointment of such workers should be sanctioned by a competent executive.

(c) Payment of wages should be made by a person other than who appointed them.

(d) When appointed as indirect workers, time sheets should be issued to them.

(e) When casual workers are employed at site for some contract work, surprise visits should be paid to check their number.

Out-Workers: These are the workers who work outside the factory premises on behalf of the undertaking. Out-workers are classified into two categories:

(a) **Workers who work from homes** Control can be exercised in following manner:

1. All materials supplied should be accounted for and there should be no undue wear and tear of tools supplied by the concern.
2. The work should be delivered within the stipulated time.
3. The quality of finished work should be carefully inspected.

(b) **Workers sent to site**

IDLE TIME

Idle time is defined as 'the difference between the time for which employees are paid and the employee's time booked against the cost object.' It represents the time for which they are paid but no production is obtained.

Treatment of Idle Time

Normal Idle Time

- This is that wastage of labour time which cannot be avoided and has to be borne by the employer. The cost of normal idle time may be treated in one of the following two ways:
- (i) As overhead cost it may be charged to factory overheads. For this purpose, idle time is allotted a separate standing order number. This helps in its effective control.
- (ii) As direct wages The wage rate may be inflated to make allowance for normal loss of labour time.

Abnormal Idle Time

- This is that idle time which arises due to reasons in no way connected with the usual routine of manufacture and for which employer must pay. Payment for such idle time is not included in cost and is transferred to Costing Profit and Loss Account.

Control of Idle Time

(a) Production should be planned so that imbalances are avoided or reduced.

(b) Repairs and maintenance of plant and machinery should be regularly undertaken to avoid breakdown.

(c) Raw materials, tools and instructions should reach the worker well in time so that no time is wasted in waiting for them.

(d) Supervision should be tightened.

OVERTIME

Overtime is defined 'as the time spent beyond normal working hours, which is usually paid at higher rate than the normal time rate.' The extra amount beyond normal wages and salaries is called overtime premium.

Treatment of Overtime

When overtime is job specific

- When overtime is spent on a specific job at the request of a customer due to urgency of work and the customer agrees to the entire charge of overtime premium, it should be charged to the job or work order concerned.

When overtime is due to general pressure

- When a business receives more orders than it can cope with in the normal working hours and there is general pressure of work, it may be treated by one of the following two methods:
- (i) Treat overtime premium as direct labour cost by inflating the wage rate and charging to different jobs at the inflated/average rate.
- (ii) Alternatively, it may be treated as indirect wages and included in overheads.

When overtime is due to abnormal reasons

- Overtime arising due to abnormal factors, like accident, power failure, fire and machine breakdown, or due to factors like defective planning or faulty management, it should not be included in the cost of products and it should be charged to costing Profit and Loss Account.

TREATMENT OF SPECIAL ITEMS

Leave with Pay

According to the Factories Act, workers are entitled to annual leave with full pay, for a specified number of days in a year. This may include casual leave, medical leave, special leave, etc. It is treated as indirect labour cost and charged to overheads. Alternatively, leave wages may be treated as direct labour cost in which case the wage rate is inflated.

Holiday with Pay

Workers are also entitled to certain holidays like Diwali, Id, Republic Day, Independence Day, etc. Payment for such holidays should, therefore, be treated in the same way as leave pay.

Profit Sharing Bonus

Under the Payment of Bonus Act, a minimum amount of bonus is payable to workers, even if no profits are earned during a period. The bonus should, therefore, be charged to cost of production. The amount of such bonus in respect of direct labour should be included in the direct labour cost and that in respect of indirect labour should be charged to overheads of the department concerned.

COST ACCOUNTING DEPARTMENT

The cost accounting department collects and analyses all costs relating to labour. For this purpose, it makes use of clock cards, job cards, daily or weekly time sheets, payroll sheets, etc. The cost accounting department is also responsible for presenting clear and well-designed reports on labour.

Wages Analysis Sheet or Wages Abstract

The analysis of labour cost is made on a document known as Wages Analysis Sheet or Wages Abstract. The purpose of this is similar to that of Material Analysis Sheet

WAGES ANALYSIS SHEET
(Wages Abstract)

No ..... Week ending.....

Worker's No.	*Weages of Job No.*												*Total wages for jobs*	*Indirect weags*
	51 ₹	*52* ₹	*53* ₹	*54* ₹	*55* ₹	*56* ₹	*57* ₹	*58* ₹	*59* ₹	*60* ₹	*61* ₹	*62* ₹		
Total														

Prepared by..... Checked by.....

Fig. 3.11: *Wages Analysis Sheet*

LABOUR REMUNERATION

The term remuneration is used to cover the total monetary earnings of employees. It includes wages according to time or piece basis and other financial incentives.

Requisites of a Satisfactory System of Labour Remuneration

1. The system should be such as will produce the best quality and quantity of work.

2. It should be satisfactory from the point of view of both employer and employee and reward should be related to effort.

3. The scheme should be clearly defined and intelligible to workers. The workers should be able to calculate wages on their own. If the workers do not understand the system, they may view it with suspicion.

4. It should guarantee a minimum living wage to each worker.

5. No maximum limit should be placed on the amount of individual earnings.

LABOUR REMUNERATION (CONTD.)

The term remuneration is used to cover the total monetary earnings of employees. It includes wages according to time or piece basis and other financial incentives.

Requisites of a Satisfactory System of Labour Remuneration

6. Earnings of the workers should not be affected by matters beyond their control. They should not, for example, be penalized for production losses due to power failure, machine breakdown, etc., for which they are not responsible.

7. It should reduce labour turnover and labour absenteeism.

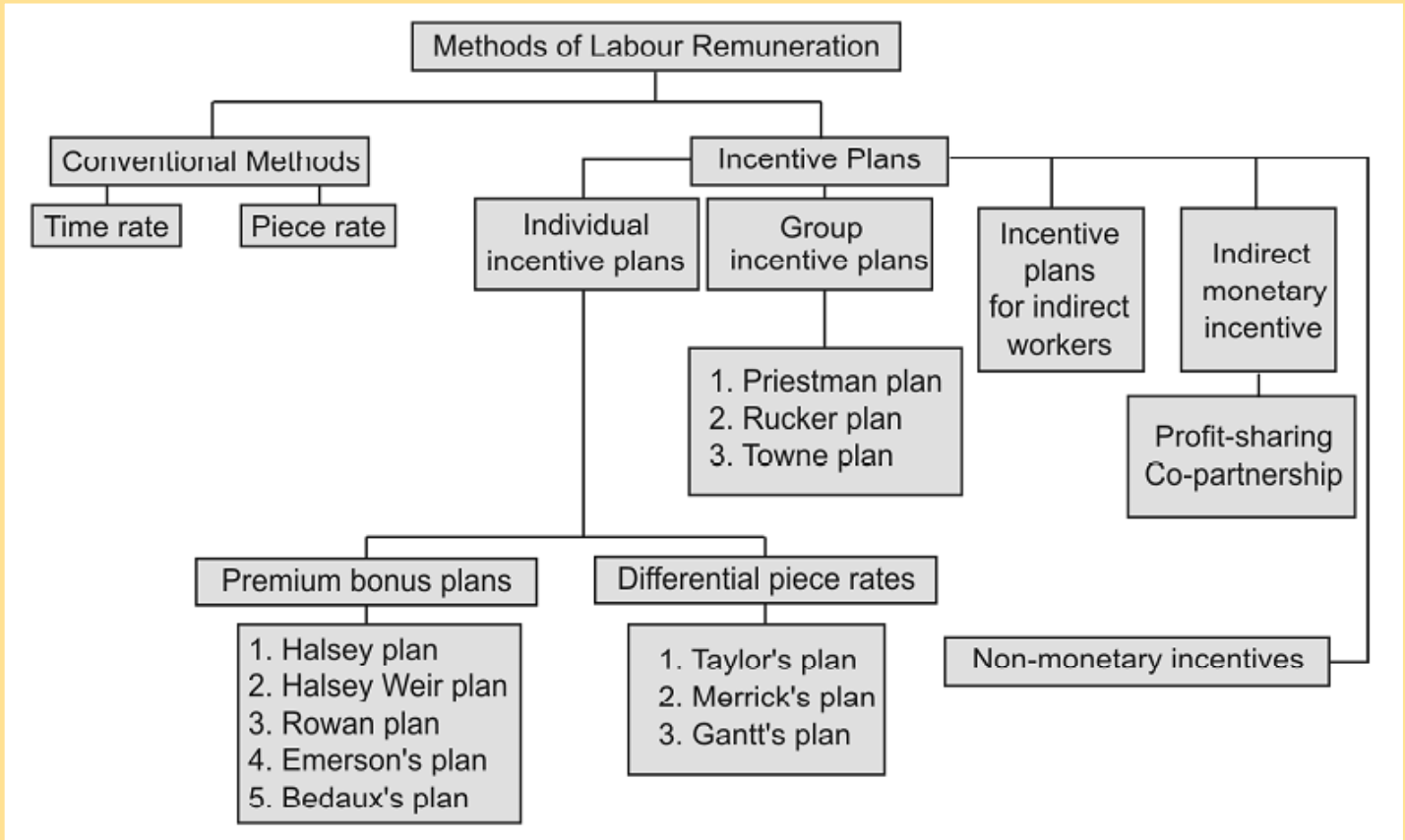
8. The system should be flexible so that changes may be introduced as and when necessary.

9. System should be capable of operation without excessive clerical work. Methods which demand detailed recording of time, quantity of output, etc are avoided.

10. If possible, the system adopted should be one which is in vogue in that particular industry or in that particular locality.

METHODS OF REMUNERATION
(Systems of Wage Payment)

There are two basic methods of labour remuneration:
(a) Time Rate System
(b) Piece Rate System



METHODS OF REMUNERATION
(Systems of Wage Payment)

Time Rate System: Under time rate system, workers are paid according to the time for which they work. Payment may be on hourly basis, daily basis or monthly basis.

Wages = No. of hours worked × Rate per hour

Suitability Time wage system is suitable for the following type of situations:

1. Where quality of work is more important than quantity, e.g., high class tailoring.
2. Where output cannot be measured in quantitative terms, e.g., in the case of indirect workers, like watchman, cleaners and sweepers
3. Where output is beyond the control of the worker or where the work of a worker is dependent on the work of other workers.
4. Where work is being done on a small scale so that close supervision is possible.
5. Where the worker is a learner or an apprentice.

Piece Rate System: Wages under this system are paid according to the quantity of work done. A rate is fixed per unit of production and wages are calculated by the formula:

Wages = Rate per unit × No. of units produced

Suitability of piece rate system Conditions for piece rates are:

(a) Where production is standardized and repetitive in nature
(b) When the aim is continuous maximum production
(c) Where the output of workers can be measured
(d) Where workers continue at the same job for long periods
(e) Where the standard time required to complete a job can be measured accurately

INCENTIVE PLANS

The primary purpose of an incentive plan is to induce a worker to produce more to earn a higher wage.

Types of Incentive Plans

1. Halsey Premium Plan: It is a simple combination of time and piece rate systems. The main features of this plan are as follows:

(a) Workers are paid at a rate per hour for the actual time taken by them.

(b) A standard time is set for each piece of work, job or operation.

(c) If a worker takes standard time or more than the standard time to complete his work, he is paid wages for the actual time taken by him at the time rate. In other words, time wages are guaranteed.

(d) If a worker takes less than the standard time, he is paid a bonus equal to 50% of the time saved at the time rate fixed. Thus, under this system, total earnings of a worker are equal to wages for the actual time taken by him plus a bonus. The formula for calculating bonus and total earnings is as follows:

$$\text{Bonus} = 50\% \text{ of } [\text{Time saved} \times \text{Time rate}]$$

$$\text{Total earnings} = \text{Time rate} \times \text{Time taken} + 50\% \text{ of } [\text{Time saved} \times \text{Time rate}]$$

2. Halsey Weir Plan

This method is precisely the same as Halsey Plan except that in Halsey Weir Plan the bonus is equal to 30% of the time saved.

INCENTIVE PLANS(Contd.)

3. Rowan Plan: This is similar to Halsey Plan except in the calculation of bonus.
(a) Wages are paid on time basis for the actual time worked by the workers.
(b) A standard time is determined for each piece of work or job.
(c) If a worker completes his work in standard time or in more than the standard time, he is paid wages for the time actually taken by him.
(d) If a worker completes his work in less than the standard time, he is entitled to a bonus.
(e) Bonus is that proportion of wages of actual time taken which the time saved bears to the standard time. Its formula is

$$\text{Bonus} = \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \times \text{Time rate}$$

$$\text{Earnings} = (\text{Time taken} \times \text{Time rate}) + \text{Bonus}$$

4. Taylor's Differential Piece Rate System: This system was introduced by F W Taylor, the father of scientific management.
(a) Day wages are not guaranteed, i.e., it does not assure any minimum amount of wages to workers.
(b) A standard time for each job is set very carefully after time and motion studies.
(c) Two piece rates are set for each job-the lower rate and the higher rate. The lower piece rate is payable where a worker takes a longer time than the standard time to complete the work. Higher rate is payable when a worker completes the work within the standard time.

INCENTIVE PLANS(Contd.)

5. Merrick' s Differential Piece Rate System (Multiple Piece Rate System): This is a modification of Taylorís plan. While Taylor prescribed two rates, Merrickís plan lays down three rates. The lowest rate is for the beginners, the middle rate is for the developing workers and the highest rate is for the highly efficient workers. Efficiency of the workers is determined in terms of percentages. Thus, the rates of remuneration are:

Level of efficiency	*Piece rate*
Upto 83%	Ordinary piece rate
83% to 100%	110% of ordinary piece rate
Above 100%	120% of ordinary piece rate

6. Gantt's Task and Bonus Plan: The main features of this plan are as follows:

(a) Day wages on time basis are guaranteed to all workers.

(b) This plan is a combination of time rate, differential piece rate and bonus.

(c) A standard is set and remuneration is calculated as follows:

(i) When output is below standard-payment at time rate.

(ii) When output is at standard-payment at time rate plus 20% bonus.

(iii) When output is above standard-payment at high piece rate.

INCENTIVE PLANS (Contd.)

7. Emerson's Efficiency Plan: This scheme is designed to give encouragement to the slow workers to perform better than before. Time wages are guaranteed. The standard output in this plan is fixed to represent 100% efficiency. A bonus is paid to a worker whose efficiency exceeds 66%. As efficiency increases, the bonus also increases gradually in steps, at a stated rate, so that at 100% efficiency, bonus would rise to 20% of wages. Beyond 100% the bonus increases at 1% of the basic rate for each 1per cent increase in efficiency. It can thus, be shown as below in a tabular form:

	Efficiency	*Bonus*
(*a*)	Below 66 $\frac{2}{3}$ %	No bonus (Only time wages)
(*b*)	66 $\frac{2}{3}$ % to 100%	Bonus increases in steps and rises to 20% at 100% efficiency
(*c*)	Over 100%	20% bonus plus 1% bonus for each increase of 1% in efficiency

8. Bedaux Plan : In this plan, standard time of each job is determined in minutes known as Bedaux points or B's. One B unit represents the amount of work which an average worker can do under ordinary conditions in one minute. The standard time is determined by work study and each job is assigned a number of B's.

GROUP BONUS PLANS

There are certain jobs or operations which are required to be done collectively, by a group of workers The following bases of distribution are commonly used:

(a) Equal distribution, if skill and grade of workers in the group is uniform

(b) On the basis of time wages of each worker

(c) In proportion to the time rate of each worker, where all have devoted equal time

(d) In a fixed ratio determined in advance on the basis of merit rating

Types of Group Incentive Plans

Priestman Plan

- According to this plan, a standard is set for the output to be achieved weekly by a factory as a whole. This standard may be in terms of units or points (Bedaux Plan). The actual output of the factory is compared with the standard and if actual exceeds standard, the employees are paid a bonus in proportion to the increase.

