**SYLLABUS**

**Class – B.Com. LL.B III Sem.**

**Subject: Cost Accounting (Major)**

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| Unit-I | Meaning of cost, costing and cost accounting, objectives, functions, advantages and limitations of cost accounting, methods and techniques of costing cost accounting VS management accounting VS financial accounting. |
| Unit-II  | Meaning and importance of material control techniques of inventory control: economic order quantity, stock level methods of pricing. |
| Unit – III | Overhead: Meaning and classification of overheads cost, allocation, apportionment and absorption of overheads, preparation of cost sheet.  |
| Unit – IV | Process Costing: Meaning, Process losses valuation of stock, Inter Process Profit on incomplete contract. |
| Unit – V  | Marginal Costing and Cost Volume Profit Analysis: Meaning, characteristics, advantages and disadvantages of marginal costing cost volume profit analysis, break even analysis profit volume ratio, and margin of safety.  |

**UNIT-I**

**Introduction**

**Costing - terminology**

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

**Cost Accounting: -** “The process of accounting for cost from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost centres and cost units.

The term ‘cost Accountancy’ includes (i) Costing and (ii) Cost Accounting. Its purposes are (i) cost-control, and (ii) profitability-ascertainment and serves as an essential tool of the management for decision-making.

**Cost Centre**

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

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

**Profit Centre**

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

**Cost Unit**

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

**NATURE AND CHARACTERISTICS OF COST ACCOUNTING**

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

**SCOPE OF COST ACCOUNTING**

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

**Difference between cost accounting and financial accounting**

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| --- | --- | --- |
| **S. No.** | **Cost Accounting** | **Financial Accounting** |
| 1.2.3.4.5.6.7.8.9.10.11.12.13.14 | Kept by business engaged either in manufacturing either in manufacturing or in rendering services where the cost per unit is to be ascertained.Maintain full and detailed records pertaining to all the three elements of cost, viz., materials, labour and expenses.Provide data and reports to management for cost-ascertainment, planning, control and decision-making.Ascertain the cost of each product, job or order and then show profit/loss made on each.Provide information to management as and when desired, daily, weekly, monthly, quarterly, etc.To calculate the cost, the indirect expenses include there in are based on estimates.Greater control is exercised on materials and stores, labour and overhead costs by budgetary control and standard costing. No emphasis is given to cash-in-hand and Bank transactions.As the cost is available, it is easier to fix selling price and quote for tendersThe production costs of a period can be compared with previous corresponding period and the difference analyzed.Provide information on the relative efficiencies of plant, machinery, labour and departments.Stocks are valued at costs.These accounts are for internal transactions and do not form the basis of receipts and payments to outside parties.The companies Act has made it obligatory for certain industries to maintain Cost Accounting, otherwise it is voluntary to maintain cost them.Charts, graphs, diagrams, statements, etc. are much used in this system for informatory reports to management. | Kept by all types of business houses, big or small, whether engaged in trading, manufacturing or non-profit making associations.Records all types of expenses and incomes and also items of profit appropriation. However, they do not keep detailed records of elements of cost.Provide general information to management and outside parties in the form of Profit & Loss A/c and Balance Sheet of the business as a whole.Do not show profit/loss on each product, job or order individually.Provide operating net result and financial position at the end of financial year.Show historical costs, i.e., they include expenses having actually been incurred in the financial year.Greater emphasis is laid on cash and financial position. They do not attach that importance to control of materials, labor and overheads.No correct tender prices can be quoted.Such comparison of costs of individual production is not easy.The relative efficiency of workmen, plants, etc., cannot be easily judged.Stocks are valued at cost price or market price, whichever is lower.They form basis for external transactions also, and record receipts, payments and credit transactions.It is almost necessary to maintain this accounting to run business. To meet the requirements of Companies Act, and Income-tax Act, it is obligatory to keep them.Not much use is made of such presentation in this system. |

 **Differences between Cost Accounting and Management Accounting**

1. The accounting related to the recording and analyzing of cost data is cost accounting. The accounting related to the producing information which is used by the management of the company is management accounting.
2. Cost Accounting provides quantitative information only. On the contrary, Management Accounting provides both quantitative and qualitative information.
3. Cost Accounting is a part of Management Accounting as the information is used by the managers for making decisions.
4. The primary objective of the Cost Accounting is the ascertainment of cost of producing a product, but the main objective of the management accounting is to provide information to managers for setting goals and future activity.
5. There are specific rules and procedure for preparing cost accounting information while there is no specific rules and procedures in case of management accounting information.
6. The scope of Cost Accounting is limited to cost data however the Management Accounting has a wider area of operation like tax, budgeting, planning and forecasting, analysis, etc.
7. Cost accounting is related to ascertainment, allocation, distribution and accounting face of cost. On the flip side, management accounting is associated with impact and effect aspect of cost.
8. Cost accounting stresses on short-range planning, but management accounting focuses on long and short range planning, for which it uses high level techniques such as probability structure, sensitivity analysis etc.
9. While management accounting can’t be installed in the absence of cost accounting, cost accounting has no such requirement; it can be installed without management accounting.

**FUNDAMENTAL PRINCIPLES OF COSTING**

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

**OBJECTS AND FUNCTIONS OF COST ACCOUNTING**

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

**TECHNIQUES AND METHODS OF COSTING**

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

**Methods of Costing**

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

**ANALYSIS OF TOTAL COST**

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

**CLASSIFICATION OF COST AND COST CONCEPT**

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

1. **According to Elements**. The cost is classified into (i) Direct cost, and (ii) Indirect cost according to elements, viz., materials, Labour and Expenses.
2. **According to Functions**. The cost is classified into the following:
	1. Production Cost, or Manufacturing Cost, or Factory Cost,
	2. Administration Cost,
	3. Selling Cost, and
	4. Distribution Cost.
3. **According to Nature**. The cost is classified into the following:
	1. Fixed Cost is “a cost which tends to be unaffected by variations in volume of output.
	2. Variable Cost is “a cost which tends to vary directly with volume of output.
	3. Semi-fixed or Semi-variable Cost is ‘a cost which is partly variable.’
4. **According to Controllability**.
5. Controllable cost. This is a cost which can be influenced by the action of a specified member of an undertaking.
6. Uncontrollable Cost. It is the cost which cannot be influenced by the action of a specified member of an undertaking, such as fixed costs.
7. **According to Normality**. The cost is classified into (i) Normal cost, and (ii) Abnormal cost.
8. Normal cost. It is the cost at a given level of output in the condition at which that level of output is normally attained.
9. Abnormal cost. It is a cost which is beyond normal cost.
10. **According to Relevance to Decision-making and Control**.
11. Shut-down Cost. A cost which will is required to be incurred even though a plant is closed or shut-down for a temporary period, e.g., the cost of rent, rates, depreciation, maintenance expenses etc.
12. Sunk cost. A cost which has been incurred in the past or sunk in the past and is not relevant to the particular decision-making. E.g. written down book value of the plant.
13. Opportunity Cost. The costs which are related to the sacrifice made or the benefits foregone are opportunity costs.
14. Imputed Cost. It is a hypothetical cost required to be considered to make costs comparable. Interest on one’s own capital.
15. Out-of-Pocket cost. A cost which will have to be paid to outsiders as against costs such as depreciation, which do not require any cash payment.
16. Replacement Cost. It is the cost of replacing a material or assets, by purchase from the current market.
17. Marginal Cost. Marginal cost refers to the increase or decrease in total cost caused due to increase or decrease in output by one single unit.
18. Differential Cost. The change in total cost due to the change in method or technique of production or charged in level of production is called differential cost.
19. Standard Cost. Standard cost is a predetermined cost or estimate which is compared with the actual cost in order to determine variance and carry out an analysis of variance for cost control.
20. Relevant Cost. The relevant costs are those cost which aids to makes specific management decisions.
	1. **Product Cost & Period Cost**

