Periyar Govt. Arts College, Cuddalore
PG & RESEARCH DEPARTMENT OF COMMERCE
M.Com., II year – III Semester
ADVANCED COST ACCOUNTING
UNIT - I

Nature and significance of cost accounts-Definition of Costing, Scope, Objectives, Functions and limitations of cost accounting-Installation of costing system-Elements of Cost- Cost centre and profit centre-Preparation of Cost sheet, tender of quotations.

Cost accounting is a branch of accounting and has been developed due to limitations of financial accounting.

Important Meaning of basic terms:

1. What is cost?
2. What is Costing?
3. What is Cost Accounting?
4. What is Cost Accountancy?

The above questions are answered by London, Chartered Institute of Management Accountants (CIMA) as follows:

Cost:

The term 'cost' has to be studied in relation to its purpose and conditions.

'Cost' is the amount of actual expenditure incurred on a given thing.

Costing:

The ascertainment of costs is costing. "It refers to the techniques and processes of ascertaining costs and studies the principles and rules concerning the determination of cost of products and services".

Cost Accounting:

It is the method of accounting for cost. The process of recording and accounting for all the elements of cost is called cost accounting.

Cost accounting is "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 centers and cost units. In its widest usage it embraces the preparation of statistical data, the application of cost control methods and the ascertainment of the profitability of activities carried out or planned".

Cost Accountancy:

The term 'Cost Accountancy' includes Costing and Cost accounting. Its purposes are Cost-control and Profitability – ascertainment. It serves as an essential tool of the management for decision-making.

Cost accountancy is "the application of costing and cost accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability. It includes the presentation of information derived there from for the purpose of managerial decision making".

Nature and Scope of Cost Accounting:

From the above Definitions the nature and scope of cost accounting is concerned with ascertainment and control of costs. The data and information available in cost accounting is

more useful for cost control and cost reduction through the managerial functions like planning, decision making and control.

At the time of introduction of cost accounting the scope is narrowed itself to cost ascertainment and presentation of the same mainly to find out product cost. But with the introduction of large-scale production, the scope of cost accounting is widened and providing information for cost control and cost reduction has assuming equal significance along with finding out the cost of production.

To start with cost-accounting was apply in manufacturing activities but now it applies in service organizations, government organizations, local authorities, agricultural farms, Extractive industries and so on.

- It assists and guide to ascertainment of cost of production.
- It discloses as profitable and unprofitable activities.
- It helps management to eliminate unprofitable activities.
- It provides information for estimates and tenders.
- It discloses the losses occurring in the form of idle time spoilage or scrap etc.
- It also provides a perpetual inventory system.
- It helps to make effective control over inventory
- It helps for the preparation of interim financial statements.
- It helps in controlling the cost of production with the help of budgetary control and standard costing.
- It provides data for future production policies and
- It also discloses the relative efficiencies of different workers and for the fixation of wages to workers.

Features of cost accounting

The following are the IMPORTANT features of cost accounting:

- It is a process of accounting for costs;
- It records income and expenditure relating to production of goods and services;
- It provides statistical data on the basis of which future estimates are prepared and quotations are submitted;
- It is concerned with cost ascertainment and cost control;
- It establishes budgets and standards so that actual cost may be compared to find out deviations or variances;
- It involves the preparation of right information to the right person at the right time so that it may be helpful to management for planning, evaluation of performance, control and decision making.

Objectives of cost accounting

1. **Calculation of Cost per Unit:** To ascertain the cost per unit of the different products manufactured by a business concern;
2. **Cost Analysis**: To provide a correct analysis of cost both by process or operations and by different elements of cost;
3. **Loss of Material and Idle time ascertainment:** To disclose sources of wastage whether of material, time or expense or in the use of machinery, equipment and tools and to prepare such reports which may be necessary to control such wastage;
4. **Data for price fixation:** To provide requisite data and serve as a guide to price fixing of products manufactured or services rendered
5. **Profitability:** To ascertain the profitability of each of the products and advise the management as to how these profits can be maximized.
6. **Expansion of Business:** To advise the management on future expansion policies and proposed capital projects;

7. **Managerial help:** To present and interpret data for management planning, evaluation of performance and control;
8. **Budgeting:** To help in the preparation of budgets and implementation of budgetary control;
9. **Managerial guidance:** To guide management in the formulation and implementation of incentive bonus plans based on productivity and cost savings;
10. **Decision Making:** To supply useful data to management for taking various financial decisions such as introduction of new products, replacement of labour by machines.

ADVANTAGES OF COST ACCOUNTING

1. **Helps in Decision Making:** Cost accounting helps in decision making. It provides vital information necessary for decision making. For instance, cost accounting helps in deciding:
   - Whether to make a product buy a product?
   - Whether to accept or reject an export order?
   - How to utilize the scarce materials profitably?
2. **Helps in fixing prices:** Cost accounting helps in fixing prices. It provides detailed cost data of each product (both on the aggregate and unit basis) which enables fixation of selling price. Cost accounting provides basis information for the preparation of tenders, estimates and quotations.
3. **Formulation of future plans:** Cost accounting is not a post-mortem examination. It is a system of foresight. On the basis of past experience, it helps in the formulation of definite future plans in quantitative terms. Budgets are prepared and they give direction to the enterprise.
4. **Avoidance of wastage:** Cost accounting reveals the sources of losses or inefficiencies such
5. **Highlights causes:** The exact cause of an increase or decrease in profit or loss can be found with the aid of cost accounting. For instance, it is possible for the management to know whether the profits have decreased due to an increase in labour cost or material cost or both.
6. **Reward to efficiency:** Cost accounting introduces bonus plans and incentive wage systems to suit the needs of the organization. These plans and systems reward ecient workers and improve productivity as well improve the morale of the work -force.
7. **Prevention of frauds:** Cost accounting envisages sound systems of inventory control, budgetary control and standard costing. Scope for manipulation and fraud is minimized.
8. **Improvement in profitability:** Cost accounting reveals unprofitable products and activities. Management can drop those products and eliminate unprofitable activities. The resources released from unprofitable products can be used to improve the profitability of the business.
9. **Preparation of final accounts:** Cost accounting provides for perpetual inventory system. It helps in the preparation of interim prot and loss account and balance sheet without physical stock verification.
10. **Facilitates control:** Cost accounting includes effective tools such as inventory control, budgetary control and variance analysis. By adopting them, the management can notice the deviation from the plans. Remedial action can be taken quickly

Limitations of cost accounting

The following are the main limitations of cost accounting:

1. **It is based on estimation:** as cost accounting relies heavily on predetermined data, it is not reliable.
2. **No uniform procedure in cost accounting**: as there is no uniform procedure, with the same information different results may be arrived by different cost accounts.
3. **A large number of conventions and estimate**: There are several conventions and estimates in preparing cost records such as materials are issuing on an average (or) standard price, overheads are charging on the percentage basis, Therefore, the profits arrive from the cost records are not true.
4. **Formalities are more:** Many formalities are to be observed to obtain the benefit of cost accounting. Therefore, it does not apply to small and medium firms.
5. **Expensive:** Cost accounts expensive and requires reconciliation with financial records.
6. **It is unnecessary:** Cost accounts of recent origin and an enterprise can survive even without cost accounting.
7. **Secondary data:** It depends on financial statements for a lot of information. Any errors or shortcomings in that information creep into cost accounts also.

The following table broadly covers the most important differences between financial accounting and cost accounting.

Point of Differences	Financial Accounting	Cost Accounting
Meaning	Recoding of transactions is part of financial accounting. We make financial statements through these transactions. With the help of financial statements, we analyze the profitability and financial position of a company.	Cost accounting is used to calculate cost of the product and also helpful in controlling cost. In cost accounting, we study about variable costs, fixed costs, semi-fixed costs, overheads and capital cost.
Purpose	Purpose of the financial statement is to show correct financial position of the organization.	To calculate cost of each unit of product on the basis of which we can take accurate decisions.
Recording	Estimation in recording of financial transactions is not used. It is based on actual transactions only.	In cost accounting, we book actual transactions and compare it with the estimation. Hence costing is based on the estimation of cost as well as on the recording of actual transactions.
Controlling	Correctness of transaction is important without taking care of cost control.	Cost accounting done with the purpose of control over cost with the help of costing tools like standard costing and budgetary control.
Period	Period of reporting of financial accounting is at the end of financial year.	Reporting under cost accounting is done as per the requirement of management or as-and-when-required basis.
Reporting	In financial accounting, costs are recorded broadly.	In cost accounting, minute reporting of cost is done per-unit wise.
Fixation of Selling Price	Fixation of selling price is not an objective of financial accounting.	Cost accounting provides sufficient information, which is helpful in determining selling price.
Relative	Relative efficiency of workers, plant, and	Valuable information about efficiency

Efficiency	machinery cannot be determined under it.	is provided by cost accountant.
Valuation of Inventory	Valuation basis is 'cost or market price whichever is less'	Cost accounting always considers the cost price of inventories.
Process	Journal entries, ledger accounts, trial balance, and financial statements	Cost of sale of product(s), addition of margin and determination of selling price of the product.

Costing System:

A costing system is designed to monitor the COSTS incurred by a business. The system is comprised of a set of forms, processes, controls, and reports that are designed to aggregate and report to management about REVENUES, costs and PROFITABILITY. The areas reported upon can be any part of a company, including:

- Customers
- Departments
- Facilities
- Processes
- Products and services
- Research and development
- Sales regions

The information issued by a costing system is used by management for a variety of purposes, including:

- Fine-tuning operations to generate higher profitability
- Deciding where to cut costs in the event of a business downturn
- Matching actual costs incurred against budgeted cost levels for control purposes
- Creating strategic and tactical plans for future operations

The reports of a costing system are intended for internal use, and so are not subject to the reporting requirements of any of the ACCOUNTING FRAMEWORKS, such as Generally Accepted Accounting Principles **(GAAP) or** International Financial Reporting Standards **(IFRS)** Instead, management can decide what types of information it prefers to see, which information to ignore, and how the results are to be formatted and distributed for its consumption. Typical reports created by a costing system include:

- Budget-versus-actual reports for costs incurred
- Profitability reports for customers, sales regions, stores, products, and/or PRODUCT LINES
- Expense trend reports that show expenses incurred by month for many consecutive months

These reports may be accompanied by additional information assembled by the accounting department, which provide details regarding how certain costs were incurred and who authorized them.

There are two main types of costing systems. A business can accumulate information based on either one, or adopt a hybrid approach that mixes and matches systems to best meet its needs. The primary costing systems are:

- Job costing system: Materials, Labour and Overhead costs are compiled for an individual unit or job. This approach works best for unique products, such as custom-designed machines or consulting projects. The cost accumulation process is highly detailed and labour-intensive.

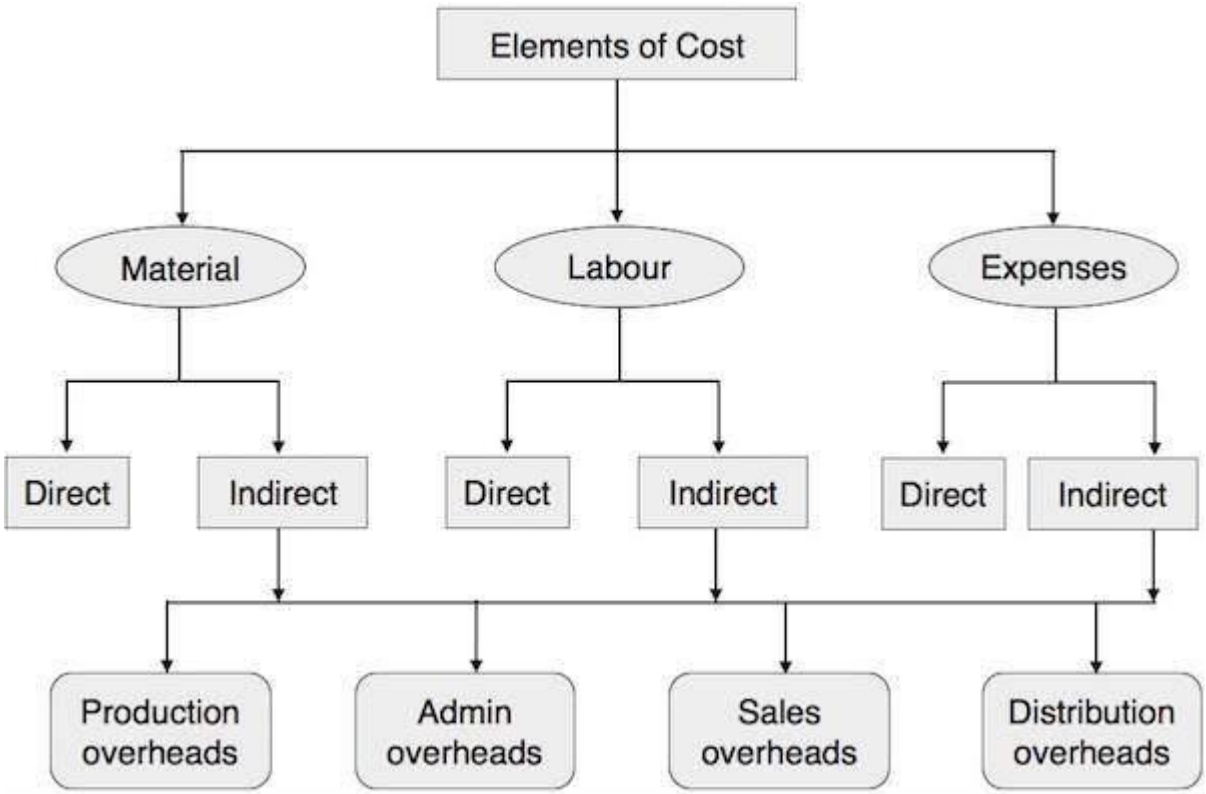
- Process Costing System: Materials, labour and overhead costs are compiled in aggregate for an entire production process, and are then allocated to individual production units. This approach works well for large production runs of identical items, such as a production run of 100,000 cell phones. The cost accumulation process is highly efficient and portions of it can possibly be automated.

Another costing system option is Activity Based Costing (ABC). ABC was developed in response to concerns that overhead costs are rarely allocated in an appropriate manner, and involves a finer degree of differentiation in determining how overhead costs are assigned to different Cost Pools, and then how the costs in those pools are allocated to COST OBJECTS. An ABC system can be difficult to set up and operate, and so works best when designed for very specific cost allocation projects that have clearly defined boundaries.

INSTALLATION OF COSTING SYSTEM

1. **Installation of costing systems** is not an expense but an investment as the rewards are much greater than the expense incurred. The cost system is for the business and not the business for systems of cost. Therefore, the system has to be designed as to meet the specific need of the enterprise.
2. **A. General Consideration for Installing Costing System**
   - Objective of Installation the System.
   - Area of Operation.
   - Collection Data and Prompt Information.
   - Cost Records in Cost Book.
   - Control System of Cost.
   - Types and Methods of costing.

   B. Specific Consideration of Installing Costing System
   - Size and Nature of Business
   - Products
   - Organization
   - Functional Study (like: Manufacturing, Administration, Selling & Distribution)
3. **Difficulties in Installation a costing system:**
   a. Lack of support from top Management
   b. Non-cooperation by other staff members
   c. Shortage of trained staff
   d. Heavy cost of Installation and operation of costing System
4. **Principles of Smooth Working**
   - The system should be simple & easy to operate.
   - It should be flexible.
   - Minimum disturbance in the existing system, should only be done when desirable.
   - Desired changes should be introduced gradually.
   - Confidence be created in the minds of management and executives regarding the use of system.



By grouping of the above elements of cost, the following divisions of cost are obtained:
(1) Prime Cost = Direct Materials + Direct Labour + Direct Expenses
(2) Works Cost (Factory) = Prime Cost + Factory Overhead
(3) Cost of Production = Factory Cost + Office and Administrative Overhead
(4) Cost of Sales (or) Total Cost = Cost of Production + Selling and Distribution Overhead

ELEMENTS OF COST

Outline to Elements of cost are require to have a proper classification and analysis of total cost. Therefore, elements of cost offer the management with necessary information for proper control and management decisions. For this purpose, the total cost is analysed by the elements or nature of cost, i.e., material, labour and overheads.

(A) Materials Cost

Materials Costs refer to cost of materials which are the major substances used in production and are converted into finished goods and semi-finished goods. Materials are grouped as direct materials and indirect materials.

Direct Materials:

Direct materials are those that form part of a product. Raw materials, semi-finished products, and finished products which can be identified with production of a product are known as direct materials. Sugar cane, cotton, oilseeds, woods etc. are examples of direct materials. The cost of materials involves conversion of raw materials into finished products.

Indirect Materials:

Material costs, other than direct material cost are known as indirect material cost. Indirect materials cannot be identified with a particular unit of cost or product. Indirect materials are indirectly used for producing the products. Lubricating oil, consumable stores, fuel, design, layout etc. are examples of indirect material cost.

(B) Labour Cost:

In actual production of the product, labour is the prime factor which is physically and mentally involved. The payment of remuneration of wages is made for their effort. The labour costs are grouped into (a) Direct Labour and (b) Indirect Labour. (a) Direct Labour:

Direct labour:

Direct labour cost or direct wages refer to those specifically incurred for or can be readily charged to or identified with a specific job, contract, work order or any other unit of cost are termed as direct labour cost. Wages for supervision, wages for foremen, wages for labours who are actually engaged in operation or process are examples of direct labour cost.

Indirect Labour:

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

(C) Expenses:

All expenses are other than material and labour that are incurred for a particular product or process. They are defined by ICMA as "The cost of service provided to an undertaking and the notional cost of the use of owned assets." Expenses are further grouped into (a) Direct Expenses and (b) Indirect Expenses.

Direct Expenses:

Direct expenses which are incurred directly and identified with a unit of output or process are treated as direct expenses. Hire charges of special plant or tool, royalty on product, cost of special pattern etc. are the examples of direct expenses.

Indirect Expenses:

Indirect expenses are expenses other than indirect materials and indirect labour, which cannot be directly identified with a unit of output. Rent, power, lighting, repairs, telephone etc. are examples of indirect expenses.

Overheads:

All indirect material cost, indirect labour cost, and indirect expenses are termed as Overheads. Overheads may also be classified into (a) Production or Factory Overhead (b) Office and Administrative Overheads (c) Selling Overhead and (d) Distribution Overhead.

Production Overhead:

Production Overhead is also termed as Factory Overhead. Factory overhead includes indirect material, indirect labour and indirect wages which are incurred in the factory. For example, rent of factory building, repairs, depreciation, wages of indirect workers, etc.

Office and Administrative Overhead:

Office and Administrative Overhead is the indirect expenditure incurred in formulating the policies, establishment of objectives, planning, organizing and controlling the operations of an undertaking. All office and administrative expenses like rent, staff salaries, postage, telegram, general expenses etc. are examples.

Selling Overhead:

Selling Overhead is the indirect expenses which are incurred for promoting sales, stimulating demand, securing orders and retaining customers. For example, advertisement, salesmen's commission, salaries of salesmen etc.

Distribution Overhead:

These costs are incurred from the time the product is packed until it reaches its destination. Cost of warehousing, cost of packing, transportation cost etc. are some of the examples of distribution overhead.