Towne Plan

- Under this plan, actual labour cost is compared with the predetermined standard set for labour cost. If the labour cost is less than the standard so set, 50% of the saving so effected is distributed as bonus to individual workers prorata with the wages earned. The supervisory staff also gets a part of this bonus and thus encouragement is provided to reduce cost.

Rucker Plan (Share of Production Plan)

- Under this plan, labour receives a constant proportion of the ëadded valueí. The term 'added value' is defined by CIMA as 'the change in market value resulting from an alteration in the form, location or availability of a product or service, excluding the cost of bought-out materials or services.'

INCENTIVE PLANS FOR INDIRECT WORKERS

Bases of Payment of Bonus to Indirect Workers: The indirect workers may be paid a bonus on any one of the following bases:

1. Where indirect workers serve a group of direct workers, they may be paid a bonus on the basis of performance of the group of direct workers whom they serve, e.g., maintenance workers attached to a particular department.

2. When indirect workers provide general services, e.g., sweeping and storekeeping, bonus may be paid on the basis of the output of the whole factory.

3. On the basis of job evaluation and merit rating of indirect workers.

4. On some arbitrary basis, like enhanced day rate so as to include an element of bonus in the rate itself.

CO-PARTNERSHIP AND PROFIT SHARING AND NON-MONETARY INCENTIVES

Co-partnership or co-ownership is a scheme whereby employees are given an opportunity to share in the capital of the business and to receive a part of the profit that accrues to their share of ownership.

Under the profit-sharing schemes, the workers are paid in addition to wages, a predetermined share of the profits of the undertaking. In India, worker's share is governed by the Payment of Bonus Act, 1965.

A co-partnership scheme may be arranged in conjunction with a profit sharing scheme, whereby the bonus to workers is to be retained as an investment in the company. This investment may be in the form of special shares, not carrying voting rights but entitled to a fixed dividend or it may be in the form of a loan carrying higher rate of interest.

Workers are sometimes provided with certain incentives, not in the form of higher wages but in terms of favourable conditions of employment. Such incentives are given in the form of better amenities or facilities. Non-monetary incentives help in attracting better workers, reduce labour turnover and absenteeism, promote better industrial relations, encourage loyalty and keep the workers happy and satisfied.

OVERHEAD COST

Chapter 4

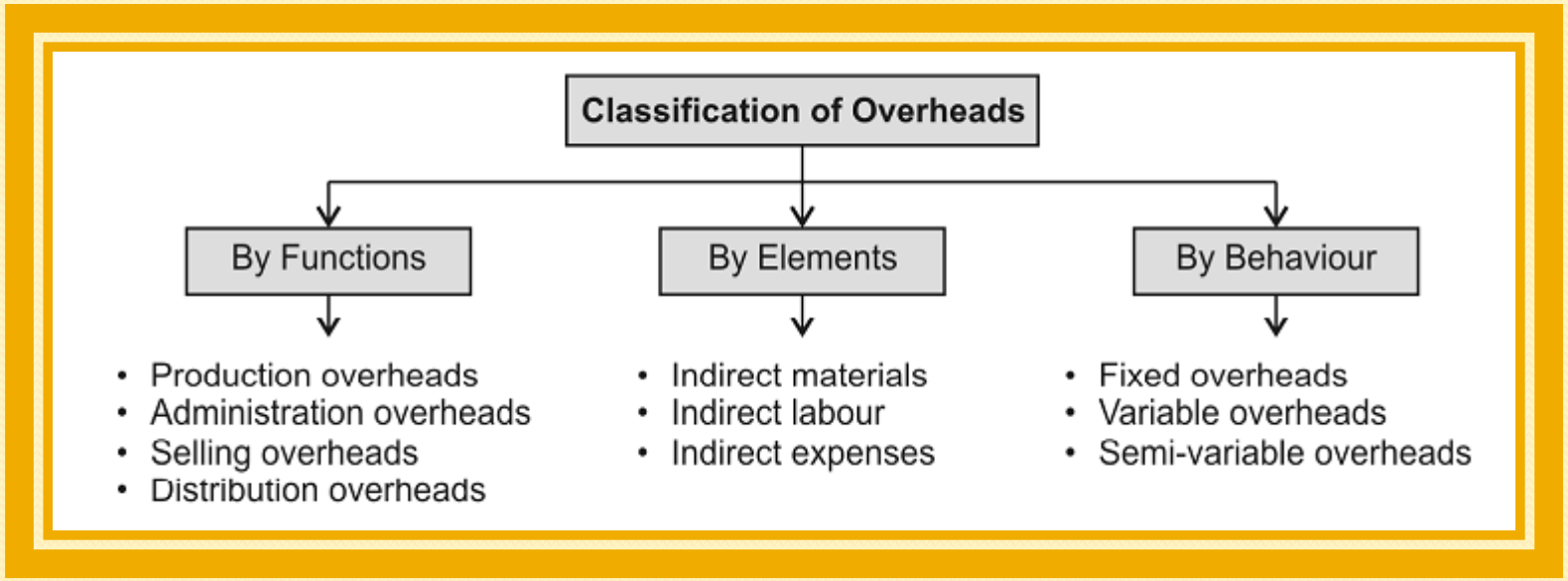
MEANING OF OVERHEAD COST

'Overhead is the aggregate of indirect materials, indirect wages and indirect expenses.' (CIMA, London)

Overhead is also known as

- Oncost
- Supplementary cost
- Burden
- Non-productive cost

CLASSIFICATIONS OF OVERHEAD COSTS



CLASSIFICATIONS OF OVERHEAD COSTS

Classifiation according to Functions

- **Production overheads** They are indirect expenditures incurred in connection with production operations.
- **Administration overheads** Costs incurred in administration of an undertaking, not related directly to production or distribution function.
- **Selling and distribution overheads** Selling Costs are costs to stimulate demand. Distribution overheads are expenditures from the time product is manufactured till it is sold.

Element - wise Classification

- **Indirect materials** They are material costs, which cannot be allocated but which are to be apportioned to or absorbed by cost centres or cost units.
- **Indirect wages** They are those which cannot be allocated but which are to be apportioned to or absorbed by cost centres or cost units.
- **Indirect expenses** Expenses which cannot be allocated but which are to be apportioned to or absorbed by cost centres or cost units are indirect expenses.

Classification according to Behaviour or Variability

- **Fixed overheads** These overheads remain unaffected or fixed in total amount by fluctuations in volume of output.
- **Variable overheads** This is the cost which, in aggregate, tends to vary in direct proportion to changes in the volume of output.
- **Semi-variable overheads** These overheads are partly fixed and partly variable.

SEGREGATION OF SEMI-VARIABLE COST

High and Low Points Method: Under this method, semi-variable costs at various level of output are considered The difference between the highest and the lowest volume of output and the difference between the corresponding costs are worked out.

$$\text{Variable element per unit} = \frac{\text{Difference in semi-variable costs (₹)}}{\text{Difference in output (units)}}$$

Method of Averages: Under this method, data given is divided into two parts. Then average of output and cost is separately computed for these two parts.

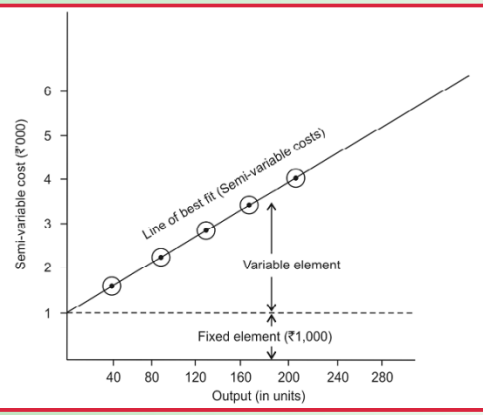
$$\text{Variable element per unit} = \frac{\text{Difference in the average costs}}{\text{Difference in average output}}$$

Scatter Diagram Method: Semi-variable costs are plotted on a graph, the X-axis represents volume of production and Y-axis, the amount of expenditure. A straight line is drawn to represent an average of all those points. This is known as the line of best fit or line of regression. The point where this line of best fit intersects the X-axis, marks the fixed cost and a line from this point parallel to X-axis is known as fixed cost line. Difference between semi-variable cost line and fixed cost line represents variable component.

Simultaneous Equations Method: In this method, overhead costs are segregated by means of an equation.

$$Y = mX + c$$

where
Y = Total semi-variable cost
X = Volume of output
c = Fixed cost
m = Slope of variable cost line, *i.e.*, variable cost per unit of output.



STANDING ORDER NUMBERS (Codification of Overheads)

After overheads are classified, it is found useful to allot a number or symbol to each group of expenses so that each such group is easily distinguished from others. Such numbers or symbols are codes for overheads and are called standing order numbers.

Each standing order number denotes a particular type of expenditure so that items of expenses of similar nature, as and when they are incurred, are appropriately classified into one of these.

A schedule or manual is maintained enlisting all standing order numbers.

OVERHEADS DISTRIBUTION

Distribution of overhead costs to cost units is one of the most complex problems of cost accounting. This is because overhead costs cannot be identified with individual cost units and there are no accounting means of exact distribution.

Steps in Overheads Distribution

Classification and collection of overheads → Allocation and apportionment of overheads to production departments and service departments → Re-apportionment of service department costs to production departments → Absorption of overheads of each production department in cost units

Collection of Overheads

Invoice-for collection of indirect expenses, like rent, insurance, etc.

Stores Requisitions-for collection of indirect materials.

Wages Analysis Sheet-for collection of indirect wages.

Journal entries-for collection of those overhead items which do not result in current cash outlay and need some adjustment

ALLOCATION AND APPORTIONMENT OF OVERHEADS (Primary Distribution)

Departmentalization of Overheads: Departmentalization of overheads is the process of allocation and apportionment of overheads to different departments or cost centres. These departments are mainly of two types: (a) Production departments (b) Service departments.

Objectives of Departmentalization

- Ensures greater accuracy in cost ascertainment
- Ensures control of overhead costs
- Use of different methods of absorption
- Ensure proper valuation of work-in-progress
- Helps in Estimation of cost of service of departments
- More accurate forecasting and estimating

ALLOCATION AND APPORTIONMENT OF OVERHEADS(Primary Distribution)

Allocation: 'The assignment of whole items of cost directly to a cost centre.'

Allocation of overheads should meet both of the following conditions:

- The cost centre must have caused the overhead cost to be incurred
- The exact amount incurred in a cost centre must be known.

Apportionment: Apportionment may be defined as 'the distribution of overheads to more than one cost centre, on some equitable basis.'

Principles of Apportionment

• It is based on the theory that greater the amount of service or benefit received by a department, the larger should be the share of the cost to be borne by that department.	• This method is used for those overhead costs that are not directly related to departments and whose remoteness necessitates an arbitrary distribution.	• This is based on the theory of taxation which holds that those who have the largest income should bear the highest proportion of the tax burden.
Service or use	Survey method	Ability-to-pay method

BASES OF APPORTIONMENT

	Overhead Cost	*Bases of Apportionment*
1.	(*i*) Rent and other building expenses (*ii*) Lighting and heating (*iii*) Fire precaution service (*iv*) Air-conditioning	Floor area, or volume of department
2.	(*i*) Fringe benefits (*ii*) Labour welfare expenses (*iii*) Time keeping (*iv*) Personnel office (*v*) Supervision	Number of workers
3.	(*i*) Compensation to workers (*ii*) Holiday pay (*iii*) ESI and PF contribution (*iv*) Fringe benefits	Direct wages
4.	General overheads	Direct labour hours, or Direct wages, or Machine hours
5.	(*i*) Depreciation of plant and machinery (*ii*) Repairs and maintenance of plant and machinery (*iii*) Insurance of stock	Capital values
6.	(*i*) Power/steam consumption (*ii*) Internal transport (*iii*) Managerial salaries	Technical estimates
7.	Lighting expenses	No. of light points, or Area
8.	Electric power	Horse power of machines, or Number of machine hours, or Value of machines
9.	(*i*) Material handling (*ii*) Stores overheads	Weight of materials, or Volume of materials, or Value of materials

RE-APPORTIONMENT OF SERVICE DEPARTMENT COST(Secondary Distribution)

Service department	*Bases of apportionment*
1. Store-keeping department	Number of material requisitions, or value/quantity of materials consumed in each department
2. Purchase department	Value of materials purchased for each department, or number of purchase orders placed
3. Time-keeping department and payroll department	Number of employees, or total labour or machine hours
4. Personnel department	Rate of labour turnover, or number of employees in each department
5. Canteen, welfare and recreation services	Number of employees, or total wages
6. Maintenance department	Number of hours worked in each department
7. Internal transport service	Value or weight of goods transported, or distance covered
8. Inspection department	Direct labour hours or machine operating hours
9. Drawing office	No. of drawings made or man hours worked

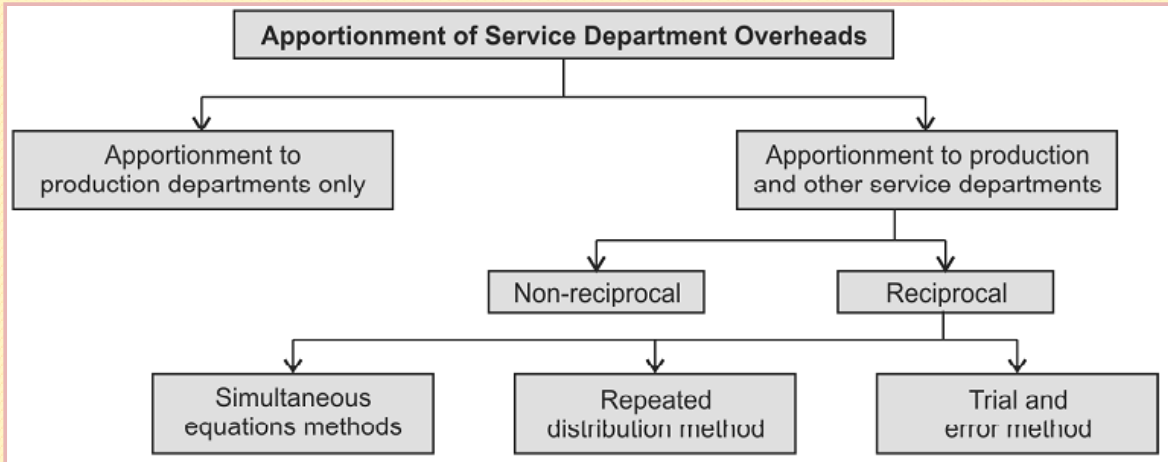


Fig. 4.3: *Distribution of Service Department Overheads*

ABSORPTION OF OVERHEADS

There are two steps in the absorption of overheads:

Computation of Overheads Absorption Rate

Absorption rates are computed for the purpose of absorption of overheads in costs of the cost units. There are mainly six methods for determining absorption rates.