The product cost is the total of cost that is associated with a unit of product. The cost in forming the product viz., direct material, direct labor, factory overhead constitute the product cost.

Period cost, on the other hand, are costs that tends to be unaffected by changes in level of activity during has given specific time period. E.g., Selling & distribution cost.

**SIGNIFICANCE OF COST ACCOUNTING**

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

**ADVANTAGES OF COST ACCOUNTING**

To the Management

1. Action against unprofitable Activities 2. Facilities Decision Making 3. Inventory Control

4. Budgetary Control 5.Facilitations cost control 6. Prevents Fraud 7.Tool of Management Control

8. Measuring rods 9.Future Prospects

1. To the Employees
	1. Sound Wage Policy
	2. Security of Job
	3. Distinction between Efficient and Inefficient Workers
2. To the Creditors

Bankers, creditors, investors etc., can have a better understanding of the firm as regard the process and prosperity, before they offer financial leading.

1. To the Government
	1. For government wage tribunals, for deciding the state subsidy to industry.
	2. In the preparation of national plans, economic development etc.
	3. Cost audit is important and industries have to keep books of accounts to show the utilization of materials, labour and other costs.
2. To the Public
	1. Removes all types of wastages and inefficiencies.
	2. Facilities the customers to pay fair price.
	3. Development and prosperity of industries will create employment opportunities.

**CHARACERTISTICS OF A GOOD COSTING SYSTEM**

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

**Limitation of Cost Accounting**

Like other branches of accounting, cost accounting is not an exact science but is an art which has developed through theories and accounting practices based on reasoning and common sense. These practices are not static but changing with time. Cost accounting lacks a uniform procedure. There is no stereotyped system of cost accounting applicable to all industries. There are widely recognized cost concepts but understood and applied differently by different industries. Cost accounting can be used only by big enterprises. The limitations of cost accounting are as follows:

1. It is expensive because analysis, allocation and absorption of overheads require considerable amount of additional work.
2. The results shown by cost accounts differ from those shown by financial accounts. Preparation of reconciliation statements frequently is necessary to verify their accuracy. This leads to unnecessary increase in workload.
3. It is unnecessary because it involves duplication of work. Some industrial units are functioning efficiently without any costing system.
4. Costing system itself does not control costs. If the management is alert and efficient, it can control cost without the help of the cost accounting. Therefore it is unnecessary.

 **UNIT-II**

**Material Costing**

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

**Objectives of Material control**

1. No under stocking or over stocking
2. Economy in purchasing
3. Proper Quality
4. Minimum wastage
5. Information about material availability

**Principles or Essentials of Material Control**

1. Proper co-ordination and Co-operation between various departments- Purchase, Stores, Inspection, Accounting etc.
2. Proper classification and codification of materials
3. Proper scheduling of material requirements.
4. Perpetual inventory system should be operated
5. Various stock levels to be fixed
6. Proper system of internal check to be introduced for adequate safeguards and supervision
7. Regular reporting to management regarding purchase, issues and stock of materials.
8. Proper storage and usage of materials to avoid theft and wastages.

**Functions of purchasing department:**

1. Determination of quality to be purchased
2. Determination of ordering point.
3. Determination of price at which to be purchased.

**Purchase Procedure: -**

1. Initiating the purchase
2. Receiving of the purchase requisitions.
3. Deciding important factors relating to purchase.
4. Inviting tenders and selecting suppliers.
5. Preparation and execution of purchase orders
6. Receipt of materials
7. Inspection and testing of materials received
8. Debit note upon the supplier in respect of rejected materials.
9. Passing invoices for payment.

**Stores Organization and control**

**Objectives**

1. Receive materials, check them and place them properly
2. To issues the materials to jobs on the basis of store requisitions
3. To enter all the receipts and issues in the bin card and show the balance
4. Avoiding overstocking and under stocking by checking the ordering points of different materials.
5. Maintain, preserve and protect the materials during storage
6. Maintain up-to-date stores records
7. To report on obsolete and slow moving materials, waste, scrap, etc.
8. Requisitioning further supplies from purchasing department.

**Stores Records**

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

**Techniques of Inventory Control**

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

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

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

‘C’ items are low value materials which represent a large number of items and require economical control procedures, and least attention.

1. **Stock Levels: -** To avoid under stocking and overstocking, maximum, minimum and reorder levels are fixed.

**Factors which influence stock levels are**

1. Anticipated rate of consumption
2. Account of capital available
3. Availability of storage space
4. Storage/ warehousing cost
5. Procurement cost
6. Reliability of suppliers
7. Minimum order quantities imposed by suppliers
8. Risk of loss due to obsolescence, deterioration, evaporation and fall in market prices
9. Maximum Level: - It indicates the maximum quantity of inventory item which can be stored at any given time

Maximum Level = Minimum Stock + Economic Order quantity

 Or

= Reorder Point + Reorder quantity –

[Minimum Consumption x Minimum reorder Period]

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

 Minimum Level = Reorder Point – [Average Consumption x Average

 Re-order period]

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

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

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

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

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1. Average stock Level:= × [ Minimum Level + Maximum Level]

 Or

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

1. EOQ [Economic or order quantity] or Re-order quantity: - EOCs is that size of the order which gives maximum economy in purchasing any material and ultimately contributes towards maintaining the material at optimum level and at minimum cost. While setting EOQ, two types of costs are considered
	1. Ordering cost: - Cost of placing orders.
	2. Carrying Cost: - Cost of holding stock in storage

EOQ =, where A= annual consumption in units, O = ordering cost per order,

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

**Control Ratios**

1. Inventory turnover Ratios: - This tells us how many a time in a year is used up and replaced. The greater the stock turnover, the more efficient is the stock policy. It indicates the rate of consumption, i.e. whether materials are moving fast or slowly. A high stock turnover ratio indicates fast moving materials and a low ratio indicates slow moving materials.
	1. Stock Turnover Ratio = Cost of Materials consumed during the period

