COST AND MANAGEMENT ACCOUNTING

(BBA4 B06)

STUDY MATERIAL
IV SEMESTER

BBA

(2019 ADMISSION)

UNIVERSITY OF CALICUT

SCHOOL OF DISTANCE EDUCATION

CALICUT UNIVERSITY P.O.

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UNIVERSITY OF CALICUT

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BBA4B06 COST AND MANAGEMENT ACCOUNTING

Core Course – BBA 2019 Admission

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Syllabus

BBA4B06 COST AND MANAGEMENT ACCOUNTING

Lectures Hours per week: 6 **Credits: 4**

Internal: 20, **External: 80**

Objective:

The objective of the course is to acquaint the students with the basic Conceptsand tools of cost and Management Accounting

Learning Outcomes: On completing the course students will be able to:

1. Understand cost and management accounting concepts and its application for decision making.
2. Aware as tocost consciousness and the various methods and techniques of costing

Module I : Cost Accounting: Definition - Meaning and scope - Objectives - Cost classification - Elements of cost - Cost units -Cost centre - Types - Methods and Techniques of Costing - Management Accounting**:**Meaning and scope - Objectives - Difference between cost Accounting, Financial accounting and Management accounting.

10 Hours

Module II : Material and Labour: Material- Meaning and types. Computation of: Stock levels- EOQ - Pricing of Issue of materials - FIFO,LIFO, Simple and Weighted Average methods. Labour: Computation of Labour cost - Time rate and piece rate system.

15 Hours

Module III : Overheads and Preparation of Cost Sheet: Overhead-Meaning and Definition – concepts of overhead Allocation, Apportionment and Absorption of overheads. (Simple problems only)Preparation of Cost sheet-Format – objects and methods of cost sheet preparation. **20 Hours**

Module IV : Methods of Costing: - Job order costing: Meaning – Features – preparation of job cost sheet - Process Costing:Meaning – Features- normal and abnormal loss. **15 Hours**

Module V : Marginal Costing & Budgetary Control: Marginal costing- Concept-Meaning and computation of contribution, PV ratio and BEP - Construction of Break Even Chart - Profit planning. Budgetary Control : Concepts of Budget and Budgetary Control-preparation of cash and flexible budget **20 Hours**

(Theory and problems may be in the ratio of 30% and 70% respectively)

Reference Books:

Ravi M Kishore: Cost and Management accounting, Taxmann's Publications
Debarshi Bhattacharyya, Cost and Management, Pearson
Dr. S.N. Maheswari : Management Accounting, Vikas Publishing
S.P.JAIN, K.L.NARANG : Cost Accounting, Kalyani Publishers
Sharma and ShahiK Gupta : Management Accounting, Kalyani Publishers.
N.K. Prasad : Cost Accounting
Horngren : Cost Accounting : A Managerial Emphasis.

Module I : Cost Accounting

Introduction

Cost Accounting is a branch of accounting and has been developed due to limitations of financial accounting. Financial accounting is primarily concerned with record keeping directed towards the preparation of Profit and Loss Account and Balance Sheet. It provides information regarding theprofit and loss that the business enterprise is making and also its financial position on a particular date. The financial accounting reports help the management to control in a general way the various functions of the business but it fails to give detailed reports on the efficiency of various divisions.

Costing and Cost Accounting

The costing terminology of C.I.M.A ., London defines costing as the “the techniques and processes of ascertaining costs”. These techniques consist of principles and rules which govern the procedure of ascertaining cost of products or services. The techniques to be followed for the analysis of expenses and the processes by which such an analysis should be related to different

products or services differ from industry to industry. These techniques are also dynamic and they change with time.

The main object of traditional cost accounts is the analysis of financial records, so as to subdivide expenditure and to allocate it carefully to selected cost centers, and hence to build up a total cost for the departments, processes or jobs or contracts of the undertaking. The extent to which the analysis of expenditure should be carried will depend upon the nature of business and degree of accuracy desired. The other important objective of costing are cost control and cost reduction.

Cost Accounting may be regarded as "a specialized branch of accounting which involves classification, accumulation, assignment and control of costs."

The costing terminology of C.I.M.A, London defines cost accounting as "the process of accounting for costs from the point at which expenditure is incurred or committed to the establishment of its ultimate relationship with cost 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 profitability of activities carried out or planned".

Wheldon defines cost accounting as "classifying, recording and appropriate allocation of expenditure for determination of costs of

products or services and for the presentation of suitably arranged data purposes of control and guidance of management". It is thus a formal mechanism by means of which costs of products or services are ascertained and controlled.

General Principles of Cost Accounting

The following may be considered as the General Principles of Cost Accounting:

1. A cost should be related to its causes: Cost should be related as closely as possible to their causes so that cost will be shared only among the cost units that pass thorough the department of which the expenses are related.

2. A cost should be charged only after it has been incurred: While determining the cost of individual units those costs which have actually been incurred should be considered.

For example, a cost unit should not be charged to the selling costs, while it is still in the factory. Selling costs can be charged with the products which are sold.

3. The convention of prudence should be ignored: Usually accountants believe in historical costs and while determining cost, they always attach importance to historical cost. In Cost Accounting this convention must be ignored, otherwise, the

management appraisal of the profitability of the projects may be vitiated.

According to W.M. Harper, “a cost statement should, as far as possible, give facts with no known bias. If a contingency needs to be taken into consideration it should be shown separately and distinctly”.

4. Abnormal costs should be excluded from cost accounts: Costs which are of abnormal nature (eg. Accident, negligence etc.) should be ignored while computing the cost, otherwise, it will distort costs figures and mislead management as to working results of their undertaking under normal conditions.

5. Past costs not to be charged to future period: Costs which could not be recovered or charged in full during the concerned period should not be taken to a future period, for recovery. If past costs are included in the future period, they are likely to influence the future period and future results are likely to be distorted.

6. Principles of double entry should be applied wherever necessary: Costing requires a greater use of cost sheets and cost statements for the purpose of cost ascertainment and cost control, but cost ledger and cost control accounts should be kept on double entry principle as far as possible.

Objectives of Cost Accounting

Cost accounting aims at systematic recording of expenses and analysis of the same so as to ascertain the cost of each product manufactured or service rendered by an organization. Information regarding cost of each product or service would enable the management to know where to economize on costs, how to fix prices, how to maximize profits and so on. Thus, the main objectives of cost accounting are the following.

1. To analyse and classify all expenditure with reference to the cost of products and operations.
2. To arrive at the cost of production of every unit, job, operation, process, department or service and to develop cost standard.
3. To indicate to the management any inefficiencies and the extent of various forms of waste, whether of materials, time, expenses or in the use of machinery, equipment and tools. Analysis of the causes of unsatisfactory results may indicate remedial measures.
4. To provide data for periodical profit and loss accounts and balance sheets at such intervals, e.g. weekly, monthly or quarterly as may be desired by the management during the financial year, not only for the whole business but also by departments or individual products. Also, to explain in detail the exact reasons for profit or loss revealed in total in the profit and loss accounts.

5. To reveal sources of economies in production having regard to methods, types of equipment, design, output and layout. Daily, Weekly, Monthly or Quarterly information may be necessary to ensure prompt constructive action.

6. To provide actual figures of costs for comparison with estimates and to serve as a guide for future estimates or quotations and to assist the management in their price fixing policy.

7. To show, where Standard Costs are prepared, what the cost of production ought to be and with which the actual costs which are eventually recorded may be compared.

8. To present comparative cost data for different periods and various volume of output and to provide guidance in the development of business. This is also helpful in budgetary control.

9. To record the relative production results of each unit of plant and machinery in use as a basis for examining its efficiency. A comparison with the performance of other types of machines may suggest the necessity for replacement.

10. To provide a perpetual inventory of stores and other materials so that interim Profit and Loss Account and Balance Sheet can be prepared without stock taking and checks on stores and adjustments are made at frequent intervals. Also to provide the

basis for production planning and for avoiding unnecessary wastages or losses of materials and stores.

Importance of Cost Accounting

The limitations of financial accounting have made the management to realize the importance of cost accounting. Whatever may be the type of business, it involves expenditure on labour, materials and other items required for manufacturing and disposing of the product. The management has to avoid the possibility of waste at each stage. It has to ensure that no machine remains idle, efficient labour gets due incentive, by-products are properly utilized and costs are properly ascertained. Besides the management, the creditors and employees are also benefited in numerous ways by installation of a good costing system. Cost accounting increases the overall productivity of an organization and serves as an important tool, in bringing prosperity to the nation, thus, the importance of cost accounting can be discussed under the following headings:

a) **Costing as an aid to management**:- Cost accounting provides invaluable aid to management.

It provides detailed costing information to the management to enable them to maintain effective control over stores and inventory, to increase efficiency of the organization and to check

wastage and losses. It facilitates delegation of responsibility for important tasks and rating of employees. For all these the management should be capable of using the information provided by cost accounts in a proper way. The various advantages derived by the management from a good system of costing are as follows:

1. **Cost accounting helps in periods of trade depression and trade competition**. In periods of trade depression, the organization cannot afford to have wastages which pass unchecked. The management must know areas where economies may be sought, waste eliminated and efficiency increased. The organization must wage a war not only for its survival but also continued growth. The management should know the actual cost of their products before embarking on any scheme of price reduction. Adequate system of costing facilitates this.

2. **Cost accounting aids price fixation**. Although the law of supply and demand determines the price of the product, cost to the producer does play an important role. The producer can take necessary guidance from his costing records in case he is in a position to fix or change the price charged.

3. **Cost accounting helps in making estimates**. Adequate costing records provide a reliable basis for making estimates and quoting tenders.

4. **Cost accounting helps in channelizing production on right lines**. Proper costing information makes it possible for the management to distinguish between profitable and non-profitable activities; profits can be maximized by concentrating on profitable operations and eliminating non-profitable ones.

5. **Cost accounting eliminates wastages**. As cost accounting is concerned with detailed breakup of costs, it is possible to check various forms of wastages or losses.

6. **Cost accounting makes comparisons possible**. Proper maintenance of costing records provides various costing data for comparisons which in turn helps the management in formulating future lines of action.

7. **Cost accounting provides data for periodical Profit and Loss Account**. Adequate costing records provide the management with such data as may be necessary for preparation of Profit and Loss Account and Balance Sheet at such intervals as may be desired by the management.

8. **Cost accounting helps in determining and enhancing efficiency**. Losses due to wastage of materials, idle time of workers, poor supervision etc will be disclosed if the various operations involved in the production are studied carefully.

Efficiency can be measured, cost controlled and various steps can be taken to increase the efficiency.

9. **Cost accounting helps in inventory control**. Cost accounting furnishes control which management requires, in respect of stock of materials, work in progress and finished goods.

b) **Costing as an aid to Creditors**.

Investors, banks and other money lending institutions have a stake in the success of the business concern are therefore benefitted immensely by the installation of an efficient system of costing. They can base their judgment about the profitability and future prospects of the enterprise on the costing records.

c) **Costing as an aid to employees**.

Employees have a vital interest in their employer's enterprise in which they are employed. They are benefited by a number of ways by the installation of an efficient system of costing. They are benefited, through continuous employment and higher remuneration by way of incentives, bonus plans, etc.

d) Costing as an aid to National Economy

An efficient system of costing brings prosperity to the business enterprise which in turn brings prosperity to the business enterprise which in turn results in stepping up of the government revenue. The overall economic development o f a country takes

place as a consequence of increase in efficiency of production. Control of costs, elimination of wastages and inefficiencies led to the progress of the industry and, in consequence of the nation as a whole.

Cost units- The Chartered Institute of Management Accountants, London, defines a unit of cost as "a unit of quantity of product, service or time in relation to which costs may be ascertained or expressed". The forms of measurement used as cost units are usually the units of physical measurements like number, weight, area, length, value, time etc.

Following are some examples of cost unit.

Industry/product	**Cost unit basis**
Automobile	Numbers
Brick works	per 1000 bricks
Cement	per Tonne
Chemicals	Litre, gallon, kilogram, ton
Steel	Tonne
Sugar	Tonne
Transport	Passenger-km, tonne- km

Cost centre – According to Chartered Institute of Management Accountants, London, cost centre means "a location, person or item of equipment (or group of these) for which costs may be

ascertained and used for the purpose of cost control". Cost centre is the smallest organizational subunit for which separate cost collection is attempted. Thus cost centre refers to one of the convenient unit into which the whole factory organization has been appropriately divided for costing purposes. Each such unit consists of a department or a sub-department or item of equipment or , machinery or a person or a group of persons.

For example, although an assembly department may be supervised by one foreman, it may contain several assembly lines. Some times each assembly line is regarded as a separate cost centre with its own assistant foreman.

The selection of suitable cost centres or cost units for which costs are to be ascertained in an undertaking depends upon a number of factors which are listed as follows.

1. Organization of the factory
2. Conditions of incidence of cost
3. Requirements of the costing system ie. Suitability of the units or centres for cost purposes.
4. Availability of information
5. Management policy regarding making a particular choice from several alternatives.

Profit centre – A profit centre is that segment of activity of a business which is responsible for both revenue and expenses and discloses the profit of a particular segment of activity. Profit centres are created to delegate responsibility to individuals and measure their performance.

Difference between Profit centre and Cost centre

The various points of difference between Profit centre and cost centre are as follows. Cost centre is the smallest unit of activity or area of responsibility for which costs are collected whereas a profit centre is that segment of activity of a business which is responsible for both revenue and expenses.

(i) Cost centres are created for accounting conveniences of costs and their control whereas as a profit centre is created because of decentralization of operations i.e., to delegate responsibility to individuals who have greater knowledge of local conditions etc.

(ii) Cost centers are not autonomous whereas profit centres are autonomous.

(iii) A cost centre does not have target cost but efforts are made to minimize costs, but each profit centre has a profit target and enjoys authority to adopt such policies as are necessary to achieve its targets.