Overheads absorption rate =Total overheads of cost centre/Total units in base

Application of rates to cost units

In order to arrive at the overhead cost of each cost unit, the overhead rate is multiplied by the number of units of base in the cost unit. Thus:

Overhead absorbed = No. of units of base in the cost unit × Overhead rate

METHODS OF ABSORPTION OF PRODUCTION OVERHEADS

Direct Materials Cost Percentage Rate: Under this method, the amount of overheads to be absorbed by a cost unit is determined by the cost of direct materials consumed in producing it.

$$\text{Overhead rate} = \frac{\text{Production overheads}}{\text{Direct materials}} \times 100$$

Direct Labour Cost Percentage Rate: The overhead rate under this method is computed by dividing the production overheads by the direct labour cost.

$$\text{Overhead rate} = \frac{\text{Production overheads}}{\text{Direct labour cost}} \times 100$$

Prime Cost Percentage Rate: This method is based on the premise that both materials and labour give rise to factory overheads and thus the total of the two, i.e., prime cost should be taken as the base for absorption of factory overheads. In a way, this is a combination of the material cost and labour cost methods.

$$\text{Overhead rate} = \frac{\text{Production overheads}}{\text{Prime cost}} \times 100$$

METHODS OF ABSORPTION OF PRODUCTION OVERHEADS(CONTD.)

Direct Labour Hour Rate: This is a rate per hour and not a percentage rate. It is obtained by dividing the total production overheads by the total number of direct labour hours for the period.

$$\text{Overhead rate} = \frac{\text{Production overheads}}{\text{Direct labour hours}}$$

Machine Hour Rate: Machine hour rate is the overhead cost of running a machine for one hour. This rate is obtained by dividing the amount of factory overheads apportioned to a machine by the number of machine hours for the period under consideration.

Rate per Unit of Output: It is the simplest of all the methods. This rate is determined by dividing the total overheads of a department by the number of units produced.

TYPES OF OVERHEAD RATES

Actual and Predetermined Rates

Actual Rate: It is calculated by dividing the actual overheads by actual base.

$$\text{Actual overhead rate} = \frac{\text{Actual amount of overheads}}{\text{Actual base}}$$

Predetermined Rate: This rate is determined in advance of the period in which it is to be used. It is computed by dividing the estimated or budgeted amount of overheads by the budgeted base. Thus:

$$\text{Predetermined rate} = \frac{\text{Budgeted amount of overheads}}{\text{Budgeted base}}$$

A blanket overhead rate is a single overhead rate for the entire factory. It is computed as follows.

$$\text{Blanket rate} = \frac{\text{Total overheads for the factory}}{\text{Total number of units of base for the factory}}$$

Multiple rates means a number of separate rates for each department, cost centre, etc.

$$\text{Overhead rate} = \frac{\text{Overheads of department or cost centre}}{\text{Corresponding base}}$$

CAPACITY UTILIZATION AND OVERHEADS

Capacity of a factory refers to its ability to produce with the resources and facilities available at its disposal.

Capacity Levels

Maximum Capacity	• This is the maximum production capability of a plant which can be achieved only under perfect conditions.
Practical Capacity	• This is the maximum capacity less output or time lost due to unavoidable factors like plant repairs and maintenance, setting up time, holidays, etc., and other normal losses.
Capacity Based on Sales Expectancy	• This is a capacity which is based on expected sales and is determined after a careful study of the market conditions.
Actual Capacity	• This is the capacity actually achieved during a particular period. This is known only after the period is over and may be below or above the capacity based on sales expectancy.
Normal Capacity	• This is the long-term average of the capacity based on sales expectancy

ADMINISTRATION OVERHEADS (Office or General Overheads)

They may be defined as the indirect expenditures incurred in formulating the policy, directing the organization and controlling the operations of an undertaking.

Absorption of Administration Overheads

Percentage of works cost Administration overhead cost is generally absorbed as a percentage of works cost.

Overhead rate = (Admn. Overheads/ works cost) × 100

Percentage of sales Sometimes office and administration overheads are absorbed as a percentage of sales.

Overhead rate = (Administration overheads/Sales) x 100)

As a percentage of conversion cost Conversion cost is the cost of converting raw material into finished goods.

Overhead rate =(Administration overheads/ Total conversion cost) x 100)

SELLING AND DISTRIBUTION OVERHEADS

Selling cost is the cost of seeking to create and stimulate demand (sometimes termed marketing) and of securing orders.

Distribution cost is the cost of the sequence of operations which begins with making the packed product available for dispatch and ends with making the reconditioned returned empty packages, if any, available for re-use.

Methods of Absorption

A rate per unit of sales The total selling and distribution overheads to be absorbed are divided by the number of units sold to arrive at a rate per unit.

A percentage of selling price This method is recommended when the concern is selling more than one type of product. Overhead rate =(Selling and distribution overheads/Sales)x100

A percentage of works cost In this method, a percentage of selling overheads to

works cost is ascertained. Overhead rate =Selling and distribution overheads/Total works cost

UNDER-ABSORPTION AND OVER-ABSORPTION OF OVERHEADS

Under-absorption

- When the amount of overheads absorbed is less than the amount of overheads actually incurred, it is called under-absorption or under-recovery.

Over-absorption

- When the amount of overheads absorbed is more than the amount of actual overheads incurred, it is known as over-absorption or over-recovery.

Use of supplementary rates

- Where the amount of under or over-absorbed overheads is significant, a supplementary overhead absorption rate is calculated to adjust this amount in the cost. However, adjustment is made in the cost of: (i) work-in-progress; (ii) finished stock; and (iii) cost of sales.

Writing off to Costing Profit and Loss Account

- This method is used when the under or over-absorbed amount is quite negligible and it is not worthwhile to absorb it by supplementary rate.

Carry over to the next year

- Under this method the under or over-absorbed amount is transferred to Overhead Reserve Account or Suspense Account for carrying over to the next accounting year.

TREATMENT OF DEPRICIATION

Depreciation: 'Depreciation is the diminution in the value of a fixed asset due to use and/or lapse of time.'

Methods of Calculating Depreciation

Straight line method	• Also known as fixed instalment method or original cost method, this method provides for depreciation by means of equal periodic charge over the assumed life of the asset. **Depreciation = (Cost of asset Scrap value)/ Life of asset**
Diminishing balance method	• In this method, depreciation is charged at a constant rate on the balance value of the asset, i.e., after deducting the amounts provided in the previous years. **Depreciation per year = Written-down balance of asset × Fixed percentage**
Production unit method	• This is a method of charging depreciation by means of fixed rate per unit of output. **Depreciation charge per unit = (Cost of asset Residual value)/ Expected output during the life of the asset**
Machine hour method	• In this method, depreciation is charged at a rate per hour of machine operation. **Depreciation charge per hour = (Cost of asset -Residual value)/Estimated number of machine hours during life of machine**

OUTPUT OR UNIT COSTING (Cost Sheet)

Chapter 5

OUTPUT COSTING

Output costing (or unit costing or single costing) is a method of cost ascertainment which is used in those industries which have the following features :

(i) Production consists of a single product or a few varieties of the same product with variations in size, shape, quality, etc.

(ii) Production is uniform and on continuous basis.

COSTING PROCEDURE

Cost Sheet: Cost sheet is defined as 'a document which provides for the assembly of the detailed cost of a cost centre or cost unit.'

Purposes Cost sheet serves the following purposes:

- 1. It reveals the total cost and cost per unit of goods produced.
- 2. It discloses break-up of total cost into different elements of cost.
- 3. It provides a comparative study of the cost of current period with that of the corresponding previous period.
- 4. It acts as a guide to management in fixation of selling prices and quotation of tenders.

Specimen of a ***simple cost sheet*** is given below:

Cost Sheet (or Statement of Cost) for the period.....

No. of units produced.....

Particulars	*Total cost* ₹	*Cost per unit* ₹
Direct Materials		
Direct Labour		
Direct (or Chargeable) Expenses		
Prime Cost		
Works Overheads		
Works Cost		
Office and Administrative Overheads		
Cost of Production		
Selling and Distribution Overheads		
Total Cost or Cost of Sales		
Profit or Loss		
Sales		

TREATMENT OF STOCKS

Stocks may be of the following three types:

Stocks of Raw Materials In order to calculate the value of raw materials consumed during the period, opening stock of raw materials is added to the raw materials purchased and closing stock is subtracted.

Stocks of Work-in-progress This is the stock of semi-finished goods. In cost sheet, opening stock of work-in-progress is added in prime cost along with factory overhead and closing stock of work-in-progress in subtracted therefrom.

Stock of Finished Goods In cost sheet, finished goods are adjusted after calculating cost of production. Opening stock of finished goods is added to cost of production and closing stock of finished goods is subtracted therefrom. The resultant figure is called cost of goods sold.

ITEMS EXCLUDED FROM COST

Following items are of financial nature and not included while preparing a cost sheet:

1. Cash discount
2. Interest paid
3. Preliminary expenses written off
4. Goodwill written off
5. Provision for taxation
6. Provision for bad debts
7. Transfer to reserves
8. Donations
9. Income tax paid
10. Dividend paid
11. Profit/loss on sale of fixed assets
12. Damages payable at law, etc.

TREATMENT OF SCRAP

Scrap may be defined as an unavoidable residue material arising in certain types of manufacturing processes. Examples of scrap are trimmings, turnings or boring from metals or timber, on which operations are performed. Scrap usually has a small realizable value. Such realizable value of scrap is deducted from either factory overheads or factory cost while preparing a cost sheet.

Illustrative Cost Sheet (Detailed)

Units produced.....

Particulars		*Total cost* ₹	*Cost per unit* ₹
	Opening Stock of Raw Materials		
Add:	Purchases	...	...
Add:	Carriage Inward	...	...
Add:	Octroi and Customs Duty	...	...
		...	...
Less:	Closing Stock of Raw Materials	...	...
	Cost of Direct Materials Consumed	...	...
	Direct or Productive Wages	...	...
	Direct (or Chargeable) Expenses	...	...
	Prime Cost	...	...
Add:	*Works or Factory Overheads:*	...	
	Indirect Materials	...	
	Indirect Wages	...	
	Internal Transport Expenses	...	
Less:	Sale of Scrap	...	
Add:	Operating Stock of Work-in-progress	...	
Less:	Closing Stock of Work-in-progress	...	
	Works Cost	...	

PRODUCTION ACCOUNT

When information shown in a cost sheet is presented in the form of a T-shape account, it is known as Production Account.

In this account, debit side shows the various item of cost while credit side shows the sales of finished goods.

Opening stock is written on the debit side while closing stock is written on the credit side.

Alternatively, closing stock may be shown as a deduction from the items in debit side.

In this way this account shows the total cost.

The balance in this account shows profit or loss, as the case may be.

PRICE QUOTATIONS AND ESTIMATED COST SHEET

- Quite often the management has to quote prices of its products in advance or has to submit tenders for goods to be supplied. For this purpose an estimated cost sheet has to be prepared. Such an estimated cost sheet is prepared to show the estimated cost of products to be manufactured.
- In this cost sheet, cost of direct materials, direct wages and various types of overheads are predetermined on the basis of past costs after taking into account the present conditions and also the anticipated changes in the future price level.
- Overheads are absorbed on the basis of a suitable method of absorption like percentage of direct materials, or wages or machine hour rate, etc.

Calculation of profit

- After the total cost has been estimated, a desired percentage of profit is added to arrive at the price to be quoted.
- Such profit may be given as a percentage of cost or percentage of selling price.
- In order to calculate the amount of profit, it is easy to assume that figure as 100 on which profit percentage is given and then calculate the amount of profit.

JOB AND BATCH COSTING

Chapter 6

Industry

All industries may be broadly classified into two categories:

- Job order industries
- Mass production industries

In job order industries, production work is done against orders from customers. Each job work needs special treatment and can be clearly distinguished from other jobs. Each job is completed as per customer's specifications. Examples of job order industries are printing press, construction of buildings, bridges, roads ship building.

In mass production, firms manufacture uniform types of products. Since production is of standard products, it is on a mass scale and on a continuous basis. No customer order or specifications are required for production. Examples of mass production industries are textiles, paper, sugar, chemicals and steel.

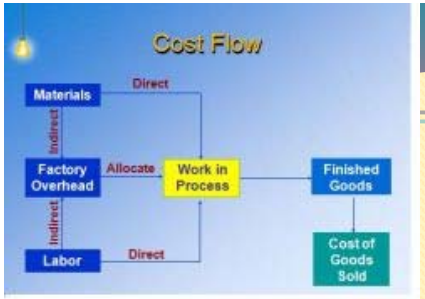
JOB COSTING

Job costing or job order costing is a method of cost ascertainment used in job order industries.

Objectives of Job Costing

1. Cost of each job/order is ascertained separately. This helps in finding out the profit or loss on each individual job.
2. It enables the management to know those jobs which are more profitable and those which are unprofitable.
3. It provides a basis for determining the cost of similar jobs undertaken in future. It thus helps in future production planning.
4. It helps the management in controlling costs by comparing the actual costs with the estimated costs.

Completion of Jobs: When jobs are completed, the cost is transferred to cost of sales account. The total cost of jobs completed during each period is set against the sales to determine the profit or loss for the, period.



Job Costing Procedure

1. Job number When an order has been accepted, an individual job number must be assigned to each job so that separate jobs are identifiable at all stages of production.

2. Production order The production control department then makes out a Production Order, thereby authorizing to start work on the job. These copies are passed on to the following:

(i) All departmental foremen concerned with the job

(ii) Storekeeper for issuance of materials

(iii) Tool room for an advance notification of tools required

3. Job cost sheet The unique accounting document under job costing is the job cost sheet. Receipt of production order is the signal for the cost accountant to prepare a job cost sheet on which he will record the cost of materials used and the labour and machine time taken.

JOB COST SHEET

Customer..... ..... Job No.
Date of Commencement..... Date of Completion .....

Material Cost			*Labour Cost*				*Factory Overheads (Absorbed)*			
Date	*Material Req. No.*	*Amount* ₹	*Date*	*Hours*	*Rate* ₹	*Amt* ₹	*Deptt*	*Hours*	*Rate* ₹	*Amt* ₹
Total			Total				Total			

Profit/Loss	₹	*Cost Summary*	₹
Price Quoted	.....	Material	
Less: Cost	.....	Labour	
	.....	**Prime cost**	
Profit or Loss	.....	Factory overheads	
	.....	**Works cost**	
		Adm. overheads	
		Cost of production	
		Selling and dist overheads	
		Total cost	

BATCH COSTI N G

This is a variation of job costing. While job costing is concerned with costing of jobs that are made to a customer ís particular requirements, batch costing is used when production consists of limited repetitive work and a definite number of articles are manufactured in each batch to be held in stock for sale to customers generally. Thus, a batch is a cost unit consisting of a group of identical items.

Batch Costing Procedure

- Each batch is given a batch number in exactly the same way as a job is given a job number.
- Direct materials, direct labour and direct expenses which can be identified with the batch are recorded on the Batch Cost Card.
- The costing of materials requisitions and time sheets follows normal job costing principles.
- Overheads are absorbed on one of the bases already explained as is done is job costing.
- When a batch is completed, the total cost of the batch is divided by the quantity produced in the batch to arrive at the cost per unit or per dozen etc., as required.
- Larger the batch size, the lower is the setting up cost per article.

ECONOMIC BATH QUANTITY (EBQ)

In industries where batch costing is employed, an important point is the determination of the optimum quantity in a batch at which cost per unit is minimum. This is known as a Economic Batch Quantity. While determining economic batch quantity, two type of costs are considered:

(a) **Setting-up costs** This is the cost of setting the machine and the tools for production of a particular batch. This is of a fixed nature. Therefore, when the size of the batch is large, setting-up cost per article in the batch is lower.