 Average stock of materials during the period

 Value of Finished Stock sold in the period

Value of Average stock held during the period

* 1. Finished Stock Turnover Ratio =
	2. Inventory Turnover in terms of days = Days of the period

 Stock Turnover Rate

 Or

 Value of Average x Days of the period

 Material consumed

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

 Input Units

Output units

 × 100

1. **Perpetual Inventory system and system of store verification**: - Perpetual Inventory aims at devising the system of records by which the receipts and issues of material stores may be recorded immediately at the time of each transaction and the balance may be brought out so as to show the up-to-date position. This system is operated by: -
	1. Reconciliation of stock bin cards and stores ledger accounts
	2. Physical stock verification which is of two types: -
		1. Periodic stock verification & (b) continuous stock verification

**Advantages of Perpetual Inventory System**

1. Records are updated
2. Materials are within Minimum and Maximum Limits
3. Purchases are requisitioned at appropriate time
4. Facilitates preparation of interim P & L Account and Balance Sheet.
5. Acts as moral check on staff of stores Department.
6. A system of internal check remains in operation all the time.
7. Discrepancies are readily discovered and rectified.
8. Slow moving, dormant and obsolete materials are readily notified to purchase department
9. A detailed and reliable check on stores is obtained.
	1. Budgetary Techniques for Inventory standards:-
10. Fixation of material cost planning
11. Preparation of material budget

**Pricing of Materials Issued**

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

**Treatment of material Wastage/ Losses**

1. Material Losses may be normal as well as Abnormal.

Normal Loss: - Which has to be incurred and is unavoidable e.g., evaporation in case of liquid materials, loss due to loading and unloading of materials, etc.

Abnormal Loss: - which arises due to inefficiency in operations or mischief, e.g., theft, pilferage, breakage, fire etc.

Accounting Treatment: - In order to absorb normal material losses in cost, the rates of usable materials in stock are inflated so that such losses are covered. Normal material loss is transferred to factory overhead.

Abnormal material losses are charged to Costing profit and loss account.

1. **Waste: -** It is that part of basic raw material which is lost in processing and has no recovery value

**Accounting: -** If it is normal, the cost will be absorbed by the good production and if it is abnormal, then it is transferred to Costing profit and loss account.

**Formulae**

1. **Economic Order Quantity (EOQ)**

EOQ =$√$ $\frac{2 AB}{CC}$

Where, A = Annual consumption

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

 CC = Carrying cost / Holding cost/ Storage cost

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

* Economic Order Quantity (EOQ)

EOQ =$√$ $\frac{2 AB}{CC}$ x =$√$ $\frac{P}{P-D}$

Where, D = Demand of item or Consumption

 P = Production of item or Procurement rate

* Economic Order Quantity (EOQ)

EOQ =$√$ $\frac{2 AB}{CC}$ x =$√$ $\frac{CC+CS}{Cs}$

Where, CS = Cost of storage

* Ordering Cost – Per order
* Carrying cost – Per unit per year
* Shortage cost – Per unit per year
1. **Total Cost**

Total Cost = Total Ordering Cost + Total Carrying Cost + Total Purchase Cost

1. Total Ordering Cost = $\frac{Annual Usage}{EOQ} $x Ordering Cost per unit
2. Total Carrying Cost = $\frac{EOQ}{2} $x Carrying Cost per unit
3. Total Purchase Cost = Annual Usage x Ordering Cost per unit
4. **Variable Cost**

Variable cost = Ordering Cost + Carrying Cost

1. **Number of Orders**

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

Number of orders cannot come in Decimal

1. **Time Between Placing Order**

Time between placing order = $\frac{No.of working days}{No.of orders}$

1. **Cycling Time**

Cycling Time = $\frac{No.of working days}{No.of orders}$

1. **Run Time**

Run Time = $\frac{EOQ}{Production in a day}$

**Note –**

* + If Discount is given in question then, cost per units will be changed in all cases.
	+ If information is given in months then, all items are converted into months.
	+ Carrying cost is changed when % of carrying cost is given on cost.
1. **Re-order Level**

Reorder Level = Maximum usage Rate x Maximum Reorder Period/Lead time

OR

(Lead Time x Average Daily Consumption) + Safety Stock

1. **Minimum Level**

Minimum Level = Reorder Level – (Average Daily Consumption x Average order Period)

1. **Maximum Level**

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

OR

Demand (Review Period x Lead Time) + Safety Stock

1. **Average Stock Level**

Average Stock Level = Minimum Stock Level + ½ of Reorder Quantity

1. **Danger Level**

Danger level = Average consumption x Maximum Reorder Period for emergency purchases

1. **Inventory Turnover Ratio**

Inventory Turnover Ratio = $\frac{Material Consumed}{AverageRaw Material }$

* + Material Consumed = Opening Stock of Raw material + Purchases – Closing Stock of Raw Material
	+ Average Raw Material = $\frac{Opening Stock+Closing Stock }{2}$
	+ Inventory Velocity = $\frac{Days in a year}{Inventory Turnover Ratio}$

 **Unit-III**

**OVERHEAD COSTING**

**Accounting for overheads**

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

**Overhead Accounting involves: -**

1. Classification, Codification & Collection of overheads
2. Allocation, Appointment and absorption of overheads.
3. **Classification of Overheads**
	1. Elements wise Overheads
		1. Indirect Material – e.g. Consumable stores, loose tools, etc.
		2. Indirect Labour – e.g. Salary of foremen, store-keeper, supervisors, etc.
		3. Indirect Expenses – e.g. Factory rent lighting, heating, insurance, administration, and selling & distribution expenses.
	2. Function-wise Classification
		1. Production or Manufacturing Overheads: - E.g. Indirect material Indirect labour & indirect expenses
		2. Administration overheads: - Audit fees, postage and telephone
		3. Selling & distribution overheads: e.g. Advertising, showroom expenses, traveling expenses, etc.
	3. Classification According to Behavior or Variability
		1. Fixed Overheads are those which tends to be unaffected by variation in the volume of output.

 E.g. rent and rates, managerial salaries.

* + 1. Variable Overheads are those which tend to vary in direct proportion to changes in the volume of output. E.g. indirect material, indirect labour.
		2. Semi Variable overheads are those which are partly fixed and partly variable? E.g. depreciation, repairs & maintenance, telephone etc.
	1. Classification According to controllability
		1. Controllable Cost: - Which Can be controlled by the action of a specified members of the department e.g. variable cost
		2. Uncontrollable Costs: - Which cannot be controlled by the action of specified members of the undertaking. E.g. fixed cost.

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

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

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

**Primary distribution of overheads: -** This is the process of allocation and apportionment of different items of overheads to all the departments.