COST CENTER - Definition

The Institute of Cost and Management Accountants, London has defined cost center as "a location, a person or an item of equipment (or group of these) in or connected with an undertaking in relation to which costs may be ascertained and used for the purpose of cost COSNTRL"" or

Cost center may be defined as any location, person or item of equipment (or a group of these) for which costs may be ascertained and used for the purposes of cost control. Cost center refers to any place, person, machine, section, part, activity or function within an organization or undertaking, by which costs are collected or accumulated, and to which costs are allocated.

Cost center is, thus, a natural division of an undertaking for purposes of measuring cost of a particular operation and for applying this cost to product. Cost center in an organization is formed keeping in view the convenience OF COST ACCUMULATION, comparability and control of costs. If costs are accumulated for a person or by a department or for a machine, such person, department or machine will be treated as a cost center.

In an undertaking, cost centers may be divided into two parts:

1. PRODUCTION COST CENTERS
2. SERVICE COST CENTERS

A production cost center refers to a cost center which is engaged on regular production i.e., in converting raw materials into finished products. A service cost center is a center which is not engaged on regular production but which assists the production cost centers in carrying on their activities e.g., stores department, personnel department, maintenance department etc.

Cost centers may also be divided into Operation cost centers and process cost centers; Personal cost centers and impersonal cost centers.

Operation cost center refers to a cost center which consists of those machines and/or persons carrying out similar operations while a process cost center is one which consists of a specific process or a continuous sequence of operations.

A personal cost center is a cost center which consists of a person or group of persons e.g., departmental foreman, salesman, supervisor, factory manager etc. An impersonal cost center refers to a cost center which consists of a location or item of equipment or a group of these e.g., machines, departments, vehicles etc.

Factors to Select a Suitable and Effective Cost Center

The selection of a suitable cost center depends on the following factors:

(a) Layout and organization of a factory:

(b) Availability of various cost data and information.

(c) The policy of the management in respect of selection of cost centers.

Classifications of Cost Center

Cost centers can easily be classified under the following three broad heads:

1. Productive, Unproductive and Mixed Cost Centres.

Factories may opt for productive cost center while administrative wing go for unproductive cost center and tool department may have a mixed cost center.

2. Personal and Impersonal Cost Center.

When the plant or a machine is taken as a unit it is the impersonal cost center and when the person or a group of persons are a unit the personal cost center is implied. "Impersonal cost centre consists of a location of item of equipment whereas personal cost center consists of a person or a group of persons," asserts I.C.M.A., London.

3. Operation and Process Cost Center.

According to I.C.M.A., London the "operation cost center is a center which consists of those machines and/or persons which carry out the same operations," and "process cost center is a cost center which consists of a continuous sequence of operations.

Profit Centre Meaning:

A Profit Centre is a division or department of a company which operates for the calculation of profit. In an organisation, different profit centres are managed by the managers, who identify profits on the basis of costs and revenues. Profit Centre is accountable for all the actions associated with the sale of goods and production.

The principal object of the profit centre is to generate and maximise the profit, by minimising the cost incurred and increasing sales. This objective helps to uplift the profit-making capability of a company. The accomplishment of a profit centre is estimated in terms of profit growth, during a definite period. The achievement of a profit centre is examined by subtracting the actual cost from the budgeted cost.

The difference between the Cost Centre and Profit Centre:

Basis	Cost Center	Profit Centre
Definition	A cost centre is a company department that supervises the all the cost of the company	A profit centre is a company department which is responsible for the company profits
Responsibilities	Reducing cost and effective cost control within the organisation	Help in earning profits and maximising revenue
Complexity involved	Cost center has lesser complexity as only focus is on costs	Profit center is more complex since it has to focus on cost, profit and revenue
Approach followed	Short term approach	Both short and long term approach followed
Scope of operations	Comparatively narrow	Comparatively wide

COST UNIT

After costs have been ascertained, accumulated, classified and recorded, these have to be related to a convenient measure of the quantity of the product or service. This measure of the quantity of product or service is known as '**cost unit'**.

A cost unit is defined as "a unit of quantity of product, service or time (or a combination of these) in relation to which costs may be ascertained or expressed".

In other words, a cost unit is a standard or unit of measurement of the goods manufactured or service rendered. Cost unit may be in terms of number, length, area, weight, volume, time and value.

Characteristics of a Cost Unit

A unit of cost must possess the following characteristics:

- It must be one with which EXENDITURE can be conveniently associated.
- It must be appropriate or natural to BUSINESS operations and the product.
- It must be certain or definite and not changing from time to time.
- It must be simple to understand and to quote.
- It must have universal acceptability.

Types of Cost Units

Cost units may be divided into two parts:

(a) Simple Unit: It involves the use of a single standard or unit of measurement of the goods manufactured e.g., per piece, per kilogram, per quintal, per tonne, per gallon, per meter etc.

(b) Composite Unit or Complex Unit: It is a combination of two simple units e.g., per passenger-kilometre, per tonne-kilometre, per kilowatt-hour etc.

The terms of measurement used in cost unit are:

(i) Number
(ii) Area
(iii) Volume
(iv) Length
(v) Weight
(vi) Time
(vii) value

Cost unit is always selected very carefully which depends on the nature of business operations. The cost unit of steal is naturally ascertained in terms of per tonne. Cost of carrying a passenger by a transporter shall naturally be ascertained in cost unit of kilometre. The following are examples in certain cases:

Industry	**Cost Unit**
Brick Industries	Cost Unit per 1000 bricks.
Coal Mines	Cost Unit per quintal.
Cotton Mills	Cost Unit per meter.
Electric Company	Cost Unit per unit.
Transport Companies	Cost Unit per kilometre.
Steel Companies	Cost Unit per tonne.
Water Supply	Cost Unit per 1000 litres
Furniture Industries	Cost Unit per number
Oil Companies	Cost Unit per litre.
Soap Factory	Cost Unit per dozen, per, kilogram or per tablet.

Difference between Cost Center and Cost Unit:

The main points of difference between cost center and cost unit may be given as follows:

(i) Costs are accumulated by cost centers, whereas these are measured and expressed in terms of cost units.

(ii) Costs centers may be used as basis of classifying costs. But cost units do not serve as basis of classification of costs.

(iii) Different cost centers may be involved in the production of a product, whereas a product will have only one cost unit in which its costs are expressed.

(iv) Formulation of cost centers depends upon the nature and techniques of production processes, size of the organization and the nature of the organizational structure.

Determination of cost units depends upon the nature of the final product or final output and the prevailing practices of trade.

(v) Cost centers are created for assisting the management in the functions of budgeting and controlling. But it is not so with cost units.

Meaning of Cost Sheet:

Cost Sheet or a Cost Statement is a document which provides for the assembly of the estimated detailed elements of cost in respect of cost centre or a cost unit. The analysis for the different elements of cost of the product is shown in the form of a Statement is called Cost sheet.

The statement summarizes the cost of manufacturing a particular product and discloses different stages of cost of a particular period:

1. Prime Cost;
2. Works Cost (or) Factory Cost;
3. Cost of Production;
4. Total Cost (or) Cost of Sales.

Importance of Cost Sheet

(1) It provides for the presentation of the total cost on the basis of the logical classification.

(2) Cost sheet helps in determination of cost per unit and total cost at different stages of production.

(3) Assists in fixing of selling price.

(4) It facilitates effective cost control and cost comparison.

(5) It discloses operational fficiency and inefficiency to the management for taking corrective actions.

(6) Enables the management in. the preparation of cost estimates to tenders and quotations.

SPECIMEN OF COST SHEET (Without the value of Stock)
Cost Sheet for the Period

Particulars	***Total Cost***		***Per Unit***	
	Rs.	***Rs.***	***Rs.***	***P***
Direct Material or Raw Materials		xxx	x	xx
Direct Wages or Productive Wages		xxx	x	xx
Direct Expenses or Chargeable Expenses		xxx	x	xx
Prime cost		xxx	x	xx
Add: Factory Overhead or Factory On Cost:				
Production supervisor salaries	xxx			
Quality assurance salaries	xxx			
Materials management salaries	xxx			
Factory rent	xxx			
Factory utilities	xxx			
Factory building insurance	xxx			
Fringe benefits	xxx			
Depreciation	xxx			
Equipment setup costs	xxx			
Equipment maintenance	xxx			
Factory supplies	xxx			
Factory small tools charged to expense	xxx			

Insurance on production facilities and equipment	xxx			
Property taxes on production facilities	xxx	xxx	x	xx
Factory or Works Cost		xxx	x	xx
Add: Administrative or Office Overheads:				
Office Rent and Rates	xxx			
Office Salaries	xxx			
Lighting and Heating	xxx			
Office Stationery	xxx			
Office Insurance	xxx			
Postage and Telegrams	xxx			
Office Cleaning	xxx			
Legal Charges	xxx			
Depreciation of Furniture and Office Equipments and Buildings	xxx			
Audit Fees	xxx			
Bank Charges and Commission	xxx	xxx		
Cost of Production		xxx	x	xx
Add: Selling and Distribution Overheads:				
Showroom Rent and Rates	xxx			
Salesmen's Salaries	xxx			
Salesmen's Commission	xxx			
Sales Office Rent and Rates	xxx			
Travelling Expenses of Salesmen	xxx			
Warehouse Rent and Rates	xxx			
Advertisement Expenses	xxx			
Warehouse Staff Salaries	xxx			
Carriage Outwards	xxx			
Sales Manager's Salaries	xxx			
Repairs and Depreciation of Delivery Van	xxx			
Sample and Free Gifts	xxx			
Bad debts, Debt Collection Expenses	xxx	xxx	x	xx
Cost of sales		xxx	x	xx
Add: Profit (If Loss deduct)		xxx	x	xx
Sales value (Selling Price in case of one unit)		xxx	x`	xx

SPECIMEN OF COST SHEET (With the value of Stock)
Cost Sheet for the Period

Particulars	Total Cost		Cost Per Unit	
	Rs.	**Rs.**	**Rs.**	**P**
Opening Stock of Raw Material	**xxx**			
Add: Purchase of Raw Material	**xxx**			
	xxx			
Less: Loss of Material	**xxx**			
	xxx			
Less: Material Returned	**xxx**			
	xxx			
Less: Closing Stock of Raw Material	**xxx**			
Direct Material Consumed		xxx	x	xx
Direct Wages or Productive Wages		xxx	x	xx
Direct Expenses or Chargeable Expenses		xxx	x	xx
Prime cost		xxx	x	xx
Add: Factory Overhead or Factory On Cost:				
Production supervisor salaries	xxx			
Quality assurance salaries	xxx			
Materials management salaries	xxx			
Factory rent	xxx			
Factory utilities	xxx			
Factory building insurance	xxx			
Fringe benefits	xxx			
Depreciation	xxx			
Equipment setup costs	xxx			
Equipment maintenance	xxx			
Factory supplies	xxx			
Factory small tools charged to expense	xxx			
Insurance on production facilities and equipment	xxx			
Property taxes on production facilities	xxx	xxx	x	xx
Total Factory or Works Cost (Gross)		xxx	x	xx
Add: Opening Stock of Work in Progress		xxx		
		xxx		
Less: Closing stock of Work in Progress		xxx		
Factory or Works Cost		xxx	x	xx
Add: Administrative or Office Overheads:				
Office Rent and Rates	xxx			
Office Salaries	xxx			
Lighting and Heating	xxx			
Office Stationery	xxx			
Office Insurance	xxx			

Postage and Telegrams	xxx			
Office Cleaning	xxx			
Legal Charges	xxx			
Depreciation of Furniture, Equipment & Buildings	xxx			
Audit Fees	xxx			
Bank Charges and Commission	xxx	xxx	x	xx
Total Cost of Production		xxx	x	xx
Add: Opening Stock of Finished Goods		xxx		
		xxx		
Less: Closing Stock of Finished Goods		xxx		
Cost of Production		xxx	x	xx
Add: Selling and Distribution Overheads:				
Showroom Rent and Rates	xxx			
Salesmen's Salaries	xxx			
Salesmen's Commission	xxx			
Sales Office Rent and Rates	xxx			
Travelling Expenses of Salesmen	xxx			
Warehouse Rent and Rates	xxx			
Advertisement Expenses	xxx			
Warehouse Staff Salaries	xxx			
Carriage Outwards	xxx			
Sales Manager's Salaries	xxx			
Repairs and Depreciation of Delivery Van	xxx			
Sample and Free Gifts	xxx			
Bad debts, Debt Collection Expenses	xxx	xxx	x	xx
Cost of sales		xxx	x	xx
Add: Profit (If Loss deduct)		xxx	x	xx
Sales value (Selling Price in case of one unit)		xxx	x	xx

Tender or Quotations: (Preparation of Estimated Cost Sheet)

Quite often the management has to quote prices of its goods in advance or has to submit tenders for goods to be supplied. For this purpose, an estimated cost sheet has to be prepared.

In this estimate, direct material cost, direct wages and various types of overhead are predetermined on the basis of past costs taking into account the present situations and also the expected changes in the future price level.

Direct material cost is generally estimated per unit taking into account the estimated prices likely to be in future.

Direct wages can be known from the previous year's records after making due allowance for any increase in the wage rates.

Similarly overheads are estimated on the basis of cost incurred in the past and likely changes in the future. In general, Factory overhead is calculated in relation to direct wages; Administrative and Selling and Distribution overheads as a percentage on Works Cost.

The expected profit on Cost or sales is also calculated on the basis of past cost records.

The estimation is prepared in the form of a cost sheet. When drawing the tender, the expected changes in the element of cost may be looked upon. Overestimation will invite losses. Therefore, it needs great care in drawing an estimated cost sheet.

Steps to be followed:

Step 1: Prepare Cost Sheet for the past
Step 2: Calculate expected percentage of Changes in cost in terms of percentage or per unit.
Step 3: Prepare Estimated Cost Sheet or Quotation or Tender.

Types of Costing and Classification:

The basic principles of ascertaining costs are the same in every system of cost accounting. However, the methods of analyzing and presenting the cost may vary from industry to industry. The method to be used in collecting and presenting costs will depend upon the nature of production. Basically there are two methods of costing, namely, Job costing and Process costing.

1. **Job costing:** Job costing is used where production is not repetitive and is done against orders. **Batch costing:** Where the cost of a group of product is ascertained, it is called 'batch costing'.
2. **Contract costing:** A contract is a big job and, hence, takes a longer time to complete.
3. **Process Costing:** Where an article has to undergo distinct processes before completion, it is often desirable to find out the cost of that article at each process.
4. **Output/Unit Costing:** This method is followed by concerns producing a single article or a few articles which are identical and capable of being expressed in simple, quantitative units. This is used in industries like mines, quarries, oil drilling, cement works, breweries, brick works etc. for example, a tone of coal in collieries, one thousand bricks in brick works etc. **The Operating Costing:** This method is applicable where services are rendered rather than goods produced.
5. **Multiple Costing:** Some products are so complex that no single system of costing is applicable. This type of costing is followed to cost such products as radios, aeroplanes, cycles, watches, machine tools, refrigerators, electric motors etc.
6. **Operating Costing:** In this method each operation at each stage of production or process is separately identified and totalled. This method is in force in industries where toys, leather and engineering goods are manufactured.
7. **Departmental Costing:** When costs are ascertained department by department, such a method is called 'departmental costing'. This method is followed by departmental stores, publishing houses etc.

CLASSIFICATION OF COST

The process of grouping costs according to their common characteristics is called classification of cost. It is a systematic placement of like items together according to their common features. The followings are the important ways of classifying costs.

1. **Classification According to Functions**
    - Manufacturing cost:
    - Administration cost:
    - Selling and distribution costs
    - Research and development cost
2. **Classification based on cost behaviour**
    - Variable cost
    - Fixed cost
    - Semi-variable cost or semi-fixed cost

3. **Committed (Fixed cost) and Discretionary costs** (Discretionary fixed costs are those which can be avoided by management.) Such costs are not permanent. Advertising, research and development cost, salaries of low level managers are examples of discretionary costs because these costs may be avoided or reduced in the short run if so desired by the managements. This classification into committed and discretionary costs is important from the point of view of cost control and decision making.
4. **Financial Costs**

Cash costs: Cash costs are those sacrifices that are reflected in actual cash outflows. Business transactions usually involve both reward (and revenue) and sacrifice (or cost) with the difference between the two being gain (or profit). Thus;

Gain = Reward - Sacrifice

Profit= Revenue – Cost

Non-cash costs: Non-cash costs are financial sacrifices that do not involve cash outlays at the time when the cost is recognized. These costs are found in deprecation, opportunity costs etc.

Non-Financial costs

Non-financial costs are those costs that are not directly traceable through a company's cash flow. While such costs (e.g., low morale of employees) certainly involve scarifies and they may lead eventually, in complex ways to a reduced cash flow in the future. They do not represent an immediate cash outlays. The above cost concepts are based on several factors like controllability, period, situation, input-output relationship, opportunity, urgency, historical, product, etc. The clear understanding of costs concepts will help the management in analysis of costs, reporting, cost control and decision making.

5. **Product Costs and Period Costs**: (Variable fixed)
6. **Classification according to Identifiability with Cost Units**: Direct costs and indirect costs
7. **Classification According to Controllability Controllable costs:**

For example, cost of raw material may be controlled by purchasing in larger quantities. Variable costs - Uncontrollable costs Fixed costs are generally uncontrollable

Periyar Govt. Arts College, Cuddalore
PG & RESEARCH DEPARTMENT OF COMMERCE
ADVANCED COST ACCOUNTING
UNIT - I TEST

1. Describe in brief Classification of Overheads.
2. Which are the different ways by which the cost can be analysed?
3. Explain the essentials of classifications of cost in cost accounting.
4. How is the cost analyzed?
5. Explain Fixed and Variable cost.
6. What is cost? How would you classify cost?
7. What is meant by elements of cost and divisions of cost?
8. Give examples of each of factory overheads and office overheads.
9. What are chargeable expenses? Give three examples.
10. What do you understand by variable cost, fixed cost and semi-variable cost?
11. Distinguish between product cost and period cost.
12. Write short notes on:
(a) Controllable Cost. (b) Conversion Cost. (c) Avoidable Cost.

13. The following figures are extracted from the Trial Balance of Gogetter Co. on 30th September, 2014.

Inventories: Finished goods 80,000 Raw Materials 1,40,000 Work-in-progress 2,00,000 Office Appliances 17,400 Plant & Machinery 4,60,500 Buildings 2,00,000 Sales 7,68,000 Sales Return & Rebates 14,000 Materials Purchased 3,20,000 Freight incurred on Materials 16,000 Purchase Returns 4,800 Direct Labour 1,60,000 Indirect Labour 18,000 Factory Supervision 10,000 Repairs & Upkeep – factory 14,000 Heat, Light, & Power 65,000 Rates & Taxes 6,300 Miscellaneous Factory Expenses 18,700 Sales Commission 33,600	Sales Travelling 11,000 Sales Promotion 22,500 Distribution Dept. Salaries & Expenses 18,000 Office Expenses 8,600 Interest on Borrowed Funds 2,000 Further details are available as follows: (i) Closing Inventories: Finished Goods 1,15,000 Raw Materials 1,80,000 Work-in-progress 1,92,000 (ii) Accrued Expenses on: Direct Labour 8,200 Indirect Labour 1,200 Interest on Borrowed Funds 2,000 (iii) Depreciation to be provided on: Office Appliances 5%, Plant & Machinery 10%, Building 4% With the help of the above information, you are required to prepare cost sheet for Gogetter Co. for the year ended 30th September, 2014.