(b) **Carrying cost** This includes the cost of storage, interest on capital invested, etc. Larger size of a batch leads to higher carrying costs. In determining the economic batch quantity, there are five main considerations:

(a) The cost and time taken in setting up the tools on the machines

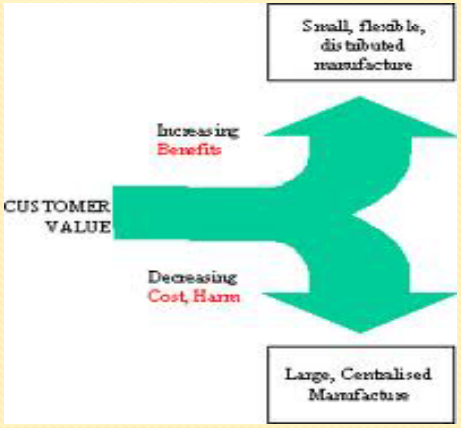
(b) The cost and time taken in manufacturing the parts

(c) The interest on capital invested in the parts

(d) The cost of storage

(e) The rate of consumption or sale of the parts

A simple formula for determining the economic batch quantity is given below:



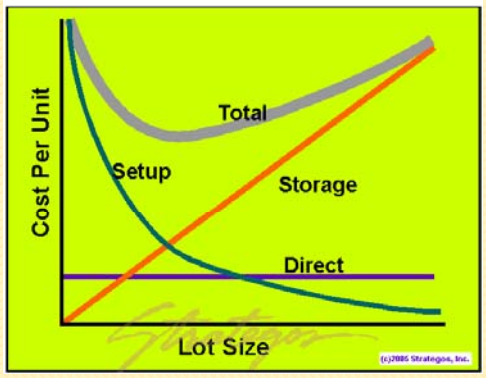
$$EBQ = \sqrt{\frac{2.U.S}{C}}$$

where EBQ = Economic Batch Quantity

U = No. of units to be produced in a year

S = Set-up costs per batch

C = Carrying cost per unit of production.



PROCESS COSTING

Chapter 8

PROCESS COSTING

Process costing is probably the most widely used method of cost ascertainment. It is used in mass production industries producing standard products, like steel, sugar and chemicals.

Process Costing is applicable in:

- Textiles mills
- Chemical works
- Oil refining
- Cement manufacture
- Paper manufacture
- Food processing
- Steel mills
- Paint manufacture
- Soap making
- Sugar works
- Confectionaries
- Plastic manufacture, etc.

ESSENTIAL CHARACTERISTICS OF PROCESS COSTING

1. The production is continuous and the final product is the result of a sequence of processes.

2. Costs are accumulated process-wise.

3. The products are standardized and homogeneous.

4. The cost per unit produced is the average cost which is calculated by dividing the total process cost by the number of units produced.

5. The finished product of each but last process becomes the raw material for the next process in sequence and that of the last process is transferred to the finished goods stock.

6. The sequence of operations or processes is specific and predetermined.

7. Some loss of materials in processes (due to chemical action, evaporation, etc.) is unavoidable.

8. Processing of a raw materials may give rise to the production of several products. These several products produced from the same raw material may be termed as joint products or by-products.

PROCESS COSTING AND JOB COSTING— A COMPARISON

Process costing	*Job costing*
1. Costs are compiled process-wise and cost per unit is the average cost, *i.e.*, the total cost of the process divided by the number of units produced.	Costs are separately ascertained for each job, which is cost unit.
2. Production is of standardized products and cost units are identical.	Production is of non-standard items with specifications and instructions from the customers.
3. Production is for stocks.	Production is against orders from customers.
4. Costs are computed at the end of a specific period.	Costs are calculated when a job is completed.
5. The cost of one process is transferred to the next process in the sequence.	Cost of a job is not transferred to another job but to finished stock account.
6. On account of continuous nature of production, work-in-progress in the beginning and end of the accounting period is a regular feature.	There may or may not be work-in-progress in the beginning and end of the accounting period.
7. Cost control is comparatively easier. This is because factory processes and products are standardized.	Cost control is comparatively more difficult because each cost unit or job needs individual attention.

PROCESS COSTING PROCEDURE

The factory is divided into a number of processes and an account is maintained for each process.

Each process account is debited with material cost, labour cost, direct expenses and overheads allocated or apportioned to the process.

The output of a process is transferred to the next process in the sequence. In other words, finished output of one process becomes input of the next process.

The finished output of the last process (i.e., the final product) is transferred to the Finished Goods Account.

PROCESS COSTING PROCEDURE

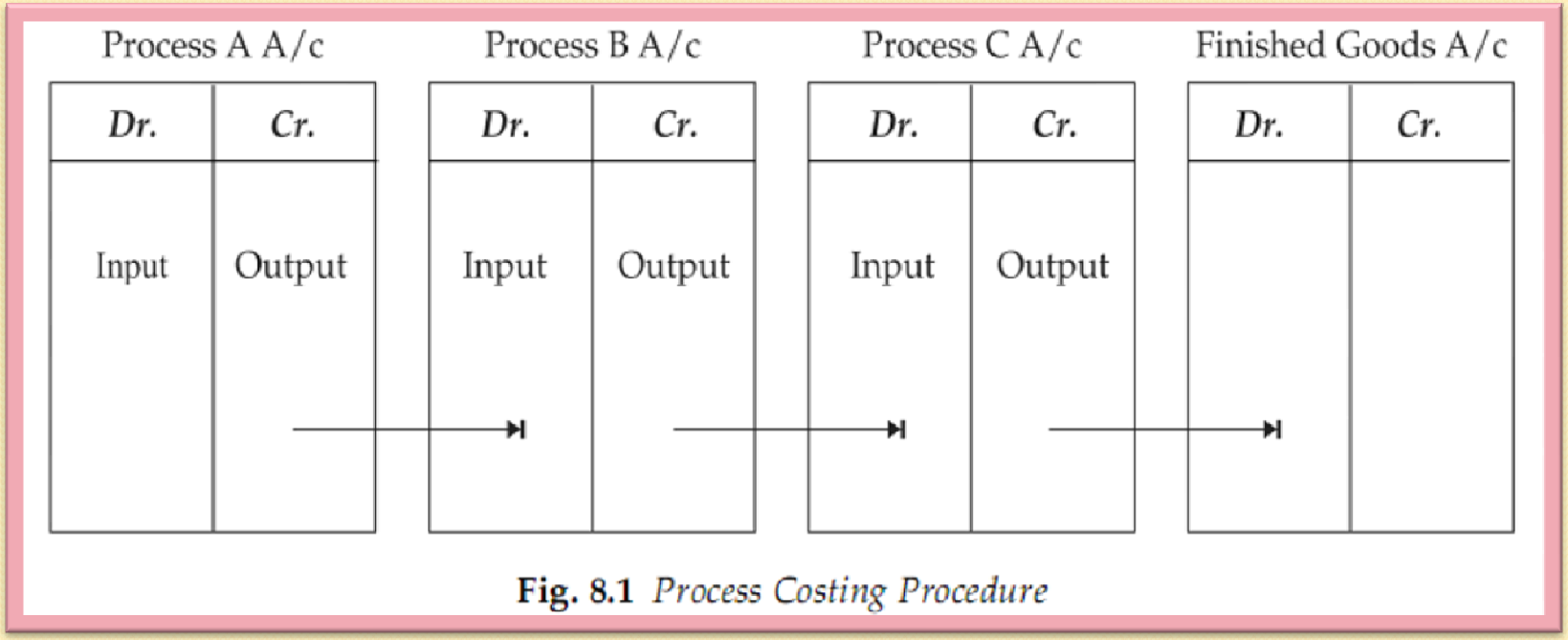


Fig. 8.1 *Process Costing Procedure*

PROCESS LOSSES AND WASTAGES

In industries which employ process costing, a certain amount of loss occurs at various stages of production. It is, therefore, necessary to keep accurate records of both input and output.

Process losses may by classified into (a) normal, and (b) abnormal.

Normal Process Loss

- That amount of loss which cannot be avoided because of the nature of material or process is normal process loss. Such a loss is quite expected under normal conditions. It is caused by factors, like chemical change, evaporation, withdrawals for tests or sampling and unavoidable spoiled quantities

Abnormal Process Loss

- This type of loss consists of loss due to carelessness, machine breakdown, accident, use of defective materials, etc. Thus, it arises due to abnormal factors and represents a loss which is over and above the normal loss.

ACCOUNTING TREATMENT OF NORMAL AND ABNORMAL LOSS

Accounting Treatment of Normal Loss

Normal loss is generally determined as a percentage of input. Such a wastage is not physically present, obviously it cannot have any value. However, when normal loss is physically present in the form of scrap, it may have some value, which is credited to the Process Account.

Accounting Treatment of Abnormal Process Loss

(a) Allow for normal loss in the manner described earlier.

(b) After considering normal loss, find out the cost per unit in that process.

Cost per unit=(Total cost-Value of normal loss)/Units introduced-Normal loss units

(c) Multiply the cost per unit by the number of units of abnormal loss. This gives the total value of abnormal loss.

(d) Credit relevant Process Account with quantity(value) of abnormal loss.

(e) The balance figure in the Process Account is the cost of good units produced in the process. This can also be found by multiplying cost per unit with the number of good units produced.

(f) Open 'Abnormal Loss Account' and debit it with the quantity and value of abnormal loss shown in the Process Account. Sale proceeds from abnormal loss are credited to Abnormal Loss Account. Any balance left in this account is net loss and transferred to Costing P&L Account.

ABNORMAL GAIN OR EFFECTIVENESS

The normal process loss represents the loss that would be expected under normal conditions. It is an estimated figure.

The actual loss may be greater or less than the normal loss. If the actual loss is greater than normal loss, it is known as abnormal loss.

But if actual loss is less than normal loss, a gain is obtained which is termed as abnormal gain or effectiveness.

The value of abnormal gain is calculated in a manner similar to abnormal loss.

It is shown on the debit side of the Process Account and credit side of the Abnormal Gain Account. Like abnormal loss, it is ultimately transferred to Costing Profit and Loss Account.

WHEN OUTPUT OF IS PARTLY SOLD AND PARTLY TRANSFERRED TO THE NEXT PROCESS

Sometimes the output of a process may be partly sold and partly transferred to the next process for further processing.

For example, in a textile mill, part of the output of a spinning process may be sold and the remaining output is passed on to the weaving process for further processing.

A part of the output so sold will contain an element of profit or loss which will be revealed in the Process Account. But when a part of the output is sent to warehouse for sale, it is at cost and does not contain an element of profit or loss.

WORK-IN-PROGRESS (EQUIVALENT PRODUCTION)

Process costing mainly deals with continuous type of production. At the end of the accounting period, there may be some work-in-progress, i.e., semi-finished goods may be in the pipeline. The valuation of such work-in-progress is done in terms of equivalent or effective production.

Equivalent Production

Equivalent production represents the production of a process in terms of completed units. Work-in-progress at the end of an accounting period are converted into equivalent completed units.

$$\text{Equivalent production} = \text{Completed units} + \left(\text{No. of units of work in progress}\right) \times \left(\text{Degree of completion in \%}\right)$$

EVALUATION OF EQUIVALENT PRODUCTION

Find out the total cost (net) for each element of cost, i.e., material, labour and overheads. Scrap value of normal loss is deducted from the material cost.

→

Ascertain the cost per unit of equivalent production separately for each element of cost. This is done by dividing the total cost of each element by the respective number of equivalent units.

→

At this rate of cost per unit, ascertain the value of finished production and work-in-progress.

For the purpose of computation of equivalent production and its evaluation, the following three statements are generally prepared:

(a) Statement of equivalent production

(b) Statement of cost (per unit)

(c) Statement of evaluation

These three statements may also be combined in one comprehensive statement called **'Statement of Production, Cost and Evaluation.'**

EQUIVALENT PRODUCTION

When there is no opening stock and no process loss

Normal Loss-Equivalent units of normal loss are taken as nil. In other words, normal loss is not added in the equivalent production. However, realizable value of normal scrap is deducted from the cost of material so as to calculate the net material cost. This net material cost becomes the basis of calculating the material cost per unit in the statement of cost.

Abnormal Loss-This is treated as if this were good production lost. Abnormal loss, thus, is added to equivalent production with due consideration to its degree of completion. Unless the degree of completion is specified, it may be assumed that abnormal loss units are 100% complete in respect of all elements of cost.

Abnormal Gain-Units of abnormal gain are represented by good finished production. It is therefore, always taken as 100% complete in respect of all elements of cost, i.e., material, labour and overheads. Abnormal gain is deducted to obtain equivalent production.

EQUIVALENT PRODUCTION(CONTD.)

When there is opening as well as closing stock of work-in-progress

In such a case there are two methods of calculating equivalent production:

1. **FIFO:** This method is based on the assumption that work-in-progress moves on a first-in-first out basis. This means that unfinished work on the opening stock is completed first, before work on any new units is taken up.

Computation of Equivalent Production under FIFO Method.

1. • State the opening stock of work-in-progress in equivalent completed units. This is done by applying the percentage of work needed to complete the unfinished work of the previous period.

2. • Ascertain the number of units introduced into the process and deduct the number of units of closing work-in-progress. This gives the number of units started and completed during the period. Add these units to the opening stock of work-in-progress calculated in (i) above.

3. • Add to the above the equivalent completed unit of closing work-in-progress. This can be determined by applying the percentage of work done on the finished units at the end of the period.

EQUIVALENT PRODUCTION(CONTD.)

2. Average Cost Method

- In this method, the cost of opening work-in-progress is not kept separately but is averaged with the additional costs incurred during the period. This method thus combines the cost of opening work-in-progress and new production. Information relating to degree of completion of opening WIP is not required.
- In order to find out the cost per unit of equivalent production, the cost of each element (material, labour and overheads) applicable to the opening work-in-progress is added to the cost incurred in the current period for that element.
- A single cumulative total and unit cost is obtained. Units completed and transferred as well as closing work-in-progress will be valued at this average unit cost.

HOW TO CHOOSE BETWEEN FIFO AND AVERAGE METHOD

Use FIFO - If the cost of the opening work-in-progress in one lump sum figure and the stage of completion is given.

Use Average - If the cost of opening work-in-progress is given in terms of materials, labour and overhead but the stage of completion is not given.

FIFO or Average-Your Choice - If the degree of completion and the cost in terms of materials, labour and overheads of the opening work-in-progress are given, then one has a choice between FIFO and Average methods.

Where the question specifies a method to be followed, then that method must be followed.

INTERNAL PROCESS PROFITS (INTER-PROCESS PROFITS)

In some businesses, it is a practice to charge the output of each process to the next process not at cost but at a price showing profit to the transferor process. The transfer price may be either the current market price or cost plus a fixed percentage.

In brief, the objects of such internal process profit are:

(a) To show whether the cost in each process competes with the market prices.

(b) To make each process stand on its own efficiency and economy.

(c) To assist in making decisions, such as to buy a partly-processed material rather than to process work internally or to sell a partly-processed product or to process it further.

JOINT PRODUCTS AND BY-PRODUCTS

Chapter 9

JOINT AND CO-PRODUCTS AND SUBSEQUENT COSTS

Joint Products: The term joint products is used for two or more products of almost equal economic value, which are simultaneously produced from the same manufacturing process and the same raw material.

Characteristics of Joint Products

(a) Joint products are produced from the same raw material in natural proportions
(b) They are produced simultaneously by a common process
(c) They are comparatively of almost equal value
(d) Joint products may be saleable after separation or may be further processed by incurring additional costs to make them saleable or an improved product

Co-products: Co-products refer to more than one product being manufactured by a company but need not necessarily arise from the same raw material and manufacturing process and the quantity of each co-product can be changed by the management.

Subsequent Costs: Subsequent (or attributable) costs, are those costs which are incurred after the separation or split-off point. These are separately incurred for individual joint or by-products and thus are identifiable with each product.