**Secondary distribution of overheads: -** This is the process of re-distribution of the overheads cost of service department among the production department.

**Methods: -**

1. Direct Redistribution
2. Simultaneous equation method
3. Step ladder method
4. Repeated Distribution method

**Objectives of Departmentalization**

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

**Common Bases of Apportionment of Overheads**

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

**Absorption of overheads**

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

**Determination of overhead rates**

Budgeted Overheads

 Budgeted Base

Actual overhead

 Actual Base

1. Actual Rate – 2. Predetermined Rate –

Standard Overhead

 Standard Base

 Total overheads for the factory

Total quantity of the entire factory fffffffffffffacfafactory

3. Standard Rate – 4. Blanket Rate –

**Under Absorption and over Absorption of overheads**

**Under Absorption: -** If the amount absorbed on predetermined rates is less than the overheads actually incurred, it is called under absorption or under recovery.

**Over Absorption: -** If the amount absorbed is more than the actual overheads, it is known as over absorption or over-recovery.

**Causes of Under/Over Absorption of overheads**

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

**According Treatment of Under/Over Absorption**

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

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

**Methods of Absorption of overheads**

i. Direct Material Cost Method ii. Direct Labour Cost Method iii. Direct Labour Hour Method

iv. Prime Cost Method v. Machine Hour Rate Method vi. Production Units Method or Rate per Unit of Output.

 **UNIT COSTING**

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

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

**Definition of Unit or Output costing**

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

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

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

**Objectives of unit or Output costing**

**The following are the main objectives for its application**

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

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

**Elements of Cost under unit or output costing**

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

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

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

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

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

**Methods of determining unit cost**

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

1. Cost Sheet
2. Statement of Cost

 **Cost Sheet**

**Meaning of Cost Sheet**

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

Definition of Cost Sheet

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

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

**Characteristics and objects of cost Sheet**

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

 **Difference between Cost Account and Cost Sheet**

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

**Indirect Expenses**

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

**Administration (Office) overheads may include**

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

**Factory overheads includes –**

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

**Selling and distribution overheads includes –**

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

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

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

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

Industry Cost unit

Colliery Per ton of coal

Sugar Per quintal

Cotton textiles yarn per pound

Cloth Per meter

Paper per kg

Steel Per tone

Automobile Per automobile i.e., number

Power Per kilo watt hour

**Items not included in cost –**

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

**Methods for finding up unit costing**

Following methods are used for finding up unit’s costing –

1. Cost Sheet
2. Cost Statement
3. Production Account
4. Trading and profit & loss account and manufacturing account

**Cost Sheet**

Output……

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

**Calculation of Tender Price**

The price at which the supplier offers his goods for sale, is known as Quotation or Tender –

The tender price should be calculated carefully in the following way –

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

**Instructions for calculation the tender price –**

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

 **Unit-IV**

 **PROCESS COSTING**

**Definition:**

Some important definitions of process costing are as under –

“Process cost accounts are applied to concerns which produce a commodity that has to go through several processes and which requires to know the cost of each process”.

**– Sharles.**

“Process costing is used to ascertain the cost of each stage of manufacture where material is passed through various operations to obtain a final product to result, with by products in many cases at different stages.

**- Lunt and Ripley**

**Application of process costing –**

Process costing is employed in the following types of industries –

1. Food processes industries, e.g., flour mills, meat products, milk diary, confectionaries, fruits and vegetables processing etc.
2. Other industries involving a sequence of processes, e.g., paper mills, cement works, coke works, canning factory, textile manufacture, cartoon making, etc.
3. Metallurgical industries, e.g., iron and steel, aluminum, wire drawing and netting and polishing, alloy production etc.
4. Chemical industries, e.g., drugs and pharmaceuticals, paints soap making, production of sugar, molasses and alcohol, breweries, distilleries, oil refining, etc.

**Salient features/essential characteristics of process costing –**

1. The cost per unit produced is the average cost which is calculates by dividing the total process cost by the number of units produced.
2. Some loss of materials in processes (due to chemical reaction, evaporation, etc.) is unavoidable.
3. The production is continuous and the final product is the result of a sequence of processes.
4. Processing of 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.
5. The products are standardized and homogeneous.
6. Costs are accumulated process-wise.
7. The sequence of operations or processes is specific and pre-determined.
8. 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.

**Advantages / uses/ need of process costing –**

Main uses of process costing are as follows –

1. System of standard costing can be applied with ease in case of process accounts.
2. Valuation of inventory of work-in-process of different processes and finished products is facilitated by process accounts.
3. Cost of individual processes as well as of finished products can be ascertained at short intervals.
4. Make or buy decisions for different processes can be taken in the light of costs at different processes. For example, in case of textile manufacture if the cost at weaving process is higher than the price at which plain cloth can be purchased from outside, the company may decide to buy plain cloth from outside and perform the process of printing only. If weaving costs are lower, the weaving process is also performed.
5. Effectiveness at each process is determined on the basis of costs incurred at individual process.
6. Since output at each process in homogeneous, average cost per unit can be easily calculated.
7. Separate cost ascertainment for each process has motivational impact. Employees at the process resulting in cost economies can be rewarded, and those not performing up to the mark can be reprimanded.
8. Cost control is facilitated as it is ascertained as to where excessive cost has been incurred and where wastages and scraps are high.

**Limitations of process costing –**

Major limitations of process costing are –

1. Process costs throw light on efficiency level of entire group of people working at a process, not on the efficiently of individuals.
2. Determination of cost at processes is by itself not sufficient for cost control, make or buy decisions or for motivational measures.
3. In case production at a process is not homogeneous as in the case of foundries making casting of different sizes, shapes and of different qualities involving different alloys, the average per unit cost based on total output and total cost at a process will be misleading.
4. Process costs are historical costs and suffer from all weaknesses of such costs.
5. Valuation of inventories where there is work-in-progress at processes, involves lot of estimation.
6. Determination of cost of by-products and joint-products is also a mere estimation.

**Principles of process costing –**

The following principles should be followed for ascertaining costs at processes –

1. Output of one process is transferred to the next process and that of final process is transferred to finished goods account.
2. Cost per unit at processes is ascertained at the end of each specified period, e.g., on monthly or quarterly basis.
3. All normal losses should be charged to the output at the processes. However, cost per unit must never be influenced by abnormal gains and losses.
4. Each processes is taken as a cost centre, i.e., all direct and indirect costs are assigned to processes on appropriate basis.
5. In case of by-products and joint-products, their share is joint costs should be carefully estimated and credited to the main process.
6. In case there are incomplete units at the process at the beginning and at the end of the period, equivalence of incomplete units is determined.

**Normal and Abnormal losses**:

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 factor like chemical change, evaporation withdrawals for tests or sampling, unavoidable spoiled quantities etc.

Abnormal Process Loss: This type of loss consists of loss due to carelessness, machine break down, accident, use of defective material etc. Thus in cases due to abnormal factors it represents a loss which is over and above the normal loss.