(iv) There may be a number of cost centres in a profit centre in a profit centre as production or service cost centres or personal or impersonal but a profit centre may be a subsidiary company within a group or division in a company.

Cost classification

Costs can be classified or grouped according to their common characteristics. Proper classification of costs is very important for identifying the costs with the cost centers or cost units.

The same costs are classified according to different ways of costing depending upon the purpose to be achieved and requirements of a particular concern. The important ways of classification are:

1. **By Nature or Elements**. According to this classification the costs are classified into three categories i.e., Materials, Labour and Expenses. Materials can further be sub-classified as raw materials components, spare parts, consumable stores, packing materials etc. This helps in finding the total cost of production and the percentage of materials (labour or other expenses) constituted in the total cost. It also helps in valuation of work-in-progress.

2. By Functions: This classification is on the basis of costs incurred in various functions of an organization ie. Production, administration, selling and distribution. According to this

classification, costs are divided into Manufacturing and Production Costs and Commercial costs.

Manufacturing and Production Costs are costs involved in manufacture, construction and fabrication of products.

Commercial Costs are (a) administration costs (b) selling and distribution costs.

3. By Degree of Traceability to the Product : According to this, costs are divided as direct costs and indirect costs.

Direct Costs are those costs which are incurred for a particular product and can be identified with a particular cost centre or cost unit. Eg:- Materials, Labour.

Indirect Costs are those costs which are incurred for the benefit of a number of cost centre or cost units and cannot be conveniently identified with a particular cost centre or cost unit. Eg:- Rent of Building, electricity charges, salary of staff etc.

4. By Changes in Activity or Volume: According to this costs are classified according to their behavior in relation to changes in the level of activity or volume of production. They are fixed, variable and semi-variable.

Fixed Costs are those costs which remain fixed in total amount with increase or decrease in the volume of the output or productive activity for a given period of time. Fixed Costs per unit decreases

as production increases and vice versa. Eg:- rent, insurance of factory building, factory manager's salary etc. **Variable Costs** are those costs which vary in direct proportion to the volume of output. These costs fluctuate in total but remain constant per unit as production activity changes. Eg:- direct material costs, direct labour costs, power, repairs etc.

Semi-variable Costs are those which are partly fixed and partly variable. For example; Depreciation, for two shifts working the total depreciation may be only 50% more than that for single shift working. They may change with comparatively small changes in output but not in the same proportion.

5. Association with the Product: Cost can be classified as product costs and period costs. Product costs are those which are traceable to the product and included in inventory cost, thus product cost is full factory cost. Period costs are incurred on the basis of time such as rent, salaries etc. thus it includes all selling and administration costs. These costs are incurred for a period and are treated as expenses.

6. By Controllability: The **CIMA** defines controllable cost as "a cost **which can be** influenced by the action of a specified member of an undertaking" and a non-controllable cost as "a cost which

cannot be influenced by the action of a specified member of an undertaking".

7. By Normality: There are normal costs and abnormal costs. Normal costs are the costs which are normally incurred at a given level of output under normal conditions. Abnormal costs are costs incurred under abnormal conditions which are not normally incurred in the normal course of production.Eg:- damaged goods due to machine break down, extra expenses due to disruption of electricity, inefficiency of workers etc.

8. By Relationship with Accounting Period: There are capital and revenue expenses depending on the length of the period for which it is incurred. The cost which is incurred in purchasing an asset either to earn income or increasing the earning capacity of the business is called capital cost, for example, the cost of a machine in a factory. Such cost is incurred at one point of time but the benefits accruing from it are spread over a number of accounting years. The cost which is incurred for maintaining an asset or running a business is revenue expenditure. Eg:- cost of materials, salary and wages paid, depreciation, repairs and maintenance, selling and distribution.

9. By Time.. Costs can be classified as 1) Historical cost and 2) Predetermined Costs. The costs which are ascertained and

recorded after it has been incurred is called historical costs. They are based on recorded facts hence they can be verified and are always supported by evidences. Predetermined costs are also known as estimated costs as they are computed in advance of production taking into consideration the previous periods' costs and the factors affecting such costs. Predetermined costs when calculated scientifically become standard costs. Standard costs are used to prepare budgets and then the actual cost incurred is later-on compared with such predetermined cost and the variance is studied for future correction.

Types, Methods and Techniques of Costing

The general fundamental principles of ascertaining costs are the same in every system of cost accounting, but the methods of analysis and presenting the costs vary from industry to industry. Different methods are used because business enterprises vary in their nature and in the type of products or services they produce or render. Basically, there are two principal methods of costing, namely (i) Job Costing, and (ii) Process costing.

1. **Job costing**: It refers to a system of costing in which costs are ascertained in terms of specific jobs or orders which are not comparable with each other. Industries where this method of costing is generally applied are Printing Process, Automobile

Garages, Repair Shops, Shipbuilding, House building, Engine and Machine construction, etc. Job Costing includes the following methods of costing:

(a) ***Contract Costing***: Although contract costing does not differ in principle from job costing, it is convenient to treat contract cost accounts separately. The term is usually applied to the costing method adopted where large scale contracts at different sites are carried out, as in the case of building construction.

(b) ***Bach Costing***: This method is also a type of job costing. A batch of similar products is regarded as one job and the cost of this complete batch is ascertained. It is then used to determine the unit cost of the articles produced. It should, however, be noted that the articles produced should not lose their identity in manufacturing operations.

(c) ***Terminal Costing***: This method is also a type of job costing. This method emphasizes the essential nature of job costing, ie, the cost can be properly terminated at some point and related to a particular job.

(d) ***Operation Costing***: This method is adopted when it is desired to ascertain the cost of carrying out an operation in a department, for example, welding. For large undertaking, it is frequently necessary to ascertain the cost of various operations.

2. **Process Costing**: Where a product passes through distinct stages or processes, the output of one process being the input of the subsequent process, it is frequently desired to ascertain the cost of each stage or process of production. This is known as process costing. This method is used where it is difficult to trace the item of prime cost to a particular order because its identity is lost in volume of continuous production. Process costing is generally adopted in textile industries, chemical industries, oil refineries, soap manufacturing, paper manufacturing, tanneries, etc.

3. **Unit or single or output or single output costing**: This method is used where a single article is produced or service is rendered by continuous manufacturing activity. The cost of the whole production cycle is ascertained as a process or series of processes and the cost per unit is arrived at by dividing the total cost by the number of units produced. The unit of costing is chosen according to the nature of the product. Cost statements or cost sheets are prepared under which various items of expenses are classified and the total expenditure is divided by total quantity produced in order to arrive at unit cost of production. This method is suitable in industries like brick-making, collieries, flour mills, cement

manufacturing, etc. this method is useful for the assembly department in a factory producing a mechanical article eg. Bicycle.

4. **Operating Costing**: This method is applicable where services are rendered rather than goods produced. The procedure is same as in the case of single output costing. The total expenses of the operation are divided by the units and cost per unit of services is arrived at. This method is employed in Railways, Road Transport, Water supply undertakings, Telephone services, Electricity companies, Hospital services, Municipal services, etc.

5. **Multiple or Complete Costing**: Some products are so complex that no single system of costing is applicable. It is used where there are a variety of components separately produced and subsequently assembled in a complex production. Total cost is ascertained by computing component costs which are collected by job or process costing and then aggregating the costs through use of the single or output costing system. This method is applicable to manufacturing concerns producing Motor Cars, Aeroplanes, Machine tools, Type-writers, Radios, Cycles, Sewing Machines, etc.

6. **Uniform Costing**: It is not a distinct method of costing by itself. It is the name given to a common system of costing

followed by a number of firms in the same industry. This helps in comparing performance of one firm with that of another.

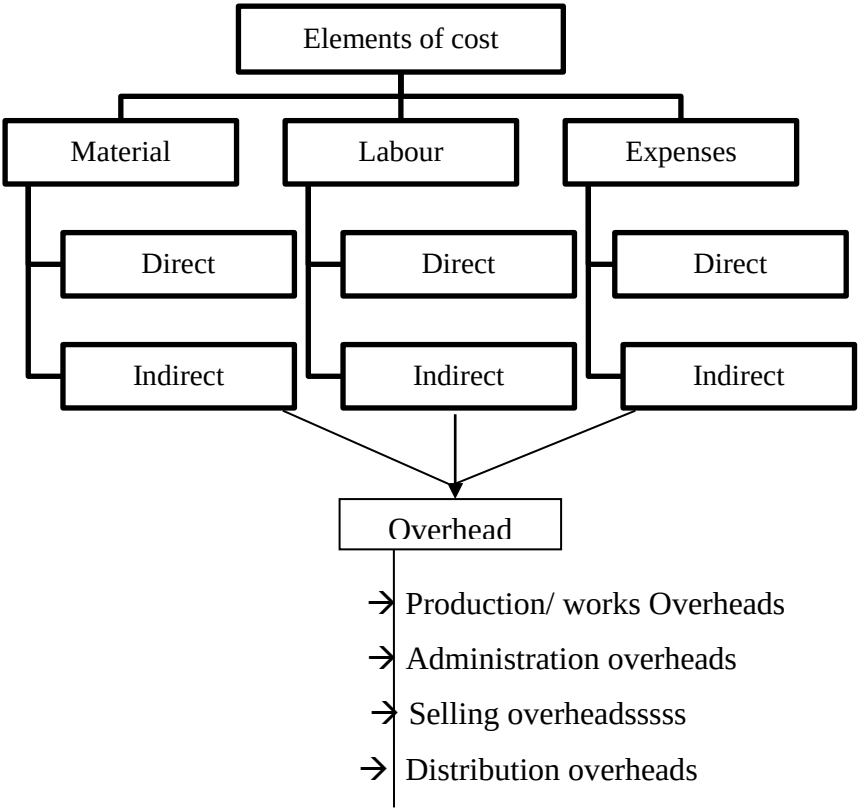
7. **Departmental Costing**: When costs are ascertained department by department, the method is called "Departmental Costing". Usually, for ascertaining the cost of various goods or services produced by the department, the total costs will have to be analysed, say, by the use of job costing or unit costing.

In addition to the above methods of costing, mention can be made of the following techniques of costing which can be applied to any one of the above method of costing for special purposes of cost control and policy making:

a) Standard or Predetermined Costs.

b) Marginal Costs

Elements of Cost- The management of an organization needs necessary data to analyze and classify costs for proper control and for taking decisions for future course of action. Hence the total cost is analyzed by elements of costs ie by the nature of expenses. The elements of costs are three and they are materials, labour and other expenses. These can be further analyzed as follows.



By grouping the above elements of cost, the following divisions of cost are obtained.

1. Prime cost = Direct Materials + Direct Labour+ Direct Expenses

2. Works or Factory Cost = Prime Cost + Works or Factory Overheads

3. Cost of Production = Works Cost + Administration Overheads

4. Total Cost or Cost of Sales = Cost of Production + Selling and Distribution Overheads

The difference between the cost of sales and selling price represents profit or loss.

Illustration 1. Find the Prime Cost, Works Cost, Cost of production, total Cost and profit from the following:- Direct Materials Rs.20000; Direct Labour Rs. 10000; Factory Expenses Rs. 7000; Administration Expenses Rs. 5000; Selling Expenses Rs. 7000 and Sales Rs.60,000.

Solution:

Prime Cost = Direct Materials + Direct Labour = Rs.20,000 + Rs.10,000 = Rs.30,000.

Works Cost = Prime Cost + Factory Expenses = Rs.30,000 + Rs.7,000 = Rs.37,000.

Cost of Production = Works Cost + Administration Expenses=Rs.37000+ Rs.5, 000 = Rs.42, 000.

Total Cost or Cost of sales= Cost of Production + Selling Expenses = Rs.42, 000+ Rs.7, 000 = Rs.49, 000.

Profit = Sales - Total Cost = Rs.60,000 - Rs.49,000=Rs.11, 000.

These terms can be explained as follows

1. **Direct Materials** are those materials which can be identified in the product and can be conveniently measured and directly charged to the product. For example, bricks in houses, wood in furniture etc. Hence all raw materials, materials purchased specifically for a job or process like glue for book making, parts or components purchased or produced like batteries for radios and tyres for cycles, and primary packing materials are direct materials.

2. **Indirect Materials** are those materials which cannot be classified as direct materials. Examples are consumables like cotton waste, lubricants, brooms, rags, cleaning materials, materials for repairs and maintenance of fixed assets, high speed diesel used in power generators etc.

3. **Direct Labour** is all labour expended in altering the construction, composition, confirmation or condition of the product. Thus direct wages means the wages of labour which can be conveniently identified or attributed wholly to a particular job, product or process or expended in converting raw materials into finished goods. Thus payment made to groups of labourers engaged in actual production, or carrying out of an operation or

process, or supervision, maintenance, tools setting, transportation of materials, inspection, analysis etc is direct labour.

4. **Direct Expenses** are expenses directly identified to a particular cost centre. Hence expenses incurred for a particular product, job, department etc are direct expenses. Example royalty, excise duty, hire charges of a specific plant and equipment, cost of any experimental work carried out especially for a particular job, travelling expenses incurred in connection with a particular contract or job etc.

5. **Overheads** may be defined as the aggregate of the cost of indirect materials, indirect labour and such other expenses including services as cannot conveniently be charged direct ot specific cost units. Overheads may be sub-divided into

(i) Manufacturing Overheads;

(ii) Administration Overheads;

(iii) Selling Overheads;

(iv) Distribution Overheads;

(v) Research and Development Overheads.

Cost Accounting and Financial Accounting-

Both financial accounting and cost accounting are concerned with systematic recording and presentation of financial data. Financial accounting reveals profits and losses of the business as a whole

during a particular period, while cost accounting shows, by analysis and localization, the unit costs and profits and losses of different product lines. The main difference between financial accounting and cost accounting are summarized below.