ACCOUNTING FOR JOINT PRODUCTS

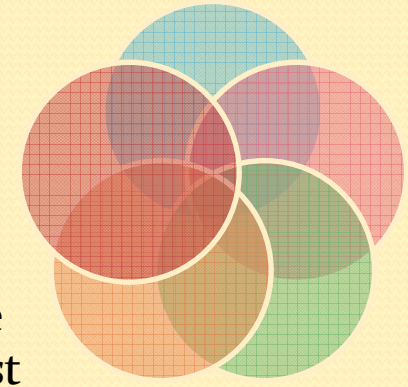
Accounting for joint products means the apportionment of joint cost to each of the joint product. Such apportionment serves the following objectives:

- (a) To determine the cost per unit of products
- (b) To help in inventory valuation
- (c) To determine the profit or loss on each line of product
- (d) To determine the price of each product

Methods of Apportionment of Joint Cost:

Sales Value Method

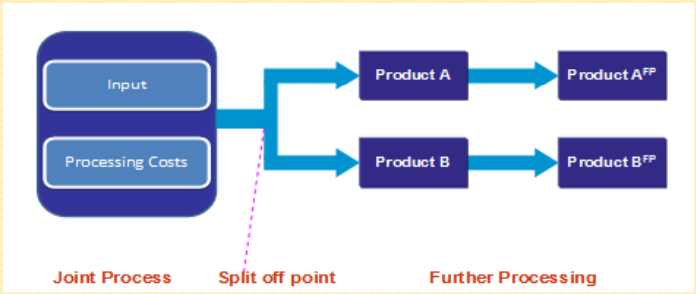
Survey Method



Reverse Cost Method

Average Unit Cost Method

Physical Units Method



SALES VALUE METHOD

- In this method, the selling prices per unit of various joint products is taken as the basis for apportionment of joint costs. In other words, joint cost is apportioned to various joint products in the ratio of selling prices of individual joint products without any regard to the quantities.

(a) On the basis of unit prices

- In this method, the apportionment is done on the basis of weighted sales value, i.e., number of units produced and sold × selling price per unit. This method thus gives due consideration to the quantities of various joint products produced.

(b) On the basis of sales value

REVERSE COST AND PHYSICAL UNITS METHOD

Reverse Cost Method In this method, the joint cost is apportioned on the basis of net value of each product.

The net value is calculated by deducting the following from the sales value.

- (a) Estimated profit margin
- (b) Selling and distribution costs, if any
- (c) After split off processing costs

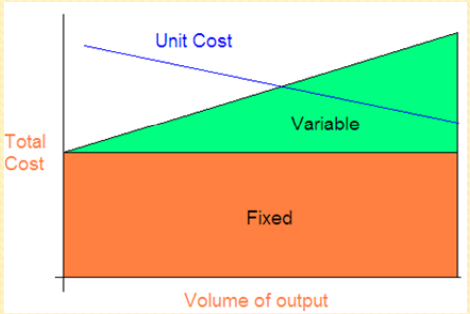
The net values of individual products so obtained are taken as the basis for apportioning joint costs. This is known as reverse cost method because net values are calculated by working backwards from sales values. This method is particularly used when products are not sold at their stage at split off point but require further processing.

Physical Units Method Under this method, the joint cost is apportioned on the basis of relative weight, volume or quantity, etc., of each product, obtained at the point where the split-off occurs.

AVERAGE UNIT COST METHOD, SURVEY METHOD

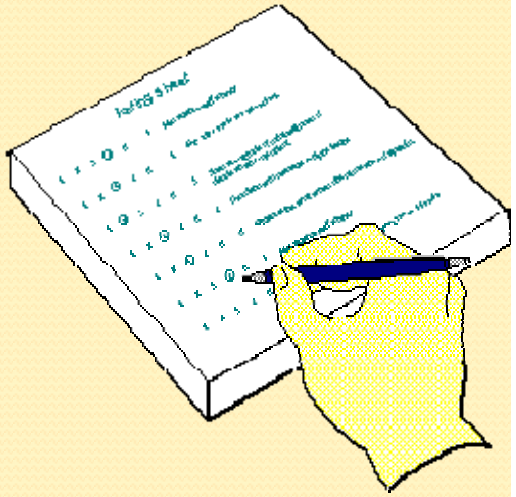
Average Unit Cost Method

- In this method, the joint cost is apportioned by using the average unit cost which is obtained by dividing the total joint cost by the total number of units produced of all the products. The average cost per unit of each product is the same.



Survey Method

- This method apportions the joint cost to various products, on the basis of the results of a survey or technical evaluation. In this survey, various factors, like volume, selling price, marketing process, etc., are studied and points or weights are assigned to each product. Costs are apportioned on the basis of such weights or points.



BY- PRODUCTS

By-products are products of relatively small value which are incidentally and unavoidably produced in the course of manufacturing the main product.

By-products may be-

- (a) Those sold in their original form without further processing
- (b) Those which require further processing in order to be saleable

Distinction between Joint Products and By- products

(a) **Relative sales value** If the sales value of all the products are more or less equal, they are treated as joint products. If, however, there are wide differences, the product with the greater sales value is treated as the main product and the products of lower value are treated as by-products.

(b) **Objective of manufacture** If the objective of manufacturing is product A, then unwanted products B and C be treated as by-products.

(c) **Policy of management** The management may decide to treat a particular product as the main product and the other products as by-products. Alternatively, it may choose to treat all products as joint products.

ACCOUNTING FOR BY-PRODUCTS

Where by-products are of small total value	Where by-products are of considerable total value
• In such a case it is not considered practicable to apportion any part of the joint cost to by-products. The net income realized by the sale of by-products may be treated as: (i) It may be treated as 'miscellaneous income' and credited to the Costing Profit and Loss Account. (ii) It may be credited to the process account in which the by-product has arisen.	• In this case, it is proper to apportion a part of the joint cost to by-products. This is debited to by-product account and credited to the main product account or the relevant process account. Any cost incurred in further processing of the by-product is debited to by-product account. The by-product account is credited with its sales value and any profit/loss arising out of this account is transferred to costing Profit and Loss Account.

ACCOUNTING FOR BY-PRODUCTS

Where by-products require further processing

- In such situations, the share of by-product in joint-cost at the split-off point may be arrived at by subtracting the profit and the further processing cost from the realizable value of the products, i.e., by using Reverse Cost Method.

Where by-product is utilized in the undertaking itself

- In those cases where by-products are used by the company itself as a raw material for some other process, such by-products may be priced at the opportunity cost. The opportunity cost is that cost which would have been incurred had the by-product been purchased from an outside firm.

LIMITATIONS OF JOINT COST ANALYSIS

Analysis of joint cost over joint products and by-products suffers from the following limitations.

1. Apportionment of joint cost over various products is mainly arbitrary and the true costs of various individual products cannot be known.
2. Apportionment of joint cost is based on certain assumptions which may be unrealistic or even misleading.
3. Arbitrary apportionment of joint costs makes inter-firm comparison difficult.
4. There is no clear cut distinction between joint products and by-products. Different firms may treat them differently.
5. Where by-products are of very small value, no worthwhile purpose is served by joint cost analysis.
6. When management has to take a decision as to whether sell the products at the split off point or to further process the products, joint cost analysis is not very relevant for such decision making.

OPERATING COSTING (Service Costing)

Chapter 10

OPERATING COSTING

According to CIMA London, Operating costing is that form of operation costing which applies where standardized services are rendered either by an undertaking or by a service cost centre within an undertaking.

Characteristics

(a)

- Services rendered to customers are of unique and standardized type.

(b)

- A large proportion of the total capital is invested in fixed assets and comparatively less working capital is required.

(c)

- The distinction between fixed cost and variable cost is of particular importance. This is because the economics and scale of operations considerably affect the cost per unit of service rendered. For example, fixed cost like insurance per passenger will be lower if buses in transport company run capacity packed.

COST UNIT

The selection of a suitable cost unit (unit of service) is very important. The cost units may be of the following two types:

(1) **Simple cost unit** A few examples are given below:

Undertaking	Cost unit
1. Transport	Per kilometre or per mile
2. Water works	Per 1,000 litres
3. Municipality	Per km of road maintained
4. Canteen	Per meal or per dish

(2) **Composite cost unit** In service undertakings, generally a composite cost unit is used. In this type, two units are rolled into one. For example, in a transport company, weight of goods as well as distance covered should be taken into account in evolving a cost unit, i.e., a tonne-kilometre, which means 1 tonne of goods transported to 1 km. Other examples are:

Undertaking	Cost unit
1. Transport	Per passenger-km or Per tonne-km
2. Hospital	Per bed per day
3. Hotel	Per room per day
4. Cinema	Per seat per show (or per man show)
5. Electricity	Per kilowatt hour (kWh)

TRANSPORT COSTING

Objectives

- To fix the rates of carriage of goods or passengers on the basis of operating costs.
- To decide the hire charges where vehicles are given on hire.
- To determine what should be charged to departments or others using the service.
- To compare the cost of using own motor vehicles and that of using alternate forms of transport.
- To compare the cost of maintaining one vehicle with another or one group of vehicles with another group.

TRANSPORT COSTING(Contd.)

Determination of Number of Cost Units

The cost unit in passenger transport is usually a passenger kilometre and in goods transport it is a tonne-kilometre.

Absolute tonne-km and Commercial tonne-km

In transport costing, composite cost units may be computed in two ways-
(a) absolute tonne-km, and (b) commercial tonne-km
In absolute tonne-km, cost units between each two stations is calculated separately in tonne-kms and then totalled up. But in commercial tonne-km, the trip is considered as a whole and it is arrived at by multiplying the total distance in kms by average load quantity.

Log Sheet

Most of the details required for transport costing are obtained from log sheet. A log sheet is maintained for each vehicle to record details of trips, running time, capacity, mileage, etc., on daily basis. These details also enable the management to avoid idleness of vehicles, to prevent waste of capacity and to guard against unnecessary duplication of trips.

TRANSPORT COSTING PROCEDURE

Costs are classified and accumulated under the following heads:

Standing or fixed charges

These are constant costs and are incurred irrespective of the mileage run. Such costs, therefore, should not be allocated to specific journeys on the basis of mileage.

Running or variable charges

These costs are those which vary in direct proportion to mileage run and so variable cost per unit may be computed straightaway.

Operating Cost Sheet for the period.....

Cost unit.....

No. of cost units .....

Particulars	*Total* ₹	*Per unit* ₹
Standing Charges:		
Licence fee		
Road tax		
Garage rent		
Insurance		
Driver's wages		
Conductor's wages		
Cleaner's wages		
Administration cost		
(*A*) Total		
Variable Charges :		
Petrol/diesel		
Oil, grease		
Depreciation		
Repair and maintenance		
Tyres and tubes		
(*B*) Total		
Grand Total (A) + (B)		

BOILER HOUSE AND POWER HOUSE COSTING

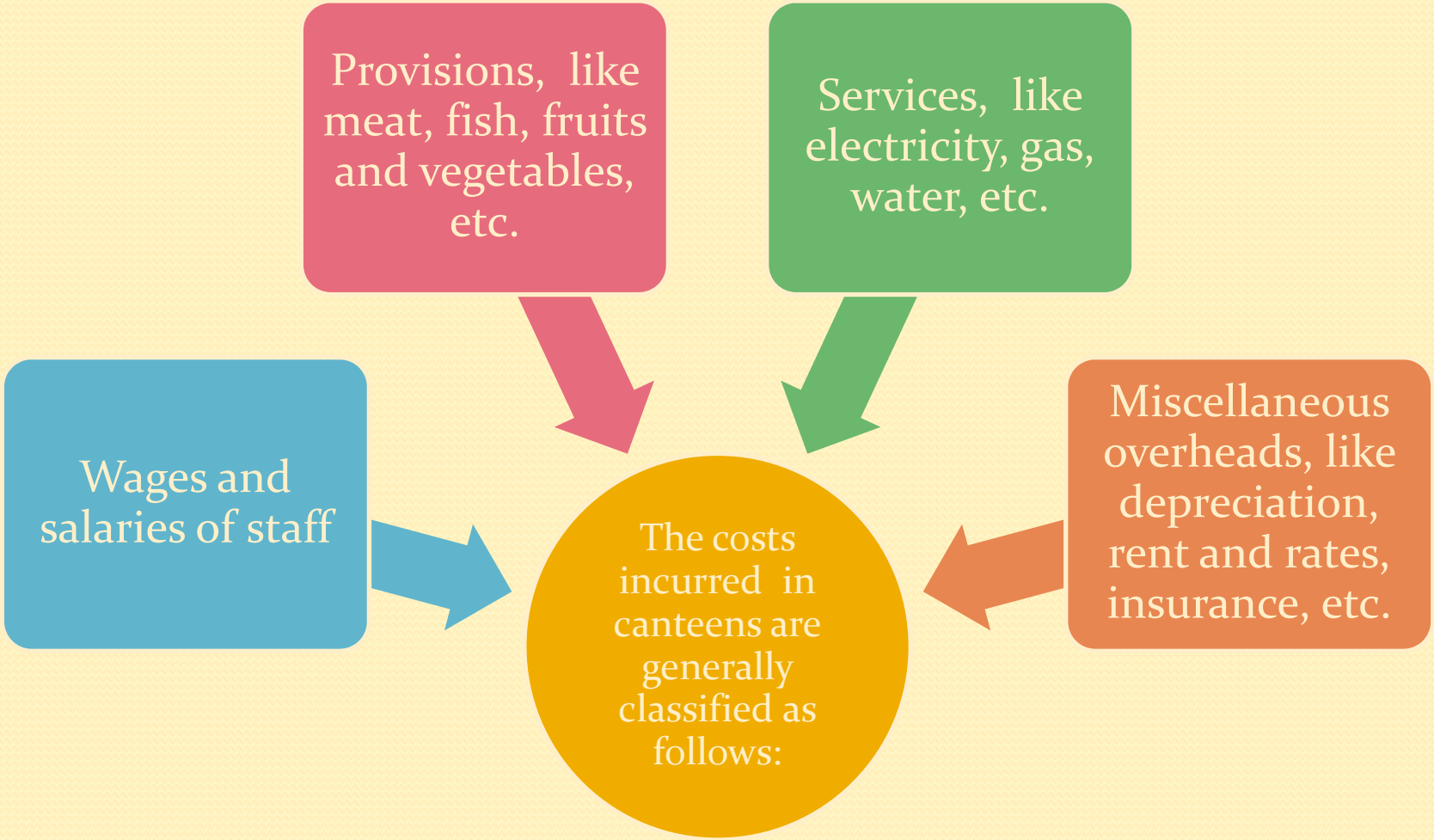
Boiler House Costing

- A boiler house produces steam which may be used either for power generation or may be supplied to certain production departments. The main purpose of boiler house costing is to ascertain the cost of steam produced. For this purposes a Boiler House Cost Sheet may be prepared.

Power House Costing

- When steam produced by boiler house is supplied to power house for generation of electricity, a separate boiler house cost sheet need not be prepared.
- Instead, a Power House Cost Sheet should be prepared to ascertain the cost of electricity generated. The cost of producing steam consumed in power house for generation of electricity is also included in the power house costs.

CANTEEN COSTING



MARGINAL (VARIABLE) COSTING AND COST-VOLUME-PROFIT ANALYSIS

Chapter 17

PRODUCT COSTING

There are mainly two techniques of product costing and income determination-

Absorption Costing: This is a total cost technique under which total cost (i.e., fixed cost as well as variable cost) is charged as production cost. In other words, in absorption costing, all manufacturing costs are absorbed in the cost of the products produced.

Marginal Costing: An alternative to absorption costing is marginal costing, also known as 'variable costing' or direct costing. Under this technique, only variable costs are charged as product costs and included in inventory valuation. Fixed manufacturing costs are not allotted to products but are considered as period costs and thus charged directly to Profit and Loss Account of that year. Fixed costs also do not enter in stock valuation.