**Accounting Treatment of normal loss**:

It is a fundamental costing principle that the cost of normal losses should be borne by the good production. Normal loss is generally determined as a percentage of input. Sometimes such a loss is due to cost of weight; say due to evaporation a chemical action. Since such 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, i.e. it may be sold at some price. Whenever scrapped material has any value, it is credited to the process account. This illustrated below.

**Accounting Treatment of Abnormal Process Loss**

 It is been stated earlier that abnormal loss is due to carelessness, accidents, machine, breakdown and other abnormal reasons. Unlike normal loss, abnormal loss is not absorbed by good production; rather it is transferred to costing P & L a/c. This is because if the cost of abnormal loss were to fall upon the good production the cost there will fluctuate and the information provided would be misleading. In order to overcome this and also to disclose the cost of abnormal loss, the following procedure may be adopted:

* + 1. Allow for normal loss in the manner described earlier.
		2. After considering normal loss, find out the cost per unit that process. This is done by the following formula process.

 Total cost – value of normal loss

 Cost per unit = Units introduced – normal loss units

* + 1. Multiply the cost per unit (calculated as above) by the number of units of abnormal loss. This gives the total value of abnormal loss.
		2. Credit the relevant process account with the quantity and value of abnormal loss.
		3. 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.
		4. Open Abnormal loss account and debit it with the quantity and value of abnormal loss shown in the process account sale proceed from abnormal loss are credited to abnormal loss account. Any balance lift in this account is net loss and transferred costing P & L a/c.

Fifty units are introduced into a process at a cost of rupee one each. The total additional expenditure incurred by the process is Rs. 30 of the units introduced 10% are normally spoiled in the spoiled in the course of manufactures these possess a scrap value of Rs. 0.25 each. Owing to an accident, only 40 units are produced. You are required to propose (i) Process a/c and (ii) abnormal loss a/c.

**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.

**Joint and By Products**

Joint products: The term joint products are 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. Joint products thus represent two or more products separated in the course of processing each product being in such proportion as the main product.

Characteristics:

* 1. Joint products are produced from the same raw material by natural proportion.
	2. They are produced simultaneously by a common process.
	3. They are comparatively of almost equal value.
	4. Joint products may be saleable after separations or may be further processed by incurring additional costs to make them stable or an improved product.

A classic example of joint products as given above is found in oil refining, where items like petrol diesel, naphtha, kerosene etc. are produced from the crude oil. Other example are in flour mill where joint products are hides, canned meat, fertilizers etc. The joint product is also used to describe various qualities of the same product, as for example many grades of coal which may be produced in coal mining.

Examples of Joint Products

|  |  |
| --- | --- |
| Industry | Joint Products |
| 1. Oil Refining  | Petrol, Diesel, Kerosene grase lubricating oils.  |
| 2. Dairy | Skimmed Milk, butter  |
| 3. Meat processing | Meat, Hides  |
| 4. Mining | Several metals from the same or example copper, silver, zinc etc. |

**By Product:**

 By products are products of relatively small value which are incidentally and unavoidably produced in the course of incidentally and unavoidably produced in the course of manufacturing the main product. For example in sugar mills the main products is sugar. But bagasses and molasses of comparatively smaller value are incidentally produced and thus are by products, other examples of by products are oil cake produced in the extraction of edible oil, cotton seed produced cotton textile industry etc. These by products are unavoidably produced and are of secondary value. The sales value of these by products is much less as compared to the main product is much loss as compared to the main product. For example sales value of byproducts bagasse and molasses is much less than that of the main products sugar.

**By Products may be**:

* 1. Those sold in their original form without further processing.
	2. Those which require further processing

Distinctions between Joint Products by Products.

 A product may be treated as a joint product in one business & the same product may be treated as byproduct is another business. However the following factors should be considered to determine if a product is a joint product as a byproduct.

* 1. Relative sales value: If the sales value of all the products all more or less equal they all treated as joint products. If however there are wide differences in the relative sales values of products, the product with the greater sales value is treated as the main products & the products of lower value are treated as by products.
	2. Objective of manufacture: If the objective of manufacturing is product A, they unwanted products B & C be treated by products.
	3. Policy of Management: The management may decide to treat a particular product as the main product & the other product as by products. Alternatively it may choose to treat all products as joint products.

**Examples of By Products:**

|  |  |
| --- | --- |
| **Industry** | **Joint Products** |
| 1. Sugar | Bagasse Molasses |
| 2. Butter textile | Cotton seed |
| 3. Edible oil | Oil cake |
| 4. Meat | Bones |
| 5. Rice mills | Husk.  |

**Distinction between Joint Product and By Product –**

The pint of distinction of Joint products and by products is a question of commercial importance, business objectives, profit pattern, certainty of market, necessity of further process etc.

The important features distinguishing Joint Products and by products are –

1) Joint products are the products of equal economic importance, while by products are of lesser economic importance.

2) Joint products are produced from same input and process where as by products are produced from wastage, scarp and discarded material of the main process.

3) Joint products are not produced incidentally but by products emerge incidentally also.

4) Joint products have significant impact on total cost at the point of separation, whereas by products have little impact on total cost.

5) Joint products require further processing, while the byproduct generally does not require to be processed any further.

**Joint Expenses –**

There are certain industries where products are simultaneously produced and the same are referred to joint products. Expenses incurred are also joint in this case.

Joint in this case means that the products from the same basic raw material. Examples may include oil industry, gasoline, fuel oil, lubricants, crude oil etc.

The aim of analyzing joint expenses is to –

i) Correct collection, compilation and classification of process cost.

ii) Determine profit or loss on each line of manufacture.

iii) Determine the pattern of production and the most profitable product mix.

iv) Study the effect on cost and profits due to increase or decrease in production of joint products in order to fix prices.

v) Determine the profitability of selling joint products and by-products as they come out at the split off point and maximize profit through marginal contribution analysis.

When accounting for joint products, the products are not identifiable as different individual products until a certain stage of production known as the split off point. All costs incurred before the split off point are called joint products costs. Joint costs should be shared properly otherwise valuation will be difficult.

**Average Unit Cost Method –**

In this method, the total costs are assessed, yielding an average unit cost with one net profit for the total operation. It is applicable where processes are common and inseparable for joint products and where the resultant products can be expressed in some common unit.

**Physical Unit Method –**

A physical base such as raw material weight, linear measure volume etc. is applied in apportioning pre-separation point costs to joint products. For example, if there is 40@ beef in product X and 60% beef in product Y, 2/10 of the cost up to separation point will be charged to X and 6/10 to Y. It is not a good method in areas for instance one product is a gas and another is liquid.

**Survey Method –**

In this method all the important factors e.g. volume, selling price, technical side, marketing process etc. affecting costing are ascertained by means of extensive survey. Point values or percentage are given to individual products according to their relative importance and costs are apportioned on the basis of total points. These ratios should be revised from time to time depending on the factors affecting production and sales.