14. From the following data, relating to the manufacturing of a standard product during September 2014, prepare a statement showing cost and profit per unit:
Raw material used 1,20,000
Direct wages 72,000
Man hours worked 10,000 hours
Man hours rate for recovering works overheads Rs. 10 per hour
Office overheads 25% on work cost
Selling overheads Rs. 1.50 per unit
Unit produced 42,000; units sold 40,000 @ Rs. 25 per unit

15. From the following information, prepare a cost statement showing maximum possible break up of
cost and total profit:
Sales for January 2014 30,00,000
Cost of goods sold 24,80,000
Administration expenses 1,80,000
Selling expenses 40,000

	1.1.14	31.1.14
Raw material stock	3,20,000	4,00,000
Work-in-progress	3,20,000	4,80,000
Finished goods	4,20,000	3,40,000

Direct wages were 30% of prime cost
Raw materials consumed were 50% of prime cost
Direct expenses were 20% of prime cost
Factory overheads were 20% of prime cost.

16. A factory uses job costing. The following data are obtained from its books for the year ended 31st December, 2013.
Direct materials 90,000
Direct wages 75,000
Factory overheads 45,000
Selling and dist. overheads 52,500
Administration overheads 42,000
Profit 60,900
(a) Prepare a Cost Sheet indicating the Prime cost, Works cost. Production cost, Cost of sales and the Sales value.
(b) In 2014, the factory received an order for a number of jobs. It is estimated that direct materials required will be Rs. 1,20,000 and direct labour will cost Rs. 75,000. What should be the price for these jobs if factory intends to earn the same rate of profit on sales assuming that the selling and distribution overheads have gone up by 15% ? The factory recovers factory overheads as a percentage of direct wages and administration, selling and distribution overheads as a percentage of works cost, based on cost rates prevailing in the previous year.

17. The following figures relate to the costing of electric fans for a period of three months ending 31st Dec., 2013.
Finished stock on 1st October, 2013 Nil
Finished stock on 31st December, 2013 20,250
Stock of raw materials, 1st October, 2013 5,000
Stock of raw materials, 31st December, 2013 3,500
Factory wages 75,000
Indirect charges 12.500
Materials purchased 32,500
Sales 1,12,500
The number of fans manufactured during the three months was 3,000. Prepare a statement, showing the cost per fan and the price to be quoted for 750 fans to realise the same percentage of profit as was realised during the three months referred to above, assuming the same conditions.

REFERENCE BOOKS:

1. S.P.Jain and Narang – Cost Accounting – Kalyani Publishers, New Delhi
2. S.N.Maheswari – Principles of Cost Accounting – Sultan Chand & sons, New Delhi
4. S.P.Iyangar – Cost Accounting – Sultan Chand & Sons, New Delhi.

UNIT-II

Methods of Costing-Process costing, Treatment of equivalent production- Inter process profit-Joint and by product Costing-Preparation of contract account, Cost plus contract and escalation clause.

Methods of Costing:

Meaning: The method of costing refers to a system of cost ascertainment and cost accounting.

Different Methods of Costing – Job Costing; Contract Costing, Batch Costing, Process Costing, Unit Costing, Operating Costing, Operation Costing and Multiple Costing.

Various methods of Costing

Since each business is so varied from the other, the method of costing cannot be uniform. The different methods of costing used by different businesses are summarized here under:

Method	Type of Business
Job Costing - The costs incurred for a particular job can be easily identified	Advertising
Contract costing - Similar to job costing but the duration of assignment is longer.	Construction
Batch costing - The costs incurred for a fixed number of units forming a batch	Manufacturing of spare parts
Process costing - The processes involved are easily distinguished.	Textile units, Cement, Bricks, Sugar cane units
Unit costing - The costs are incurred for a fixed quantity.	Mining
Operating costing - The costs are incurred for services rendered.	Hospitals
Multiple costing, also known as composite costing, is a type of accounting method used when goods are sold that contain several other processed parts, and these parts are Costed differently. Just as the final product needs a cost associated with it, so do each of the parts created by other processes. Operation costing is a form of Hybrid Costing System. A mix of job costing and process costing is used to compile the Cost of a product; this mixed costing environment is called operation costing.	Televisions, vehicles, computers, airplanes, and smart phones. And A company builds unique, custom-designed race cars.
Operation costing is a mix of job costing and process costing, and is used in either of the following situations: 1. A product initially uses different raw materials, and is then finished using a common process that is the same for a group of products; or 2. A product initially has identical processing for a group of products, and is then finished using more product-specific procedures.	Group of products

PROCESS COSTING

Meaning - Process Costing

Process costing is sued where the production moves from one process or department to the next until its final completion and there is a continuous mass production of identical units through a series of processing operations.

It is applied for a various industries like chemicals and drugs, oil refining, food processing, paints & varnish, plastics, soaps, textiles, paper etc.

Definition:

CIMA defines process costing as, "The costing method applicable where goods or services result from a sequence of continuous or repetitive operations or processes. Costs are averaged over the units produced during the period."

FEATURES:

Features of Process Costing:
(a) The production is continuous
(b) The product is homogeneous
(c) The process is standardized
(d) Output of one process become raw material of another process
(e) The output of the last process is transferred to finished stock
(f) Costs are collected process-wise
(g) Both direct and indirect costs are accumulated in each process
(h) If there is a stock of semi-finished goods, it is expressed interms of equivalent units
(i) The total cost of each process is divided by the normal output ofthat process to find out cost per unit of that process.

ADVANTAGES OF PROCESS COSTING:

1. Costs are be computed periodically at the end of a particular period
2. It is simple and involves less clerical work that job costing
3. It is easy to allocate the expenses to processes in order to have accurate costs.
4. Use of standard costing systems in very effective in process costing situations.
5. Process costing helps in preparation of tender, quotations
6. Since cost data is available for each process, operation and department, good managerial control is possible.

LIMITATIONS:

1. Cost obtained at each process is only historical cost and are not very useful for effective control.
2. Process costing is based on average cost method, which is not that suitable for performance analysis, evaluation and managerial control.
3. Work-in-progress is generally done on estimated basis which leads to

inaccuracy in total cost calculations.

4. The computation of average cost is more difficult in those cases where more than one type of products is manufactured and a division of the cost element is necessary.

5. Where different products arise in the same process and common costs are prorated to various costs units. Such individual products costs may be taken as only approximation and hence not reliable. Many process industries some loss or wastage is inevitable. Such a loss may be the result of an evaporation, shrinkage, chemical change, and change in moisture content or spoilage. The process loss may be normal or abnormal.

Normal Wastage

(1) This is the loss which is un-avoidable because of the nature of raw materials for the production technique and is inherent in the normal course of production. Such loss can be estimated in advance on the basis of past experience or chemical data.**It may visible or invisible. Invisible loss is treated loss in weight, which does not have any realisable value. But visible loss has some realisable value.**

The normal loss is recorded only in terms of quantity and the cost per unit of usable production is increased accordingly. Where the scrap possesses some value as a waste product or as raw material for an earlier process, the value there of is credited to the process account. This reduces the cost of normal output and process loss is shared by usable unit.

(2) **Abnormal Loss:** Any loss caused by unexpected or abnormal conditions such as sub-standard materials, carelessness, accident or loss in excess of the margin anticipated for normal process loss is regarded as abnormal process loss. Abnormal loss is not expected to arise, when operation are carried on efficiently according to norms relating to manufacturing operations. Cost of normal loss is shared by good units of production in the process, but the same cannot be given to abnormal loss.

Units representing abnormal loss are valued like good units produced and the value of units representing abnormal loss is debited to a separate account, which is known as abnormal loss account. The value of abnormal loss is calculated with the help of the following formula:

$$\frac{\text{Normal cost of normal output}}{\text{Normal output}} \times \text{Units of abnormal loss}$$

If the abnormal loss has got any scrap value, it should be credited to abnormal loss account and the balance is ultimately written off to the costing profit and loss account.

(3) **Abnormal Gain:** If the quantum of loss is less than the determined percentage of normal loss, the difference is called abnormal gain or effectives. The presence of abnormal effectives should not affect the cost of goods units in the normal circumstances. The value of abnormal effective is debited to the concerned process account. This value is calculated at the rate at which the effective output would have been valued if normal wastage had taken place according to expectation. The value of abnormal effective is calculated as follows:

$$\frac{\text{Normal cost of normal output}}{\text{Normal output}} \times \text{Units of abnormal gain}$$

PROCESS - I A/c

Particulars	Units	Rs.	Particulars	Units	Rs.
To Direct Materials	xxx	xxxx	By Normal Loss		
To Direct Labour		xxxx	a) Weight Loss	xxx	Nil
To Direct Expenses		xxxx	b) Scrap Loss	xxx	xxxx
To Overheads		xxxx	**By Process II (Units x CPU)**	**xxx**	**xxxx**
To Abnormal Gain (?)	xxx	xxxx	By Abnormal Loss (?) (Units x CPU)	xxx	xxxx
	xxx	xxxx		xxx	xxxx

1. DM+DL+DE+Ohs - NL VALUE = NORMAL COST
2. UNITS INTRODUCED + ADDITTIOANL RAW MATERIALS IN UNITS - NORMAL LOSS UNIT = NORMAL OUTPUT
3. **Cost Per Unit (CPU) = NORMAL COST/NORMAL OUTPUT**

Problem 1:

A product is completed in three consecutive processes. During a particular month the input to Process 1 of the basic raw material was 5,000 units at Rs.2 per unit. Other information for the month was as follows:

Particulars		Process1	Process2	Process3
Output	(Units)	4,700	4,300	4,050
Normal loss as % of input		5%	10%	5%
Scrap value per unit	(Rs.)	1	5	6
Direct wages	(Rs.)	3,000	5,000	8,000
Direct expenses	(Rs.)	9,750	9,910	15,560

Overhead total Rs.32,000, chargeable as percentage of direct wages. There were no opening or closing work- in-progress stocks. Compile three process and finished stock account with details of abnormal loss and gain, where applicable.

Ans.:

Process 1A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Raw material	5,000	10,000	By Normal Loss	250	250
To Direct wages	-	3,000	By Abnormal Loss (50 x Rs,6)	50	300
To Direct expenses	-	9,750	By Process 2 A/c (4700 x Rs.6)	4,700	28,200
To Overheads (32,000 × 3,000/16,000)	-	6,000			
	5,000	28,750		5,000	28,750

1. RM+DL+DE+Ohs - NL VALUE = NORMAL COST
   Normal Cost = Rs. 28,500 (Rs.10,000+3,000+9,750+6,000 – Rs. 250)
2. Units Introduced + Additional Raw Materials in Units - Normal Loss Unit = Normal Output
   Normal Output = 4,750 units (5,000 units -250 units)
3. **Cost Per Unit (CPU) = Normal Cost/Normal Output**
   CPU = Rs.28,500/4,750 = Rs.6

Process 2A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process 1 A/c	4,700	28,200	By Normal Loss	470	2,350
To Direct wages	-	5,000	By Process 3 A/c (4,300 x12)	4,300	51,600
To Direct expenses	-	9,910			
To Overheads	-	10,000			
(32,000 × 5,000/16,000)					
To Abnormal Gain (70 x12)	70	840			
	4,770	53,950		4,770	53,950

1. P1+DL+DE+Ohs - NL VALUE = NORMAL COST

   Normal Cost = Rs. 50,760 (Rs.28,200+5,000+9,910+10,000 – Rs. 2,350)

2. Units Introduced + Additional Raw Materials in Units - Normal Loss Unit = Normal Output

   Normal Output = 4,230 units (4,700 units -470 units)

3. **Cost Per Unit (CPU) = Normal Cost/Normal Output**

   CPU = Rs.50,760/4,230 = Rs.12

Process 3A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process 2 A/c	4,300	51,600	By Normal Loss	215	1,290
To Direct wages	-	8,000	By Abnormal Loss (35 x Rs.22)	35	770
To Direct expenses	-	15,560	By Finished Stock A/C**(4,050xRs.22)**	4,050	89,100
To Overheads (32,000 × 8,000/16,000)	-	16,000			
	4,300	91,160		4,300	91,160

1. P2+DL+DE+Ohs - NL VALUE = NORMAL COST

   Normal Cost = Rs. 89,870 (Rs.51,600+8,000+15,560+16,000 – Rs. 1,290)

2. Units Introduced + Additional Raw Materials in Units - Normal Loss Unit = Normal Output

   Normal Output = 4,085 units (4,300 units -215 units)

3. **Cost Per Unit (CPU) = Normal Cost/Normal Output**

   CPU = Rs.89,870/4,085 = Rs.22

Normal Loss A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process 1 A/c	250	250	By Abnormal Gain A/c	70	350
To Process 2 A/c	470	2,350	By Bank A/c	250	250
To Process 3 A/c	215	1,290	By Bank A/c (470 – 70)	400	2,000
			By Bank A/c	215	1,290
	935	3,890		935	3,890

Abnormal Loss A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process 1 A/c	50	300	By Bank A/c	50	50
To Process 3 A/c	35	770	By Bank A/c	35	210
			By Costing P & L A/c	-	810
	85	1,070		85	1,070

Abnormal Gain A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Normal Loss A/c	70	350	By Process 2 A/c	70	840
To Costing P & L A/c	-	490			
	70	840		70	840

Exercise:

A product passes through three distinct processes X, Y and Z. It is known that wastage is incurred in each process as follows:

Process X – 2%, Y – 4%, Z – 10%

The wastage at each process possesses scrap value. The wastage of processes X and Y is sold at Rs.5 per unit, and that of process Z at Rs.10 per unit. The output of each process passes immediately to the next process and finished units are transferred from process Z into stock. The following information is obtained.

Particulars	X Rs.	Y Rs.	Z Rs.
Material	5,40,000	5,20,000	2,40,000
Wages	8,60,000	4,80,000	2,60,000
Direct Expenses	2,75,000	2,90,000	3,60,000

1,00,000 units were put in Process X at a cost of 20 per unit. The output of each process is as follows:

Process X – 97,500 units, Process Y – 94,000 units, Process Z – 84,000 units.

There is no stock of work-in-progress. Prepare the process accounts, Normal Loss account, abnormal gain account and abnormal loss account.

Equivalent Production

Equivalent production represents the production of a process in terms of completed units. It means converting the incomplete production into its equivalent of completed units.

According to CIMA, London the term equivalent unit's means, "Notional whole units representing un- completed work. Used to apportion costs between work-in-progress and completed output. "The principle applies when operation costs are being apportioned between work-in-progress and completed output. The formula for equivalent production is:

Equivalent units of work-in-progress

= No. of Units × % of Work Completed

Total equivalent production will be equal to the sum of equivalent completed units of work-in-progress in the beginning plus units started and finished during the year plus equivalent completed units of work- in-progress at the end. The cost per unit of equivalent production will be equal to the total cost divided by effective production and the cost of work-in-progress will be equal to the equivalent units of work-in-progress multiplied by the cost per unit of effective production.

Procedure for valuation of work-in-process

The valuation of work-in-process can be made in the following three ways, depending up on the assumptions made regarding the flow of costs:

(1) **FIFO Method:** According to this method the units first entering the process are completed first. Thus the units completed during a period would consist partly of the units which were in complete at the beginning of the period and partly of the units introduced during the period. The cost of completed units is affected by the value of the opening inventory, which is based on the cost of the previous period. The closing inventory of work-in-process is valued at its current cost.

(2) **LIFO Method:** According to this method units last entering the process are to be completed first. The completed units will be shown at their current cost and the closing cost and the closing-work- in-process will continue to appear at the cost of the opening inventory of work-in-progress along with current cost of work in progress if any.

(3) **Average Cost Method:** According to this method opening inventory of work-in-process and its costs are merged with the production and cost of the current period, respectively. An average

cost per unit is determined by dividing the total cost by the total equivalent units, to ascertain the value of the units in process.

I. Format of statement of Equivalent Production:

Input		Output		Equivalent Production					
Particulars	Units	Particulars	Units	Material		Labour		Overheads	
				%	Units	%	Units	%	Units
Opening Stock	xx	Units completed	xx	xx	xx	xx	xx	xx	xx
Units Introduced	xx	Normal Loss	xx	--	--	--	--	--	---
		Abnormal Loss	xx	xx	xx	xx	xx	xx	xx
	xx	Total	xx	xx	xx	xx	xx	xx	xx

II. Statement of cost per Equivalent Units:

Element of costing	Cost Rs.	Equivalent Units	Cost per Equivalent Units Rs
	(1)	(2)`	(3) = (1)/(2)
Material Cost (Net)	xx	xx	xx
Labour Cost	xx	xx	xx
Overheads Cost	xx	xx	xx
	xx		xx

III. Statement of Evaluation

Particulars	Element of cost	Equivalent Units	Cost per equivalent units	Cost	Total Cost
		Units	Rs.	Rs.	Rs.
Units completed	Material	xx	xx	xx	
	Labour	xx	xx	xx	
	Overheads	xx	xx	xx	Xx
Closing WIP	Material	xx	xx	xx	
	Labour	xx	xx	xx	
	Overheads	xx	xx	xx	Xx
Abnormal Loss	Material	xx	xx	xx	
	Labour	xx	xx	xx	
	Overheads	xx	xx	xx	Xx

Example: 1

Compute the equivalent units of production of Process X for the month of January using FIFO method.

	Units	% of Completion	
		Materials	Labour & Overheads
Work in Process, January 1	400	55	30

Units Started in Production	10,000		
Units Competed during the month and transferred to next process	9,600		
Work in Process, January 31	800	40	25

Solution

Input		**Output**		**Equivalent Production**					
Particulars	**Units**	**Particulars**	**Units**	**Material**		**Labour**		**Overheads**	
				%	**Units**	**%**	**Units**	**%**	**Units**
Opening Stock	400	Opening Stock	400	45	180	70	280	70	280
Introduced	10,000	Produced & Transferred (9,600-400)	9,200	100	9,200	100	9,200	100	9,200
		Closing Stock	800	40	320	25	200	25	200
Total Equivalent Units of Production	10,400		10,400		9,700		9,680		9,680

Example:2

From the following details, prepare statement of equivalent production, Statement of Cost, Statement of evaluation and Process Account by following under (a) Average Cost Method; (b) FIFO Method and (c) LIFO Method

Opening Work in Progress 2,000 Units:

Materials (100% Complete) Rs.7,500; Labour (60% Complete) Rs.3,000 and Overhead (60% Complete) Rs.1,500

Units introduced into the Process – 8,000

There are 2,000 units in process, and **the stage of Completion** is estimated to be:

Material 100%; Labour 50% and Overhead 50%

8,000 **Units are transferred** to the next process.