MARGINAL COSTING

CIMA London as 'The accounting system in which variable costs are charged to cost units and fixed costs of the period are written off in full, against the aggregate contribution. Its special value is in decision making'.

Characteristics of Marginal Costing

Segregation of costs into fixed and variable elements	• In marginal costing all costs are classified into fixed and variable. Semi-variable costs are also segregated into fixed and variable elements.
Marginal costs as products costs	• Only marginal (variable) costs are charged to products produced during the period.
Fixed costs as period costs	• Fixed costs are treated as period costs and are charged to Costing Profit and Loss Account of the period in which they are incurred.
Valuation of inventory	• The work-in-progress and finished stocks are valued at marginal cost only.
Contribution	• Contribution is the difference between sales value and marginal cost of sales. The relative profitability of products or departments is based on a study of 'contribution' made by each of the products or departments.
Pricing	• In marginal costing, prices are based on marginal cost plus contribution.
Marginal costing and profit	• In this, profit is calculated by a two-stage approach. First all, contribution is determined for each product or department which are pooled together called 'Fund'. Then from this fund is deducted the total fixed cost to arrive at a profit or loss.

DISTINCTION BETWEEN ABSORPTION COSTING AND MARGINAL COSTING

Treatment of fixed and variable costs	• In marginal costing, only variable costs are charged to products. Fixed costs are treated as period costs and charged to Profit and Loss Account of the period. In absorption costing, all costs (both fixed and variable) are charged to the product.
Valuation of stock	• In marginal costing, stock of work-in-progress and finished goods are valued at marginal cost only. In absorption costing, stocks are valued at total cost which includes both fixed and variable costs. Thus stock values in marginal costs are lower than that in absorption costing.
Measurement of profitability	• In marginal costing, relative profitability of products or departments is based on a study of relative contribution made by respective products or departments. The managerial decisions are thus guided by contribution. In absorption costing, relative profitability is judged by profit figures which is also a guiding factor for managerial decisions.

FORMAT OF INCOME STATEMENT (ABSORPTION COSTING)

		₹
Sales		×××××
Production Costs:		
Direct material consumed		×××××
Direct labour cost		×××××
Variable manufacturing overheads		×××××
Fixed manufacturing overheads		×××××
Cost of goods produced		×××××
Add: Opening stock of finished goods (valued at cost of previous period's production)		×××××
		×××××
Less: Closing stock of finished goods (valued at production cost of current period)		×××××
Cost of goods sold		×××××
Add: (or less) Under (or over) absorption of fixed manufacturing overheads		×××××
Add: Administration costs	×××××	
Selling and distribution costs	×××××	×××××
Total Cost		×××××
Profit (Sales – Total cost)		×××××

FORMAT OF INCOME STATEMENT (MARGINAL COSTING)

		₹
	Sales	xxxxx
	Variable manufacturing costs	
	—Direct material consumed	xxxxx
	—Direct labour	xxxxx
	—Variable manufacturing overheads	xxxxx
	Cost of goods produced	xxxxx
Add:	Opening stock of finished goods (valued at variable cost of previous period)	xxxxx
Less:	Closing stock of finished goods (valued at current variable cost)	
	Cost of goods sold	xxxxx
Add:	Variable adm., selling and dist. overheads	xxxxx
	Total Variable Cost	xxxxx
	Contribution (Sales – Total variable cost)	xxxxx
Less:	Fixed costs (Production, adm., selling and dist.)	xxxxx
	Net Profit	xxxxx

DIFFERENCE IN PROFIT UNDER MARGINAL AND ABSORPTION COSTING

Profit under the two systems is different because of difference in stock valuation.

Production is equal to sales	Production is more than sales:	Production is less than sales
• (i) When there are no opening and closing stock, profit/loss under absorption and marginal costing systems are equal. • (ii) When opening stock is equal to closing stocks then also profit/loss under the two systems will be equal provided the fixed cost element in opening and closing stocks is the same amount.	• When production during a period is more than sales, i.e., when closing stock is more than opening stock, the profit as per absorption costing will be more than that shown by marginal costing. This is because in absorption costing a part of fixed overheads included in closing stock value is carried forward to next accounting period in the form of closing stock.	• When production during a period is less than sales, i.e., when opening stock is more than closing stock, profit shown by marginal costing will be more than that shown by absorption costing. This is because under absorption costing, cost of goods sold is higher because a part of fixed cost from the preceding period is added to the current year's cost of goods sold in the form of opening stock.

COST-VOLUME-PROFIT ANALYSIS

Cost-volume-profit analysis (CVP analysis) is an extension of the principles of marginal costing. It studies the interrelationship of three basic factors of business operations:

- Cost of production
- Volume of production/sales
- Profit

CIMA London has defined CVP analysis as, 'the study of the effects on future profits of changes in fixed cost, variable cost, sales price, quantity and mix.' An understanding of CVP analysis is extremely useful to management in budgeting and profit planning. It explains the impact of the following on the net profit:

(a) Changes in selling prices

(b) Changes in volume of sales

(c) Changes in variable cost

(d) Changes in fixed cost

BREAK-EVEN ANALYSIS

Break-even analysis is a widely-used technique to study the CVP relationship.

In its narrow sense, it is concerned with determining break-even point, i.e., that level of production and sales where there is no profit and no loss. At this point total cost is equal to total sales revenue. **When used in broad sense**, break-even analysis is used to determine probable profit/loss at any given level of production/sales. It is also used to determine the amount of sales to earn a desired amount of profit.

- All costs can be separated into fixed and variable components.
- Variable cost per unit remains constant and total variable cost varies in direct proportion to the volume of production.
- Total fixed cost remains constant.
- Selling price per unit does not change as volume changes.
- There is only one product or in the case of multiple products, sales mix does not change.
- There is synchronization between production and sales. In other words, volume of production equals volume of sales.
- Productivity per worker does not change.
- There will be no change in the general price level.

CONTRIBUTION AND MARGINAL COST EQUATION

As stated earlier, contribution is the difference between sales and the marginal (variable) cost of sales. It is also known as contribution margin (Cm) or gross margin. Thus contribution is calculated by the following formula:

Contribution = Sales – Variable cost $(C = S - V)$

Also, Contribution = Fixed cost + Profit $(C = F + P)$

or Contribution = Fixed cost – Loss $(C = F - L)$

From this, the following marginal cost equation is developed:

$$S - V = F + P$$

If any three of the above four factors in the equation are known, the fourth one can be easily found out. Thus:

or

$$P = S - V - F$$

$$P = C - F$$

$$F = C - P$$

$$V = S - F - P$$

PROFIT-VOLUME RATIO (P/V RATIO)

The profit/volume ratio, better known as contribution/sales ratio (C/S ratio), expresses the relation of contribution to sales.

Symbolically,

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} = \frac{C}{S} = \frac{S-V}{S}$$

By transposition, we have

(*i*) $C = S \times \text{P/V ratio}$

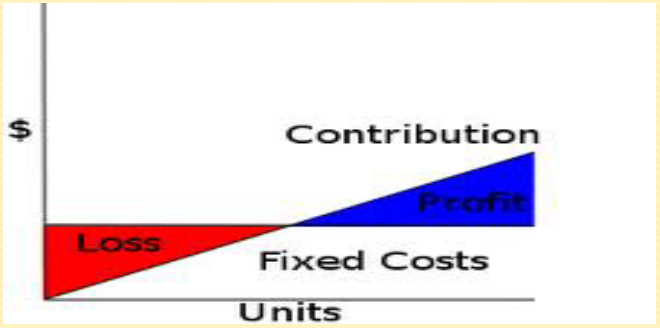
(*ii*) $S = \dfrac{C}{\text{P/V ratio}}$

$$\text{P/V ratio} = \frac{\text{Change in contribution}}{\text{Change in sales}} = \frac{\text{Change in profit}}{\text{Change in sales}}$$

METHODS OF BREAK-EVEN ANALYSIS

ALGEBRAIC METHOD (CALCULATIONS IN BREAK-EVEN ANALYSIS)

Break-even point The break-even point is the volume of output or sales at which total cost is exactly equal to sales. It is a point of no profit and no loss. This is the minimum point of production at which total cost is recovered and after this point profit begins. The fundamental formula to calculate break-even point is:



$$\text{Break-even point (in units)} = \frac{\text{Total fixed cost}}{\text{Contribution per unit}} = \frac{F}{S-V}$$

$$\text{Break-even point (in Rupees)} = \frac{\text{Total fixed cost}}{\text{Contribution}} \times \text{Sales} = \frac{F \times S}{S-V}$$

$$\text{Break-even point (in Rupees)} = \frac{\text{Total fixed cost}}{\text{P/V ratio}}$$

Cash Break-even Point: When break-even point is calculated only with those fixed costs which are payable in cash, such a break-even point is known as cash break-even point. This means that depreciation and other non-cash fixed costs are excluded from the fixed costs.

$$\text{Cash break even point} = \frac{\text{Cash fixed costs}}{\text{Contribution per unit}}$$

METHODS OF BREAK-EVEN ANALYSI S

GRAPHIC PRESENTATION OF BREAK- EVEN ANALYSIS

Break-even Chart: Break-even chart is a graphic presentation of break-even analysis. This chart takes its name from the fact that the point at which the total cost line and the sales line intersect is the break-even point.

Angle of Incidence: This angle is formed by the intersection of sales line and total cost line at the break-even point.

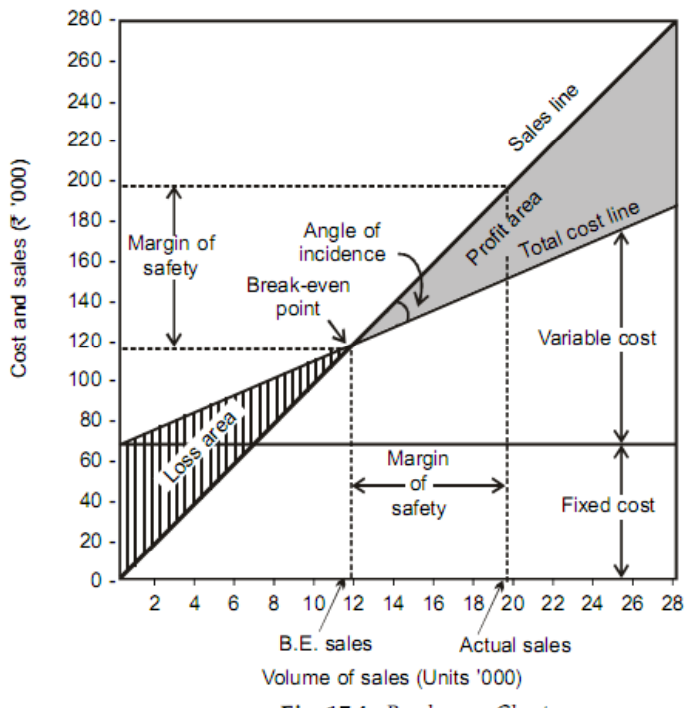


Fig. 17.4: *Break-even Chart*

CONSTRUCTION OF BREAK-EVEN CHART

Select a scale on X-axis

- The X-axis is a horizontal base line which is drawn and spaced into equal distances to represent any one or more of the following factors:
- (i) Volume of output (units)
- (ii) Volume of output (in rupee value)
- (iii) Volume of sales (units)
- (iv) Volume of sales (in rupee value)
- (v) Production capacity (in percentage)

Select scale on Y-axis

- The Y-axis is a vertical line at the extreme left of the chart which is spaced into equal distances. On this Y-axis, it is usual to show cost and sales in rupee value.

Draw the fixed cost line

- This is drawn parallel to X-axis, starting from an appropriate point on Y-axis.

Draw the total cost line

- The variable cost is depicted in the chart by super-imposing it on the fixed cost line. Thus a total cost line is drawn starting from the point on the Y-axis which represents fixed cost.

Drawn the sales line

- This line starts from the o point at the left (the intersection of X-axis and Y-axis, where there is no production at a nil cost) and extends to the point of maximum or any other sales value.

PROFIT- VOLUME CHART

The profit-volume chart or profit graph portrays the profit and loss at different levels of sales and is an alternative presentation of the facts illustrated in the break-even chart. Such a chart can be constructed from the same basic data from which a break-even chart can be drawn.

Construction of Profit-Volume Chart

1. • Select a scale on horizontal axis The horizontal axis in the profit-volume graph represents sales. This horizontal line, known as sales line, divides the graph into two parts.

2. • Select a scale on vertical axis The vertical axis shows fixed cost and profit. The fixed costs are market below the sales line on the left hand vertical line and profit is shown above the sales line on the right hand vertical line.

3. • Plot fixed cost and profit Points are plotted for the given fixed cost and profit. These points are connected by a diagonal line which crosses the sales line at break-even point.

BUDGETING AND BUDGETARY CONTROL

Chapter 18

CONCEPT OF BUDGET

The Chartered Institute of Management Accountants (CIMA) London, has defined a budget as 'a financial and/or quantitative statement, prepared prior to a defined period of time, of the policy to be pursued during that period for the purpose of attaining a given objective.' It may include income, expenditure and employment of capital.

Characteristics

(a) • A budget is primarily a planning device but it also serves as a basis for performance evaluation and control.

(b) • A budget is prepared either in money terms or in quantitative terms or in both.

(c) • A budget is prepared for a definite future period.

(d) • Purpose of a budget is to implement the policies formulated by management for attaining the given objectives.

CONCEPT OF BUDGETARY CONTROL

Budgeting: The act of preparing budgets is called budgeting. In the words of J Batty, 'the entire process of preparing the budgets is known as budgeting.'

Concept of Budgetary Control: According to CIMA, London, 'Budgetary control is the establishment of budgets relating to the responsibilities of executives of a policy and the continuous comparison of the actual with the budgeted results, either to secure by individual action the objective of the policy or to provide a basis for its revision.'

Characteristics

(a) • Establishment of budgets for each function/department of the organization.

(b) • Comparison of actual performance with the budgets on a continuous basis.

(c) • Analysis of variations of actual performance from that the budgeted performance to know the reasons thereof.

(d) • Taking suitable remedial action, where necessary.

(e) • Revision of budgets in view of changes in conditions.

OBJECTIVES OF BUDGETARY CONTROL

- A budget provides a detailed plan of action for a business over a definite period of time.

Planning

- Budgeting aids managers in co-ordinating their efforts so that objectives of the organization.

Co-ordination

- A budget is a communication device. It provides not only adequate under- standing and knowledge of the programmes and policies to be followed but also alerts about the restrictions to be adhered to .

Communication

- A budget is a useful device for motivating managers to perform in line with the company objectives.

Motivation

- Control is necessary to ensure that plans and objectives as laid down in the budgets are being achieved.

Control

- A budget provides a useful means of informing managers how well they are performing in meeting targets they have previously helped to set.

Performance evaluation

ESSENTIALS OF EFFECTIVE BUDGETING

- Support of top management
- Participation by responsible executives
- Reasonable goals
- Clearly defined organization
- Continuous budget education
- Adequate accounting system
- Constant vigilance
- Maximum profits
- Cost of the system
- Integration with standard costs

PRELIMINARIES IN THE INSTALLATION OF BUDGET SYSTEM

Creation of budget centres

- Budget centre is section of organization for which a budget is prepared.

Introduction of adequate accounting records

- System is designed to be able to record and analyse information required.

Preparation of an organization chart

- Organization chart should be prepared which shows the plan of organization.

Establishment of budget committee

- In large concerns, the direction and execution of the budget is delegated to a budget committee which reports directly to the top management.