**Contribution (Gross Margin) Method –**

In this method the marginal cost of the joint cost is apportioned on the basis of weight or quantity or each product and fixed cost on the basis of marginal contribution made by each of the products. The method provides useful information for taking decision on maximization of profits by rearrangement of products and sales mix.

**Market Value Method –**

This is the most popular method of apportioning expenses that are joint. The joint costs are split into the ratio of selling price of each individual product and the costs are based on these ratios.

**Oil Crushing, Refining and Finishing Process –**

1. Crushing process

2. Refining process

3. Finishing process

**Crushing Process –**

In this process raw material i.e. oil seeds or coconut or copra or kernels etc. are used. Other expenses of the process are debited; sale of bags or sacks is credited. Oil cakes or oil residue are sold as a by-product is also credited. The output is crude oil transferred as input in the next process. There are may be loss in weight in the process.

**Refining Process –**

Crude oil from crushing process is debited, other materials, wages and overheads of the process are debited. Loss weight if any, is credited. The output is refined oil. Fats and residual oil may be obtained as by products which are credited. The output being refined oil is transferred to the next process i.e. finishing process.

**Finishing Process –**

Refined oil obtained from refining process is debited. Other materials, wages and overheads of the process are debited. Sale of by product and loss in weight are credited. Sundry sales of finished oil are also credited. The balance of this process is credited as cost of production of refined oil. Cost of drums or barrels or tins for storage of refined oil is also debited to find out cost of stored finished oil.

If sale of finished oil is given in the question, then finished Stock A/c should be opened after finishing process A/c and in such a case cost of goods transferred from Finishing Process A/c, Cost of Packing material and sale of Finished oil are shown in Finished Stock A/c and the profit or loss is transferred to Profit & Loss A/c.

**Inter-Process Profit**

**Generally, the output of one proces**s is transferred to another on cost basis. Similarly, goods manufactured in the final process are also transferred at cost to Finished Stock A/c. But sometimes it is desirable by a manufacturing concern to value goods processed by each process at a price corresponding to the market price of comparable goods. Thus profit or loss made by each process is revealed and the efficiency of a process is not affected by the efficiency or inefficiency of a previous process. The market price of the goods processed being generally higher than the cost of the process, each process account will show some profit. This profit is termed as inter-process profit.

**Advantages of Inter Process Profit –**

1. ***Introducing of Working Efficiency of Process*** – In this case, a process is doing well maintaining profits or loss is utilized by this method. It knows that process is working at loss and to remove default of this process and default gets by attempts of remove difficulties of that process, finished stock is treated as cheaper rate from markets and finished production of that process.

2. ***Compare to other Process*** – Transfer of cost including profits and compare to different process, cost is deficit by trying cost less product by that working efficiency increased.

3. ***Confidential of Real Profits*** – Cost transfer with profit to next process. Profits are confident in every cost plus profit in process.

4. ***Decision to do Work by self –*** Trader may acknowledge of any cost of production of process transfer to contractor which production will be effected in surplus or deficit.

**Limitations of Inter Process Profit –**

***1. Imaging Profit* –** We cannot tell real profits to inter process profits, this is only imaginary profits. Its main reason that is not sale in fact to transfer of goods in inter process.

***2.*** ***Difficulty in Calculation of Real Profit*** – In this method, unrealized profits is calculated for the calculation of real profits become its calculation is very difficult.

***3. Unrealized Profit*** – Opening stock and closing stock is taking to all the method, unrealized profit is included in that process in which book profits and real profits is not a acknowledge.

**Computation of Inter-Process Profit –**

Under this method, the output of first process after charging certain profit is transferred to second process and the output of second process after charging certain profit is again transferred to third process. But in every process there remains certain stock which includes the part of profit of previous process. Thus profit included in the stock by previous process, is known as unrealized profit. Therefore, at the end of year the amount of profit included in the closing stock should be computed and the provision for unrealized profit should be made from the amount of total profit.

**It is essential for calculation of unrealized profit for reserve –**

1. In this first method, closing stock is not making of reserve of unrealized profit.

2. Calculation of profit of transfer of goods by a cost of ¼ or 20/80 or 25%.

3. Calculation of reserve of unrealized profit by method for closing stock difference of its called unrealized profit –

 Unrealized profit = Value of closing stock – Cost of closing stock

OR

 Cost of closing stock = $\frac{Stock x Cost Amount}{Total Amount}$

**UNIT-V**

**MARGINAL COSTING –**

**Marginal costing for decision making tools**

Marginal costing is a specific technique of cost analysis in which cost information’s is presented in such a manner so that it may help the management in cost control and various managerial decisions.

**Marginal Cost = Prime Cost + All Variable Overheads**

“The ascertainment of marginal cost and the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs is known as marginal costing.”

**Basic Characteristics of Marginal Costing**

1. Technique of Cost Analysis and Presentation
2. Division of Costs into Fixed and Variable
3. Period Cost and Product Cost
4. Valuation of Stock
5. Determination of Price
6. Calculation of Profit
7. Recovery of Costs
8. Break-even Analysis

**Assumptions of Marginal Costing**

The technique of marginal costing is based on following assumptions:

1. All the elements of cost, i.e., manufacturing, administrative and selling and distribution expenses can be divided into fixed and variable components.
2. Per unit variable cost of a product remains constant at all levels of output. In other words, total variable cost price varies in proportion to the volume of output.
3. Per unit selling price remains constant at all levels of operating activity.
4. Total fixed cost remains unchanged at all levels of output.
5. In case of production in addition to present level, only marginal or variable cost is incurred as additional cost.

**Advantages of Marginal Costing**

1. **Easiness:** This method makes the process of cost accounting simple and easily understandable. In fact, it is very simple to understand and easy to operate because income statement is prepared allocating variable and fixed expenses separately.
2. **Proper Valuation of Closing Stock:** Under marginal costing the valuation of closing stock is done at marginal cost. This is considered proper and logical because fixed cost of one period is not carried over to the next period in the form of valuation of stock.
3. **Helpful in Profit Planning:** This technique helps in profit planning, particularly of short term nature. In short-term profit increases or decreases on account of changes in selling price and variable cost because fixed cost does not change during this period. Hence, planning of earning desired profit can be designed easily by making necessary adjustments in sales volume, price and variable cost. Moreover, knowledge of cost behaviour under various operational conditions is also necessary for profit planning. Marginal costing technique studies cost behaviour by segregating fixed and variable costs and helps profit planning on the basis of contribution and cost-volume relationship.
4. **Meaningful Managerial Reporting:** Marginal costing serves as a good basis for meaningful managerial reporting. In this method reporting is based on sales and not on production so as change in stock does not influence the comparison of efficiency. Moreover, treating all fixed expenses as period costs, their effect on profit is precisely and clearly reflects by this technique.
5. **Profitability Appraisal:** This technique also serves as a tool of profitability appraisal. Whenever there is problem relating to the comparative profitability of various lines, departments or divisions or profitability of various sales areas and channels, etc., this technique helps significantly.
6. **Useful to standard and Budgetary Costing:** This technique is very useful in adopting and implementing the system of standard and budgetary costing.
7. **Convenience in Computing Fixed Overheads:** Since fixed overheads are charged against the contribution in marginal costing, there is no problem of computing fixed overhead recovery rates and their under or over-recovery.