1. Financial accounting aims at safeguarding the interests of the business and its proprietors and others connected with it. This is done by providing suitable information to various

parties, such as shareholders or partners, present or prospective creditors etc. Cost accounting on the other hand, renders information for the guidance of the management for proper planning, operation, control and decision making.

2. Financial accounts are kept in such a way as to meet the requirements of the Companies Act, Income Tax Act and other statues. On the other hand cost accounts are generally kept voluntarily to meet the requirements of the management. But now the Companies Act has made it obligatory to keep cost records in some manufacturing industries.

3. Financial accounting emphasizes the measurement of profitability, while cost accounting aims at ascertainment of costs and accumulates data for this very purpose.

4. Financial accounts disclose the net profit and loss of the business as a whole, whereas cost accounts disclose profit or loss

of each product, job or service. This enables the management to eliminate less profitable product lines and maximize the profits by concentrating on more profitable ones.

5. Financial accounting provides operating results and financial position usually gives information through cost reports to the management as and when desired.

6. Financial accounts deal mainly with actual facts and figures, but cost accounts deal partly with facts and figures, but cost accounts deal with facts and figures and partly with estimates.

7. In case of financial accounts stress is on the ascertainment and exhibition of profits earned or losses incurred in the business. On account of this reason in financial accounts, the transactions are recorded, classified and analyzed in a subjective manner i.e. according to the nature of expenditure. In cost accounts the emphasis is more on aspects of planning and control and therefore transactions are recorded in an objective manner.

8. Financial accounts are concerned with external transactions i.e. transactions between the business concern on one side and third parties on the other. These transactions form the basis for payment or receipt of cash. While cost accounts are concerned with internal transactions which do not form the basis of payment or receipt of cash.

9. The costs are reported in aggregate in financial accounts but costs are broken into unit basis in cost accounts.

10. Financial accounts do not provide information on the relative efficiencies of various workers, plants and machinery while cost accounts provide valuable information on the relative efficiencies of various plants and machinery.

11. In financial accounts stocks are valued at cost or market price whichever is less, whereas stocks are valued at cost price in cost accounts.

Management Accounting

Management accounting is developedmainly to help the management in the discharge of its functions and for taking various decisions.

According to the Institute of Chartered Accountants of England and Wales “any form of accounting which enables a business to be conducted more efficiently can be regarded as Management Accounting “

The term management accounting is composed of 'management' and 'accounting ‘It is the use of Accounting Information for discharging Management functions, especially planning and decision making.

Scope of Management Accounting

Management accounting is concerned with presentation of accounting information in the most useful way for the management. Its scope is, therefore, quite vast and includes within its fold almost all aspects of business operations.

However, the following areas can rightly be identified as falling within the ambit of management accounting:

(i) Financial Accounting: Management accounting is mainly concerned with the rearrangement of the information provided by financial accounting. Hence, management cannot obtain full control and coordination of operations without a properly designed financial accounting system.

(ii) Cost Accounting: Standard costing, marginal costing, opportunity cost analysis, differential costing and other cost techniques play a useful role in operation and control of the business undertaking.

(iii) Revaluation Accounting: This is concerned with ensuring that capital is maintained intact in real terms and profit is calculated with this fact in mind.

Cost Accounting and Management Accounting

Cost accounting is the process of accounting for costs. It embraces the accounting procedures relating to recording of all income and

expenditure and the preparation of periodical statements and reports with the object of ascertaining and controlling costs. It is, thus, the formal mechanism by means of which the costs of products or services are ascertained and controlled. On the other hand, management accounting involves collecting, analyzing, interpreting and presenting all accounting information, which is useful to the management. It is closely associated with management control, which comprises planning, executing, measuring and evaluating the performance of an organization. Thus, management accounting draws heavily on cost data and other information derived from cost accounting.

Today cost accounting is generally indistinguishable from the so-called management accounting or internal accounting because it serves multiple purposes. However, management accounting can be distinguished from cost accounting in one important respect.

Management accounting has a wider scope as compared to cost accounting. Cost accounting deals primarily with cost data while management accounting involves the considerations of both cost and revenue. Management accounting is an all inclusive accounting information system, which covers financial accounting, cost accounting, and all aspects of financial management. But it is not a substitute for other accounting functions. It involves a

continuous process of reporting cost, financial and other relevant data in an analytical and informative way to management. We should not be very much concerned with boundaries of cost accounting and management accounting since they are complementary in nature. In the absence of a suitable system of cost accounting, management accountant will not be in a position to have detailed cost information and his function is bound to lose significance. On the other hand, the management accountant cannot effectively use the cost data unless it has been reported to him in a meaningful and informative form.

Objectives of Management Accounting

The primary objective is to enable the management to maximize profits or minimize losses. The fundamental objective of management accounting is to assist management in their functions. The other main objectives are:

1. Planning and policy formulation: planning is one of the primary functions of management. It involves forecasting on the basis of available information.

2. Help in the interpretation process: The main object is to present financial information. The financial information must be presented in easily understandable manner.

3. Helps in decision making: Management accounting makes decision making process more modern and scientific by providing significant information relating to various alternatives.

4. Controlling: The actual results are compared with pre determined objectives. The management is able to control performance of each and every individual with the help of management accounting devices.

5. Reporting: This facilitates management to take proper and timely decisions. It presents the different alternative plans before the management in a comparative manner.

6. Motivating: Delegation increases the job satisfaction of employees and encourages them to look forward. so it serves as a motivational devise.

7. Helps in organizing: “return on capital employed” is one of the tools if management accounting. All these aspects are helpful in setting up effective and efficient organization.

8. Coordinating operations: It provides tools which are helpful in coordinating the activities of different sections

Distinction between Financial Accounting and Management Accounting

Financial accounting is concerned with the recording of day to day transactions of the business. Management accounting is to provide the quantitative as well as the qualitative to the management.

Financial Accounting	**Management Accounting**
It gives the periodical reports to owners, creditors and government.	Its assist the internal management.
It concerned with historical records.	It concerned with future plans and policies
It deals the business as a whole.	It deals only a limited coverage.
Here standards are fixed by externalparties.	Standards are fixed by management itself.
Statutory for every business.	Adopted on voluntary basis.
The period is longer.	It's prepared when its required.
Transactions are very accurate.	Sometimes approximate figures are used.
Recognizes whole business as unit of account.	Results of the divisions.
Covers entire range of business inmonetary items.	Non monetary items are considered.
It's very essential for the use of public.	It's for management only.
It has principles and conventions.	No such principles.

Module II : Material and Labour

Materials

The materials are a major part of the total cost of producing a product and are one of the most important assets in majority of the business enterprises. Hence the total cost of a product can be controlled and reduced by efficiently using materials.

The materials are of two types, namely:

(a).Direct materials: The materials which can be easily identified and attributable to the individual units being manufactured are known as direct materials. These materials also form part of finished products. All costs which are incurred to obtain direct materials are known as direct material costs.

(b).Indirect materials: Indirect materials, on the other hand, are those materials which are of small value such as nuts, pins, screws, etc. and do not physically form part of the finished product.

Costs associated with indirect materials are known as indirect material costs.

Factory supplies, office supplies and selling supplies are generally termed as stores.

Storekeeping

Store keeping is a service function. The storekeeper is a custodian of all the items kept in the store. The stores should be maintained properly and cost minimized.

The main objectives of store keeping are:-

i) To protect stores against losses

ii) To keep goods ready for delivery/issue

iii) To provide maximum service at minimum cost.

The **duties and functions of Store-keeper** can be summarized as follows:

i) Materials should be received, unloaded, inspected and then moved to stores. The materials have to be stored in appropriate places and records the receipts in proper books.

ii) The stores records should be maintained in an efficient and orderly manner so that materials can be easily located and information can be obtained for various departments.

iii) The stores should provide maximum protection and safety and accessibility and utilize minimum space. Suitable storage devices should be installed.

iv) The materials should be given special covering to prevent damage due to atmospheric conditions.

v) All issues should be properly recorded, efficiently, promptly and accurately. All issues should be duly authorized and procedures laid down should be duly followed.

vi) The storekeeper is responsible for co-ordination with materials control according to the type of production, size of the company, the organization structure etc.

vii) Ensure that all transactions are posted in the Bin Card see that the Bin Card is up-todate.

viii) All items should be in its proper place.

ix) Maintenance of stores at required levels.

x) Neatness in stores to facilitate physical verification.

xi) Co-ordination and supervision of staff in the stores department.

xii) Periodical review of various scales, measuring instruments, conversion ratios etc.

xiii) Protect stores from fires, rust, erosion, dust, theft, weather, heat, cold, moisture and deterioration etc.

Requisitioning for Stores

One of the duties of the storekeeper is to send requisitions for materials for replenishment in time so that the production is not

held up due to shortage of materials. The storekeeper should also see that there is no unnecessary blocking of capital due to overstocking of materials. For this he keeps a check on the re-order level, economic ordering quantity, and the maximum and minimum quantity which he is authorized to store in respect of each kind of material.

(a) Re-ordering Level

Re-ordering level is that point of level of stock of a material where the storekeeper starts the process of initiating purchase requisition for fresh supplies of that materials. This level is fixed somewhere between the maximum and minimum levels in such a way that the difference of quantity of the material between the re-ordering level and minimum level will be sufficient to meet the requirements of production until the fresh supply of the materials is received.

Re-ordering Level= Minimum Level + Consumption during the time required to get the fresh delivery

According to Wheldon,

Re-ordering Level= Maximum Level x Minimum re-order period.

Here, maximum re-order period means the maximum period taken to get the material once the order for new material is placed. Wheldon has taken the maximum period and maximum

consumption during that period so that factory may not stop production due to shortage of materials.

Illustration: 3. Calculate the ordering level of material A from the following particulars:

Minimum Limit 1,000 units.

Maximum Limit 5,000 units.

Daily requirement of material 200 units.

Time required for fresh delivery 10 days.

Solution

Ordering Level=Minimum limit + Consumption during the time required for fresh delivery

= 1000 units+ 200 units x 10 days = 3000 units

Order for the purchase of material should be placed when the material in stock reaches 3,000 units.

Illustration: 4. Calculate the re-ordering level from the following information:

Maximum consumption = 500 units per day

Minimum consumption = 400 units per day

Re-order period = 10 to 12 days

Solution

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

= 500 units x 12 days = 6000 units.

(b) Economic Ordering Quantity

The quantity of material to be ordered at one time is known as economic ordering quantity. This quantity is fixed in such a manner as to minimize the cost of ordering and carrying the stock.

The total costs of a material usually consist of:

Total acquisition cost + total ordering cost + total carrying cost.

Since the acquisition cost per unit of material is same whatever is the quantity purchased, it is usually excluded when deciding the quantity of a material to be ordered at one time. The only costs to be taken care of are the ordering costs and carrying costs which vary with the quantity ordered.

Carrying Cost: It is the cost of holding the materials in the store and includes:

1. Cost of storage space which could have been utilized for some other purpose.
2. Cost of bins and racks
3. Cost of maintaining the materials to avoid deterioration.
4. Amount of interest payable on the amount of money locked up in the materials.

5. Cost of spoilage in stores and handling.
6. Transportation cost in relation to stock.
7. Cost of obsolescence of materials due to change in the process or product.
8. Insurance cost
9. Clerical cost etc.

In India all these costs amount to 20 to 25 % of the cost of materials per year. Hence it becomes necessary to reduce such carrying cost for efficient operations.

Ordering Cost: It is the cost of placing orders for the purchase of materials and includes:

1. Cost of staff posted in the purchasing department, inspection section and stores accounts department.
2. Cost of stationary postage and telephone charges.

Thus, this type of costs includes cost of floating tenders, cost of comparative evaluation of quotations, cost of paper work, and postage involved in placing the order, cost of inspection and cost of accounting and making payments. In other words, the cost varies with the number of orders.

When the quantity of materials ordered is less, the cost of carrying will decrease but ordering cost will increase and vice versa.

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

Q = Quantity to be ordered

C = Consumption of the material concerned in units during a year.

O = Cost of placing one order including the cost of receiving the goods i.e. the cost of getting an item into the firms inventory

I = Interest payment including variable cost of storing per unit per year i.e holding costs of inventory.

Illustration 4: Find out the economic ordering quantity (EOQ) from the following particulars.

Annual usage: 6000 units

Cost of material per unit: Rs. 20

Cost of Placing and receiving one order: Rs.60

Annual carrying cost of one unit: 10% of inventory value.

Solution

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

Where C = Annual usage of material ie6,000 units

O = Cost of placing one order ie Rs.60

Annual carrying cost of one unit: Rs. 20 x 10% = Rs. 2

$$EOQ = \sqrt{\frac{2 \times 6000\ units \times 60}{2}} = \sqrt{3600} = 600 \text{ units}$$

c) **Minimum Level or Safety Stock level**

The minimum level is the minimum quantity of the material which must be maintained in hand at all times. The quantity is fixed so that the production is not held up due to shortage of the materials. In fixing this level, the following factors should be considered:

1. Lead time i.e. time lag between indenting and receiving of the material. It is the time required to replenish the supply.
2. Rate of consumption of the material during the lead time.
3. Nature of the material. Minimum level is not required in case of a special material which is required against customer's specific order.

Formula for calculating minimum level or safety stock level given by Wheldon is as follows:

Minimum Stock Level = Re-ordering level – (Normal consumption x Normal Re-order period)

d) **Maximum Level**

It is the maximum of stock which should be held in stock at any time during the year. The quantity is fixed so as to avoid overstocking as it leads to the following disadvantages.

1. Overstocking leads to increase in working capital requirement which could be profitable used somewhere else.

2. Overstocking will need more godown space, so more rent will have to be paid.
3. It may also lead to obsolescence on account of overstocking.
4. There are chances that the quality of materials will deteriorate because large stock will require more time before they are consumed.
5. There may be fear of depreciation in market values of the overstocked materials.