The Process Cost of the month are: Material Rs.1,00,000; Labour Rs. 78,000 and Overheads Rs.39,000

Solution:

(a) Statement of Equivalent production – Average Cost Method

Input		**Output**		**Equivalent Production**					
Particulars	Units	Particulars	Units	Material		Labour		Overheads	
				%	Units	%	Units	%	Units
Opening Stock	2,000	Units completed	8,000	100	8,000	100	8,000	100	8,000
Units Introduced	8,000	Normal Loss Nil	Nil	--	--	--	--	--	---
		Closing Stock	2,000	100	2,000	50	1,000	50	1,000
	10,000	Total	10,000	-	10,000	-	9,000		9,000

Statement of Cost per Unit

Element of costing	**Cost Rs.**	**Equivalent Units**	**Cost per Equivalent Units Rs**
	(1) Rs.	**(2)` Units**	**(3) = (1)/(2) Rs./Units**
Opening stock material value	7,500		
Material Cost of the month	1,00,000		
Total Material Cost	1,07,500		
Less: Sale of Scrap	Nil		
Material Cost Net (A)	**1,07,500**	**10,000**	Rs.1,07,500/10,000 = Rs.10.75
Labour Cost (B) 3,000+78,000	**81,000**	**9,000**	Rs.81,000/9,000 = Rs.9
Overheads Cost (C) 1,500+39,000	**40,500**	**9,000**	Rs.40,500/9,000 = Rs.4.50
Total Cost (A+B+C)	**2,29,000**	----	Cost Per Unit = Rs.24.25

III. Statement of Evaluation

Particulars	**Element of cost**	**Equivalent Units**	**Cost per equivalent units**	**Cost**	**Total Cost**

		Units	Rs.	Rs.	Rs.
Units completed	Material	8,000	10.75	86,000	
	Labour	8,000	9.00	72,000	
	Overheads	8,000	4,.50	36,000	**1,94,000**
Closing WIP	Material	2,000	10,75	21,500	
	Labour	1,000	9.00	9,000	
	Overheads	1,000	4.50	4,500	**35,000**

Process B A/c

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening stock	2,000	12,000	By Normal loss	Nil	Nil
To Materials	8,000	1,00,000	By Units completed	8,000	1,94,000
To Labour		78,000	By Closing Stock	2,000	35,000
To Overheads		39,000			
	10,000	2,29,000		10,000	2,29,000

(b) Statement of Equivalent production - FIFO

Input		Output		Equivalent Production					
Particulars	Units	Particulars	Units	Material		Labour		Overheads	
				%	Units	%	Units	%	Units
Opening Stock	2,000	Opening Stock **Completed**	2,000	-	-	40	800	40	800
Units Introduced	8,000	Units completed- out of newly introduced	6,000	100	6,000	100	6,000	100	6,000
		Normal Loss Nil	Nil	--	--	--	--	--	---
		Closing Stock	2,000	100	2,000	50	1,000	50	1,000
9,715	10,000	Total	10,000	-	8,000	-	7,800		7,800

Statement of Cost per Unit

Element of costing	Cost Rs.	Equivalent Units	Cost per Equivalent Units Rs
	(1) Rs.	(2)` Units	(3) = (1)/(2) Rs./Units
Material Cost of the month Less: Sale of Scrap	1,00,000 Nil		
Material Cost Net (A)	**1,00,000**	**8,000**	Rs.1,00,000/8,000 = Rs.12.50
Labour Cost (B)	**78,000**	**7,800**	Rs.78,000/7,800 = Rs.10
Overheads Cost (C)	**39,000**	**7,800**	Rs.39,000/7,800 = Rs.5
Total Cost (A+B+C)	**2,17,000**	----	Cost Per Unit = Rs.27.50

III. Statement of Evaluation

Particulars	Element of cost	Equivalent Units	Cost per equivalent units	Cost	Total Cost
		Units	Rs.	Rs.	Rs.
Opening Stock	Material	**Nil**	**12.50**	**Nil**	
	Labour	**800**	**10.00**	**8,000**	
	Overheads	**800**	**5.00**	**4,000**	**12,000**
Units completed	Material	6,000	**12.50**	75,000	

	Labour	6,000	**10.00**	60,000	
	Overheads	6,000	**5.00**	30,000	**1,65,000**
Closing WIP	Material	2,000	**12.50**	25,000	
	Labour	1,000	**10.00**	10,000	
	Overheads	1,000	**5.00**	5,000	**40,000**

Process B A/c

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening stock	2,000	12,000	By Normal loss	Nil	Nil
To Materials	8,000	1,00,000	By Units completed (12,000+12,000 + 1,65,000)	8,000	1,89,000
To Labour		78,000	By Closing Stock	2,000	40,000
To Overheads		39,000			
	10,000	2,29,000		10,000	2,29,000

(c) Statement of Equivalent production - LIFO

Input		Output		Equivalent Production					
Particulars	Units	Particulars	Units	Material		Labour		Overheads	
				%	Units	%	Units	%	Units
Opening Stock	2,000	Units completed- out of newly introduced	8,000	100	8,000	100	8,000	100	8,000
Units Introduced	8,000	Normal Loss Nil	Nil	--	--	--	--	--	---
		Closing Stock (Opening Stock becomes closing)	2,000	-	-	-	-	-	-
	10,000	Total	10,000	-	8,000		8,000		8,000

Statement of Cost per Unit

Element of costing	Cost Rs.	Equivalent Units	Cost per Equivalent Units Rs
	(1) Rs.	(2)` Units	(3) = (1)/(2) Rs./Units
Material Cost of the month Less: Sale of Scrap	1,00,000 Nil		
Material Cost Net (A)	**1,00,000**	**8,000**	Rs.1,00,000/8,000 = Rs.12.50
Labour Cost (B)	**78,000**	**8,000**	Rs.78,000/8,000 = Rs.9.75
Overheads Cost (C)	**39,000**	**8,000**	Rs.39,000/8,000 = Rs.4.875
Total Cost (A+B+C)	**2,17,000**	----	Cost Per Unit = Rs.27.125

III. Statement of Evaluation

Particulars	Element of cost	Equivalent Units	Cost per equivalent units	Cost	Total Cost
		Units	Rs.	Rs.	Rs.
Units completed	Material	8,000	**12.50**	75,000	
	Labour	8,000	**9.75**	60,000	
	Overheads	8,000	**4.875**	30,000	**1,65,000**
Closing WIP **(Opening Stock)**	Material	2,000	**No process made during the month so same value continuous as Closing stock**		
	Labour	1,000			
	Overheads	1,000			

Process B A/c

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening stock	2,000	12,000	By Normal loss	Nil	Nil
To Materials	8,000	1,00,000	By Units completed (12,000+12,000 + 1,65,000)	8,000	2,17,000
To Labour		78,000	By Closing Stock	2,000	12,000
To Overheads		39,000			
	10,000	2,29,000		10,000	2,29,000

Workout:

From the following information prepare:

(i) Statement of equivalent production,
(ii) Statement of Cost,
(iii) Statement of evaluation and
(iv) Process Account

Under (a) Average Cost Method; (b) FIFO Method and (c) LIFO Method

Opening Work in Progress 15,000 Units @ Cost of Rs.66,000 (50% Complete) which consists of**:** Materials Rs.18,000; Labour Rs.24,000 and Overhead Rs.24,000

During the month units introduced into the Process – 30,000

There are 22,500 units in process, and **the stage of Completion** is estimated to be 50% Complete at the end of the month.

22,500 **Units are transferred** to the next process at a total Process cost of Rs.4,57,500. (Material Rs.90,000; Labour Rs. 1,57,500 and Overheads Rs.2,10,000)

Comprehensive Problem 1: (Average Cost Method)

XYZ Paper mills Limited furnishes you the following information relating to Process B for the month of October, 1998:

(va) Opening work-in-progress – Nil

(ii) Units introduced 10,000 units @ Rs.3 per unit

(iii) Expenses debited to the Process:

Material – Rs.14,650; Labour – Rs.21,148 and Overheads Rs.42,000.

(iv) Normal loss in process = 1% of input.

(v) Closing work-in-process – 350 units Degree of completion – Materials 100% Labour and Overheads 50%

(vi) Finished output – 9,500 units

(vii) Degree of completion of abnormal loss: Materials 100% Labour & Overheads 80%

(viii) Units scrapped as normal loss were sold at Re 1.00 per unit,

(ix) All the units of abnormal loss were sold at Rs.2.50 per unit

Prepare:

1. Statement of Equivalent production;

2. Statement showing the cost of finished goods, abnormal loss and closing work-in- progress.
3. Process B Account.

Solution:

Statement of Equivalent production;

Input		Output		Equivalent Production					
Particulars	Units	Particulars	Units	Material		Labour		Overheads	
				%	Units	%	Units	%	Units
Opening Stock	Nil	Units completed	9,500	100	9,500	100	9,500	100	9,500
Units Introduced	10,000	Normal Loss 1% of Input	100	--	--	--	--	--	---
		Closing Stock	350	100	350	50	175	50	175
		Abnormal Loss	50	100	50	80	40	80	40
	10,.000	Total	10,000	-	9,900	-	9,715		9,715

Statement of Cost per Unit

Element of costing	**Cost Rs.**	**Equivalent Units**	**Cost per Equivalent Units Rs**
	(1) Rs.	**(2)` Units**	**(3) = (1)/(2) Rs./Units**
Raw Material Cost (10,000 x 3)	30,000		
Direct material	14,650		
Total Material Cost	44,650		
Less: Sale of Scrap (100x Re.1)	100		
Material Cost Net (A)	**44,550**	9,900	Rs.44,550/9,900 = Rs.4.50
Labour Cost (B)	21,148	9,715	Rs.21,148/9,715 = Rs.2,1768
Overheads Cost (C)	42,000	9,715	Rs.42,000/9,715 = Rs.4.3232,
Total Cost (A+B+C)	1,07,698	----	Cost Per Unit = Rs.11,00

III. Statement of Evaluation

Particulars	**Element of cost**	**Equivalent Units**	**Cost per equivalent units**	**Cost**	**Total Cost**
		Units	**Rs.**	**Rs.**	**Rs.**
Units completed	Material	9,500	4.50	42,750	
	Labour	9,500	2.1768	20,680	
	Overheads	9,500	4.3232	41,070	**1,04,500**
Closing WIP	Material	350	4.50	1,575	
	Labour	175	2.1768	381	
	Overheads	175	4.3232	757	**2,713**
Abnormal Loss	Material	50	4.50	225	
	Labour	40	2.1768	87	
	Overheads	40	4.3232	173	**485**

Process B A/c

Particulars	**Units**	**Rs.**	**Particulars**	**Units**	**Rs.**
To Raw Material	10,000	30,000	By Normal loss	100	100
To Materials		14,650	By Units completed	9,500	1,04,500
To Labour		21,148	By Closing Stock	350	2,713
To Overheads		42,000	By Abnormal Loss	50	485

	10,000	1,07,798		10,000	1,07,798

Abnormal Loss A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process B A/c	50	485	By Bank A/c (50 x Rs.2.50)	50	125
			By Costing P & L A/c	-	360
	50	485		50	485

Illustration 6: (Average Costing)

Prepare a statement of equivalent production, statement of cost, process account from the following information using average costing method.

Opening Stock	50,000 Units
Material	Rs. 25,000
Labour	Rs. 10,000
Overheads	Rs. 25,000
Units Introduced	2,00,000 Units
Material	Rs. 1,00,000
Wages	Rs. 75,000
Overheads	Rs. 70,000

During the period 1,50,000 units were completed and transferred to Process II. Closing stock 1,00,000 units. Degree of completion Material 100%; Labour 50% and Overhead s 40%.

Solution:

Statement of Equivalent Production:

Input		Output		Equivalent Production					
Particulars	**Units**	**Particulars**	**Units**	**Material**		**Labour**		**Overheads**	
				%	**Units**	**%**	**Units**	**%**	**Units**
Opening Stock	50,000	Produced	1,50,000	100	1,50,000	100	1,50,000	100	1,50,000
Introduced	2,00,000	Closing Stock	1,00,000	100	1,00,000	50	50,000	40	40,000
	2,50,000		2,50,000		2,50,000		2,00,000		1,90,000

Statement of Cost:

Element	Opening cost Rs.	Current cost Rs.	Total Cost Rs.	Equivalent units	Cost per unit
Material	25,000	1,00,000	1,25,000	2,50,000	0.500
Labour	10,000	75,000	85,000	2,00,000	0.425
Overheads	25,000	70,000	95,000	1,90,000	0.500
	60,000	2,45,000	3,05,000		1.425

Statement of Apportionment of Cost

Particulars	**Units**	**Cost per unit**	**Cost**	**Total cost**
1. Units introduced & transferred	1,50,000	1.425		2,13,750
2. Closing work-in-progress				
Material	1,00,000	0.500	50,000	
Labour	50,000	0.425	21,250	
Overheads	40,000	0.500	20,000	91,250

				3,05,000

Dr. Process I A/c. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Opening Stock	50,000	60,000	By Units completed & transfer	50,000	2,13,750
To Materials	2,00,000	1,00,000	By Closing Stock	50,000	91,250
To Labour		75,000			
To Overheads		70,000			
	2,50,000	3,05,000		2,50,000	3,05,000

Inter Process Profit

In some process industries the output of one process is transferred to the next process not at cost but at market value or cost plus a percentage of profit. ***The difference between cost and the transfer price is known as inter-process profits.*** The advantages and disadvantages of using inter-process profits, in the case of process type industries are as follows:

Advantages:

- Comparison between the cost of output and its market price at the stage of completion is facilitated.
- Each process is made to stand by itself as to the profitability.

Disadvantages:

- The use of inter-process profits involves complications.
- The system shows profits which are not realised because of stock not sold out

Computation of provision for unrealized profits:
Formula Cost of inventory = cost/total X Closing inventory
Provision for unrealized profits = Value of closing inventory – Cost

Illustration 1:
A product passes through two processes A and B. Output of A is transferred to B at cost plus 25% profit and from B to finished stock at cost plus 25% profit. There were no work in progress in both processes and opening stock of finished goods at the end of the period.
Additional information available is as follows:

Particulars	Process A Rs.	Process B Rs.
Direct Materials	20,000	60,000
Direct Wages	30,000	40,000
Closing Stock	10,000	30,000

Closing stock of finished goods was valued at Rs.45,000 and the balance was sold for Rs. 1,50,000. Prepare Process Accounts and Finished Stock Account.

Solution:

Process A

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
To Materials	20,000	20,000	-	By Transfer to Process B	50,000	40,000	10,000
To Wages	30,000	30,000					
	50,000	50,000					
Less: Closing Stock	10,000	10,000					
	40,000	40,000					
To Profit (25% on Cost	10,000	-	10,000				
	50,000	40,000	10,000		50,000	40,000	10,000

Profit = Rs.40,000 x 25% = 10,000

Note:1
The stock in Process A is Valued at Cost and therefore there is no unrealised Profit.
Computation of Cost stock:
Formula = Cost of Stock = $\frac{Cost}{Total}$ x $Closing\ Stock$
Unrealised Profit = Value of Stock – Cost of Stock

Process B

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
To Transfer from Process A	50,000	40,000	10,000	By Transfer to Finished Stock	150,000	112,000	38,000
To Materials	60,000	60,000					
To Wages	40,000	40,000					
	150,000	140,000	10,000				
Less: Closing Stock	30,000	28,000	2,000				
	120,000	112,000	8,000				
To Profit (25% on Cost)	30,000	-	30,000				
	150,000	112,000	38,000		150,000	112,000	38,000

Note:2

Profit = Rs.1,20,000 x 25% = 30,000

Cost of Stock = 1,40,000/1,50,000 x 30,000 = Rs.28,000

Cost of Stock in Process B

$$\text{Cost of Stock} = \frac{1,40,000}{1,50,000} \times 30,000 = \text{Rs.}28,000$$

Unrealised Profit = Rs. 30,000- Rs.28,000 = Rs.2,000

Finished Stock Account

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
To Transfer from Process B	150,000	112,000	38,000	By Sales	150,000	78,400	71,600
Less: Closing Stock	45,000	33,600	11,400				
	105,000	78,400	26,600				
To Profit	45,000	-	45,000				
	150,000	78,400	71,600		150,000	78,400	71,600

Note:3

Cost of Stock in Finished Goods

$$\text{Cost of Stock} = \frac{1,10,000}{1,50,000} \times 45,000 = \text{Rs.}33,000$$

Unrealised Profit = Rs. 45,000- Rs.33,000 = Rs.12,000

Note: 4 Stock Value for Balance Sheet:

Stock in Process A = Rs.10,000

Stock in Process B = Rs.30,000- Rs.2,000 = Rs.28,000

Stock in Finished Stock = Rs.45,000 – Rs.11,400 = Rs.33,600

Total Unrealised Profit = Rs.2,000 + Rs.11,400 = Rs.13,400

Total Stock = 10,000+30,000+45,000 = Rs.85,000

Total Stock = Rs. 85,000 – Rs.13,400 = Rs.71,600

Problem 2: From the following information prepare Process Accounts and calculate the actual profits earned by a company for the month of January 2003:

Particulars	Process A Rs.	Process B Rs.	Process C Rs.	Finished Stock Rs.
Opening Stock	4,000	4,800	3,200	12,000
Direct Materials	8,000	8,400	12,000	-
Direct Wages	6,000	6,000	6,400	-
Overheads	5,600	2,400	16,000	-
Closing Stock	2,000	2,400	1,600	6,000

Profit on Cost	33-1/3	25	25	-
Inter Process Profit for Opening Stock	-	800	8,000	4,400

Stocks in process are valued at prime cost and finished stock has been valued at price at which it received from Process C. Sales during the period were Rs. 1,40,000.

Solution:

Process A Account

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
To Opening Stock	4,000	4,000	-	By Transfer to Process B	28,800	21,600	7,200
To Materials	8,000	8,000	-				
To Wages	6,000	6,000	-				
	18,000	18,000	-				
Less: Closing Stock	2,000	2,000	-				
Prime Cost	16,000	16,000	-				
To Overheads	5,600	5,600	-				
	21,600	21,600	-				
To Profit (33.33% on Cost)	7,200	-	7,200				
	28,800	21,600	7,200		28,800	21,600	7,200

Process B Account

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
To Opening Stock	4,800	4,000	800	By Transfer to Process C	60,000	40,400	19,600
To Transfer from A	28,800	21,600	7,200				
To Materials	8,400	8,400	-				
To Wages	6,000	6,000	-				
	48,000	40,000	8,000				
Less: Closing Stock	2,400	2,000	400				
Prime Cost	45,600	38,000	7,600				
To Overheads	2,400	2,400	-				
	48,000	40,400	7,600				
To Profit (25% on Cost)	12,000	-	12,000				
	60,000	40,400	19,600		60,000	40,400	19,600

Calculation of Unrealized profits

Process B = 4,000/4,800 x 2,400 = Rs.2,000

Unrealized Profit = Rs.2,400 - Rs.2,000 = Rs.400

Process C Account

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
To Opening Stock	3,200	2,400	800	By Transfer to Finished Stock	1,20,000	76,000	44,000
To Transfer from A	60,000	40,400	19,600				
To Materials	12,000	12,000	-				
To Wages	6,400	6,400	-				
	81,600	61,200	20,400				
Less: Closing Stock	1,600	1,200	400				
Prime Cost	80,000	60,000	20,000				
To Overheads	16,000	16,000	-				
	96,000	76,000	20,000				
To Profit (25% on	24,000	-	24,000				

Cost)							
	1,20,000	76,000	44,000		1,20,000	76,000	44,000

Process C = 71,200/81,600 x 1,600 = Rs.1,200
Unrealized Profit = Rs.1,600 - Rs.1,200 = Rs.400

Finishsed Stock Account

Particulars	Total Rs.	Cost Rs.	Profit Rs.	Particulars	Total Rs.	Cost Rs.	Profit Rs.
To Opening Stock	12,000	7,600	4,400	By Sales	1,40,000	79,800	60,200
To Transfer from A	1,20,000	76,000	44,000				
	1,32,000	83,600	48,400				
Less: Closing Stock	6,000	3,800	2,200				
Prime Cost	1,26,000	79,800	46,200				
To Profit (25% on Cost)	14,000	-	14,000				
	1,40,000	79,800	60,200		1,40,000	79,800	60,200

Finished Stock = 76,000/1,20,000 x 6,000 = Rs.3,800
Unrealized Profit = Rs.6,000 - Rs.3,800 = Rs.2,200

Statement of Actual Profits

		Reserve		
Process (1)	**Profits (2) Rs.**	**(3) Rs.**	**(4) Rs.**	**Profit actual (5=2+3-4) Rs.**
A	7,200	-	-	7,200
B	12,000	800	400	12,400
C	24,000	800	400	24,400
Finished Stock	14,000	4,400	2,200	16,200
Total	57,200	6,000	3,000	60,200

Note: Opening Reserve will be treated as realized profit and therefore added to process profits. Closing reserve will be treated as unrealized profit and therefore deducted from the process profits.