An important role of cost accounting is to assist in the process of managerial decisions. In this context profitability of two or more alternative options is compared and such option is selected which offers maximum profitability along with fulfillment of objectives of the enterprise.

**Main Areas of Decision-Making and Applications of Marginal and Differential Costing**

Marginal costing is a very useful technique in solving various managerial problems and contributing to various areas of decisions. In this chapter, the use of marginal costing in following important areas have been discusses:

1. Make or Buy Decision
2. Change in Product Mix
3. Pricing Decisions
4. Exploring a New Market
5. Shut-down Decisions

**Make or Buy Decision**

‘Make or Buy Decision’ is a problem in respect of which management has to take decisions continuously. In this context, the management has to decide whether a certain product or a component should be made in the factory itself or bought from outside suppliers.

The nature of decision regarding make or buy may be of the following types:

1. Stopping the production of the part and buying it from the market: A business concern is already making a part or component which is used in the business. Now due to some reasons, a decision has to take whether this part or component should be bought from the market or additional requirement due to increase in production of main factory should be made in the factory or should be bought from the market.
2. Stopping the purchase of a component and to produce it in own factory: Another aspect of the problem of ‘make’ or ‘buy’ may be that a component or part thus far being purchased from the market should be produced or made in the factory or not. In this case, normally some extra arrangements regarding space, labour, machines, etc. will be required. This may involve capital investments too. Some special overheads may also be necessary. If the decision for making requires the setting up of a new and separate factory, separate supervisory staff may also be needed. All these arrangements will require additional costs. As such, the price being paid to outsiders (suppliers of the component) should be compared with additional costs which will have to be incurred in the form of raw materials, wages, salaries of additional supervisors, interest on capital investments, depreciation on new machines, rent of premises, etc. If such additional costs are less than the buying price, the component should be manufactured and vice-versa.

**Change in Product Mix**

Introducing a New Line or Department: The problem of introducing a new product or line involves decision in two respects – (i) whether a new product or line should be added to the existing production or not, and (ii) If it should be introduced, then what should be the model or design or shape of the new product. In other words, if new product can be produced in more than one model, which model should be introduced?

A decision like above should not be based on contribution but other relevant factors should also be considered. The marginal cost of new product in all its possible models should be considered. The marginal cost of new product in all its possible models should e considered. It is also possible that a portion of the cost of facilities relating to the original production may be used for the purpose of producing new product. Some additional investments in the form of additional plant and machinery may be desired. This will likely increase the fixed overheads, which should also be considered along with marginal costs.

**Pricing Decision**

It is generally contended that price, in the long-run should be such as to cover total cost (Marginal Costs + Fixed Costs) as well as desired profit. In such a case, marginal costing will not play any significant role. Again, in a competitive market, price is not determined by the individual concern but is governed by the market forces. Thus, costing (particularly Marginal Costing) is helpful in price determination only in short-term and monopoly conditions. Here we shall confine our discussion only to the short-term price policy. The various aspects of price policy may be enumerated as under:

1. Normal Price, (2) Minimum Price (3) Depression Price (4) Special Price including dumping (5) Price-changes.

**Exploring a New Market**

Schemes of sales promotion as discussed earlier would aim at increasing the sales volume within the usual sales territories. Sales volume can also be increased by taping new territories. This can be done either by extending its own marketing organization (such as opening a Branch/ Depot/ Shop) or through local distributors. It is also significant to note that some initial expenses will have to be incurred in organizing sales-channels in the new territories. A sort of competition may also be there due to the attachment of customers of that area to some other brand, removal of which will involve higher selling and distribution costs. Again, Marginal Costing will be helpful in providing adequate and relevant data for taking a decision in this regard.

If the firm finds opportunity to receive an export order the following additional points should also be considered:

1. Export order may result in some additional costs like special packing cost, freight and insurance charges, export duty etc. These costs should be deducted from contribution to determine profit from export order.
2. There may be some additional benefits like export subsidy from government concession in excise duty etc. Such items should also be deducted from cost or added in contribution.

**Shut-Down Decisions**

Shut-down decisions may be of two types- (a) Closure of entire business, (b) Dropping a Line or product or Department.

1. Closure of entire Business’ (Suspension of Activities): Sometimes, a business concern may not be in a position to carry out its trading activities (i.e., production and selling) in an adequate volume due to trade recession/ depression or cut-throat competition. As such, the management of such business concern may be faced with a problem of suspending the trading activities. Such suspension may be of the following nature:
2. Temporary closure or shut-down for a short period.
3. Permanent closure.

Temporary Closure: When trading activity particularly plant operation is suspended for a short period; it is known as temporary closure. Such closure is necessitated either due to depression/ recession or due to ensuing off-season. In the former case, the period of closure will run over the period of recession/ depression, while in the latter case, it will cover the period of off-season.

Permanent Closure: Sometimes, management may have a problem, the solution of which will be the permanent closure of the factory or plant or liquidation of the whole show. If a business concern may not run profitably and reasonable or minimum return is not forthcoming on capital employed in the business in spite of possible e4fforts being taken to improve it, it may be wise as well as profitable to close the factory permanently. If it is not done immediately and time is allowed to pass on, there will be a number of financial problems due to erosion in capital day after day. Here the management of the concern should adopt the military rule followed by the General of Army, i.e., to retreat timely and gracefully, if it cannot be avoided.

1. Dropping a Line or Product or Department: Basically this problem is very much related to the profitability of a product or department. The best possible and maximum profitable utilization of limited resources of a business concern clearly demands the continuance of the production of that product/ line/ department, which will ensure the maximization of profit. This requires on the part of management to fix priorities for various products/ lines. Management will also have to decide whether the production of one or more product/ line should be dropped or curtailed. Such decision may be effective and judicious only, when it is based on the comparative study of contributions made by each product/ line or department. Here comes the role of marginal costing with the help of which Marginal cost and Contribution Statement is prepared and decision data are made available.

Earning of maximum profit in the ultimate goal of almost all business enterprises. The amount of profit on the sales of a product depends upon volume of production and its costs.

Cost-Volume-Profit Analysis is a logical extension of the concept of marginal costing, in which cost of production is divided into two parts, i.e. fixed cost and variable cost. Total amount of fixed cost remains constant up to a certain level of activity and change in production volume is associated with the change in variable (marginal) cost only.