According to Wheldon,

Maximum Stock level = Reordering level + Re-ordering Quantity –

(Minimum consumption x Minimum re-ordering period)

e) **Danger Level**

This level means that level of stock at which normal issues of the material are stopped and issues are made only under specific instructions. The purchase officer will make special arrangements to get the materials which reach at their danger levels so that the production may not stop due to shortage of materials.

Danger Level = Average consumption x Max.re-order period for emergency purchases.

f) Average Stock Level

The average stock level is calculated by the following formula:

Average Stock Level = Minimum Stock Level + ½ of Re-order Quantity.

Or ½ (Minimum Stock Level + Maximum Stock Level)

Illustration 5: Calculate the minimum stock level, maximum stock level, re-ordering level and average stock level from the following information:

(i) Minimum consumption = 100 units per day

(ii) Maximum consumption = 150 units per day

(iii) Normal consumption = 120 units per day

(iv) Re-order period = 10-15 days

(v) Re-order quantity = 1,500 units

(vi) Normal re-order period = 12 days

Solution

Re-ordering Level = Maximum Consumption x Maximum re-order period

= 150 units x 15 days = 2,250 units

Minimum Stock Level = Re-ordering Level-(Normal consumption x Normal re-order period)

= 2,250 – (120 x12) = 810 units

Maximum Stock Level = Re-ordering Level + Re-order Quantity – (Minimum Consumption x Minimum Re-Order Period)

= 2,250 + 1500 – (100 x 10) = 2,750 units

Average stock Level = Minimum Stock Level + ½ Re-order Quantity

= 810 units + ½ x 1500 units = 1,560 units

Stores (or Materials) records

In the stores the most important two records kept are bin cards and stores ledger.

(a) **Bin Card**: A bin card is a record of the receipt and issue of material and is prepared by the store keeper for each item of stores. A bin card is also known as bin tag or stock card and is usually kept in the rack where the material is kept. In a bin card not only the receipt and issue of material is recorded, minimum quantity, maximum quantity and ordering quantity are stated on the card. This helps the store keeper to send the material requisition for the purchase of material in time.

(b) **Stores Ledger**: This ledger is kept in the costing department and is identical with the bin card except that receipts, issues and balances are shown along with their money values. This

provides the information for the pricing of materials issued and the money value at any time of each item of stores.

Issue of materials

Materials issued from stores are debited to the jobs or work orders which received them and credited to the materials account. These jobs are debited with the value of materials issued to them.

Theoretically the value includes the invoice price less trade discount, the freight, cartage, octroi and insurance on incoming materials, expenses of purchase, receiving, storing and record keeping and carriage from the stores up to the process plant. However, in practice, it involves minute calculations for including all these expenses and is a big task compared to the benefit derived from it.

Moreover the price changes according to the market conditions and at any given time there will be stock of materials purchased at different times at different prices. Hence the problem as to at what price the materials should be issued?There are many methods of pricing material issues. The most important being: FIFO, LIFO, simple and weighed average methods.

1) First in First Out (FIFO)

Under this method material is first issued from the earliest consignment on hand and priced at the cost at which that consignment was placed in the stores. In other words, materials received first are issued first. The units in the opening stock of materials are treated as if they are issued first, the units from the first purchase issued next, and so on until the units left in the closing stock of materials are valued at the latest cost of purchases.

This method is most suitable in times of falling prices because the issue price of materials to jobs or work order will be high while the cost of replacement of materials will be low. But in case of rising prices this method is not suitable because the issue price of materials to production will be low while the cost of replacement of materials will be high. The following example will illustrate how issues of materials are valued under this method.

Illustration 6: The received side of the Stores Ledger Account shows the following particulars:

Jan. 1	Opening Balance:	500 units @ Rs. 4
Jan. 5	Received from vendor:	200 units @ Rs. 4.25
Jan.12	Received from vendor:	150 units @ Rs. 4.10

Jan.20 Received from vendor: 300 units @ Rs. 4.50

Jan.25 Received from vendor: 400 units @ Rs.4

Issues of material were as follows:

Jan. 4- 200 units; Jan.10- 400 units; Jan. 15- 100 units; Jan 19- 100 units; Jan.26- 200 units; Jan.30- 250 units.

Issues are to be priced on the principle of "first in first out". Write the Stores Ledger Account in respect of the materials for the month of January.

Solution:

Date	Particulars	Receipts			Issues			Balance		
		Quantity (Units)	Total Cost(Rs)	Unit cost(Rs)	Quantity (units)	Total Cost(Rs)	Unit cost(Rs)	Quantity (units)	Amount (Rs)	Per unit(Rs)
Jan 1	Balance b/d	-	-	-	-	-	-	500	2000	4
Jan 4	Requisition slip no.	-	-	-	200	800	4	300	1200	4
Jan 5	Goods received note no. ……	200	850	4.25	-	-	-	300	1200	4
								200	850	4.25
Jan 10	Requisition slip no.	-	-	-	300	1200	4			
					100	425	4.25	100	425	4.25

Jan 12	Goods received note no.	150	615	4.10	-	-	-	100	425	4.25
								150	615	4.10
Jan 15	Requisition slip no.	-	-	-	100	425	4.25	150	615	4.10
Jan 19	Requisition slip no.	-	-	-	100	410	4.10	50	205	4.10
Jan 20	Goods received note no.	300	1350	4.50	-	-	-	50	205	4.10
								300	1350	4.50
Jan 25	Goods received note no.	400	1600	4.00	-	-	-	50	205	4.10
								300	1350	4.50
								400	1600	4.00
Jan 26	Requisition slip no.	-	-	-	50	205	4.10	150	675	4.50
					150	675	4.50	400	1600	4.00
Jan 30	Requisition slip no.	-	-	-	150	675	4.50	300	1200	4.00
					100	400	4.00			

2) Last in Last Out (LILO)

Under this method, issues are priced in the reverse order of purchase i.e., the prices of the latest available consignment is taken. This method is suitable in times of rising prices because

material will be issued from the latest consignment at a price which is closely related to the current price levels. Valuing material issues at the price of the latest available consignment will help the management in fixing the competitive selling prices of the products.

Illustration 7: Prepare Stores Account on Last in First Out method assuming the same particulars as in Illustration 6:

SOLUTION

Date	Particulars	Receipts			Issues			Balance		
		Quantity (Units)	Total Cost(Rs)	Unit cost(Rs)	Quantity (units)	Total Cost(Rs)	Unit cost(Rs)	Quantity (units)	Amount	Per unit(Rs)
Jan 1	Balance b/d	-	-	-	-	-	-	500	2000	4
Jan 4	Requisition slip no.	-	-	-	200	800	4	300	1200	4
Jan 5	Goods received note no.	200	850	4.25	-	-	-	300	1200	4
								200	850	4.25
Jan 10	Requisition slip no.	-	-	-	200	850	4.25			
					200	850	4.00	100	400	4.00
Jan 12	Goods received note no.	150	615	4.10	-	-	-	100	400	4.00
								150	615	4.10

Jan 15	Requisition slip no.	-	-	-	100	410	4.10	100	400	4.00
								50	205	4.10
Jan 19	Requisition slip no.	-	-	-	50	205	4.10			
					50	200	4.00	50	200	4.00
Jan 20	Goods received note no.	300	1350	4.50	-	-	-	50	200	4.00
								300	1350	4.50
Jan 25	Goods received note no.	400	1600	4.00	-	-	-	50	200	4.00
								300	1350	4.50
								400	1600	4.00
Jan 26	Requisition slip no.	-	-	-	200	800	4.00	50	200	4.00
								300	1350	4.50
								200	800	4.00
Jan 30	Requisition slip no..	-	-	-	200	800	4.00	50	200	4.00
					50	225	4.50	250	1125	4.50

3) Simple Average Method

In this method, price is calculated by dividing the total of the prices of the materials in the stock from which the material to be priced could be drawn by the number of the prices used in that

total. This method may lead to over-recovery or under-recovery of cost of materials from production because quantity purchased in each lot is ignored.

Eg:- 1000 units purchased @ Rs. 10

2000 units purchased @ Rs. 11 3000

units purchased @ Rs. 12

In this example, simple average price will be Rs.11 calculated as below:

$$\frac{Rs.10 + Rs.11 + Rs.12}{3} = Rs.\ 11$$

4) Weighted Average Methods

In this method, price is calculated by dividing the total cost of materials in the stock from which the materials to be priced could be drawn by the total quantity of materials in that stock.

In the above example, the weighted average price is Rs.11.33 per unit calculated as follows:

$$\frac{1000 \times Rs.10 + 2000 \times Rs.11 + 3000 \times Rs.12}{1000+2000+3000} = Rs.\ 11.33$$

In the periods of heavy fluctuations in the prices of materials, the average cost method gives better results because it tends to smooth out the fluctuations in prices by taking the average of prices of various lots in stock.

Labour

Labour cost is a second major element of cost. The control of labour cost and its accounting is very difficult as it deals with human element. Labour is the most perishable commodity and as such should be effectively utilized immediately.

Importance of Labour Cost Control

Labour is of two types

(a) direct labour, and

(b) indirect labour.

Direct Labour is that labour which is directly engaged in the production of goods or services and which can be conveniently allocated to the job, process or commodity or process. For example labour engaged in spinning department can be conveniently allocated to the spinning process.

Indirect Labour is that labour which is not directly engaged in the production of goods and services but which indirectly helps the direct labourengaged in production. The examples of indirect labour are supervisors, sweepers, cleaners, time-keepers, watchmen etc. The cost of indirect labour cannot be conveniently allocated to a particular job, order, process or article.

The distinction between direct and indirect labour must be observed carefully because payment of direct labour is a direct expenditure and is a part of prime cost whereas payment of indirect labour is an item of indirect expenditure and is shown as works, office, selling and distribution expenditure according to the nature of the time spent by the indirect worker.

Management is interested in the labour costs due to the following reasons.

- To use direct labour cost as a basis for increasing the efficiency of workers.
- To identify direct labour cost with products, orders, jobs or processes for ascertaining the cost of every product, order, or process.
- To use direct labour cost as a basis for absorption of overhead, if percentage of direct labour cost to overhead is to be used as a method of absorption of overhead.
- To determine indirect labour cost to be treated as overhead
- To reduce the labour turnover.

Hence control of labour cost is an important objective of management and the realization of this objective depends upon the

co-operation of every member of the supervisory force from the top executive to foremen.

Time Wage System

Under this method of wage payment, the worker is paid at an hourly, daily, weekly or monthly rate.

This payment is made according to the time worked irrespective of the work done. This method is highly suitable for following types of work:

1. Where highly skilled and apprentices are working.
2. Where quality of goods produced is of extreme importance eg., artistic goods
3. Where the speed of work is beyond the control of the workers.
4. Where close supervision of work is possible.
5. Where output cannot be measured.

The disadvantages of this method are:

1. Workers are not motivated.
2. Workers will get payment for idle time.
3. Efficient workers will become inefficient in the long run as all of them get same wages.
4. Employer finds it difficult to calculate labour cost per unit as it varies as production increases and decreases.

5. Strict supervision is necessary to get the work done.
6. Inefficiency results in upsetting the production schedule and increases the cost per unit.
7. It will encourage a tendency among workers to go slow so as to earn overtime wages.

Thus this method does not establish a proportionate relationship between effort and reward and the result is that it is not helpful in increasing production and lowering labour cost per unit.

Piece Rate System (payment by result)

Under this system of wage payment, a fixed rate is paid for each unit produced, job completed or an operation performed. Thus, payment is made according to the quantity of work done no consideration is given to the time taken by the workers to perform the work.

There are four variants of this system.

a) Straight piece rate system
b) Taylor's differential piece rate system
c) Merrick's multiple piece rate system
d) Gant's task and bonus plan

(a) Straight piece rate system

Payment is made as per the number of units produced at a fixed rate per unit. Another method is piece rate with guaranteed time

rate in which the worker is given time rate wages if his piece rate wages is less than the time rate.

Advantages

1. Wages are linked to output so workers are paid according to their merits.
2. Workers are motivated to increase production to earn more wages.
3. Increased production leads to decreased cost per unit of production and hence profit per unit increases.
4. Idle time is not paid for and is minimized.
5. The employer knows his exact labour cost and hence can make quotations confidently.
6. Workers use their tools and machinery with a greater care so that the production may not be held up on account of their defective tools and machinery.
7. Less supervision is required because workers get wages for only the units produced.
8. Inefficient workers are motivated to become efficient and earn more wages by producing more.

Disadvantages

1. Fixing of piece work rate is difficult as low piece rate will not induce workers to increase production.

2. Quality of output will suffer because workers will try to produce more quickly to earn more wages.
3. There may not be an effective use of material, because of the efforts of workers to increase the production. Haste makes waste. Thus there will be more wastage of material.
4. When there is increased production, there may be increased wastage of materials, high cost of supervision and inspection and high tools cost and hence cost of production might increase.
5. Increased production will not reduce the labour cost per unit because the same rate will be paid for all units. On the other hand, increased production will reduce the labour cost per unit under the time wage system.
6. Workers have the fear of losing wages if they are not able to work due to some reason.
7. Workers may work for long hours to earn more wages, and thus, may spoil their health.
8. Workers may work at a very high speed for a few days, earn good wages and then absent themselves for a few days, upsetting the uniform flow of production.

9. Workers in the habit of producing quality goods will suffer because they will not get any extra remuneration for good quality.
10. The system will cause discontentment among the slower workers because they are not able to earn more wages.