Preparation of budget manual

- A budget manual has been defined by CIMA, London as 'a document which sets out the responsibilities for the persons engaged in the routine of and the forms and records required for budgetary control.'

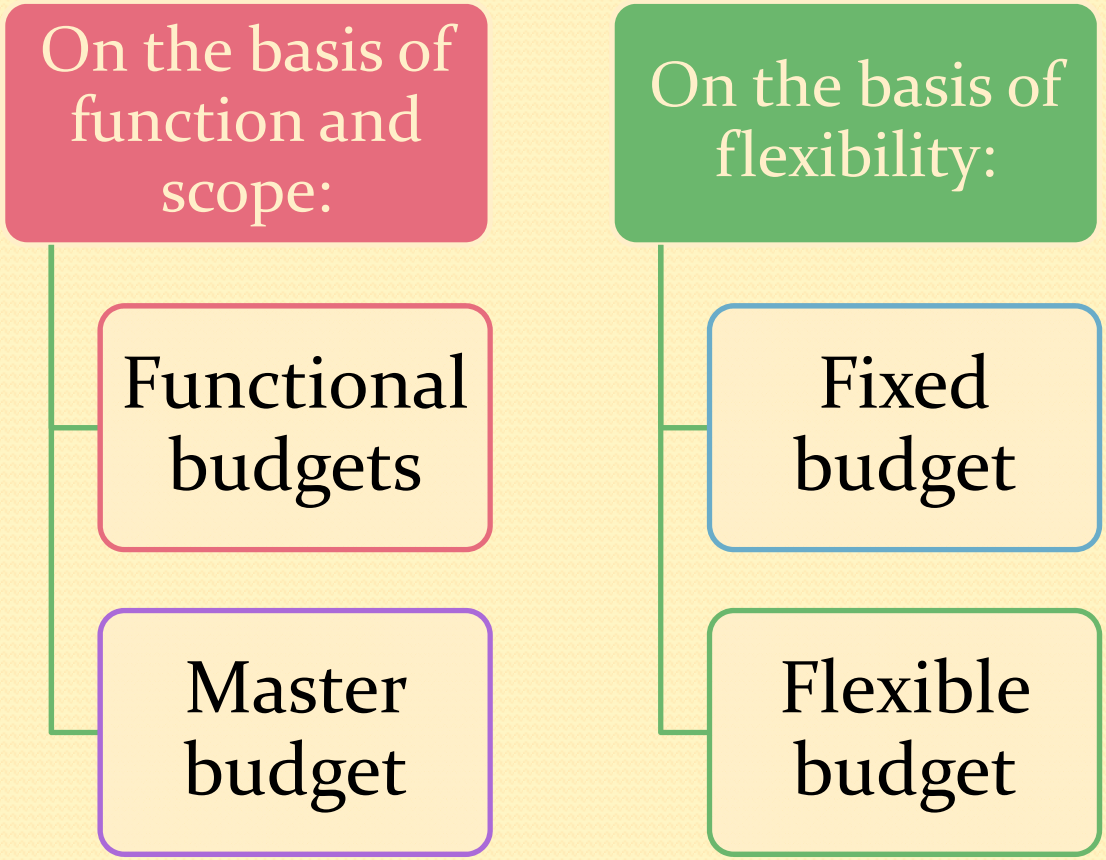
Budget period

- Budget period is a length of time for which a budget is prepared and operated.

Determination of the key factor

- The key factor means the factor which limits the size of output.

CLASSIFICATION OF BUDGETS



FUNCTIONAL BUDGETS

A functional budget is one which relates to a particular function of the business.

Sales Budget: The sales budget is a statement of planned sales in terms of quantity and value.

Production Budget: The production budget is a plan of production for the budget period.

Production Cost Budget: This budget shows the estimated cost of production. The production budget shows the quantities of production. These quantities of production are expressed in terms of cost in production cost budget.

Raw Material Budget: This budget shows the estimated quantities of all the raw materials and components needed for production demanded by the production budget.

Purchase Budget: The purchase budget provides details of the purchases which are planned to be made during the period to meet the needs of the business.

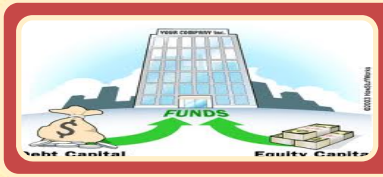
FUNCTIONAL BUDGETS(Contd.)

Labour Budget: Labour cost is classified into direct and indirect. Some companies prepare a labour budget that includes both direct and indirect labour, while others include only direct labour cost and include the indirect labour in the overhead cost budget.

Production Overheads Budget: The production overheads budget represents the forecast of all the production overheads (fixed, variable and semi-variable) to be incurred during the budget period.

Selling and Distribution Cost Budget: This is closely related to sales budget and represents the forecast of all costs incurred in selling and distributing the company's products during the budget period.

Administration Cost Budget: This budget represents forecast of all administration expenses, like directors' fees, managing director's salary, office lighting, heating and air conditioning, etc.



Capital Expenditure Budget: This budget represents the expenditure on all fixed assets during the budget period. It includes such items as new buildings, machinery, land and intangible items like patents, etc.

Cash Budget: It is a detailed estimate of cash receipts from all sources and cash payments for all purposes and the resultant cash balances during the budget period.

CASH BUDGET

It is a detailed estimate of cash receipts from all sources and cash payments for all purposes and the resultant cash balances during the budget period.

Preparation of Cash Budget

Receipts and Payments Method

- This method is usually used for short-term cash. The cash budget begins with the opening balance of cash in hand and at bank. To this are added the cash receipts from various sources and from this are deducted all payments of cash, whether on capital or revenue account. The resultant figure is the closing cash balance.

Adjusted Profit and Loss Method

- This method is suitable for long term cash forecast. It is based on the view that it is the profit that is the source of cash in the business. The profit as per P&L accounts is converted into cash figure by preparing an Adjusted Profit and Loss Account. All those items of income and expenditure, which do not involve an inflow or outflow of cash, are adjusted in the forecasted profit figure to arrive at the figure of cash made available by profit.

Balance Sheet Method

- This method is also used for forecasting cash requirements for long. Under this method budgeted balance sheet is prepared with all items of assets and liabilities, excepting cash or bank balance. The two sides of the balance sheet are then totalled and the balancing figure is taken as cash.

MASTER BUDGET

According to CIMA, London, 'master budget is a summary budget incorporating its component functional budgets and which is finally approved, adopted and employed.'

A master budget has two parts

- (i) operating budget, i.e., budgeted profit and loss account,
- (ii) financial budget, i.e., budgeted balance sheet.

The master budget is prepared by the budget director (or budget officer) and is presented to the budget committee for approval. If approved, it is submitted to the Board of Directors for final approval. The Board may make certain amendments/alterations before it is finally approved.

FIXED AND FLEXIBLE BUDGETS

Fixed Budget: A fixed budget is one which is prepared keeping in mind one level of output. It is defined as a budget 'which is designed to remain unchanged irrespective of the level of activity attained.'

Flexible Budget: In contrast to a fixed budget, a flexible budget is one 'which is designed to change in relation to the level of activity attained.' The underlying principle of flexible budget is that a budget is of little use unless cost and revenue are related to the actual volume of production.

Distinction between Fixed and Flexible Budgets

Fixed budget assumes static business conditions whereas flexible budget is based on the assumption of changing business conditions.

Fixed budget is prepared for only one level of activity but flexible budgets may be prepared for different capacity levels or for any level of activity.

Fixed budget figures are not changed when actual level of activity changes. But in flexible budgets, the figures are adjusted according to the actual level of activity attained.

When actual level of activity differs from budgeted level of activity, then in fixed budgets meaningful comparison between actual and budget figures is not possible. But in flexible budgets, such comparisons are quite realistic.

Under changing business environments, fixed budgets have very limited use for control. But flexible budgets are very useful for cost control and performance evaluation under changing business environments.

BUDGET REPORTS

Establishing budgets in itself is of no use unless there is a continuous flow of budget reports showing comparison of actual and budget figures. Budget reports should be prepared at regular intervals (say, every month) showing the reasons for the differences between actual and budget figures.

Essentials of a Budget Report

(a) The budget reports should be simple and suitable for the level of understanding for the user.

(b) Reports should be presented promptly.

(c) Reports should be accurate but the extreme accuracy should not be at the cost of promptness.

(d) The principle of exception should be utilized, where possible.

(e) The reports should contain only essential information according to the needs of the user.

Budget Report

Budget Centre ..... *Period .....*

Code No.	Item of Expenses	Budget ₹	Actual ₹	Variance		Reason
				Adverse ₹	Favourable ₹	

Fig. 18.3: *Budget Report in Statement Form*

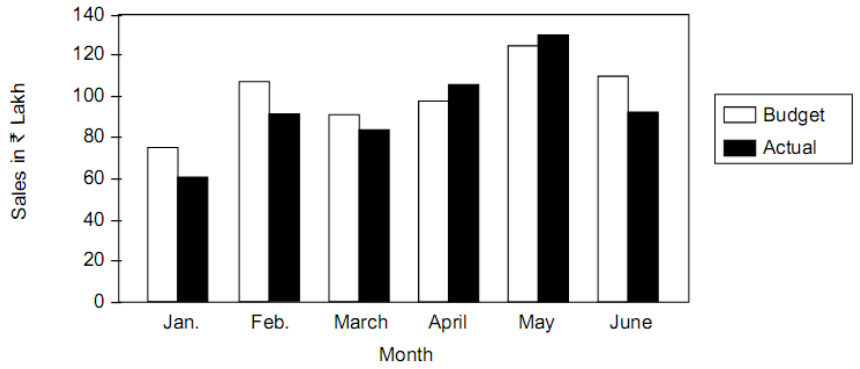


Fig. 18.4: *Budget Report in Diagrammatic Form*

ZERO BASE BUDGETING (ZBB)

According to CIMA, London, ZBB is defined as 'a method of budgeting whereby all activities are revaluated each time a budget is set. Discrete levels of each activity are valued and a combination chosen to match funds available.'

Main Features of Zero Base Budgeting (ZBB)

1. All budget items, both old and newly proposed, are considered totally afresh

2. Amount to be spent on each budget item is to be totally justified

3. A detailed cost benefit analysis of each budget programme is undertaken and each programme has to compete for scarce resources

4. Departmental objectives are linked to corporate goals

5. The main stress in not on 'how much' a department will spend but on 'why' it needs to spend

6. Managers at all levels participate in ZBB process and they have corresponding accountabilities.

PERFORMANCE BUDGETING

Performance budgeting is a relatively new concept which focuses on functions, programmes and activities. Performance 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.

Steps in Performance Budgeting

Establishment of responsibility centre Responsibility centres, a segment of an organization where a manager is responsible for the performance are established.

Establishment of performance targets For each responsibility centre, targets are set in terms of physical performance to be achieved.

Estimating financial requirements In this step, the financial support needed to achieve the physical targets is estimated.

Comparison of actual with budgeted performance This is a usual step in budgetary control to evaluate the actual performance.

Reporting and action Variances from budgeted performance are analysed and reported for corrective action to be taken.

STANDARD COSTING AND VARIANCE ANALYSIS

Chapter 19

HISTORICAL COSTING

Historical costs are the actual costs which have been incurred in the past. Such costs are ascertained only after these have been incurred.

Limitations of Historical Costing

No basis for cost control

- Historical costs cannot be used for the purpose of cost control as the cost has already been incurred before the cost figures can become available to management.

No yardstick for measuring efficiency

- Historical costs do not provide any yardstick against which efficiency can be measured. It only indicates the actual cost which is of little value in measuring performance efficiency.

Delay in availability of information

- Cost data under historical costing is obtained too late and is not of much use in price quotations and production planning.

Expensive system

- Historical costing is comparatively an expensive system of costing as it involves the maintenance of a larger volume of records.

STANDARD COSTING

According to Chartered Institute of Management Accountants (CIMA), London, 'Standard cost is the predetermined cost based on technical estimates for materials, labour and overhead for a selected period of time for a prescribed set of working conditions'.

Standard costing system involves the following steps:

1. The setting of standard costs for different elements of cost, i.e., material, labour and overheads.
2. Ascertaining actual costs.
3. Comparing standard with actual costs to determine the differences between the two, known as 'variances'.
4. Analysing variances for ascertaining reasons thereof.
5. Reporting of these variances and analysis thereof to management for appropriate action, where necessary.

APPLICABILITY OF STANDARD COSTING

The application of standard costing requires certain conditions to be fulfilled. These are:

(a) A sufficient volume of standard products or components should be produced.

(b) Methods, operations and processes should be capable of being standardized.

(c) A sufficient number of costs should be capable of being controlled.

STANDARD COSTS AND ESTIMATED COSTS—COMPARISON

Standard cost	*Estimated cost*
1. ***Nature*** Standard cost aims at what the cost SHOULD be.	Estimated cost is an assessment of what the cost WILL be.
2. ***Basis*** Standard costs are planned costs which are determined on a scientific basis after taking into account certain level of efficiency.	Estimated costs are based on average of the past figures, taking into consideration anticipated changes in future.
3. ***Relation to accounts*** In standard costing system, standard costs are usually incorporated into the accounts, from which variances of actual from standard are ascertained.	Estimated costs are used as statistical data for comparing with actual figures. Such costs are not entered in the books of accounts.
4. ***Use*** Standard costs are meant to be used for a concern operating on a standard costing system.	Estimated costs may be used in any concern operating on a historical cost system.
5. ***Purpose*** Standard costs serve the purpose of cost control.	Estimated costs do not serve the purpose of cost control. Such costs serve other purposes, like quoting selling price of new products, decision to buy or manufacture, etc.

STANDARD COSTING vs BUDGETARY CONTROL

Points of Similarity

1. The establishment of predetermined targets of performance
2. The measurement of actual performance
3. The comparison of actual performance with the predetermined targets
4. The analysis of variances between the actual and the standard performance
5. To take corrective measures, where necessary

Points of Difference

Standard costing	*Budgetary control*
1. ***Scope*** Standard costs are developed mainly for the manufacturing function and sometimes also for marketing and administration functions.	Budgets are compiled for different functions of the business such as sales, purchases, production, cash, capital expenditure, research and development.
2. ***Intensity*** Standard costing is intensive in application as it calls for detailed analysis of variances.	Budgetary control is extensive in nature and the intensity of analysis tends to be much less than that in standard costing.
3. ***Relation to accounts*** In standard costing, variances are usually revealed through accounts.	In budgetary control, variances are normally not revealed through accounts and control is exercised by statistically putting budgets and actuals side by side.
4. ***Usefulness*** Standard costs represent realistic yardsticks and, are therefore, more useful for controlling and reducing costs.	Budgets usually represent an upper limit on spending without considering the effectiveness of the expenditure in terms of output.
5. ***Basis*** Standard costs are usually established after considering such vital matters as production capacity, methods employed and other factors which require attention when determining an acceptable level of efficiency.	Budgets may be based on previous year's costs without any attention being paid to efficiency.
6. ***Projection*** Standard cost is a projection of cost accounts.	Budget is a projection of financial accounts.

ADVANTAGES OF STANDARD COSTING

- Effective cost control
- Helps in planning
- Provides incentives
- Fixing prices and formulating policies
- Facilitates delegation of authority
- Facilitates coordination
- Eliminates wastes
- Simplifies valuation of stocks
- Management by exception and variances
- Economical and simple

PRELI MINARIES IN ESTABLISHING A SYSTEM OF STANDARD COSTING

Establishment of Cost Centres: The first step in the establishment of a system of standard costing is the establishment of cost centres with clearly defined areas of responsibility.