JOINT AND BY PRODUCT COSTING

General Characteristics of Joint Production

Joint products are two or more products produced simultaneously by the same process.
Joint products become separate and identifiable at the **split-off point**.
A. Cost Separability and the Need for Allocation
1. Joint costs are the total of the raw material, labour, and overhead costs incurred up to the initial split-off point.

Joint costs can be allocated to the final product only in some arbitrary manner because such costs cannot be traced directly to the products they benefit.

2. **Separable costs** are those costs incurred after the split-off point; they can be easily traced to individual products.

B. Distinction and Similarity between Joint Products and By-Products

1. The distinction between joint products and by-products rests solely on the relative importance of their sales value.

2. A **by-product** is a secondary product whose total sales value is relatively minor in comparison with the sales value of the main product (joint product).
3. Relationships between joint products and by-products change over time as technology and markets change.
a. By-products may become more and more important, eventually becoming joint products.
b. When the relative importance of individual products changes, the products need to be reclassified and the costing procedures need to be changed.

METHODS OF APPORTIONMENT OF JOINT COST TO JOINT PRODUCTS

Proper apportionment of joint cost over the joint products is of considerable importance, as this affects (a) Valuation of closing inventory; (b) Pricing of products; and (c) Profit or loss on the sale of different products.

The commonly used methods for apportioning total process costs upto the point of separation over the joint products are as follows:

(i) Physical Units Method

(ii) Net Realizable Value at split-off point

(iii) Using Technical Estimates

Some other methods, which managers may also use for making decisions, are:

(i) Market value at the point of separation
(ii) Market value after further processing
(iii) Average unit cost method
(iv) Contribution margin method

(i) Physical Unit Method: This method is based on the assumption that the joint products are capable of being measured in the same units. Accordingly, joint costs here are apportioned on the basis of some physical base, such as weight, numbers etc. In other words, the basis used for apportioning joint cost over the joint products is the physical volume of material present in the joint products at the point of separation. Any loss arises during the joint production process is also apportioned over the products on the same basis. This method cannot be applied if the physical units of the two joint products are different. The main defect of this method is that it gives equal importance and value to all the joint products.

ILLUSTRATION 1

A coke manufacturing company produces the following products by using 5,000 tons of coal @ Rs.1,100 per ton into a common process.

Coke	3,500 tons
Tar	1,200 tons
Sulphate of ammonia	52 tons
Benzol	48 tons

Apportion the joint cost amongst the products on the basis of the physical unit method.

SOLUTION

Note-1: Apportionment of wastage of 200 tons over the four products is as follows:

Wastage = [5,000 – (3,500+1,200+52+48)] = 200

Coke: 200/4,800 x 3,500	= 146 tons
Tar: 200/4,800 x 1,200	= 50 tons
Sulphate of ammonia: 200/4,800 x 52	= 2 tons
Benzole : 200/4,800 x48	= 2 tons

	Products

	Coke	Tar	Sulphate of ammonia	Benzole	Wastage	Total
Output (in ton)	3,500	1,200	52	48	200	5,000
Wastage (in ton) (Refer Note-1)	146	50	2	2	-200	
Net weight (in ton)	3,646	1,250	54	50	-	5,000
Share of Joint Cost @ Rs.1,100 per ton (in Rs.)	40,10,600	13,75,000	59,400	55,000	-	55,00,000

(ii) Net Realizable Value at Split-off Point Method: in this method of joint cost apportionment the followings are deducted from the sales value of joint products at final stage i.e. After processing:

(i) Estimated profit margins,

(ii) Selling and distribution expenses, if any, and

(iii) Post split- off costs.

The resultant figure so obtained is known as net realizable value of joint products. Joint costs are apportioned in the ratio of net realizable value.

Particulars	Product- A Amount (Rs.)	Product- B Amount (Rs.)	Product- C Amount (Rs.)
Sales Value (Units after processing × Selling Price)	xxx	xxx	xxx
Less: Profit Margin	(xxx)	(xxx)	(xxx)
	xxx	xxx	xxx
Less: Selling & Distribution costs	(xxx)	(xxx)	(xxx)
	xxx	xxx	xxx
Less: Post split-off cost	(xxx)	(xxx)	(xxx)
Net Realizable Value	xxx	xxx	xxx

Example: An entity incurs a joint cost of Rs. 64,500 in producing two products A (200 units), B (200 units) and earns a sales revenue of Rs. 86,000 by selling @ Rs. 170 per unit of product A and product B @ Rs. 260 per unit. Further processing costs for products A and B are Rs. 4,000 and Rs. 32,000 respectively the Joint cost can be apportioned to products A and B as follows:

Particulars	Product- A Amount (Rs.)	Product- B Amount (Rs.)
Sales Value	34,000 (Rs.170 × 200 units)	52,000 (Rs.260 × 200 units)
Less: Post split-off cost (Further processing cost)	(4,000)	(32,000)
Net Realizable Value	30,000	20,000
Apportionment of Joint Cost of Rs. 64,500 in ratio of 3:2	38,700	25,800

The net realizable value at split-off point method is widely used in the industries. This method is used when the realizable value of joint products at split-off is not known.

(iii) Market value at the point of separation: This method is used for the apportionment of joint costs to joint products upto the split off point. To determine the apportionment of joint costs over joint products, a factor known as multiplying factor is determined. This

multiplying factor on multiplication with the sales values of each joint product gives rise to the proportion of joint cost.

$$\text{Multiplying factor:-} \quad \frac{\text{Joint Cost}}{\text{Total Sales Revenue}} \times 100$$

Example: An entity incurs a joint cost of Rs.64,500 in producing two products A (200 units), B (200 units) and earns a sales revenue of Rs. 86,000 by selling @ Rs. 170 per unit of product A and product B @ Rs. 260 per unit.

The multiplying factor in this case is obtained by dividing the total joint cost by total sales revenue and finally multiplying the figure so obtained by 100. The multiplying factor based on the data can be computed as follows:

$$\text{Multiplying Factor} \quad \frac{\text{Rs. 1,00,000}}{\text{2,000 ton}} \times 100 = 75\%$$

Joint cost apportioned over product A	=	Sales revenue of product A × 75%
	=	Rs. 34,000 × 75%
	=	Rs. 25,500
Joint cost apportioned over product B	=	Sales revenue of product B × 75%
	=	Rs. 52,000 × 75%
	=	Rs. 39,000

(iv) **Market value after further processing:** Here the basis of apportionment of joint cost is the total sales value of finished products and involves the same principle as discussed above. Suppose that in the example given above, if sales prices of products A and B after further processing are Rs. 200 and Rs. 300 respectively the joint cost apportioned over Products A and B is as follows:

The pre-separation costs of Rs. 64,500 will be apportioned in the ratio of (2: 3) as follows:

Market sales value after further processing

		(Rs.)
A : 200 units × Rs. 200	=	40,000
B : 200 units × Rs. 300	=	60,000
		1,00,000

Joint cost apportionment:

$$A = \text{Rs. } 64{,}500 \times \frac{\text{Rs. } 1{,}00{,}000}{\text{2,000 ton}} = \text{Rs. } 25{,}800$$

$$B = \text{Rs. } 64{,}500 \times \frac{\text{Rs. } 60{,}000}{\text{Rs. } 1{,}00{,}000} = \text{Rs. } 38{,}700$$

The use of this method is unfair where further processing costs after the point of separation are disproportionate or when all the joint products are not subjected to further processing. The net realizable value method which is discussed as above overcomes the shortcoming of this method.

(v) **Average Unit Cost Method:** Under this method, total process cost (upto the point of separation) is divided by total units of joint products produced. On division average cost per unit of production is obtained.

Average unit cost = Total process cost (upto the point of separation) ÷ Total units of joint product produced.

This is a simple method. The effect of application of this method is that all joint products will have uniform cost per unit. If this method is used as the basis for price fixation, then all the products may have more or less the same price. Under this method customers of high quality items are benefitted as they have to pay fewer prices on their purchase.

ILLUSTRATION 2

Find out the cost of joint products A, B and C using average unit cost method from the following data:

(a) Pre-separation Joint Cost Rs. 60,000

(b) Production data:

Products	Units produced
A	500
B	200
C	300
	1,000

SOLUTION

$$\text{Average cost per unit} = \frac{\text{Total joint costs}}{\text{Units produced}} = \frac{\text{Rs. } 60{,}000}{\text{Rs. } 1{,}00{,}000} = \text{Rs. } 60$$

The joint costs apportioned @ Rs. 60 are as follows:

Products	**Units**	**Cost per unit (Rs.)**	**Value (Rs.)**
A	500	60	30,000
B	200	60	12,000
C	300	60	18,000
Total			60,000

(i) Contribution Margin Method: According to this method, joint costs are segregated into two parts - variable and fixed. The variable costs are apportioned over the joint products on the basis of units produced (average method) or physical quantities. In case the products are further processed after the point of separation, then all variable cost incurred be added to the variable costs determined earlier. In this way total variable cost is arrived which is deducted from their respective sales values to ascertain their contribution. The fixed costs are then apportioned over the joint products on the basis of the contribution ratios.

ILLUSTRATION 3

Find out the cost of joint products A and B using contribution margin method from the following data:

Sales
A : 100 kg @ Rs. 60 per kg. B : 120 kg @ Rs. 30 per kg.
Joint costs:
Marginal cost Rs. 4,400 Fixed cost Rs. 3,900

SOLUTION

The marginal cost (variable cost) of Rs. 4,400 is apportioned over the joint products A and B in the ratio of their physical quantity i.e 100: 120

Marginal cost for Product A : $\text{Rs.}4{,}400 \times \frac{100}{220}$ = Rs.2,000

Marginal cost for Product B : $\text{Rs. } 4{,}400 \times \frac{120}{220}$ = Rs.2,400

The fixed cost of Rs. 3,900 is apportioned over the joint products A and B in the ratio of their contribution margin i.e. 40 : 12

(Refer to working note)

Product A : Rs. 3,900 × 40/52 = Rs. 3,000

Product B : Rs. 3,900 × 12/52 = Rs. 900

Working Note:

Computation of contribution margin ratio

Products	Sales revenue (Rs.)	Marginal cost ()	Contribution (Rs.)
A	6,000	2,000	4,000
B	3,600	2,400 (Refer to above)	1,200

Contribution ratio is 40: 12

Fill the blanks:

1. Costs that are easily traced to individual products are _____.
2. The _____ allocates joint production costs by comparing the percentage of sales to the percentage of production.
3. The _____ allocates joint production costs based on each product's share of total units.
4. The _____ allocates joint production costs based on each product's share of revenue at the split-off point.
5. The _____ allocates joint production costs based on the proportionate share of the product's eventual revenue less further processing costs.
6. A(n) _____ tries to incorporate the relative size of products or the difficulty to produce them.
7. _____ make no attempt to cost the by-product or its inventory.
8. The _____ is where the joint products become separate and identifiable.
9. The _____ values by-products at the opportunity cost of purchasing or replacing the products.

Answers:

1. Separable costs
2. Sales-to-production-ratio method
3. Physical units' method
4. Sales-value-at-split-off method
5. Net realizable value method
6. Weight factor
7. Non-cost methods
8. Split-off point
9. Replacement cost method

I. MULTIPLE CHOICE QUESTIONS:

1. Which of the following is *not* an acceptable method of accounting for by-products?
   - **a.** The revenue from the sale of by-products is credited to "Other Income."
   - **b.** The by-product is valued at its opportunity costs of purchasing or replacing the product.
   - **c.** The revenue from the sale of by-products is deducted from the costs of the main products.
   - **d.** The by-product is valued at a standard price; any fluctuations in the price are isolated in a variance account.
   - **e.** All of the above methods are acceptable approaches to accounting for by-products.

2. Which of the following is a *true* statement regarding joint costs?
- **a.** Joint costs are easily traced to individual products.
- **b.** The primary reason for allocating joint costs is to determine whether a product should be sold immediately or processed further.
- **c.** The primary reason for allocating joint costs is for inventory valuation for financial reporting.
- **d.** Joint costs consist only of overhead, never of materials or direct labor.
- **e.** None of the above statements are true.

3. Which of the following costs of a joint process would be allocated to the joint products?
- **a.** materials, labor, and overhead
- **b.** labor and overhead only
- **c.** materials and labor only
- **d.** conversion costs less by-product values
- **e.** prime costs less by-product values

4. The joint cost allocation method that yields the same gross margin percentage for each product is the:
- **a.** net realizable value method.
- **b.** sales-to-production-ratio method.
- **c.** physical units method.
- **d.** constant gross margin percentage method.
- **e.** sales-value-at-split-off method.

5. The joint cost allocation method that assigns joint production costs based on the proportionate share of eventual revenues less further processing costs is the:
- **a.** net realizable value method.
- **b.** sales-to-production-ratio method.
- **c.** physical units method.
- **d.** constant gross margin percentage method.
- **e.** sales-value-at-split-off method.

6. The secondary product recovered in the course of manufacturing a primary product during a joint process is:
- **a.** a by-product.
- **b.** a joint product.
- **c.** a replacement product.
- **d.** a split-off product.
- **e.** none of the above.

7. Which of the following joint cost allocation methods is *not* acceptable for financial reporting under generally accepted accounting principles?
- **a.** net realizable value method
- **b.** sales-value-at-split-off method
- **c.** physical units method
- **d.** constant gross margin percentage method
- **e.** All of the methods are acceptable under GAAP.

MULTIPLE-CHOICE QUIZ

1	2	3	4	5	6	7
E	C	A	D	A	A	E

II. MULTIPLE-CHOICE QUIZ

1. In sugar manufacturing industries molasses is also produced along with sugar. Molasses may be of smaller value as compared with the value of sugar and is known as
(a) Common product
(b) By- product
(c) Joint product
(d) None of them

2. Method of apportioning joint costs on the basis of output of each joint product at the point of split off is
(a) Sales value method
(b) Physical unit method
(c) Average cost method Marginal
(d) cost and contribution method

3. In the Net realisable value method, for apportioning joint costs over the joint products, the basis of apportionment makes use of
(a) Selling price per unit of each of the joint products
(b) Selling price multiplied by units sold of each of the joint products
(c) Sales value of each joint product less further processing costs of individual products
(d) Both (b) and (c)

4. The main purpose of accounting of joint products and by- products is to
(a) Determine the opportunity cost
(b) Determine the replacement cost
(c) Determine profit or loss on each product line
(d) None of the above

5. Under net realizable value method of apportioning joint costs to joint products, the selling & distribution cost is:
(a) Added to joint cost
(b) Deducted from further processing cost
(c) Deducted from sales value
(d) Ignored

6. Which of the following is a co-product:
(a) Diesel and Petrol in an oil refinery
(b) Edible oils and oil cakes
(c) Curd and butter in a dairy
(d) Mustard oil and Sunflower oil in an oil processing company.

7. Which of the following is an example of by-product
(a) Diesel and Petrol in an oil refinery
(b) Edible oils and oil cakes
(c) Curd and butter in a dairy
(d) Mustard seeds and mustard oil.

8. Which of following method can be used when the joint products are of unequal quantity and used for captive consumption:
(a) Technical estimates, using market value of similar goods
(b) Net Realisable value method
(c) Physical Units method

(d) Market value at split-off method.

9. Which of the following statement is not correct in relation to Co-products:
(a) Co-products may also have joint products
(b) Costing for co-products are done according to process costing method
(c) Co-products do not have any by-products
(d) Co-products are treated as a separate cost object for costing purpose.

10. When a by-product does not have any realisable value, the cost of by-product is:
(a) Transferred to Costing Profit & Loss A/c
(b) By-product cost is borne by the good units
(c) By-product cost is ignored
(d) By-product cost is determined taking value of similar goods

Answers:

1	2	3	4	5	6	7	8	9	10
(b)	(b)	(d)	(c)	(c)	(d)	(b)	(a)	(c)	(b)

Questions for Self-practice

I. Objective Type

(A) State True/False

1. Stock reserve is created for unrealised profit where the output of one process is transferred to the next process at cost.
2. Process costing is used in industries working against specific orders.
3. The sales value of scrap is credited to Process A/c.
4. The sale value in units of abnormal loss is credited to Abnormal Loss A/c.
5. The cost of units of abnormal loss is credited to Process A/c.
6. The cost of abnormal gain is debited to Process A/c.
7. Cement companies follow practice process costing.
8. Separate A/c is not necessary for each process.
9. Abnormal loss is non-controllable.
10. Normal loss is controllable.
11. In Abnormal Loss A/c, the balancing figure is transferred to Costing P & L A/c.
12. In Abnormal Gain A/c, the balancing figure is taken to costing P & L A/c.
13. Abnormal gain is excess of normal output over actual output.
14. Normal loss is debited to Process A/c.
15. Cost accounting includes process costing.
16. Process costing, by-products and job costing are same.

[Ans.: True: 3,4,5,7,11,15
False: 1,2,6,8,9,10,12,13,14,16]

(B) Multiple Choice Questions

1. Abnormal loss is charged to _____.
(i) Process A/c (ii) Costing P & L A/c (iii) Normal Loss A/c

2. The stage where joint products are separated from each other is known as _____.
(i) BEP (ii) Angle of incidence **(iii) Split-off point**

3. Process costing is followed when _____.
(i) Standardized goods are produced (ii) perishable goods are manufactured
(iii) Consumer goods are manufactured

4. Scrap value of normal loss is _____.
(i) Debited to Process A/c **(ii) Credited to Process A/c** (iii) Debited to Financial A/c

5. Normal loss is a _____.
(i) Valuation A/c **(ii) Nominal A/c** (iii) Real A/c

6. Abnormal gain occurs due to _____.
(i) Good supervision **(ii) Efficiency of production department** (iii) Control over material cost

7. Abnormal loss arises due to _____.
(i) Normal situations **(ii) Abnormal situations** (iii) Unavoidable conditions
8. Abnormal loss is valued at _____.
(i) Market rate (ii) Scrap value **(iii) Cost of output**

9. Process costing is applied when _____.
(i) Large number of identical units is manufactured
(ii) Large number of different units is manufactured
(iii) Small number of different units is manufactured

10. Process cost is based on the concept of _____.
(i) Average cost (ii) Marginal cost (iii) Standard cost

[Ans. 1. (i), 2. (iii), 3. (i), 4. (ii), 5. (ii), 6. (ii), 7. (ii), 8. (iii), 9. (i), 10. (i).]