**Profit Volume Ratio, Break Even Point & Margin of Safety**

Cost-volume-Profit analysis is an important tool in the process of managerial decisions and it is extremely helpful to management in a variety of problems involving planning and control. The main objectives of such analysis are as follows:

1. **Setting up Flexible Budget:** This analysis is helpful in setting up flexible budget which indicates that what trend of amount of sales and cost of production at different levels of activity will be.
2. **Determination of B.E.P.:** The most important objective of Cost-volume-Profit analysis is to find out break-even point, i.e., the point of no profit no loss.
3. **Profit Planning:** This analysis is useful in profit planning also because whereas, on the one hand, we can determine the amount of profits at different levels of activity we can also determine the volume of sales or production to earn desired profit on the other hand.
4. **Performance Evaluation for Control:** This analysis assists in evaluation of performance for the purpose of control. On the basis of profits achieved costs incurred it can be analyzed that what the role of volume of production and other factors was in effecting the amount of profit?
5. **Allocation of Overloaded Costs:** This analysis in finding out the amount of overhead costs to be rates is related to a selected volume of production.

**Meaning of Break-Even Point (B.E.P)**

Break-even point is that point of production or sales at which firm neither earns any profit nor incurs any loss. It is also known as ‘No Profit Point’ or Zero Loss Point’. Some of its definitions are as follows:

“The Break-even Point of a company or a unit of a company is that level of sales income which will equal the sum of its fixed cost and its variable costs.”

**- Keller and Ferrara**

**Assumption of Break Even Analysis**

The break-even analysis is based upon the following assumptions:

1. **Fixed and Variable Costs:** The basic assumption of Break-even analysis is that all elements of cost (i.e., production, administration, selling and distribution) can be divided into two parts, i.e., fixed cost and variable cost.
2. **Proportionate Variable Cost:** It is assumed that variable cost remains constant per unit at all levels of production. In other words, variable cost fluctuates directly in proportion to changes in volume of production.
3. **Certain and Constant Fixed Cost:** Fixed cost remains certain and constant at any level of activity from zero production to full capacity.
4. **Unchanged Selling Price:** Selling price per unit remains constant or unchanged at all levels of production, i.e., there is no change in selling price despite increase or decrease in supply or demand of goods.
5. **Linear Behaviour:** Behaviour of different costs is linear, i.e., a straight line will be drawn if cost data are represented on a graph paper.
6. **Technological Stability:** It is assumed that during the period, for which break-even analysis is being made, there will be no change in production system, efficiency of machines or technology of production.
7. **No Role of Stock:** Production and sales both are taken as equal. In other words, whatever will be produced, all will be sold and there will be no role of stock of finished goods.
8. **No change in general Price Level:** It is assumed that during a specific period there will be no change in general price level, i.e., cost of material, labour and other overheads.
9. **Unchanged Sales-mix:** There is only one product. If several products are being produced and sold, the sales-mix will remain constant.
10. **Relationship between Volume and cost:** An important assumption of break-even analysis is that volume of production is the only factor which does affect the cost of production.

**Calculation of Break-Even Point**

Break-even point can be calculated in terms of amount (Rs.) as well as in terms of units. Hence, as per direction or information given in the question it is decided that in what term this point is to be calculated. In this context following guidelines may be helpful:

1. If there is clear-cut direction in the question, then amount or units should be calculated accordingly.
2. If per unit information’s are available in the question and there is no specific direction, then B.E.P. should be calculated in both terms i.e., in Rs. And in units.
3. If per unit information’s are not available, then B.E.P. will be calculated only in terms of Rs.
4. If the technique of P/V ratio is to be used, then also B.E.P. will be obtained in terms of Rs.
5. B.E.P. (Rs.): It is also known as B.E.P. Sales
6. B.E.P. (Rs.) = $\frac{fixed Cost x Sales}{Contribution}$ or $\frac{FC x S}{C}$
7. B.E.P. (Rs.) = $\frac{fixed Cost }{P/V Ratio}$
8. B.E.P. (Rs.) = Sales – Margin of Safety
9. B.E.P. (In units): It is also known as ‘Break-even Point in Quantity’ or Output B.E.P.’
10. B.E.P. (Units) = $\frac{fixed Cost }{Contribution per unit}$ or $\frac{FC}{Cpu}$ or $\frac{FC x Spu}{Cpu}$
11. B.E.P. (Units) = $\frac{B.E.P.(Rs.)}{Spu}$s

**Margin of Safety**

Margin of safety is the difference between actual total sales and B.E.P sales and may be calculated in rupees, unit or even in percentage form as explained below:

1. M.O.S. in Rupees:
2. M.O.S. (Rs.) = Sales (Rs.) – B.E.P. (Rs.)
3. M.O.S. (Rs.) = $\frac{Profit}{P/V Ratio}$
4. M.O.S. in units:
5. M.O.S. (units) = Sales (Units) – B.E.P. (Units)
6. M.O.S. (units) = $\frac{Profit}{Contribution per unit}$
7. M.O.S. in Percentage:

It is also called as M.O.S. Ratio.

% of margin of safety to sales (M.O.S. Ratio) = $\frac{Margin of Safety}{Total Actual Sales}$ x 100

**Importance of Margin of Safety**

Margin of safety is an indicator of the strength of the business. If the margin of safety is large, the position of the business will be sound and it can easily resist the situation of reduction in sales. Moreover, it will have more opportunities to earn profit. If the margin of safety is small, a small reduction in sales can be serious mater and may result even in loss. Thus, margin of safety serves as a cushion in between profit position and loss position.

**Calculation of Sales for Desired Profit**

Generally, it is considered in managerial decisions that what should be the target of sales in a particular period? In this context profit target is fixed and then attempt are made to attain that volume of sales which may yield the target of desired profit. A similar position may arise when a businessman is interested in maintaining the existing level of profit, even when the selling price is being reduced due to market situations. The following formulae may be applied for this purpose:

1. When total amount of desired profit is given in the question:
2. Sales (Rs.) = $\frac{fixed Cost+D.Profit}{S-V or COntribution}$ x Sales **OR**  $\frac{FC+Pt}{C}$ x S
3. Sales (Rs.) = $\frac{fixed Cost+D.Profit}{P/v Ratio}$ **OR**  $\frac{FC+Pt}{P/v Ratio}$
4. Sales (Unit) =$\frac{fixed Cost+D.Profit}{C per unit}$ **OR**  $\frac{FC+Pt}{Cpu}$

 2. When desired profit per unit is given in the question:

1. Sales (Rs.) = $\frac{Fixed Cost x Selling Price per unit}{Contribution per unit-Profit per unit}$

 = $\frac{FC x Spu}{Cpu-Ppu}$

1. Sales (Unit) = $\frac{Fixed Cost}{Cpu-Ppu}$