Classifi cat i on of A ccount s: Accounts are classified according to the purpose in hand. Classification may be by function, revenue item, etc. For speedy collection and analysis of accounts, codes and symbols may be used.

Types of Standards:

Basic standards These are the standards which are established for an indefinite period of time. They are similar to an index number against which all later results are measured.

Current Standards Such standards remain in operation for a limited period and are related to current conditions. These standards are revised at regular intervals. They are of three types:

1. **Ideal standard** This is a theoretical standard which is rather not practicable to attain.
2. **Expected or practical standards** This is a standard, which may be anticipated to be attained during a future period.
3. **Normal standards** This is known as Past Performance Standard because it is based on the average performance in the past.

PRELI MINARIES IN ESTABLISHING A SYSTEM OF STANDARD COSTING

Setting Standard Costs

Setting standards for direct materials Two standards are developed for material costs:

1. **Material price standard** This is a forecast of the average prices of materials during the future period.
2. **Material quantity (or usage) standard** While setting quantity standard, the quality and size of material items to be consumed should be standardized.

Setting standards for direct labour The following two standards:

1. **Labour rate standard** This standard is determined having regard to the current rates of pay and any anticipated variations.
2. **Labour time (or efficiency) standard** Standard time for labour should be scientifically determined by time and motion studies, carried out in conjunction with a study to determine the most efficient method of working.

Setting Standards for Direct Expenses Direct expenses are not very common, but if there are any direct expenses relating to the cost unit, standards for these too must be set.

Setting Standards for Overheads: Developing this standard involves the following two distinct calculations: (a) Determination of the standard overhead costs; and (b) Determination of the estimates of production

$$\text{Standard overhead rate (per hour)} = \frac{\text{Standard overhead cost for the period}}{\text{Standard hours for the period}}$$

or

$$\text{Standard overhead rate (per unit)} = \frac{\text{Standard overhead cost for the period}}{\text{Standard production (in units) for the period}}$$

STANDARD HOUR AND COST CARD

In the words of CIMA, London, a standard hour is 'a hypothetical hour which represents the amount of work which should be performed in one hour under stated conditions.'

Standard Cost Card (Standard Cost Sheet)

Once the standard costs have been established, these are recorded on a standard cost card. A standard cost card is thus a record of the standard material, labour and overhead costs. Such a card is maintained for each product or service. The card will normally show the quantity and price of each material item to be consumed, the time and rate of labour required, the overheads to be absorbed and the total cost

VARIANCE ANALYSIS

Cost Variance: According to CIMA, London, Terminology, variance analysis is the process of computing the amount of variance and isolating the causes of variance between actual and standard.

Favourable and Unfavorable Variances: Where the actual cost is less than standard cost, it is known as favourable or credit variance. On the other hand, where the actual cost is more than standard cost, the difference is referred to as unfavourable, adverse or debit variance.

Controllable and Uncontrollable Variances: If a variance can be regarded as the responsibility of a particular person, with the result that his degree of efficiency can be reflected in its size, then it is said to be a controllable variance. If a variance arises due to certain factors beyond the control of management, it is known as uncontrollable variance.

Methods Variance: According to CIMA, London Terminology, methods variance is 'the difference between the standard cost of a product or operation, produced or performed by the normal method and the standard cost of a product or operation, produced or performed by the alternative method actually employed.'

Revision Variance: Revision variance is the difference between the standard cost originally set and the revised standard cost.

Thus:

$$\text{Revision variance} = \text{Original standard cost of actual output} = \text{Revised standard cost of actual output}$$

COST VARIANCE ANALYSIS

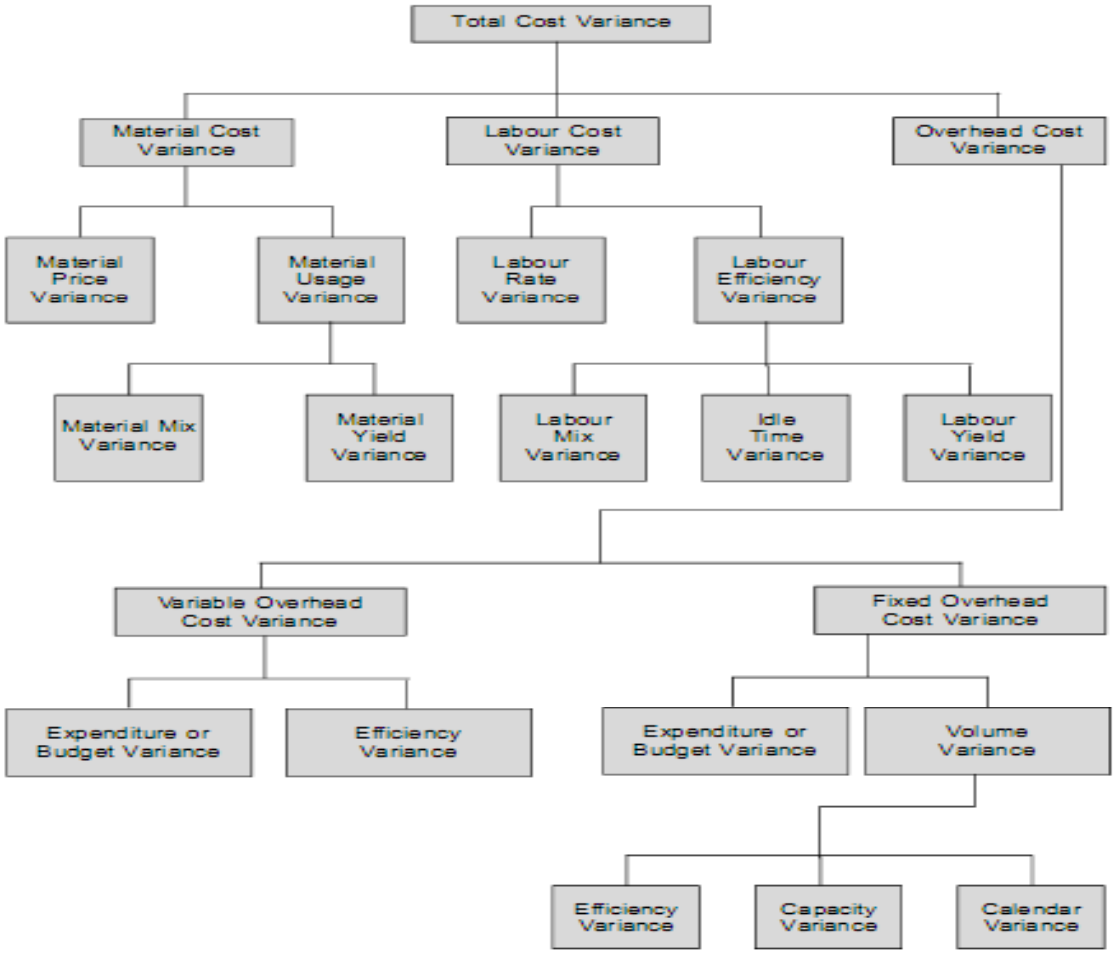


Fig. 19.2: *Cost Variance Analysis*

MATERIAL PRICE VARIANCE

This is 'that portion of the material cost variance which is due to the difference between the standard price specified and the actual price paid'.

Material Price Variance = (Standard price – Actual price) × Actual quantity

$$MPV = (SP - AP) \times AQ$$

Material Usage (or Quantity) Variance

This is 'that portion of the material cost variance which is due to the difference between the standard quantity specified and the actual quantity used'.

$$\text{Material Usage Variance} = \left(\begin{matrix}\text{Standard quantity} \\ \text{for actual output}\end{matrix} - \begin{matrix}\text{Actual} \\ \text{quantity}\end{matrix}\right) \times \begin{matrix}\text{Standard} \\ \text{price}\end{matrix}$$

$$MUV = (SQ - AQ) \times SP$$

LABOUR VARIANCES

Labour Cost Variance

$$\text{Labour Cost Variance} = \begin{matrix}\text{Std labour cost}\\ \text{of actual output}\end{matrix} - \begin{matrix}\text{Actual labour}\\ \text{cost}\end{matrix}$$

$$LCV = SC - AC$$

Classification of Labour Cost Variance

Labour Rate Variance

$$\text{Labour Rate Variance} = (\text{Standard rate} - \text{Actual rate}) \times \text{Actual hours}$$

$$LRV = (SR - AR) \times AH$$

Labour Time (or Efficiency) Variance

$$\text{Labour Efficiency Variance} = \left(\begin{matrix}\text{Std hours for}\\ \text{actual output}\end{matrix} - \begin{matrix}\text{Actual}\\ \text{hours}\end{matrix}\right) \times \text{Standard rate}$$

$$LEV = (SH - AH) \times SR$$

OVERHEADS VARIANCES

Overhead cost is the aggregate of indirect materials, indirect labour and indirect expenses.

Standard Overhead Rate

$$\text{Standard overhead rate (per hour)} = \frac{\text{Budgeted overheads}}{\text{Budgeted hours}}$$

Or

$$\text{Standard overhead rate (per unit)} = \frac{\text{Budgeted overheads}}{\text{Budgeted output (in units)}}$$

Overhead Cost Variance

CIMA, London has defined it as 'the difference between the standard cost of overheads absorbed in the output achieved and the actual overhead cost.'

$$\text{Overhead Cost Variance} = \text{Absorbed overheads} - \text{Actual overheads}$$

$$\text{OCV} = \left(\begin{matrix}\text{Std hours for} \\ \text{actual output}\end{matrix} \times \begin{matrix}\text{Std overheads} \\ \text{absorption rate}\end{matrix}\right) - \text{Actual overheads}$$

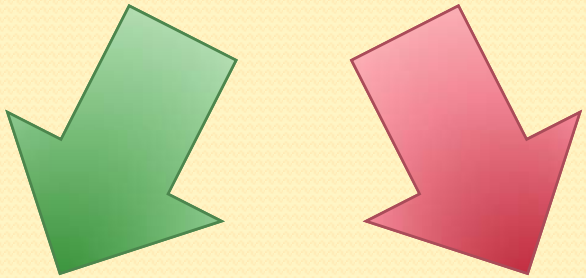
VARIABLE OVERHEADS(V.O.) VARIANCES

Variable Overhead Cost Variance

$$\text{Variable Overhead Cost Variance} = \left(\text{Std hours for actual output} \times \text{Std variable ohds rate}\right) - \text{Actual overhead cost}$$

VOCV = (Absorbed V.O. – Actual V.O.)

This variance is sub-divided into the following two variances:



Variable Overheads Expenditure Variance

$$\text{V.O. Expenditure Variance} = \left(\text{Std variable overhead rate} \times \text{Actual hours}\right) - \text{Actual overhead cost}$$

= (Standard V.O. – Actual V.O.)

Variable Overhead Efficiency Variance

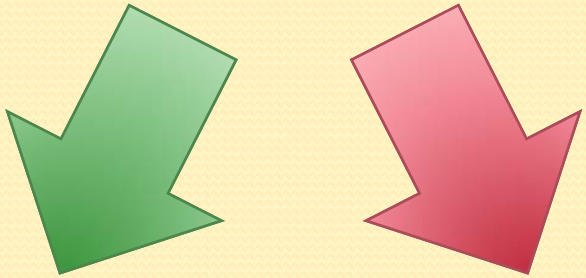
$$\text{V.O. Cost Variance} = \left(\text{Std variable overhead rate} \times \text{Actual hours}\right) - \text{Std variable overhead rate}$$

= (Absorbed V.O. – Standard V.O.)

FIXED OVERHEADS(F.O.) VARIANCES

Fixed Overhead Cost Variance

$$\text{F.O. Cost Variance} = \left(\begin{matrix}\text{Std hours for}\\ \text{actual output}\end{matrix} \times \begin{matrix}\text{Std F.O.}\\ \text{rate}\end{matrix}\right) - \begin{matrix}\text{Actual}\\ \text{fixed overheads}\end{matrix}$$



Fixed overhead cost variance is sub-divided into the following two variances:

Fixed Overhead Expenditure Variance

$$\begin{matrix}\text{F.O. Expenditure}\\ \text{Variance}\end{matrix} = \left(\begin{matrix}\text{Budgeted}\\ \text{fixed overheads}\end{matrix} - \begin{matrix}\text{Actual}\\ \text{fixed overheads}\end{matrix}\right)$$

Fixed Overheads Volume Variance

$$\begin{matrix}\text{F.O. Volume}\\ \text{Variance}\end{matrix} = \left(\begin{matrix}\text{Std hours for}\\ \text{actual output}\end{matrix} - \begin{matrix}\text{Budgeted}\\ \text{hours}\end{matrix}\right) \times \text{Std rate}$$

$$= \text{Absorbed Overheads} - \text{Budgeted Overheads}$$

REPORTING OF VARIANCES

Essentials of Effective Variance Report

1. The reports should be simple, clear and quick. If reports do not inform management, in a clear and unmistakable manner, of what has taken place and what action may be taken, they may not fully serve their purpose.
2. The reports should show the results of the period in view and assess the level of efficiency achieved.
3. The reports should show a comparison of results achieved with those planned.
4. The amount of details included in a report should vary according to the person for whom it is intended. For example, reports for top management should be in the nature of summaries of periodís activities while reports for department heads should be detailed and should show individuals responsible for sub-standard and above standard operations.
5. Variances arising out of each factor should be correctly segregated. Moreover, controllable variances should be separated from uncontrollable variances and analysis of uncontrollable variances should be made with the same care as for controllable variances.
6. Special attention should be focused on significant variances, thereby following the 'principle of exception' rule.
7. Wherever possible, the use of charts and graphs should be made in variance reports.

CONTROL RATIOS

In addition to variances, certain control ratios are commonly used by management for controlling operations. These ratios are generally expressed in terms of percentage. If the ratio is 100% or more, it indicates a favourable position and versa, if the ratio is less than 100%, it indicates unfavourable position.

Efficiency Ratio It is defined as the standard hours equivalent to the work produced expressed as a percentage of actual hours spent in production. Thus, this ratio shows whether actual time taken in production is more or less than the time allowed by the standard. Its method of calculation is:

$$\text{Efficiency ratio} = \frac{\text{Standard hours for actual output}}{\text{Actual hours worked}} \times 100$$

Activity Ratio It is defined as 'the standard hours equivalent to the work produced, expressed as percentage of budgeted standard hours.' This ratio shows the extent to which the production facilities have been utilized as compared with that contemplated in budgets. Its formula is

$$\text{Activity ratio} = \frac{\text{Standard hours for actual output}}{\text{Budgetary hours}} \times 100$$

Capacity Ratio It shows the relationship between actual hours worked and the budgeted hours. Its formula is:

$$\text{Capacity ratio} = \frac{\text{Actual hours worked}}{\text{Budgeted hours}} \times 100$$

DISPOSITION OF VARIANCES

When standard costs are not entered in the books of accounts and are used only as a statistical information, no adjustments are required at the end of the period for the variances. However, when standard costs are incorporated into the accounting system through journals and ledgers, there arises a question of adjustment and disposition of variances at the end of the accounting period. The following methods of disposition of variances are based on practice followed in certain firms:

Transfer to Profit and Loss Account

- Under this method, all variances are transferred to profit and loss account at the end of the accounting period. Thus, the stocks of work-in-progress and finished stock and cost of sales are maintained at standard costs.

Allocation of Variances to Inventories and Costs of Sales

- Under this method, variances are distributed over stocks of work-in-progress, finished stock and cost of sales. This will result in showing inventories and costs of sales at actual costs.

Combination Method

- The best and most logical way is to combine the first two methods by analysing the variances according to the causes and disposing them off according to the underlying reasons for their existence.