(C) Match the Column

A	B
1. Process costing	(i) non-controllable **(2)**
2. Normal loss	**(ii)** abnormal conditions **(3)**
3. Abnormal loss	(iii) excess of actual output over normal output **(4)**
4. Abnormal gain	(iv) stages of production **(1)**
	(v) at market price of output
	(vi) standardized costing

[*Ans. 1. (iv), 2. (i), 3. (ii), 4. (iii).*]

(D) Match the Pair

A	B
1. Abnormal loss	(i) Normal cost/normal output **(4)**
2. Abnormal gain	(ii) Input × % of normal loss **(3)**
3. Normal loss	(iii) Actual output – Normal output
4. Unit cost	(iv) Normal output – Actual output
	(v) Unit cost × Unit of Abnormal loss **(1)**
	(vi) Unit cost × Unit of Abnormal gains **(2)**

[*Ans. 1. (v), 2. (vi), 3. (ii), 4. (i).*]

CONTRACT ACCOUNT

Contract Costing is applicable in:

- ✓ Building Construction
- ✓ Road Construction
- ✓ Bridge Construction
- ✓ Ship Building, etc.,

- ➢ Contract costing, also known as terminal costing, is a alternative of job costing.
- ➢ Contract means a big job in which work is done at site and not in factory premises.
- ➢ It is created on the basis of agreement between two persons called contactor (Person accepted to perform the Job) and contractee (Person offered a Job).
- ➢ The consideration accepted at the time of agreement is called Contract Price.
- ➢ The cost and Profit of each contract is ascertained with the help of contract account opened in the books of Contractor.
- ➢ It is a kind of nominal account like Trading and Profit and loss account. Each Contract is a cost Unit.

Features of Contract Costing

Contract costing usually shows the following features: .

1. Contracts are generally of large size and, therefore, a contractor usually carries out a small number of contracts at a particular point of time.
2. A contract generally takes more than one year to complete,
3. Work on contracts is carried out at the site of contracts and not in factory premises.
4. Each contract undertaken is treated as a cost unit.
5. A separate contract account is prepared for each contract in the books of contractor to ascertain profit or loss on each contract.
6. Most of the materials are specially purchased for each contract. These will, therefore, be charged direct from the supplier's invoices. Any materials drawn from the store are charged to contract on the basis of material requisition notes.
7. Nearly all labour cost will be direct.
8. Most expenses (*e.g.*, electricity, telephone, insurance, etc.) are also direct.
9. Specialist subcontractors may be employed for say, electrical fittings, welding work, glass work, etc.
10. Plant and equipment may be purchased for the contract or may be hired for the duration of the contract.
11. Payments by the customer (contractee) are made at various stages of completion of the contract based on architect's certificate for the completed stage. An amount, known as retention money, is withheld by the contractee as per agreed terms.
12. Penalties may be incurred by the contractor for failing to complete the work within the agreed period.

Contract account format

in case of contract is completed:
In the Books of Contractor
Contract No ___ A/c
for the period _____

Particulars	Rs.	Rs.	Particulars	Rs.	Rs.
To Material Purchased		xxx	By Materials Returned to store	-	xxx
To Material Issued from Stores		xxx	By Materials Returned to suppliers	-	xxx
To Material Transfer from Other Contract		xxx	By Material Transferred to other Contract	-	xxx
To Wages	xxx		By P & L A/c - Material lost	-	xxx
Add: Outstanding wages	xxx	xxx	By Plant Returned to store	-	xxx
To Overheads	xxx		By P & L A/c - Plant Lost	-	xxx
Add: Outstanding	xxx	xxx	By Contractee a/c – **contract price**	-	xxx
To Depreciation on P & M	-	xxx	By P & L A/c if Loss		xxx
To P & L A/c - when completed	-	xxx			
	-	xxx		-	xxx

Contract account format
in case of incompleted contract:
In the Books of Contractor
Contract No ___ A/c

for the period _____

Particulars	Rs.	Rs.	Particulars	Rs.	Rs.
To Material Purchased		xxx	By Materials Returned to store		xxx
To Material Issued from Stores		xxx	By Materials Returned to suppliers		xxx
To Material Transfer from Other Contract		xxx	By Material Transferred to Other Contract		xxx
To Wages	xxx		By P & L A/c - Material lost		xxx
Add: Outstanding wages	xxx	xxx	By Plant Returned to store		xxx
To Overheads	xxx		By P & L A/c - Plant Lost		xxx
Add: Outstanding	xxx	xxx	By P & M at site or Closing value		xxx
To Plant & Machinery		xxx	By Work in Progress A/c c/d		
To P & L A/c - when completed		xxx	(i) Work Certified		
To Notional Profit c/d (?)		xxx	(ii) Work Uncertified		xxx
			By P & L A/c if Loss		xxx
		xxx			xxx
To P & L A/c (as per rule)		xxx	By Notional Profit b/d		xxx
To Reserve or WIP A/c (b/f)		xxx			
		xxx			xxx

Contractee A/c

To Balance c/d	xxx	By Bank a/c	xxx
	xxx		xxx
		By Balance b/d	xxx

PROFIT ON INCOMPLETE CONTRACTS

There are no hard and fast rules in this regard. However, the following general rules may be followed:

1. When work-in-progress certified is less than 1/4 of the contract price, no profit is transferred to Profit and Loss Account. This is based on the principle that no profit should be taken into account unless the contract has reasonably advanced.

2. When work-in-progress certified is 1/4 or more but less than 1/2 of the contract price, then generally 1/3 of the profit is transferred to Profit and Loss Account. The balance amount is treated as reserve. Thus, profit to be transferred to Profit and Loss Account is computed by the following formula:

$$\text{Transfer to P\&L A/c} = \text{Notional profit X } \frac{1}{3} \text{ x } \frac{Cash\ Received}{Work\ Certified}$$

3. When work certified is 1/2 or more but less than 9/10 of the contract price, (*i.e.*, 50% to 90%), then the profit to be transferred to P & L Account is computed as follows:

$$\text{Transfer to P\&L A/c} = \text{Notional profit X } \frac{2}{3} \text{ x } \frac{Cash\ Received}{Work\ Certified}$$

4. When contract is near completion then the estimated profit should be calculated on the whole contract. The proportion of estimated profit to be transferred to Profit and Loss Account is computed by any one of the following formulas:

a. $\text{Estimated Profit x } \frac{Work\ Certificed}{contract\ \ Price}$

b. $\text{Estimated Profit x } \frac{Cash\ Received}{Work\ Certified} \text{ x } \frac{Work\ Certified}{Contract\ \ Price}$

c. $\text{Estimated Profit x } \frac{Cost\ of\ work\ \ to\ date}{Estimated\ \ Total\ Cost\ of\ Work}$

d. Estimated Profit x $\frac{Cost\ of\ work\ to\ date}{Work\ Certified}$ x $\frac{Cash\ Received}{Work\ Certified}$

5. **Loss on Uncompleted Contracts.** In the event of a loss on uncompleted contracts, this should be transferred in full to the Profit and Loss Account, whatever be the stage of completion of the contract.

PLANT DEPRECIATION

There are two different methods generally followed in accounting depreciation on plant & Machinery in contract account:

Method 1: In case of incompleted Contract generally used:

(a) Contract account is debited with the cost of the plant installed.

(b) At the end of the year contract account is credited with depreciated value.

(c) In case plant is sold the contract account is credited with its sale proceeds.

Method 2: In case of completed Contract:

Contract account is simply debited with the amount of depreciation for the period of usage in the Contract. No need to debit the P & M account

WORK-IN-PROGRESS — Work Certified and Uncertified

When the contract is not completed till the end of the accounting year, The Value of work done (work in Progress) must be valued by the architect and has to issue a certificate. Such work-in-progress is classified into work certified and work uncertified.

Work Certified. This is that part of the work-in-progress which has been approved by the contractee's architect or engineer for payment.

Work Uncertified. This is that part of the work-in-progress which is not approved by the architect or engineer.

Both work certified and uncertified appear on the credit side of the contract account and also on the assets side of the balance sheet.

RETENTION MONEY AND CASH RATIO

- It is usual practice that the contractee will not pay the full amount of work certified.
- The contractee may pay a fixed percentage, say 80% or 90% of the work certified, depending upon the terms of the contract. This is known as *Cash Ratio*.
- The balance amount not paid is known as Retention *Money*. This retention money is a type of security for any defective work which may be found in the contract later on.

For Example:

- Work certified = 100%
- When Cash Ratio is 80% then
- Retention Money will be 20%.

ESCALATION CLAUSE

Generally contracts take long time to complete and there may be changes in the price of Mterial and Labour.

Escalation clause is often provided in contracts to cover any likely changes in the price or utilization of materials and labour. The object of this clause is to safeguard the interest of the contractor against unfavourable changes in cost.

Thus, a contractor is entitled to suitably enhance the contract price if the cost rises beyond a given percentage.

De-Escalation Clause

Just as an escalation clause safeguards the interest of the contractor by upward revision of the contract price, a de-escalation clause may be inserted to look after the interest of the contractee by providing to downward revision of the contract price in the event of cost going down beyond an agreed level.

COST-PLUS CONTRACTS

When the cost of the contract is not possible to predict with reasonable degree of accuracy in advance due to unstable market price conditions in the price of material, labour etc this type of contract is preferred.

Cost-plus contract is a contract in which the contract price is ascertained by adding a specified amount or percentage of profit to the costs allowed in the contract.

The contractee undertakes to reimburse the actual cost of contract plus a stipulated profit.

The profit to be added to cost may be either a fixed amount or a specified percentage of cost.

The items of cost to be included for the purpose of determining contract price are broadly agreed upon in advance.

The accounts of the contractor are usually subject to audit by the contractee.

Cost-plus contracts are usually entered into for executing special type of work, like construction of dam, powerhouse, newly-designed ship, etc., where estimation of cost is difficult.

Government often prefers to give contracts on 'cost-plus' terms.

Cost-plus contracts offer the following advantages:

To the Contractor:

1. There is no risk of loss on such contracts.
2. It protects him from the risk of fluctuations in market prices of material, labour, etc.
3. It simplifies the work of preparing tenders and quotations.

To the Contractee:

The contractee can ensure a fair price of the contract by being entitled to audit the accounts of the contractor.

The disadvantages of cost-plus contracts are:

To the Contractor:

1. The contractor is deprived of the advantages which would have accrued due to favourable market prices.
2. The contractor has to suffer for his own efficiency. This is because profit is usually based as a percentage of cost and efficient working resulting

in lower cost also leads to lower profits.

To the Contractee:

1. The contractee has to pay more for the inefficiency of the contractor as a contractor has no incentive to reduce costs.
2. The price a contractee has to pay is unknown until after the completion of work.

Problem 1:

The following expenditure was incurred on a contract of Rs. 12,00,000 for the year ending 31-12-2015.

	Rs.
Materials	2,40,000
Wages	3,28,000
Plant	40,000
Overheads	17,200

Cash received on account of the contract to 31st Dec., 2015 was Rs. 4,80,000, being 80% of the work certified. The value of materials in hand was Rs. 20,000. The plant had undergone 20% depreciation. Prepare Contract Account.

Problem 2:

The following expenses were incurred on an unfinished contract during the year 2015.

Materials	Rs. 90,000
Wages	Rs. 60,000
Other expenses	Rs. 30,000

Rs. 2,00,000 was received by the contractor, being 80% of the work certified. Work done but not certified was Rs. 5,000. Determine the profit to be credited to profit and loss account and profit kept reserve in all the three alternatives given below:

(i) Contract price is	Rs. 3,00,000
(ii) Contract price is	Rs. 5,50,000
(iii) Contract price is	Rs. 12,00,000

Problem 3:

How much of profit, if any, you would consider in the following case:

Contract price	Rs. 20,00,000
Cost incurred	Rs. 11,20,000
Cash received	Rs. 10,80,000
Work not certified	Rs. 1,20,000

Deduction from bills by way of security deposit is 10%.

Problem 4:

The following were the expenses on a contract which commenced on 1st January 2015.

	Rs.
Materials purchased	1,10,000
Material at the end	1,250
Direct wages	15,000
Plant issued	5,000
Direct expenses	8,000

The contract price was Rs. 1,50,000. It was duly received when the contract was completed on 31-3-2015. Charge indirect expenses at 15% on wages and provide Rs. 1,000 for depreciation on plant. Prepare the contract account and contractee's account.

Problem 5:

Thekedar accepted a contract for the construction of a building for Rs. 10,00,000, the contractee agreeing to pay 90% of work certified by the architect. During the first year, the amounts spent were:

Particulars	*Rs.*	*Particulars*	*Rs.*
Material	1,20,000	Machinery	30,000
Labour	1,50,000	Other expenses	90,000

At the end of the year, the machinery was valued at Rs. 20,000 and materials at site were of the value of Rs. 5,000. Work certified during the year totalled Rs. 4,00,000. In addition work- in-progress not certified at the end of the year had cost Rs. 15,000. Prepare Contract Account in the books of Thekedar. Also show the various figures of profit that can be reasonably transferred to the Profit and Loss Account.

Problem.6:

The BBA Construction Company undertakes large contracts. The following particulars relate to contract No. 125 carried out during the year ended on 31st March, 2015.

Particulars	*Rs.*	*Particulars*	*Rs.*
Work certified by architect	1,43,000	Wages accrued on 31st March 2015	1,800
Cost of work not certified	3,400	Direct expenditure	2,400
Plant installed at site	11,300	Materials on hand on 31st March 2015	1,400
Value of plant on 31st March 2915	8,200	Materials returned to store	400
Materials sent to site	64,500	Direct expenditure accrued on 31st	-
Labour	54,800	March 2015	200
Establishment charge	3,250	Contract price	2,00,000
		Cash received from contractee	1,30,000

Prepare a Contract Account for the period ending 31st March 2015 and find out the profit. It was decided to transfer 2/3 of the profit on cash basis to Profit and Loss Account.

Problem 7:

The Indian Construction Co. Ltd. has undertaken the construction of a bridge over the River Yamuna for a Corporation. The value of the contract is Rs. 15,00,000 subject to retention of 20% until one year after certified completion of the contract, and final approval of the Corporation's engineer. The following are the details as shown in the books on 30th June, 2015.

	Rs.		*Rs.*
Labour on site	4,05,000	Materials on hand on June 30th, 2015	6,300
Materials direct to site	4,20,000	Wages accrued on June 30th, 2015	7,800
Materials from stores	81,200	Direct expenses accrued on June 30th 2015	1,600
Hire and use of plant	12,100	Works not yet certified at cost	16,500
Direct expenses	23,000	Amount certified by the engineer	11,00,000
General overhead allocated to the contract	37,100	Cash received on account	8,80,000

Prepare (*a*) Contract Account, (*b*) Contractee's Account, and (*c*) show how it would appear in the Balance Sheet.

Problem 8:

An expenditure of Rs. 3,88,000 has been incurred on a contract upto the end of 31st December, 2015. The value of work certified is Rs. 4,40,000. The cost of work uncertified is Rs. 12,000. It is estimated that contract will be completed by 31st March, 2015 and an additional expenditure of Rs. 80,000 will have to be incurred to complete the contract. The total estimated expenditure on the contract is to include a provision of 2.5 per cent for contingencies. The contract price is Rs. 5,60,000 and Rs. 4,00,000 has been realised in cash upto 31st December, 2015. Calculate the proportion of profit to be taken to Profit and Loss Account as on 31st December, 2015 under different methods. (*B.Com. Hons., Delhi; M.Com. Madras*)

Answers:

Particulars	1	2	3*	4	5	6	7
Notional Profit Rs.	26,800	75,000	2,00,000	NIL	50,000	18,150	1,35,000
Profit & Loss Rs.	14,283	(i) 40000 (ii) 20,000 (iii) Nil	1,20,000	15,000	15,000	11,000	72,000

*Cash received is 100 – 10% = 90% of the bills or work certified. Thus work certified	12,00,000
*Notional profit = (Work certified + Uncertified) – Cost incurred	-

3.8: Solution:

Calculation of Notional Profit	*Rs.*	**Estimated Profit on Full Contract**	*Rs.*
Value of work certified	4,40,000	Contract price	5,60,000
Add: Cost of work not certified	12,000	*Less:* Cost to date	3,88,000
	4,52,000	Further cost	80,000
		Contingencies Note 1:	12,000 *
Less: Cost to date	3,88,000		4,80,000
Notional Profit	64,000	Estimated profit	80,000

Note 1: Calculation of Contingencies:

$(3,88,000 + 80,000) \times \frac{2.5}{97.5}$ = Rs. 12,000 for contingencies.