    This method can be successfully applied when:

    1. The work is of a repetitive type.
    2. Quantity of output can be measured.
    3. Quality of goods can be controlled.
    4. It is possible to fix an equitable and acceptable piece rate
    5. The system is flexible and rates can be adjusted to changes in price level.
    6. Materials, tools and machines are sufficiently available to cope with the possible increase in production.
    7. Time cards are maintained so that workers are punctual and regular so that production may not slow down.

(b) Taylor's Differential Piece Rate system

This system was introduced by Taylor, the father of scientific management to encourage the workers to complete the work within or less than the standard time. Taylor advocated two piece rates, so that if a worker performs the work within or less than the

standard time, he is paid a higher piece rate and if he does not complete the work within the standard time, he is given a lower piece rate.

Illustration 9 : Calculate the earnings of workers A and B under Straight Piece-rate System and Taylor's Differential Piece-rate System form the following particulars.

Normal rate per hour = Rs.1.80

Standard time per unit = 20 seconds

Differentials to be applied:

80 % of piece rate below standard

120 % of piece rate at or above standard.

Worker A produces 1,300 units per day and worker B produces 1,500 units per day.

SOLUTION

Standard production per 20 seconds = 1 unit

Standard production per minute = 60/20= 3 units

Standard production per hour = 3 x 60 = 180 units

Standard production per day of 8 hrs(assumed) = 180 x 8 = 1440 units

Normal rate per hour = Rs.1.80

Normal piece rate = Rs.1.80/ 180 units = 1 paisa

Low piece rate below standard production $\frac{1P \times 80}{100}$ = 0.8paise

High piece rate at or above standard $\frac{1P \times 120}{100}$ = 1.2paise

Earning of worker A

Under straight piece rate system

1300 units @ 1P = $\frac{1300 \times 1}{100}$ = Rs. 13

Under Taylor's Differential Piece-rate System

1300 units @ 0.8 P = $\frac{1300 \times 0.8}{100}$ =Rs.10.40

Low piece rate has been applied because worker A's daily production of 1300 units is less than the standard daily production of 1,440 units.

Earnings of Worker B

Under Straight Piece-rate System

1500 units @ 1P = $\frac{1500 \times 1}{100}$ = Rs. 15

Under Taylor's Differential Piece-rate System

1500 units @ 1.2P = $\frac{1500 \times 1.2}{100}$ = Rs. 18

High piece-rate has been applied because worker B's daily production of 1500 units is more than the standard daily production of 1440 units.

c) **Merrick's Multiple Piece Rate System**

This method seeks to make an improvement in the Taylor's differential piece rate system. Under this method, three piece rates are applied for workers with different levels of performance. Wages are paid at ordinary piece rate to those workers whose performance is less than 83% of the standard output, 110% of the ordinary piece rate is given to workers whose level of performance is between 83% and 100% of the standard and 120% of the ordinary piece rate is given to workers who produce more than 100% of the standard output.

This method is not as harsh as Taylor's piece rate because penalty for slow workers is relatively lower.

Illustration 10: Calculate the earnings of workers A, B and C under straight piece rate system and Merrick's multiple piece rate system from the following particulars:

Normal rate per hour Rs.1.8

Standard time per unit1 minute

Output per day is as follows:

Worker A : 384 units

Worker B : 450 units

Worker C : 552 units

Wording hours per day are 8

SOLUTION

Standard output per minute = 1 unit

Standard production per hour = 60 units

Standard production per day of 8 hours = 480 units(8 x 60)

Normal rate per hour = Rs.1.80

Normal output per hour = 60 units

Normal piece rate $= \frac{\text{Rs.1.80}}{60}$ =3 paise

Calculation of level of performance:

Standard output per day = 480 units

Worker A's output per day = 384 units

Worker A's level of performance $= \frac{384}{480} \times 100$ = 80%

Worker B's output per day = 450 units

Worker B's level of performance $= \frac{450}{480} \times 100$ = 93.75%

Worker C's output per day = 552 units

Worker C's level of performance $= \frac{450}{480} \times 100$ = 115%

Earnings of Worker A

Under straight piece rate system:

For 384 units @ 3 paise per unit =384x0.03=Rs.11.52

Under Merrick's multiple piece rate system:

For 384 units @ 3 paise per unit =384 x 0.03 = Rs.11.52

Earnings of Worker B

Under straight piece rate system:

For 450 units @ 3 paise per unit = 450 x 0.03 = Rs.13.50

Under Merrick's multiple piece rate system:

For 450 units @ 3.3 paise per unit =450 x 0.033= Rs.14.85

Earnings of Worker C

Under straight piece rate system:

For 552 units @ 3 paise per unit = 552 x 0.03 = Rs.16.56

Under Merrick's multiple piece rate system:

For 552 units @ 3.6paise per unit =552 x 0.036 = Rs.19.87

Worker C's level of performance is 115% which is more than 100% of standard output; so he is entitled to get 120% of normal piece rate (ie. 120% of 3 paise or 3.6 paise per unit)

Premium and Bonus Plan

The object of a premium plan is to increase the production by giving an inducement to the workers in the form of higher wages for less time worked.

Under a premium plan, a standard time is fixed for the completion of a specific job or operation at an hourly rate plus wages for a certain fraction of the time saved by way of a bonus. The plan is also known as incentive plan because a worker has the incentive to earn more wages by completing the work in less time.

This system of wage payment is in between the time wage system and piece work system. In time wage system, worker does not get any reward for the time saved and in piece work system, the worker gets full payment for time saved whereas in a premium plan both the worker and the employer share the labour cost of the time saved.

The following are some of the important premium plans.

(i) Halsey Premium Plan:

Under this method, the worker is given wages for the actual time taken and a bonus equal to half of wages for time saved. The standard time for doing each job or operation is fixed. In practice the bonus may vary from 33⅓ % to 66⅔ % of the wages of the time saved.

Thus if S is the standard time, T the time taken, R the labour rate per hour, and % the percentage of the wages of time saved to be given as bonus, total earnings of the worker will be:

$$T \times R + \% (S-T) R$$

Under Halsey-Weir plan, the premium is set at 30% of the time saved.

Illustration 11:

Rate per hour = Rs.1.50 per hour

Time allowed for job = 20 hours

Time taken = 15 hours

Calculate the total earnings of the worker under the Halsey Plan. Also find out effective rate of earnings.

SOLUTION:

Standard time (S) = 20 hours

Time taken (T) = 15 hours

Rate per hour (R)= Rs.1.50 per hour

Total Earnings = T x R + 50% (S-T) x R

= 15 X Rs. 1.50 + $\frac{50}{100}$ (20-15) xRs. 1.50

=Rs.26.25

Total wages for 15 hours = Rs.26.25

Therefore, effective rate of earning per hour

= Total Wages = Rs.26.25 = Rs. 1.75

Actual Time Taken

(The percentage of bonus is taken as 50% when not given)

The advantages of the Halsey Premium Plan are:

It is simple to understand and relatively simple to calculate.

1. It guarantees time wages to workers.
2. The wages of time saved are shared by both employers and workers, so it is helpful in reducing labour cost per unit.

3. It motivates efficient workers to work more as there is increasing incentive to efficient workers.
4. Fixed overhead cost per unit is reduced with increase in production.
5. The employer is able to reduce cost of production by having reduction in labour cost and fixed overhead cost per unit. So, he is induced to provide the best possible equipment and working conditions.

Disadvantages

1. Quality of work suffers because workers are in a hurry to save more and more time to get more and more bonus.
2. Workers criticize this method on the ground that the employer gets a share of wages of the time saved.

(ii) **Rowan Plan**

The difference between Halsey plan and Rowan Plan is the calculation of the bonus. Under this method also the workers are guaranteed the time wages but the bonus is that proportion of the wages of the time taken which the time saved bears to the standard time allowed.

$$\textbf{Total Earnings} = T \times R + \frac{S-T}{S} \times T \times R$$

Illustration 12:

A worker completes a job in a certain number of hours. The standard time allowed for the job is 10 hours, and the hourly rate of wages is Rs.1. The worker earns a 50% rate of bonus of Rs. 2 under Halsey Plan. Ascertain his total wages under the Rowan Premium Plan.

Solution: The worker earns Rs.2 as bonus at 50 %; so total bonus at 100% should be Rs.4. The hourly rate of wages being Re.1, the time saved should be 4 hours.

Standard time allowed 10 hours

Less: Time Saved 4 hours

Time Taken 6 hours

Earnings under the Rowan Premium Plan

Earnings =T x R + $\frac{S-T}{S}$x T x R

Where, T = 6 hours

S = 10 hours

R = Re.1 per hour

Earnings = 6 x 1 + $\frac{10-6}{10}$ x 6 x 1

= 6 + Rs.2.40 = Rs. 8.40

Advantages

1. It guarantees time wages to workers

2. The quality of work does not suffer as they are not induced to rush through production as bonus increases at a decreasing rate at higher levels of efficiency.
3. Labour cost per unit is reduced because wages of time saved are shared by employer and employee.
4. Fixed overhead cost is reduced with increase in production.

Disadvantages

1. The Rowan plan is criticized by workers on the ground that they do not get the full benefit of the time saved by them as they are paid bonus for a portion of the time saved.
2. The Rowan plan suffers from another drawback that two workers, one very efficient and the other not so efficient, may get the same bonus.

Module III : Overheads and Preparation of Cost Sheet

Overheads

Cost related to a cost center or cost unit may be divided into two ie. Direct and Indirect cost. The Indirect cost is the overhead cost and is the total of indirect material cost, indirect labour cost, indirect expenses.

CIMA defines indirect cost as ***"expenditure on labour, materials or services which cannot be economically identified with a specific salable cost per unit"***.

Indirect costs are those costs which are incurred for the benefit of a number of cost centers or cost units. So any expenditure over and above prime cost is known as overhead. It is also called **'burden', 'supplementary costs', 'on costs', 'indirect expenses'.**

Classification of Overheads

Overheads can be classified on the following basis:

i) **Function-wise classification**: Overheads can be divided into the following categories on functional basis.
   a) Manufacturing or production overheads eg:- indirect materials like lubricants, cotton wastes, indirect labour like salaries and wages of supervisors, inspectors, storekeepers, indirect expenses like rent, rates and insurance of factory, power, lighting of factory, welfare expenses like canteen, medical etc.

b) Administration overheads eg:- indirect materials like office stationery and printing, indirect labour salaries of office clerks, secretaries, accountants, indirect expenses rent, rates and insurance of office, lighting heating and cleaning of office, etc.

c) Selling and Distribution overheads eg:- indirect materials like catalogues, printing, stationery, price list, indirect salary of salesmen, agents, travellers, sales managers, indirect expenses like rent, rates and insurance of showroom, finished goods, godown etc., advertising expenses, after sales service, discounts, bad debts etc.

ii) **Behavior-wise classification**: Overheads can be classified into the following categories as per behavior pattern.

a) Fixed overheads like managerial remuneration, rent of building, insurance of building, plant etc.

b) Variable overheads like direct material and direct labour.

c) Semi-variable overheads like depreciation, telephone charges, repair and maintenance of buildings, machines and equipment etc.

iii) **Element-wise classification**: Overheads can be classified into the following categories as per element.

a) Indirect materials

b) Indirect labour

c) Indirect expenses

Allocation and Apportionment of Overhead to Cost Centres (Depart-mentalisation of Overhead)

When all the items are collected properly under suitable account headings, the next step is allocation and apportionment of such expenses to cost centres. This is also known as departmentalization or primary distribution of overhead.

A factory is administratively divided into different departments like Manufacturing or Producing department, Service department, partly producing departments.

Allocation of Overhead Expenses

Allocation is the process of identification of overheads with cost centres. An expense which is directly identifiable with a specific cost centre is allocated to that centre. Thus it is allotment of a whole item of cost to a cost centre or cost unit. For example the total overtime wages of workers of a department should be charged to that department. The electricity charges of a department if separate meters are there should be charged to that particular department only.

Apportionment of Overhead Expenses

Cost apportionment is the allotment of proportions of cost to cost centres or cost units. If a cost is incurred for two or more divisions or departments then it is to be apportioned to the different departments on the basis of benefit received by them. Common items of overheads are rent and rates, depreciation, repairs and maintenance, lighting, works manager's salary etc.

Basis of Apportionment

Suitable bases have to be found out for apportioning the items of overhead cost to production and service departments and then for reapportionment of service departments costs to other service and production departments. The basis selected should be correlated to the expenses and the expense should be measurable by the basis. This process of distribution of common expenses over the departments on some equitable basis is known as 'Primary Distribution'.

The following are the main bases of overhead apportionment utilized in manufacturing concerns:

Direct Allocation. Under direct allocation, overheads are directly allocated to the department for which it is incurred. Example overtime premium of workers engaged in a particular department, power, repairs of a particular department etc.

(i) **Direct Labour/Machine Hours.** Under this basis, overhead expenses are distributed to various departments in the ratio of total number of labour or machine hours worked in each department. Majority of general overhead items are apportioned on this basis.

(ii) **Value of materials passing through cost centres.** This basis is adopted for expenses associated with material such as material handling expenses.

(iii) **Direct wages.** Expenses which are booked with the amounts of wages eg:-worker's insurance, their contribution to provident fund, worker's compensation etc. are distributed amongst the departments in the ratio of wages.

Illustration 13: The Modern Company is divided into four departments: A, B and C are producing departments, and D is a service departments. The actual costs for a period are as follows:

Rent	Rs.1000	Repairs to Plant	Rs.600
Supervision	Rs.1500	Fire Insurance in respect of Stock	Rs.500
Depreciation of Plant	Rs.450	Power	Rs.900
Light	Rs.120	Employers' liability for insurance	Rs.150

The following information is available in respect of the four departments;

	Dept.A	Dept.B	Dept.C	Dept.D
Area (sq.mtrs)	1,500	1,100	900	500
Number of Employees	20	15	10	5
Total Wages (Rs.)	6,000	4,000	3,000	2,000
Value of Plant (Rs.)	24,000	18,000	12,000	6,000
Value of stock (Rs.)	15,000	9,000	6,000	-
H.P. of Plant	24	18	12	6

Apportion the costs to the various departments on the most equitable basis.

SOLUTION

OVERHEADS DISTRIBUTION SUMMARY

Items	Basis of apportionment	Total Amount Rs.	Product Departments			Service Dept D Rs.
			A Rs.	B Rs.	C Rs.	
Rent	Floor Area	1,000	375	275	225	125
Supervision	No. of Employees	1,500	600	450	300	150
Depreciation	Plant Value	450	180	135	90	45
Light	Floor area	120	45	33	27	15
Repairs to Plant	Plant Value	600	240	180	120	60
Fire Insurance	Stock Value	500	250	150	100	-
Power	HP. Of Plant	900	360	270	180	90
Employer's Liability	No. of Employees	150	60	45	30	15

Total	5,220	2,110	1,538	1,072	500

Re-apportionment of Service Department Costs to Production Departments

Service department costs are to be reapportioned to the production departments or the cost centres where production is going on. This process of re-apportionment of overhead expenses is known as '**Service Distribution**'. The following is a list of the bases of apportionment which may be accepted for the service departments noted against

Service Department Cost	**Basis of Apportionment**
1. Maintenance Department 2. Payroll or time-keeping department 3. Store keeping department 4. Employment or Personnel epartment. 5. Purchase Department 6. Welfare, ambulance, canteen service, recreation room expenses. 7. Building service department 8. Internal transport service or overhead crane service	-Hours worked for each department -Total labour or Machine hours or number of employees in each department -no. of requisitions or value of materials of each department. -Rate of labour turnover or number of employees in each department. -no. of purchase orders or value of materials -No. of employees in each department. -Relative are in each department -Weight, value graded product handled, weight and distance

9. Transport Department 10. Power House (Electric power cost)	travelled. -crane hours, truck hours, truck mileage, truck tonnage, truck tonne-hours, tonnage handled, number of packages. –wattage, horse power, horse power machine hours, number of electric points etc.

The following are the various methods of re-distribution of service department costs to production departments.

1. Direct re-distribution method
2. Step distribution method
3. Reciprocal Services method
    a. Simultaneous Equation Method
    b. Repeated Distribution Method
    c. Trial and Error Method

Direct re-distribution method

Under this method, the costs of service departments are directly apportioned to production departments without taking into consideration any service from one service department to another service department. Thus, proper apportionment cannot be done on the assumption that service departments do not serve each other and as a result the production departments may either be

overcharged or undercharged. The share of each service department cannot be ascertained accurately for control purposes. Budget for each department cannot be prepared thoroughly. Therefore, Department Overhead rates cannot be ascertained correctly.

Illustration 14:In an Engineering factory, the following particulars have been collected for the three months' period ended on 31st March, 2007. You are required to prepare Production Overheads Distribution Summary showing clearly the basis of apportionment where necessary.

		Production Departments			Service Departments	
		A	B	C	D	E
Direct Wages	Rs.	2000	3000	4000	1000	2000
Direct Material	Rs.	1000	2000	2000	1500	1500
Staff	Nos.	100	150	150	50	50
Electricity	Kwh.	4000	3000	2000	1000	1000
Light Points	No.	10	16	4	6	4
Asset Value	Rs.	60,000	40,000	30,000	10,000	10000
Area Occupied Sq.m.		150	250	50	50	50

The expenses for the period were:

Motive power Rs.550; Lighting Power Rs.100; Stores Overheads Rs.400; Amenities to Staff Rs.1500; Depreciation Rs.15,000; Repairs and Maintenance Rs.3,000; General Overheads Rs.6000; and Rent and Taxes Rs. 275.

Apportion the expenses of service department E in proportion of 3:3:4 and those of service department D in the ratio of 3:1:1 to departments A, B and C respectively.

SOLUTION

PRODUCTION OVERHADS DISTRIBUTION SUMMARY

For the quarter ending 31st March, 2007

	Production Dept.			Service Dept.		Total Rs.
	A Rs.	B Rs.	C Rs.	D Rs.	E Rs.	
Direct Wages				1000	2000	3000
Direct Materials						
Motive Power @ 5p.per Kwh	200	150	100	1500	1500	3000
Lighting Power @ Rs.2.50per Point	25	40	10	50	50	550
Stores Overhead @ 5% of Direct Material	50	100	100	15	10	100
Amenities to staff @ Rs.3 per employee	300	450	450	75	75	400
Depreciation @ 10% of the value of asset.	600 0	4000	300 0	150 1000	150 1000	1500 15000
Repairs and maintenance	120	800				

@ 2% of value General Overheads @ 50% of Direct Wages Rent and Taxes @Re.0.50 per sq.meter	0 1000 75	1500 125	600 2000 25	200 500 25	200 1000 25	3000 6000 275
Total Dept. E (3: 3 : 4) Dept. D (3 : 1 : 1)	8,850 1,803 2,709	7,165 1,803 903	6,285 2,404 903	4,515 (4,515)	6,010 (6,010)	32,825
Total	13,362	9,871	9,592			32,825

Absorption of Overhead

Absorption means the distribution of the overhead expenses allotted to a particular department over the units produced in that department. Overhead absorption is accomplished by overhead rates.

Methods of Absorption of Manufacturing Overhead

The following are the main methods of absorption of manufacturing or factory overheads.

(a) **Direct Material Cost Method**. Under this method percentage of factory expenses to value of direct materials consumed in production is calculated to absorb manufacturing overheads.

The formula is Overhead Rate

= Production Overhead Expenses (Budgeted)

Anticipated Direct Material Cost

If in a factory the anticipated cost of direct material is Rs. 4,00,000 and the over head budgeted expenses are Rs. 1,00,000, then the overhead rate will be 25% ie.(Rs.1,00,000 ÷ Rs.4,00,000) of the materials used. It is assumed that relationship between materials and factory expenses will not change. This method is simple and can be adopted under the following circumstances:

(i) Where the proportion of overheads to the total cost is significant.

(ii) Where the prices of materials are stable.

(iii) Where the output is uniform ie. Only one kind of article is produced.

(b) **Direct Labour Cost (or Direct Wages) Method**. This is a simple and easy method and widely used in most of the concerns. The overhead rate is calculated as under:

$$\text{Overhead Rate} = \frac{\text{Production Overhead Expenses}}{\text{Direct Labour Cost}}$$

If from past experience, the percentage of factory expenses to direct wages is 50%, then the factory expenses in the next year is taken as 50% of the direct wages.

This method is suitable under the following situations:

(i) Where direct labour constitutes a major proportion of the total cost of production.

(ii) Where production is uniform.

(iii)Where labour employed and types of work performed are uniform.

(iv)Where the ratio of skilled and unskilled labour is constant.

(v) Where there are no variations in the rates of pay ie., the rates of pay and the methods are the same for the majority of the workers in the concern.

In some concerns a separate rate is calculated for the fringe benefits and applied on the basis of direct labour cost.

(c) **Prime Cost Method.** Under this method the recovery rate is calculated dividing the budgeted overhead expenses by the

aggregate of direct materials and direct labour cost of all the products of a cost centre. The formula is

Overhead Recovery Rate =

$$\frac{\text{Production Budgeted Overhead Expenses}}{\text{Anticipated Direct Materials and Direct Labour Cost}}$$

Suppose if the budgeted overheads are Rs.50,000 and the estimated values of direct materials and direct labour are Rs.30,000 and Rs.20,000, then overhead recovery rate will be 100%

$$\text{ie} = \frac{50000}{30000+20000} \times 100.$$

(d) **Direct Labour (or Production) Hour Method.** This rate is obtained by dividing the overhead expenses by the aggregate of the productive hours of direct workers. The formula is

$$\text{Overhead rate} = \frac{\text{Production Overhead Expenses}}{\text{Direct Labour Hours}}$$

If in a particular period the overhead expenses are Rs.50,000 and direct labour hours are 1 ,00,000, then overhead labour rate will be Re.0.50 (i.e., Rs.50,000 ÷ 1,00,000).

This rate is suitable where:

i. The production is done using more of labour and less technology is used.

ii. It is desired to taken into consideration the time factor.

iii. The rate may not be affected by the method of wage payment or the grade or the rate of workers.

Illustration17: From the following particulars find out "Direct Labour Rate".

(a) Total number of labourers working in the department. 400

(b) Total working days in a year 300

(c) Number of working hours per day 8

(d) Total departmental overheads per year Rs.1,82,400

(e) Normal idle time allowed. 5 %

SOLUTION:

CALCULATION OF DIRECT LABOUR RATE FOR DEPARTMENTAL OVERHEADS

Total working days in a year	300
Number of working hours per day	8
Total working hours available per worker per year	2,400
	(300 x 8)
Less:normal idle time allowed (5% of 2,400hrs)	120
Effective working hours per worker per year (2400-120)	2,280

Number of workers working in the department 400

Total effective working hours in the department(2280 x 400) 9,12,000

Total departmental overheads per year Rs. 1,82,000

Direct Labour Rate for absorption of overheads per hour Rs.0.20

(Rs.182,400÷9,12,000hrs=Rs.0.20)

(e) **Machine Hour Rate**. Machine hour rate is the cost of running a machine per hour. It is one of the methods of absorbing factory expenses to production. There is a basic similarity between the machine hour and the direct labour hour rate methods, in so far as both are based on the time factor. The choice of one or the other method depends on the actual circumstances of the individual case. In respect of departments or operations, in which machines predominate and the operators perform a relatively a passive part, the machine hour rate is more appropriate. This is generally the case for operations or processes performed by costly machines which are automatic or semi-automatic and where operators are needed merely for feeding and tending them rather than for regulating the quality or quantity of their output. In such cases, the machine hour rate method alone can be depended on to correctly apportion the manufacturing overhead expenses to

different items of production. What is needed for computing the machine hour rate is to divide overhead expenses for a specific machine or group of machines for a period by the operating hours of the machine or the group of machines for the period. It is calculated as follows:

$$\text{Machine hour rate} = \frac{\text{Amount of overheads}}{\text{Machine hours during a given period}}$$

The following steps are required to be taken for the calculation of machine hour rate:

1) Each machine or group of machine should be treated as a cost centre.
2) The estimated overhead expenses for the period should be determined for each machine or group of machines.
3) Overheads relating to a machine are divided into two parts i.e., fixed or standing charges and variable or machine expenses.
4) Standing charges are estimated for a period for every machine and the amount so estimated is divided by the total number of normal working hours of the machine during that period in order to calculate an hourly rate for fixed charges. For machine expenses, an hourly rate is calculated for each item

of expenses separately by dividing the expenses by the normal working hours.

5) Total of standing charges and machines expenses rates will give the ordinary machine hour rate.

Some of the bases which may be adopted for apportioning the different expenses for the purpose of calculation of machine hour rate are given below.

Some of the expenses and the basis of apportionment are given below.

1. Rent and Rates - Floor area occupied by each machine including the surrounding space.

2. Heating and Lighting - The number of points used plus cost of special lighting or heating for any individual machine, alternatively according to floor area occupied by each machine.

3. Supervision – estimated time devoted by the supervisory staff to each machine.

4. Lubricating Oil and Consumable Stores – On the basis of past experience.

5. Insurance – Insurable value of each machine

6. Miscellaneous Expenses – Equitable basis depending upon facts.

Machine Expenses

1.Depreciation – cost of machine including cost of stand-by equipment such as spare motors, switchgears etc., less residual value spread over its working life.

2.Power – Actual consumption as shown by meter readings or estimated consumption ascertained from past experience.

3.Repairs – Cost of repairs spread over its working life.

Illustration 18: A machine is purchased for cash at Rs.9,200. Its working life is estimated to be 18 ,000 hours after which its scrap value is estimated at Rs.200. it is assumed from past experience that:

(i) The machine will work for 1,800 hours annually.

(ii) The repair charges will be Rs.1,800 during the whole period of life of the machine.

(iii) The power consumption will be 5 units per hour at 6 paisa per unit.

(iv) Other annual standing charges are estimated to be: Rs.

(a) Rent of department (machine occupies $1/5^{th}$ of total space) 780

(b) Light (12 points in the department-2 points engage d in the machine) 288

(c) Foreman's salary ($1/4^{th}$ of his time is occupied in the machine) 6000

(d) Insurance premium (fire) for machinery 36

(e) Cotton waste 60

Find out the machine hour rate on the basis of above data for allocation of the works expenses to all jobs for which the machine is used.

SOLUTION:

CALCULATION OF MACHINE HOUR RATE

	Per Annum Rs.	*Per Hour Rs.*
Standing Charges:		
Rent[Rs.780 ÷Rs.5]	156	
Light [2/12 x Rs.288]	48	
Insurance Charges	36	
Cotton waste	60	
Total Standing Charges Hourly rate of standing charges Rs.1800 1800	1,500	
	1,800	
Machine Expenses:		
Depreciation (Rs.9,200-Rs.200)÷18,000 = Rs.9000 ÷18,000		1.00
Repairs and Maintenance (Rs.1,080÷18,000)		0.50
Power (0.06 x 5)		0.06
		0.30

Machine Hour Rate		1.86

f.Rate Per Unit of Production. This method is simple, direct and easy. It is suitable for mining and other extractive industries, foundries and brick laying industries, where the output is measured in convenient physical units like number, weight, volume etc. the rate is calculated as under:

$$\text{Overhead Rate} = \frac{\text{Overhead expenses (budgeted)}}{\text{Budgeted production}}$$

For example, if the overhead expenses (budgeted) are Rs. 30,000 and the budgeted production is 10,000 tonnes, then overhead rate according to this method will be Rs. 3 per tonne.