Profit to be transferred to Profit and Loss Account

Method (*i*) $\frac{2}{3} \times$ Notional profit $= \frac{2}{3} \times 64,000 =$ Rs,42,667

Method (*ii*) $\frac{2}{3} \times$ Notional profit $\times \frac{\text{Cash received}}{\text{Work certified}} = \frac{2}{3} \times 64,000 \times \frac{4,00,000}{4,40,000} =$ Rs,38,788

Method (*iii*) Estimated profit $\times \frac{\text{Work certified}}{\text{Contract price}} = 80,000 \times \frac{4,40,000}{5,60,000} =$ Rs, 62,857

Method (*iv*) Estimated profit $\times \frac{\text{Work certified}}{\text{Contract price}} \frac{\text{Cash received}}{\text{Work certified}}$

80,000 x 4,40,000/5,60,000 X 4,00,000/4,40,000
= Rs. 57,143

III. MCQ

1. The costing method which can be used in industry where the product pass through different processes is known as _____.
A job costing
B operating costing
C. batch costing
D. process costing

10.Value of normal loss is charged to _____.
A. other good product
B. trading a/c
C. profit and loss a/c
D. costing profit and loss a/c

11. Which of the following will be affected by normal loss?
A. Costing profit
B. Financial profit
C. Process profit
D. cost of Good units

12. Actual loss is less than the predetermined normal loss, it is _____.
A. normal loss
B. abnormal loss
C. seasonal loss
D. abnormal gain

13. When output of earlier process is transferred at a profit to the subsequent process, it is _.
A. inter departmental profit
B. abnormal gain
C. inter process profit
D. manufacturing profit

14. 100 units are introduced in a process in which normal loss is 5% of input If actual output is 97 then there is _____.
A. no abnormal loss and normal gain
B. 2 units of abnormal gain
C. 3 units of abnormal gain
D. 3 units of normal loss

15. 50 units are processed at a cost of Rs 80, normal loss is 10%, each unit carries a scrap value of 25 paise. If output is 40 units, the value of abnormal loss will be _____.
A. Rs. 1.25
B. Rs. 800
C. Rs. 875
D. Rs. 888

16. Abnormal process loss can be transferred to _____.
A. costing profit and loss a/c
B. financial profit and loss a/c
C. manufacturing
D. trading

17. When two products are simultaneously produced in a process and one of them has comparatively high value and other is of low value , the low value product is called _____.
A. joint products
B. by products
C. seasonal products
D. economic products

18. If any by-product is produced and sold it is credited to _____.
A. profit and loss a/c
B. by-product a/c
C. process a/c
D. abnormal gain a/c

19. Balance of abnormal gain a/c is transferred to _____.
A. balance sheet
B. debit side of profit and loss a/c
C. credit side of profit and loss a/c
D. costing profit and loss a/c

20. Inter process profits are _____.
A. credited to each process a/c
B. debited to respective process a/c
C. shown only in the finished stock a/c
D. shown in the balance sheet

21.Input is 10,000 units and normal loss is 20% of input and abnormal loss is 400 units What is actua
A. 7600 units B. 10,000 units C. 10, 400 units D. 12,000 units

22. Cost of process Rs1,60,000 and profit to be charged on the transfer price is 20% What is the inter process profit?
A. Rs 32,000; **B. Rs 40,000;** C. Rs 48,000 D. Rs 54,000

23. Job costing method is the most suitable method for _____
A. oil process units; B. transport companies; C. sugar industries; **D. repair shops**

24. Which method of costing can be used in furniture manufacture industr24. Which method of costing can be used in furniture manufacture industr
A. Job costing; B. Contract costing; C. Process costing; D. Specific order costing

25. Contract costing is most appropriate method of costing for _____
A. construction industry; B. banking industry; C. textile mills; D. cement industry

26. Cost of contract and profit or loss thereon are determined by preparing _____.
A. cost sheet
B. profit and loss a/c

C. trading a/c
D. separate ledger a/c

27. The basis for determining profit to be taken into account on incomplete contract is _____.
A. cost of contract
B. contract price
C. percentage of work certified as done
D. uncertified work

28. The amount paid to sub-contractor is _____.
A. subtracted from the contract price
B. debited to contract a/c
C. credited to contract a/c
D. added with the contract price

29. Work uncertified is _____. Answer & Solution Discuss in Board (
A. debited to contract a/c
B. credited to contract a/c
C. debited to contractor a/c
D. debited to profit and loss a/c

30. In case of complete contract, the whole amount of profit is transferred to _____.
A. contract a/c
B. work in progress a/c
C. profit and loss a/c
D. contractee a/c

31. Process a/c is _____.
A. nominal a/c
B. a real a/c
C. personal a/c
D. either nominal or real a/c

32. Profit to be transferred to profit and loss a/c, if the contract is complete to the extent of only 20% is _.
A. nil
B. 20%
C. 25%
D. 75%

Problem – 1:

A manufacturing concern, which has adopted standard costing, furnished the following information:
Standard Material for 70 kg finished product: 100 kg.
Price of materials: Re. 1 per kg.
Actual Output: 2,10,000 kg.
Material used: 2,80,000 kg. Cost of material: Rs. 2,52,000.
Calculate:
(a) Material Usage Variance (b) Material Price Variance (c) Material Cost Variance

Solution:

(1) Standard quantity	For 70 kg standard output
	Standard quantity of material = 100 kg.
	2,10,000 kg. of finished products
	$\frac{2,10,000 \times 100}{70}$ = 3,00,000 kg.
(2) Actual price per kg.	$\frac{Rs.2,52,000}{2,80,000}$ = Re.0.90
(a) Material Usage Variance	= Standard Rate (Standard quantity for actual output – Actual quantity)
	=Re. 1 (3,00,000 – 2,80,000)
	=Re. 1 x 20,000
	=Rs. 20,000 (favorable)
(b) Material Price Variance	=Actual quantity(Standard price -Actual price)
	2,80,000 (Re.1 – Re.0.90)
	2,80,000 x Re.0.10
	Rs. 28,000 (Favorable)
(c) Material Cost Variance	= Standard quantity for actual output x Standard rate) – (Actual quantity x Actual rate)
	=(3,00,000 x 1) – (2,80,000 x 0.90)
	= Rs.3,00,000 x Rs. 2,52,000
	Rs.48,000(favorable)

Verification:

MCV = MPV + MUV = Rs. 48,000 (F) = Rs.28,000 (F) + Rs.20,000 (F)

Problem – 2

The standard mix to produce one unit of product is as follows:

Material A	60 units @ Rs. 15 per unit = Rs.	9,00
Material B	80 units @ Rs. 20 per unit = Rs.	1,600
Material C	100 units @ Rs. 25 per unit = Rs.	2,500
	240 units	Rs. 5,000

During the month of April, 10 units were actually produced and consumption was as follows:

Material A	640 units @ Rs. 17.50 per unit = Rs.	11,200
Material B	950 units @ Rs. 18.00 per unit = Rs.	17,100
Material C	870 units @ Rs. 27.50 per unit =Rs.	23,925
	2,460 units Rs.	52,225

Calculate all material variances.

Solution:-

Material	**Standard for 10 units**			**Actual for 10 units**		
	Qty	**Rate**	**Amt. Rs.**	**Qty**	**Rate**	**Amt. Rs.**
A	600	15	9,000	640	17.50	11,200
B	800	20	16,000	950	18.00	17,100
C	1,000	25	25,000	870	27.50	23,925
Total	2,400		50,000	2,460		52,225

Note: Calculation of Revised Standard Quantity (RSQ) :

Material A =	$\frac{2460 \times 600}{2400}$	= 615 Units
Material B =	$\frac{2460 \times 800}{2400}$	= 820 Units
Material C =	$\frac{2460 \times 1,000}{2400}$	= 1,025 Units

Calculation of Variances:

(1) Material Cost Variance	= Standard cost – Actual cost
	=Rs. 50,000 – Rs.52,225
MCV	= Rs.2,225(A)
(2) Material Price Variance	=(St. Price – Actual Price) x Actual Qty
Material A	= (15- 17.50) x 640 = Rs. 1,600 (A)
Material B	= (20 – 18) x 950 = Rs. 1,900 (F)
Material C	= (25 – 27.50) x 870 = Rs. 2,175 (A)
MPV	= Rs.1,875 (A)
(3) Material Usage Variance	= (St. Qty – Actual Qty.) x St. Price
Material A	= (600 – 640) x 15 = Rs. 600(A)
Material B	= (800- 950) x 20 = Rs.3,000 (A)
Material C	= (1,000 – 870) x 25 = Rs. 3,250 (F)
MUV	= Rs.350 (A)
(4) Material Mix Variance	= (Revised St. Qty – Actual Qty.) x St. Price
Material A	= (615 - 640) x 15 = Rs.375 (A)
Material B	=(820- 950) x 20 = Rs. 2,600 (A)

Material C	= (1,025- 870) x 25 = Rs. 3,875 (F)
MMV	= Rs. 900(F)
(5) Material Yield Variance	= (Actual yield – Standard yield) xSt. output price
	= (10 -10.25) x 5000 = Rs. 1,250 (A)

Check:

MCV =	MPV + MUV
Rs. 2,225 (A) =	Rs. 1,875 (A) + Rs.350 (A)

Check

MCV = MPV + MMV + MYV =

Rs. 2,225 (A) = Rs. 1,875 (A) + 900 (F) + Rs.1,250 (A)

Problem : 3

For making 10 kg of yarn, the standard material requirement is:

Material	Quantity (kg.)	Rate per kg. (Rs.)
White	8	6.00
Black	4	4.00

In March, 1,000 kg of yarn was produced. The actual consumption of materials is as under:

Material	Quantity (kg.)	Rate per kg. (Rs.)
White	750	7.00
Black	500	5.00

Calculate: (1) MCV (2) MPV (3) MUV

Solution:

Particular	Standard for 1000 kgs.			Actual for 1000 kgs.		
	Quantity	Rate	Amount	Quantity	Rate	Amount
A	800	6	4,800	750	7	5,250
B	400	4	1,600	500	5	2,500
Total	1,200		6,400	1,250		7,750

(1) MCV: SC - AC

= 6,400 - 7,750 **= Rs. 1,350 (A)**

(2) MPV: (SP - AP) x AQ

A = (6 - 7) x 750 **= Rs. 750 (A)**

B = (4 -5) x 500 **= Rs. 500 (A)**

= **1,250(A)**

(3) MUV: (SQ - AQ) x SP

A = (800 - 750) x 6 **= Rs. 300 (F)**

B = (400 - 500) x 4 **= Rs. 400 (A)**

= Rs. 100 (A)

Labour Variance:

Problem-4

Calculate Labour cost variance from the information:

Standard production : 100 units
Standard Hours : 500 hours
Wage rate per hour : Rs. 2
Actual production : 85 units

Actual time taken : 450 hours
Actual wage rate paid : Rs. 2.10 per hour

Solution:

Standard time for one unit = 500 hours ÷ 100 units = 5 hours Standard hours for actual production 85 units = 85 x 5 = 425 hours

Labour cost Variance = (Std. Hours of Actual Production x Std. Rate) - (Actual Hours x Actual Rate)
= (425 Hours x Rs. 2) --- (450 Hours x Rs. 2.10)
= (Rs .850 -- Rs. 945)
= RS. 95 (U)

Problem – 5

Standard wage rate is Rs. 2 per hour and standard time is 10 hours. But actual wage rate is Rs. 2.25 per hour and actual hours used are 12 hours.
Calculate Labour cost variance.

Solution:

Labour cost variance = (Std. Rate x Std. Hours) --- (Actual Rate x Actual Hours)
=(Rs. 2 x 10) – (Rs. 2.25 x 12)
= Rs. 20 – Rs. 27 =Rs. --- 7 (U)

Here labour variance is adverse because actual labour cost exceeds standard cost by Rs.7

Problem – 6

Standard labour hours and rate for production of one unit of Article P is given below:

	Per Unit Hour	Rate per Hour	Total Rs.
Skilled worker	5	1.50	7.50
Unskilled worker	8	0.50	4.00
Semi- skilled worker	4	0.75	3.00

Actual Data

	Rate per Hour	Total (Rs.)
Articles produced 1,000 units		
Skilled worker 4,500 hour	2.00	9,000
Unskilled worker 10,000 hour	0.45	4,500
Semi- skilled worker 4,200 hour	0.75	3,150

Calculate Labour cost variance.

Solution:

Labour cost variance = (SH for actual production x SR) --- (AH x AR)

Skilled worker = (5,000 x 1.50) --- (4,500 x 2)
= 7,500 – 9,000 = Rs. 1,500 (Adverse)

Unskilled worker = (8,000 x 0.50) --- (10,000 x 0.45)
= 4,000 - 4,500 = Rs. 500 (Adverse)

Semi- skilled worker = (4,000 x 0.75) --- (4,200 x 0.75)
= 3,000 --- 3,150 = Rs. 150 (Adverse)

Total Labour cost variance = Rs. 2,150(Adverse)

Problem – 7

India Ltd. Manufactures a particular product, the standard direct labour cost of which is Rs. 120 per unit whose manufacture involves the following:

Type of workers	Hours	Rate (Rs.)	Amount (Rs.)
A	30	2	60
B	20	3	60
	50		120

During a period, 100 units of the product were produced, the actual labour cost of which was as follows:

Type of workers	Hours	Rate (Rs.)	Amount (Rs.)
A	3,200	1.50	4,800
B	1,900	4.00	7,600
	5,100		12,400

Calculate: (1) Labour cost variance (2) Labour Rate variance (3) Labour Efficiency variance (4) Labour mix variance.

Solution:

Type of Worker	Standard for 100 units			Actual for 100 units		
	Hours	Rate	Amount	Hours	Rate	Amount
A	3,000	2	6,000	3,200	1.50	4,800
B	2,000	3	6,000	1,900	4.00	7,600
Total	5,000		12,000	5,100		12,400

(1) LCV: SC -AC

LCV = 12,000 - 12,400 = **Rs. 400 (A)**

(2) LRV: (SR - AR) x AH

A = (2 - 1.50) x 3,200 = **Rs. 1,600 (F)**

B = (3 - 4) x 1,900 = **Rs. 1,900 (A)**

= Rs. 300 (A)

(3) LEV: (SH - AH) x SR

A = (3,000 - 3,200) x 2 **= Rs. 400 (A)**

B = (2,000 - 1,900) x 3 **= Rs. 300 (F)**

= Rs. 100 (A)

(4) LMV: (RSH - AH) x SR

A = (3,060 - 3,200) x 2 **= Rs. 280 (A)**

B = (2,040 - 1,900) x 3 **= Rs. 420 (F)**

= Rs. 140 (F)

Working: Revised standard Hours:

RSH = St. hours of the type x Total actual hours / Total St. hours A = 3,000 x 5,100 / 5,000 = 3,060 hrs.

B = 2,000 x 5,100 / 5,000 = 2,040 hrs.

Overhead Variance:

Problem – 8

MLM Ltd. has furnished you the following information for the month of January:

	Budget	Actual
Outputs (units)	30,000	32,500
Hours	30,000	33,000
Fixed overhead	45,000	50,000
Variable overhead	60,000	68,000
Working days	25	26

Calculate overhead variances.

Solution: Calculations

Standard hour per unit = Budgeted hours/ Budgeted units = 30,000/30,000 = Re.1.

Standard hour for actual output = 32,500 units x 1 hour = 32,500

Standard overhead rate per hour =

Budgeted overheads / Budgeted hours For fixed overhead =

45,000/30,000 = Rs. 1.50 per unit

For variable overhead = 60,000/30,000 = Rs. 2 per unit

Standard fixed overhead rate per day = Rs. 45,000 ÷ 25 days = Rs. 1,800

Recovered overhead = Standard hours for actual output x Standard Rate

For fixed overhead = 32,500 hours x Rs. 1.50 = Rs. 48,750

For variable overhead = 32,500 hours x Rs. 2 = Rs. 65,000

Standard overhead =Actual hours x Standard Rate For fixed overhead

=33,000 x 1.50 =Rs. 49,500

For variable overhead =33,000 x 2 = Rs. 66,000

Revised budgeted hours = (Budgeted Hours/ Budgeted Days) x Actual days

$\frac{30,000}{25}$ x 26 = 31,200 hours

Revised budgeted overhead = 31,200 x 1.50 = Rs. 46,800

Calculation of Variances

Fixed Overhead Variances:

Fixed Overhead Cost Variance = Recovered Overhead – Actual Overhead

= 48,750 – 50,000 =**Rs. 1,250 (A)**

Fixed Overhead Expenditure Variance = Budgeted Overhead – Actual Overhead

=45,000 – 50,000 **=Rs. 5,000 (A)**

Fixed Overhead Volume Variance = Recovered Overhead – Budgeted Overhead

= 48,750 – 45,000 =**Rs. 3,750 (F)**

Fixed Overhead Efficiency Variance = Recovered Overhead – Standard Overhead

= 48,750 – 49,500 **= Rs. 750 (A)**

Fixed Overhead Capacity Variance = Standard Overhead – Revised Budgeted Overhead

= 49,500 – 46,800 **=Rs. 2,700 (F)**

Calendar Variance =(Actual days – Budgeted days) x Standard rate per day

= (26—25) x 1,800 =**Rs. 1,800 (F)**

Variable Overhead Variances:

- Variable Overhead Cost Variance = Recovered Overhead – Actual Overhead

  = 65,000 – 68,000 = **Rs. 3,000 (A)**
- Variable Overhead Expenditure Variance = Standard Overhead – Actual Overhead

  = 66,000 – 68,000 =**Rs. 2,000(A)**
- Variable Overhead Efficiency Variance = Recovered Overhead – Actual Overhead

  = 65,000 -- 66,000 = **Rs. 1,000 (A)**

UNIT-IV

Cost control and Cost Reduction-Control over wastages, Scrap, Spoilage and defectives– Methods of cost reduction.

COST CONTROL AND COST REDUCTION

One of the major concern of the enterprise is to maximize the profit, which is possible only through decreasing the cost of production. For this purpose, two efficient tools are used by the management, i.e. cost control and cost reduction.

Cost Control is a technique which provides the necessary information to the management that actual costs are aligned with the budgeted costs or not.

Conversely, **Cost Reduction** is a technique used to save the unit cost of the product without compromising its quality.

While cost control, regulates the action to keep the cost elements within the set limits, cost reduction refers to the actual permanent reduction in the unit cost.

Definition of Cost Control

Cost Control is a process which focuses on controlling the total cost through competitive analysis. It is a practice which works to maintain the actual cost in agreement with the established norms. It ensures that the cost incurred on an operation should not go beyond the pre-determined cost.

Cost Control involves a chain of functions, which starts from preparation of the budget in relation to the operation, thereafter evaluating the actual performance, next is to compute the variances between the actual cost & the budgeted cost and further, to find out the reasons for the same, finally to implement the necessary actions for correcting discrepancies.

The major techniques used in cost control are standard costing and budgetary control. It is a continuous process as it helps in analysing the causes for variances which control wastage of material, any embezzlement and so on.

Features of Cost control

Cost control process involves setting targets and standards, ascertaining the actual performance, comparing the actual performance with standard, investigating the variances and taking corrective action.

It aims at achieving the standard. It is a preventive function. In cost control, costs are optimized before they are incurred. It is generally applicable to items which have standards. It contains guidelines and directive management such as, how to do a thing.

Aspects Of Cost Control

1) Planning: Initially a plan or set of targets is established in the form of budgets and standards.

2) Communication: The next step is to communicate the plan to those whose responsibility is to implement the plan.

3)Motivation: Motivation is defined as the process that initiates, guides and maintains goal-oriented behaviors.

4) Appraisal and Reporting: comparison has to be made with the predetermined targets and actual performance. Deficiencies are noted and discussion is started to overcome deficiencies.

5) Decision-making: Finally, corrective actions and remedial measures are taken or the set of targets are revised, depending upon the administration's understanding of the problem.

Main Areas of cost control

- Materials,
- Labuor,
- Overheads,
- Sales,
- Energy,

Advantages cost control

1. It helps the firm to improve its profitability and competitiveness.
2. It helps the firm in reducing its costs and thus reduce its prices.
3. It is indispensable for achieving greater productivity.
4. If the price of the product is stable and reasonable, it can maintain higher sales and thus employment of work force.

Disadvantages of cost control

1. Reduces the flexibility and process improvement in a company.
2. Restriction on innovation.
3. Requirement of skillful personnel to set standards.

General techniques of Cost cutting

1. Use Skype to make domestic and international phone calls.
2. Establish presence on social media sites such as Face book and Twitter instead of newspaper, magazine, mail.
3. Use electronic communication, cut down on print and paper communication.
4. Outsource computer maintenance. Lease equipments.
5. Share office or building space with another business.

Techniques of cost control

- Budgetary control,
- Standard costing,
- Inventory control,
- Ratio analysis,
- Variance analysis

COST REDUCTION

Definition of Cost Reduction

Cost Reduction is a process, aims at lowering the unit cost of a product manufactured or service rendered without affecting its quality by using new and improved methods and techniques. It ascertains substitute ways to reduce the cost of a unit. It ensures savings in per unit cost and maximisation of profits of the organisation.

Cost Reduction aims at cutting off the unnecessary expenses which occur during the production, storing, selling and distribution of the product. To identify cost reduction, the following are the major elements:

- Savings in per unit cost.
- No compromise with the quality of the product.
- Savings are non-volatile in nature.

Tools of cost reduction are Quality operation and research, Improvement in product design, Job Evaluation & merit rating, variety reduction, etc.

Definition: The process of identifying and eliminating unnecessary costs to improve the profitability of a business is known as cost reduction.

Features of Cost reduction:

1. Cost reduction is not concerned with setting targets and standards. Cost reduction is the final result in the cost control process.
2. Cost reduction aims at improving the standards.
3. It is continuous, dynamic and innovative in nature, looking always for measures and alternative to reduce costs.
4. It is a corrective function.
5. This is applicable to every activity of the business.
6. It adds thinking and analysis to action at all levels of management.