The main limitation of this method is that it is restricted to those concerns which produce only one item of product or a few sizes, qualities or grades of the same product. If more than one item are produced, then it is essential to express dissimilar units against a common denominator on weightage or point basis.

g. Sale Price Method: Under this method, budgeted overhead expenses are divided by the sale price of units of production in order to calculate the overhead recovery rate. The formula is sale

price of units of production in order to calculate the overhead recovery rate, the formula is

Overhead Recovery Rate= Budgeted overhead expenses

Sale value of units of production

The method is more suitable for apportioning of administration, selling and distribution, research, development and design costs of products. It can also be used with advantage for the appropriation of joint products costs.

Cost sheet or Statement of Cost

When costing information is set out in the form of a statement, it is called "Cost Sheet". It is usually adopted when there is only one main product and all costs almost are incurred for that product only. The information incorporated in a cost sheet would depend upon the requirement of management for the purpose of control.

Specimen of Cost Sheet or Statement of Cost

	Total Cost Rs.	Cost per Unit Rs.
Direct Material	xxx	xx
Direct Labour	xxx	xx
Prime Cost	xxx	xx
Add: Works Overheads	xxx	xx
Works Cost	xxx	xx
Add: Administrative Overheads	xxx	xx
Cost of Production	xxx	xx

Add: Selling & Distribution Overheads	xxx	xx
Total Cost/ Cost of Sales	xxx	xx

Illustration 2: Calculate Prime Cost, Factory Cost, Cost of Production, Cost of Sales and profit from the following particulars:

	Rs.		Rs.
Direct Materials	1,00,000	Consumable stores	2,500
Direct Wages	30,000	Manager's Salary	5,000
Wages of Foreman	2,500	Directors' fees	1,250
Electric power	500	Office Stationery	500
Lighting: Factory	1,500	Telephone Charges	125
Office	500	Postage and Telegrams	250
Storekeeper's wages	1,000	Salesmen's salary	1,250
Oil and water	500	Travelling expenses	500
Rent: Factory	5,000	Advertising	1,250
Office	2,500	Warehouse charges	500
Repairs and Renewals:		Sales	1,89,500
Factory plant	3,500	Carriage outward	375
Transfer to Reserves	1,000	Dividend	2,000
Discount on shares written off	500		
Depreciation: Factory Plant	500		

Office Premises		1,250	

Solution

STATEMENT OF COST AND PROFIT

			Rs.
Direct Materials			1,00,000
Direct Wages			30,000
	Prime Cost		1,30,000
Add: Factory Overheads:			
	Wages of foreman	2,500	
	Electric power	500	
	Storekeeper's Wages	1,000	
	Oil and Water	500	
	Factory rent	5,000	
	Repairs and renewals-Factory Plant	3,500	
	Factory lighting	1,500	
	Depreciation-Factory Plant	500	
	Consumable stores	2,500	
		17,500	
	Factory Cost		1,47,500
Add:	Administration Overheads:		
	Office rent	2,500	
	Repairs and Renewals-Office Premises	500	

	Office lighting		500	
	Depreciation : Office Premises		1,250	
	Manager's Salary		5,000	
	Director's fees		1,250	
	Office Stationery		500	
	Telephone charges		125	
	Postage and telegrams		250	
			11,875	
		Cost of Production		1,59,375
Add:	Selling and Distribution Overheads:			
	Carriage Outward		375	
	Salesmen's Salaries		1,250	
	Travelling Expenses		500	
	Advertising	1,250		
	Warehouse charges	500		
		3,875		
		Cost of Sales		1,63,250
		Profit		26,250
		Sales		**1,89,500**

Module IV : Methods of Costing

Job Costing

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

In the case of a job, work is usually carried out within the factory or workshop. Sometimes, a job is accomplished even in the

customer's premises. This method of costing is applicable to ship building, printing, engineering, machine tools, readymade garments, shoes, hats, furniture, musical instruments, interior decorations etc. **Features:**

1. Each job has its own characteristics, depending up on the special order placed by the customer.
2. Each job is treated as a cost unit.
3. A separate job cost sheet is made out for each job on the basis of distinguishing numbers.
4. A separate work in progress ledger is maintained for each job.
5. The duration of the job is normally a short period.
6. Profit or loss is determined for each job independently of others

Advantages of Job costing:

1. It helps to distinguish profitable jobs from unprofitable jobs

2. It helps to identify defective work and spoilage with a department or person

3. Selling price of special orders can easily be fixed.

4. It helps to prepare estimates of cost for submitting quotations and tender for similar jobs

5. It helps to control future cost.

Requisites of Job costing system:

1. A sound system of production control
2. An effective time booking system
3. Clearly defined cost centre
4. Appropriate overhead absorption rate, and
5. Proper material issue pricing method.

Procedure for Job order costing system:

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

1. Receiving an enquiry from the customer regarding price, quality etc
2. Make an estimation of the price of the job after considering the cost incurred for the execution of similar job in the previous year
3. Receiving an order, if the customer is satisfied with the quotation price and other terms of execution.

4. If the job is accepted, a production order is made by the Planning department.
5. The costs are collected and recorded for each job under separate production order Number, and a Job Cost Sheet is maintained for that purpose.
6. On completion of job, a completion report is sent to costing department.

Illustration I

From the following particulars calculate the cost of Job No.505 and price for the job to give a profit of 25 % on the selling price.

Material : Rs. 6820

Wage details:

Department X : 60 hrs @ Rs. 3 per hr

Y : 50 hrs @ Rs. 3 per hr

Z : 30 hrs @ Rs. 5 per hr

The variable Overheads are as follows:

Department X : Rs. 5000 for 5000 hrs

Y : Rs. 4000 for 2000 hrs

Z : Rs. 2000 for 500 hrs

The total fixed expenses amounted to Rs. 20,000 for 10,000 working hours. Calculate the cost of Job No. 505 and price for the job to give a profit of 25% on selling price.

Solution:

Job Cost Sheet No. 505

		Rs.
Direct Material		6,820
Wages:		
Department X	60x3=180	
Department Y	50x3=150	
Department Z	30x5=150	480

Prime Cost		7,300
Overheads: - Variables		
Department X	60 x1 = 60	
Department Y	50 x 2= 100	
Department Y	30x 4= 120	280

		7,580
Fixed OH 140 x 2 = 280(60+50+3(		280

	Total cost	7,860
Profit 25% on selling price ie 1/3 of cost 7860 x1/3		2 , 620

	Selling price	10,480

Practical problem 1

The following information is extracted from the Job ledger in respect of Job No. 205

Materials Rs. 8,500

Wages : 80 hours @ Rs. 6 per hour

Variable OH incurred for all jobs is Rs. 10,000 for 4,000 labour hours. Find the profit if the job is billed for Rs. 8,400.

Practical Problem 2

From the following information, ascertain the work cost of Job No. 505

The job was commenced on 10th January 2011 and completed on 1st Feb.2011. Materials used were Rs. 2,400 and labour charges were Rs. 1,600. Other details were as follows:

1. Indirect labour cost in the factory amounted to Rs. 1,200
2. Machine X was used for 50 hours @ Rs. 20 per hour
3. Machine Z was used for 40 hours @ Rs. 22 per hour

Contract Costing

Meaning

It is a special form of job costing and it is the most appropriate method to be adopted in such industries as building and construction work, civil engineering, mechanical fabrication and ship building. In other words, it is a form of specific order costing which applies where the work is undertaken to customer's

requirements and each order of long duration as compared to job costing. It is also known as terminal costing.

The official CIMA terminology defines contract costing as " a form of specific o$_{rder}$ costing in which costs are attributed to individual contracts."

Basic features:

1. Each contract itself a cost unit.
2. Work is executed at customers site
3. The existence of sub contract
4. Most of the expenses incurred upon the contracts are direct.
5. Cost control is very difficult in contract costing.

Types of contracts

Generally there are three types of contracts:

1. Fixed price contracts: Under these contracts both parties agree to a fixed contract price.
2. Fixed price contract with Escalation clause
3. Cost plus contract: Under this contract no fixed price could be settled for a contract.

Contract Account

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

Special Terms in Contract Account

1. **Work in Progress:** It is the unfinished contract at the end of the accounting period and it includes amount of work certified and amount of work uncertified. Work in progress is an asset, shown in the balance sheet by deducting there from any advance received from the contractee.
2. **Work certified:** The sales value of work completed as certified by the architect is known as 'work certified'. In the case of contracts of long duration, the amount payable by the customer to the contractor is based on the sales value of work done as certified by the architect. At the end of the financial

year, the total sales value of work done and certified by the architect is credited to the contract account.

3. **Work Uncertified:** It means work which has been carried out by the contractor but has not been certified by the architect. Sometimes, work which is complete remains uncertified at the end of the financial year. The reasons for the same may be
   a. Work not sufficient enough to be certified
   b. Work has not reached the stipulated stage to qualify for certification It is always valued at cost and credited to the contract account.
4. **Retention money:** - Regardless of the amount of work certified, the contractor is paid a specified percentage of the same and the balance is held or retained by the contractee. This is because of the fact that the contractee has to safe guard himself against any contingency arising from the non fulfillment of the terms of the contract by the contractor. The unpaid balance of work certified or the amount held back or retained by the contractee is known as 'retention money'.
5. **Sub contract:** Sometimes the contractor enters into contracts with another contractor to give a portion of work undertaken by him. In such cases the work performed by the subcontractor s forms a direct charge to the contract

concerned. Sub contract cost will be shown on the debit side of the contract account.

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

Specimen Form of Contract Account (Unfinished contract)

Contract A/C

To materials	xxx	By work in progress:	
To Labour	xxx	Work certified	xxx
To Plant	xxx	Work un certified	xxx
To Overheads	xxx	By material returned	xxx
To cost of sub contracts	xxx	By Plant xxxx	
	xxx	Less:Depreciation xxx	xxx
To Notional Profit c/d(B/F)		By material lying at site	xxx
		By Notional profit B/d	xxx
	xxx		xxx

To Profit and Loss A/C	xxx xxx		xxx
To WIP (B/F)	xxx =====		xxx =====

Treatment of Plant and Machinery

One of the distinguishing features of a contract is the use of special plant and machinery. The cost of these is capital expenditure, but yet, the usage of these should be reflected in the form of depreciation. There are two distinct methods of charging depreciation.

1. At the time of issue of plant to contract the contract account is debited with the full value of the plant. At the end of the period contract account is credited with the depreciated value. This method is used when plant and machinery is used at the contract site for a long period.
2. In the second method, contract account is debited with an hourly rate of depreciation for the number of hours the plant is used on the contract. A cost centre is set up for each machine. An estimate is made is made of the cost such as maintenance, depreciation, driver's wage etc to be

incurred. The total of this cost is divided by the number of hours that the machine is expected to be used.

Profit on Incomplete Contract

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

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

1. **When the work has not reasonably advanced (1/4 or less than ¼)** : - No profit should be taken to the credit of p/L account in the case of contracts which have just commenced and a small portion of the work is complete.

2. **Where the work is complete more than ¼ but less than ½ of contract price:** In this case 1/3 of the notional profit as reduced by the percentage of cash received may be credited to profit and loss account. The usual formula is

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

The balance of notional profit shall be kept as reserve till the completion

3. **If the contract completed is more than 1/2 but less than 90%**: Here 2/3 rd of the notional profit should be taken to profit and loss account.

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

The balance of notional profit shall be transferred to work in progress as reserve. It is to be noted that in order to find out how much portion of contract is completed, work certified should be compared with contract price.

4. **If the contract is nearing completion:** Here, estimated profit may be ascertained by deducting the total cost of contract to date plus estimated additional expenses to complete the contract , from the contract price. It is calculated by using the following formula

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

The loss on incomplete contract should be fully transferred to profit and loss account.

Example 1

The following was the expenditure on a contract for Rs. 6,00,000

Material	1 , 20,000
Wages	1 , 64,000
Plant	20,000
Overheads	8,600

Cash received on account of the contract was Rs. 2,40,000 being 80% of the work certified. The Value of material in hand was Rs. 10,000. The plant has undergone 20% depreciation.

Solution:

Contract Account

	Rs.		Rs.
To materials	1,20,000	By material in hand	10,000
To Wages	1,64,000	By plant on hand	16,000
To Plant	20,000	By work certified	
To overheads	8,600	(2,40,000x100/80)	3 , 00,000
To Notional profit	13,400		

	3,26,000		3 , 26,000
	======		=====
To P/L account	7,147	By notional profit b/d	13,400
To Balance c/d	6,253		
	13, 400		13,400

Example 2

XY Ltd undertook a contract, the following was the expenditure on a contract for Rs. 6,00,000.

Material issued to contract Rs. 1,02,000
Plant issued for contract Rs. 30000
Wages Rs.1,62,000
Other expenses Rs. 10,000

Cash received on account of contract up to 31st march 2011 amounted to Rs. 2,56,000 being 80% of work certified. Of the plant and material charged to the contract plant costing Rs. 3000 and material costing Rs. 4000/ were lost. On Ist March 2011, Plant which cost Rs. 2,000 was returned to the store, the cost of work done but not certified was Rs. 3000 and material costing Rs.

2,500 were in hand on site. Provide 10% depreciation on plant, reserve 1/3 of profit received and prepare contract account from the above particulars.

Solution

Contract Account

To materials	1,02,000	By work in progress:	
To Plant	30,000	Work certified	
To wages	1,62,000	256000x100/80	
To other expenses	10,000	3,20000	
		Work uncertified	
		3000	3 , 23,000
To Notional profit c/d (B. F)	52800	By P & L Account	
		Plant lost 3000	
		Material lost 4000	
		By plant returned:	7000
		2,000	
		Less: depreciation	1,800
		200	
		By material in hand	2,500
		By plant at site(30000-3000-	
		2000) 25000	
		Less: depr 2500	22500
	356800		356800
			=========
To P/L Account	28160	By notional profit B/d	52 800
52800x2/3x80/100	24640		

Reserve BF	52 800 ========		52 800 ======

WORK IN PROGRESS ACCOUNT

To contract A/c	3 23,000	By Contract A/c (reserve)	24640 2 , 98,360
	3,23,000 =======	By Balance c/d	3 , 23,000 ========

Note: It is assumed that the contract has begun on 1/4/10.