Techniques of cost reduction

a. Organization and methods
b. Work study
c. Material handling
d. Automation
e. Value analysis
f. Variety reduction
g. Production control
h. Design
i. Materials control
j. Quality control

Key Differences Between Cost Control and Cost Reduction

The following are the major differences between Cost Control and Cost Reduction:

1. The activity of maintaining cost as per the established norms is known as cost control. The activity of decreasing per unit cost by applying new methods of production in such a way that it does not affect the quality of the product is known as cost reduction.
2. Cost Control focuses on decreasing the total cost while cost reduction focuses on decreasing per unit cost of a product.
3. Cost Control is temporary in nature. Unlike Cost Reduction which is permanent.
4. The process of cost control is completed when the specified target is achieved. Conversely, the process of cost reduction has no visible end as it is a continuous process that targets for eliminating wasteful expenses.
5. Cost Control does not guarantee quality maintenance. However, 100% quality maintenance is assured in case of cost reduction.
6. Cost Control is a preventive function as it ascertains the cost before its occurrence. Cost Reduction is a corrective action.

Cost Control Vs Cost Reduction - Comparison Chart

BASIS FOR COMPARISON	COST CONTROL	COST REDUCTION
Meaning	A technique used for maintaining the costs as per the set standards is known as Cost Control.	A technique used to economize the unit cost without lowering the quality of the product is known as Cost Reduction.
Savings in	Total Cost	Cost Per Unit
Retention of Quality	Not Guaranteed	Guaranteed
Nature	Temporary	Permanent
Emphasis on	Past and Present Cost	Present and Future Cost
Ends when	The pre-determined target is achieved.	No end
Type of Function	Preventive	Corrective

Conclusion

The two techniques cost control and cost reduction are used by many manufacturing concerns to diminish the cost of production. Cost Reduction has a larger scope than cost control as cost reduction is applicable for all the industries, but cost control is applicable only to the industries where pre- optimization of the cost which is not yet incurred is possible. Cost Control works as a road map for the organisation to incur costs as per the set standard. On the other hand, cost reduction challenges the established standards by decreasing the costs and increasing the profit.

UNIT-V

Activity based costing–Meaning and concept-Characteristics of ABC-Benefits from adoption of ABC-Just in Time Costing (JIT)

ACTIVITY BASED COSTING

Introduction

In any system of costing direct costs are easier to handle as these are directly charged to the end products but indirect costs are difficult to handle because they need to be allocated to the end products by following a suitable basis of allocation.

Traditionally, indirect costs have been allocated to the end products in three steps:

first from ledger accounts to production and service departments, taken from Service departments to production departments following reapportionment methods of allocation and then finally allocating the indirect costs of production departments to the end products.

In traditional costing there is no general basis of allocation of indirect costs and it is left to the judgment of the cost accountant to select the most appropriate basis of allocation. Indirect costs so allocated do not truly reflect the resources consumed by the end products and unnecessarily result in inflated or reduced costs of the end products.

Inaccurate cost information thus provided by the traditional costing methods may lead to wrong decisions if used for control purposes or for fixing selling prices or sending quotations.

Inaccurate cost information is further aggravated if the indirect costs are more as compared to the direct cost which is more likely to be the case with more and more automation taking place in the present world.

To quote Professor Vipul, "Activity Based Costing had its genesis in the increasing importance of indirect costs in the manufacturing operations. The direct processing costs which are easier to handle are being relegated to the background with each passing day due to automation. In this changing scenario where indirect costs far outweigh the direct processing costs in many a situations, one cannot be content with rough and ready methods of yesteryears in dealing with the indirect costs. "

Now-a-days many organisations have adopted advanced manufacturing technology with the result that indirect costs are increasing enormously and direct costs are becoming a smaller portion of total costs.

Traditional costing systems which absorb indirect costs on a direct labour basis are, therefore, not relevant in the present set up of advanced manufacturing technology. In the present set up, ABC is a better approach of cost allocation.

The CIMA Official Terminology defines ABC as "Cost attribution to cost units on the basis of benefit received from indirect activities e.g. ordering, setting up, assuring quality. "

Concept of ABC

Activity based costing (ABC) is a new term developed for finding out the cost. The basic feature of ABC is its focus on activities as the fundamental cost objects.

It uses activities as the basis for calculating the costs of products and services.

To quote Horngren. Foster and Datar, "ABC is not an alternative costing system to job costing or process costing, rather, ABC is an approach to developing the cost numbers used in job costing or process costing systems.

The distinctive feature of ABC is its focus on activities as the fundamental cost objects. In contrast, more traditional approaches to developing the cost numbers used in job or process costing systems rely on general purpose (generric) accounting systems not tailored to the activities found in individual organisations.

The ABC approach **is more expensive than traditional approaches**. ABC has the potential, however, to provide managers with information they find more useful for costing purposes".

It is an effective method of exercising cost control and can be used in **designing either a job costing system or process costing system.**

ABC approach is **used to refine a costing system to get better results.**

In ABC approach, **the first step** is to identify the activities for which costs are to be collected and controlled. The various activities may be identified as direct activities and indirect activities. Direct activities may be taken as materials and direct labour. Indirect cost pools may be identified as order processing, materials handling, machine insertion of parts, manual insertion of parts, repairs and maintenance, quality testing etc.

The next step is the selection of suitable cost allocation base for assigning indirect costs to various activities so that all activities are suitably burdened.

In today's environment of globalisation, when each organisation has to continuously improve its products and benchmark its activities with the most efficient in the world, a firm cannot do without activity based costing.

A firm can have a hold on the market only if it manages properly the value chain at each stage.

Value added at each stage is to be compared with the costs associated and on that decisions are taken about cutting the unnecessary activities or adding the new activities .

Activity based costing makes available exact cost information which improves the quality of managerial decisions.

In activity based costing the focus of attention is an activity rather than a department. A department may have a number of activities which may be non-value adding. Such activities are targeted in downsizing exercise with the help of activity based costing for better effectiveness of the department.

Activity based costing (ABC) aims at rectifying the inaccurate cost information. It is modern approach of indirect cost allocation.

ABC does not restrict itself to the allocation of indirect costs to departments as is done in the traditional approach but it recognises individual activity as the lowest unit for indirect cost allocation. **Costs allocated to each activity represents the resources consumed by it.**

Activity based costing is based on the belief that activities give rise to costs. Therefore, a link should be made between activities and products by assigning cost of activities to products based on an individual product.

Traditional Versus ABC Approach to Designing a costing System

In traditional approach, there is lack of cause and effect relationship between the cost allocation bases and indirect cost pools because one or a few cost pools for each department or entire plant having little homogeneity are used.

In ABC approach, many homogeneous indirect cost pools for various activity areas rather than a department or entire plant are used. There is a cause and effect relationship between the cost allocation bases and the indirect cost pools.

The traditional approach usually uses a few pools of indirect costs, so cost allocations are oftenly based on broad averages. The costs of products thus ascertained may be either over costed or under costed which may lead managers to make wrong pricing decisions resulting in loss of market share by fixing higher selling prices or selling prices for some products may be below the costs incurred to produce them.

Activity based costing is a rational way of assigning indirect costs to various activities and pricing decisions taken by managers will be rational.

The activity based job costing method or process costing method **is helpful** in **ascertaining areas where cost reductions are possible**.

Activity based costing can **lead to improved decision making** such as fixing selling price and pinpointing the area where cost reduction is possible because it provides more detailed information about various activities involved in a product or service.

Activity based principles can be successfully applied to the art of budgeting. Activity based budgeting is an approach to budgeting that lays emphasis on budgeting the costs of activities necessary to produce and sell products and services. Activity based budgeting is especially useful in case of budgeting of indirect costs.

Important steps in activity based budgeting are as follows:

1. Determining the demand for each individual activity on the basis of budgeted production.
2. Determining the budgeted cost of performing each activity.
3. Ascertaining the actual cost of each activity.
4. Comparing the actual cost with the budgeted cost of each activity, noting down the difference and taking corrective action wherever necessary.

Implementation of Activity Based costing

Since allocation of indirect costs to various products or departments on a reasonable basis is a complicated job, activity based costing technique helps a cost accountant to find out product cost to a greater accuracy. The following steps are involved in implementing ABC to achieve the desired results:

I. Identifying the functional areas (like material management, production, quality control etc. involved.
II. Identifying the key activities involved in each functional area.
III. Allocating the common indirect costs to various activities in each functional area.
IV. Identifying the most suitable cost driver in each activity under functional areas for better ; allocation of indirect costs to get accurate cost information. A cost driver is any factor that influences cost. A change in the cost driver will lead to a change in the total cost of a related cost object.
V. Preparing the statement of expenditure activity wise and comparing it with the value addition activity wise to know the activities which are to be eliminated or need improvement for better performance of the organisation.

Functional areas may be as follows:

(a) Material Management, (b) Stores Management, (c) Production Management, (d) Quality Control Management, (e)'Personnel Management, (j) Sales Management, (g) Repairs & Maintenance, (h) Administration and (i) Public Relation.

Some of the functional areas along with activities involved and cost drivers are given below:

Functional Areas	Activities Involved	Cost driver
Material Management	1. Issuing tenders 2. Receiving of indents 3. Analysis of offers from suppliers 4. Issue of purchase orders 5. Inspection of materials **6.** Information to stores for receiving the materials	1. No. of tenders issued 2. No. of indents 3. No. of purchase orders 4. No. of purchase orders 5. No. of purchase orders 6. No. of purchase orders
Stores Management	1. Storing the materials 2. Servicing of requisitions 3. Inspection and verification **4.** Taking perpetual stock taking	1. Value of materials stored 2. No. of requisitions 3. No. of times inspected 4. Value of stock handled
Quality Control	1. Receipt of Samples 2. Testing the sample **3.** Issue of Test Certificates	1. No. of batches produced
Personnel Management	1. Recruitment 2. Maintenance of records of attendance, leave, increment, etc 3. Training 4. Industrial relations 5. Settlement of industrial disputes **6.** Labour turnover	1. No. of employees recruited . 2. No. of employees 3. No. of employees 4. No. of employees 5. No. of employees 6. No. of employees replaced
Marketing	1. Demand creation 2. Advertising effort 3. Analysis of feedback from sales **4.** Preparation of Sales Forecasts	1. % increase in Sales 2. % increase in Sales 3. Time spent with distributors, customers 4. Time spent

BENEFITS OF IMPLEMENTING ABC

The following are the main benefits of implementing ABC:

1. Cost Management and Downsizing

ABC helps to reduce costs by providing meaningful information on the opportunities available for reducing costs.

If the company's financial performance is not satisfactory, it may have to resort to extreme measures like layoffs.

ABC helps in making the right decisions as it clearly defines the various activities. Thus one can focus on value adding activities and eliminating the non-value adding activities.

2. Determination of Products Service Costs

Nowadays, non-manufacturing costs can no longer be neglected as they constitute a substantial portion of the total cost. e.g. , soft drink giants of the world, Coke and Pepsi have huge Marketing and Advertising Costs.

On the contrary manufacturing costs constitute a very small proportion of the total cost. These non-manufacturing costs can be allocated easily using ABC because the relationship between costs and its causes is better understood.

Wrong allocation of these costs leads to a tendency of overvaluing the high volume products and undervaluing the low volume products which causes cross subsidization of one product by the other unknowingly. This may lead to a faulty pricing policy.

3. Improvements in Performance

ABC involves preparing the statement of expenditure activity-wise and comparing it with the corresponding value addition to know the activities which are to be eliminated or need improvement for better performance of the organisation.

ABC provides accurate cost information which is essential for most of the recent productivity improvement approaches like Total Quality Management (TQM), Business Process Reengineering (BPR) Kaizen.

4. Product/Service Pricing

ABC enables the management to fix the product/service prices by formulating an effective pricing policy. ABC helps in price fixation by providing information about the product/service cost.

5. Make or Buy Decision

ABC enables the manager to decide whether he should get the activity done within the firm or subcontract the same to an outside agency.

Sub-contracting may be done if the firm is incurring higher overhead cost as compared to the subcontractor.

On the contrary if the cost is not going to decrease or I the resources fed by sub-contracting cannot be economically diverted elsewhere, the company should get the activity done internally.

6. Transfer Pricing

ABC helps to determine the cost of each activity. Thus when finished good of department 'A' is transferred to department 'B', the cost of the product to department B can he easily known.

Moreover, accuracy of indirect cost allocation to the product being transferred is very important as the performance evaluation of both departments A and B depends on the proportion of indirect costs being passed on to Department B.

ABC provides accurate cost information to evaluate the performance of the transferor and transferee departments.

JUST IN TIME (JIT)

Just-in- Time Inventory System:

Keeping in view the enormous carrying cost of inventory in the stores and godowns, manufacturers and merchandisers are asking for more frequent deliveries with shorter purchase-order lead times from their suppliers. Now-a-days organisations are becoming more and more interested in getting potential gains from making smaller and more frequent purchase orders. In other words, they are becoming interested in just-in-time purchasing system. Just-in-time (JIT) purchasing is the purchase of material or goods in such a way that delivery of purchased items is assured before their use or demand.

Just-in-time purchasing recognises too much carrying costs associated with holding high inventory levels. Therefore, it advocates developing good relations with suppliers and making timely purchases from proven suppliers who can make ready delivery of goods available as and when need arises. EOQ (i.e., Economic Order Quantity) model assumes a constant order quantity whereas JIT purchasing policy advocates a different quantity for each order if demand fluctuates. Economic order quantity lays emphasis on ordering and carrying costs but inventory management extends beyond carrying and ordering costs to include purchase costs, quality costs and stock out cost. Just-in-time purchasing takes into consideration all these costs and move outside the assumptions of the EOQ model.

The assumptions of EOQ model are as follows:

1) The quantity of the item to be consumed during a particular period is known i.e., quantity to be consumed is certain.
2) Prices of materials or goods to be purchased remain stable which keep carrying cost constant.
3) There are dynamic conditions of the supply which enable a firm to place as many orders as it needs.

The above assumptions do not hold true. As such just-in-time purchasing is not based on these assumptions. Costs of quality and timely deliveries have special significance in JIT purchasing and companies following this policy make a right choice of suppliers for getting quick delivery and goods supplied are of good quality. Price is only one consideration in making a choice of suppliers.

Advantages of JIT Purchasing

1) Investment in inventory is reduced because more frequent purchase orders of small quantities are made.
2) Carrying cost is reduced as a result of low investment in inventory.
3) A reduction in the number of suppliers to.be dealt with is possible. Only proven suppliers who can give quick delivery of quality goods are given purchase orders. As a result of this reduction in negotiated time is possible. The use of long-run contracts with some suppliers with minimal paper work involved is possible
4) Quality costs such as inspection cost of incoming materials or goods, scraps and rework costs are reduced because JIT purchasing assures quick and frequent deliveries of small size orders which results in low level of inventories causing minimum possible wastage. Therefore, JIT purchasing is frequently applied by organisations dealing in perishable goods.

Example and practical idea about JIT

JIT works best for companies using repetitive manufacturing functions; hospitals, small companies, and other entities may not find JIT feasible.

For example, let's assume that Company XYZ is a small car manufacturer. On Tuesdays the company assembles the car chassis, and the workers put the windshield in on Thursdays. With a just in time inventory method, XYZ might have parts delivered exactly one day before they need them. The chassis would be delivered on Monday and the windshield on Wednesdays.

The goal of JIT is to decrease costs by keeping only enough inventory on hand to meet immediate production needs. Thus, in order to effectively employ JIT a company must accurately forecast demand. JIT's encouragement of planning, simplification, and standardization is aimed at reducing carrying costs by eliminating the expense of housing idle materials and lower the costs of defective products, wasted space, extra equipment, overtime, warranty repair, and scrap. JIT also speeds the production process, thereby eliminating long lead times and improving delivery performance.

Companies that utilize JIT often only have a few suppliers. Due to the importance of receiving inventory when needed, a small number of suppliers make it easy to coordinate deliveries. Additionally, the large orders placed by JIT companies encourage suppliers to be committed to meeting delivery and quality requirements and offer bulk discounts, but long-term contracts may counter this benefit.

Why it matters:

JIT's focus on efficiency emphasizes identification and correction of production obstacles. JIT proponents often claim that inventory hides problems -- JIT prevents a company from using excess inventory to "smooth" operations if a particular task takes longer than expected or a defective part is discovered in the system. This is also why JIT companies invest in preventive maintenance; when equipment breaks down, the entire process stops.

Possible indicators of a company's use of JIT methods are high inventory turnover ratios and high asset turnover ratio ratios. Low inventory balances also mean a company's choice of inventory accounting methods has minimal impact.

Advantages of just in time inventory management

Companies like to use JIT as it is seen as a more cost efficient method of holding stock. Its purpose is to minimise the amount of goods you hold at any one time, and this has numerous advantages:

1) **Less space needed**: With a faster turnaround of stock, you don’t need as much warehouse or storage space to store goods. This reduces the amount of storage an organisation needs to rent or buy, freeing up funds for other parts of the business.
2) **Waste reduction**: A faster turnaround of stock prevents goods becoming damaged or obsolete while sitting in storage, reducing waste. This again saves money by preventing investment in unnecessary stock, and reducing the need to replace old stock.
3) **Smaller investments**: JIT inventory management is ideal for smaller companies that don’t have the funds available to purchase huge amounts of stock at once. Ordering stock as and when it’s needed helps to maintain a healthy cash flow.

All of these advantages will save the company money.

Disadvantages of just in time inventory management

JIT unfortunately comes with a number of potential disadvantages, which can have a significant impact on the company if they occur.

1) **Risk of running out of stock**: By not carrying much stock, it is imperative you have the correct procedures in place to ensure stock can become readily available, and quickly. To do this, you need to have a good relationship with your supplier(s).
2) **Lack of control over time frame**: Having to rely on the timeliness of suppliers for each order puts you at risk of delaying your customers' receipt of goods. If you don't meet your customers' expectations, they could take their business elsewhere, which would have a huge impact on your business if this occurs often.
3) **More planning required**: With JIT inventory management, it's imperative that companies understand their sales trends and variances in close detail. Most companies have seasonal sales periods, meaning a number of products will need a higher stock level at certain times of the year due to higher demand. Therefore, company need to factor that into planning for inventory levels, ensuring suppliers are able to meet different volume requirements at different times.

If run properly, JIT inventory management is seen as one of (if not the) best ways of managing inventory. While it is not without risks, it has significant rewards, and is ideal for those who are able to plan carefully in advance, and build strong relationships with suppliers.

Questions:

A. Objective Type

Indicate which of the following statements are true?

(a) Value analysis is a systematic identification of unnecessary costs.

(b) Value analysis is not a creative approach for finding out unnecessary costs.

(c) Value analysis is not an effective tool for cost reduction.

(d) Value analysis lays emphasis on searching out new ideas while cost reduction is usually confined to already known facts.

(e) The relationship of value, function and cost can be expressed as :

Cost = Value /Function

(f) Increase in production necessarily means increase in productivity.

(g) Productivity should not be confused with production.

Ans. [True: (a) ; (d) ; (g)]

Short Answer Type

1. Express the relationship between value, function and cost.
2. Give the functions of the National Productivity Council.
3. Give the formula for the measurement of overall productivity.
4. State the basic steps involved 'in understanding a systematic value analysis programme. (I.C W.A. Inter)
5. Give the meaning of activity based costing.
6. What do you mean by cost management? State the main areas of cost management.
7. Give the meaning of JIT
8. What are the advantages of JIT
9. List the disadvantage of JIT
10. JIT is considered must - Justify.