Example- 3

Mr. A has undertaken several contract works. He maintains a separate record for each contract. From the records for the year ending 31-12-98, Prepare contract account for Contract No.50 and find the amount transferred to profit and loss account.

Direct purchase of material	1 , 80,000
Material issued from stores	50,000
Wages	2,44000
Direct expenses	24,000
Machinery purchased	1 , 60,000

Establishment charges 54,000

The contract price was Rs. 15,00,000. Cash received up to 31-12-2008 wasRs. 6,00,000 which is 80 % of work certified . Material at site Rs. 16,000. Depreciation for Machine Rs. 16,000.

Solution:

To materials:		By material at site	16,000
Direct purchase	1,80,000	Machinery on hand	1 , 44,000
Issued from stores	50,000	(1,60,000- 16000)	
Wages		Work certified	7 , 50,000
Direct expenses	2,44,000		
Machinery purchased	24,000		
Establishment	1 , 60,000		
Notional profit	54,000		9 , 10,000
	1 , 98,000		=======
	9,10,000	By notional profit b/d	1 , 98,000
To P/L account	=======		
Work in progress	1,05,600		1 , 98,000
A/c	92,400		=======
	1,98,000		
	======		

Process Costing

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

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

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

Costing is used in the industries like manufacturing industries, chemical industries, mining works and public utility undertakings.

Characteristics of Process Costing

1. Production is continuous
2. Products pass through two or more distinct processes of completion.

3. Products are standardized and homogeneous.
4. Products are not distinguishable in processing stage.
5. The finished product of one process becomes the raw material of the subsequent process.
6. Cost of material, labour and overheads are collected for each process and charged accordingly.

Advantages of Process Costing

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

Disadvantages of Process Costing

1 Valuation of work in progress is difficult.

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

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

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

5 Process costs are only historical.

Principles of Process Costing

The following points are considered while determining the cost under Process Costing.

1 Production activity should be divided into different processes or departments.

2 A separate account is opened for each process.

3 Both direct and indirect costs are collected for each process.

4 The quantity of output and costs are recorded in the respective process accounts.

5 The cost per unit is determined by dividing the total cost at the end of each process by the number of output of each process.

6 Normal loss and abnormal loss are credited in the process account

7 The accumulated cost of each process is transferred to subsequent process along with output. The output of the last

process along with cost is transferred to the finished goods account.

8 In case of by-products and joint products their share in joint cost should be estimated and credited to the min process.

9 When there is work in progress at the end of the period the computation of inventory is made I terms of complete units.

Difference between Process Costing and Job Costing

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

Procedure for Process Costing

1. Each process is separately identified. Separate process account is opened for each process.
2. Along with ‘Particulars Column’, two columns are provided on both sides of the process account – units (quantity) and amount (Rupees).
3. All the expenses are debited in the respective process account.
4. Wastage, sale of scrap, by-products etc are reordered on the credit side 0f the process account.
5. The difference between debit and credit side shows the cost of production and output of that particular process which is transferred to the next process.
6. The cost per unit in every process is calculated by dividing the net cost by the output.
7. The output of last process is transferred to the Finished Stock Account.
8. Incomplete units at the end of the each period ion every process s converted in terms of completed units.

Specimen of Process Account

Process Account

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

Preparation of Process Accounts

The preparation of Process Account depends upon the following situations

1. Simple Process Account
2. Process costing with normal process loss
3. Process costing with abnormal process loss
4. Process costing with abnormal process gains
5. Inter – process profits.

Simple Process Account

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

Illustration 1: Product A requires three distinct processes and after the third process the product is transferred to finished stock. Prepare various process accounts from the following information.

	Total	P1	P2	P3
Direct Materials	5000	4000	600	400
Direct Labour	4000	1500	1600	900
Direct Expenses	800	500	300	
Production overheads	6000			

Production overheads to be allocated to different processes on the basis of 150% of direct wages. Production during the period was 200 units. Assume 5here is no opening or closing stock.

Solution:

Process I Account

	Units	Rs.		Units	Rs.
To Direct materials	200	4000	By Process II Account(Transfer)		
To Direct Wages		1500	Cost per unit 8250/41.25	200	8250
To Direct Expenses		500	=200		
To Production overheads (1500x150 %)		2250			
	200	8250		200	8250

Process II Account

	Units	Rs.		Units	Rs.
To Process I A/c	200	8250	By Process III = Account(Transfer)	200	13150
To Direct materials		600			
To Direct Wages		1600	Cost per unit 13150 = 200 65.75		
To Direct Expenses		300			
To Production overheads (1600x150%)		2400			
	200	13150		200	13150

Process III Account

	Units	Rs.		Units	Rs.
To Process II A/c	200	13150	By Finished stock A/c	200	15800
To Direct materials		400	(OutputTransferred)		
To Direct Wages			Cost per unit		
To Production overheads (900x150%)		900 1350	$\frac{15800}{200} = 79$		
	200	15800		200	15800

Process losses

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

Normal process loss

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

weight should be credited to the concerned process account. It should be recorded only in terms of quantity.

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

Illustration 2: From the following figures, show the cost of three processes of manufacture. The production of each process is passed on to the next process immediately on completion.

	Process A	Process B	Process C
Wages and Materials	30400	12000	29250
Works Overhead	5600	5250	6000
Production ion units	36000	37500	48000
Stock on 1 July 2012 (units from preceding process)		4000	16500
Stock on 31 July 2012 (units from preceding process)		1000	5500

Solution:

Process A Account

	Units	Rs.		Units	Rs.

To Wages and Materials	36000	30400	By Process B A/c (Transfer) Cost per unit 36000 / 36000 = 1	36000	36000
To Works Overhead		5600			
	36000	36000		36000	36000

Process B Account

	Units	Rs.		Units	Rs.
To Opening Stock (Re.1 p.u)	4000	4000	By loss in weight	1500	1000
			(Bal. fig) By Closing stock @ Re.1p.u	1000	
To Process A A/c (transfer)	36000	36000			56250
			By Process C A/c (Transfer) Cost per unit 56250 / 37500 = 1.50	37500	
To Wages and Materials		12000			
To Works Overhead		5250			
	40000	57250		40000	57250

Process C Account

	Units	Rs.		Units	Rs.
To Opening Stock (Rs	16500	24750	By loss in weight (Bal. fig)	500	8250

.1.50 p.u) To Process B A/c (transfer) To Wages and Materials To Works Overhead	37500 54000	56250 29250 6000 116250	By Closing stock@Rs.1.5p.u By Finished stock A/c (Transfer) Cost per unit 108000 = 2.25 48000	5500 48000 54000	108000 116250

Illustration 3: Bihar Chemicals Ltd produced three chemicals during the month of July 2012 by three consecutive processes. In each process 2% of the total weight put in is lost and 10 % is scrap which from process 1 and 2 realizes Rs.100 a ton and from process 3Rs.20 a ton.

The product of three processes is dealt with as follows:

	Process 1	Process 2	Process 3
Passed on to the next process	75%	50 %	
Sent to warehouse for sale	25%	50%	100 %

Expenses incurred:

	Rs	Tons	Rs	Tons	Rs	Tons
Raw materials	120000	1000	28000	140	107840	1348
Manufacturing wages	20500		18520		15000	
General expenses	10300		7240		3100	

Prepare Process Cost Accounts showing the cost per ton of each product.

Solution:

Process 1 Account

	Tons	Rs.		Tons	Rs.
To Raw materials	1000	120000	By loss in weight (2%)	20	10000
To Manufacturing wages		20500	By Sale of scrap (10%)	100	35200
To General expenses		10300	By Warehouse - transfer (880x25%)	220	105600
			By Process 2 A/c(Transfer)	660	
			Cost per unit $\frac{140800}{880} = 160$		
	1000	150800		1000	150800

Process 2 Account

	Tons	Rs.		Tons	Rs.
To Process 1 A/c(Transfer)	660	105600	By loss in weight (2%)	16	
To Raw materials	140	28000	By Sale of scrap (10%)	80	8000
To Manufacturing wages		18520	By Warehouse - transfer (704x50%)	352	75680
To General expenses		7240	By Process 2 A/c(Transfer)	352	75680
			Cost per unit 151360 = 215 704		
	800	159360		800	159360

Process 3 Account

	Tons	Rs.		Tons	Rs.
To Process 2 A/c(Transfer)	352	75680	By loss in weight (2%)	34	
To Raw materials	1348	107840	By Sale of scrap (10%)	170	3400
To Manufacturing wages		15000	By Warehouse - transfer	1496	198220
To General expenses		3100	Costper unit 198220		

			1496 =132.5		
	1700	201620		1700	201620

Abnormal Process Loss

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

Value of Abnormal loss

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

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

Proceeds of scrap (i.e. Value of normal loss)

Normal output = Input – Units of normal loss

Illustration 4: In process A 100 units of raw materials were introduced at a cost of Rs.1000. the other expenditure incurred by the process was Rs. 602. Of the units introduced 10% are normally lost in the course of manufacture and them posses a scrap value of Rs.3 each. The output of process A was only 75 units. Prepare Process A A/c and Abnormal loss A/c.

Solution:

Process A A/c

	Units	Rs.		Units	Rs.
To Raw Materials	100	1000	By Normal loss-100x10% @Rs.3 each	10	30
To Other expenses		602	By Abnormal loss (Bal.Fig)	15	262*
			By Process B A/c (transfer)	75	1310
	100	1602		100	1602

Working Note:

Normal cost of normal output = Total expenditure – Sale Proceeds of scrap

= 1602-30= 1572

Normal output = Input – Units of normal loss

= 100 – 10 = 90

$$= \frac{1572}{90} \times 15 = \text{Rs. } 262$$

Abnormal Loss A/c

	Units	Rs.		Units	Rs.
To Process A	15	262	By Cash (scrap value of loss @ Rs.3)	15	45
			By Costing P&L A/c		217
	15	262		15	262

Abnormal Gain (or Abnormal Effective)

Sometimes actual loss or wastage in a process is less than expected normal loss. In this case the difference between actual loss and expected loss is known as abnormal gain or abnormal effective. It is the excess of actual production over normal output.

Abnormal gain is valued in the same manner as abnormal loss. The value of abnormal gain is debited to process A/c and credited to abnormal gain A/c. the value of scrap is debited to abnormal gain A/.c and credited to normal loss A/c. finally abnormal loss

A/c is closed by transferring the credit balance to Costing P&L A/c.

Value of Abnormal Gain =

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

Normal cost of normal output = Total expenditure– Sale Proceeds of scrap

Normal output = Input – Units of normal loss

Units of Abnormal gain = Normal loss- Actual loss

Or = Actual output - Normal output

Illustration 5: Product X is obtained after it passes through three distinct processes. 2000 kg of materials at Rs.5 per kg were issued to the first process. Direct wages amounted to Rs.900 and production overhead incurred was Rs.500. Normal loss is estimated at 10% of input. This wastage is sold at Rs.3 per kg. The actual output is 1850 kg. Prepare process I A/c and Abnormal Gain/ Abnormal loss A/c as the case may be.

Solution:

Process I Account

	Kg	Rs.		Kg	Rs.

To Materials To Direct wages To Production OH To Abnormal gain (Bal.)	2000 50[1]	10000 900 500 300[3]	By Normal loss (Sale of scrap) By Process II - transfer	200 1850	600 11100[2]
	2050	11700		2050	11700

Abnormal Gain A/c

	Kg	Rs.		Kg	Rs.
To Normal loss (loss of income) To Costing P&L A/c (Bal.)	50	150 150	By Process I A/c	50	300
	50	300		50	300

Working note:

1. (200+1850)-2000=50

2. (10000+900+500)-600 = Rs.6
   1850-50
   1850x6=11100

3. 50x6=30

Illustration 6: The product of a company passes through three distinct processes to completion – A,B and C. from the past experience it s ascertained that los s incurred in each process as – A-2 %, B-5% and C-10 %.

In each case the percentage of loss is computed on te number of units entering the process concerned. The loss of each process possesses a scrap value. The los of processes A and B sold at Rs.5 per 100 units and that of C at Rs.20 per 100 units.

The output of each process passes immediately to the next process and the finished units are passed from process C into stock.

	Process A	Process B	Process C
Materials consumed	6000	4000	2000
Direct labour	8000	6000	3000
Manufacturing expenses	1000	1000	1500

20000 units have been issued to process A at a cost of Rs.10000. the output of each process has been as under:

A-19500, B- 18800 and C - 16000.

There is no work in progress in any process. Prepare process accounts. Calculations should be made to the nearest rupee.

Solution:

Process A Account

	Units	Rs.		Units	Rs.

To Units introduced	20000	10000	By Normal loss	400	20
To Materials		6000	By Abnormal loss	100	127
To Direct labour		8000	(Bal.)		
To Manufacturing		1000	By Process B -	19500	24853
Expenses			transfer		
	20000	25000		20000	25000

Process B Account

	Units	Rs.		Units	Rs.
To Process A A/c	19500	24853	By Normal loss	975	49
To Materials		4000	By Process C -	18800	36336
To Direct labour		6000	transfer		
To Manufacturing		1000			
Expenses					
To abnormal gain	275	532			
	19775	36385		19775	36385

Process C Account

	Units	Rs.		Units	Rs.
To Process B A/c	18800	36336	By Normal loss	1880	376
To Materials		2000	By To abnormal	920	2309
To Direct labour		3000	loss		
To Manufacturing		1500	By Finished stock	16000	40151
Expenses			A/c transfer		
	18800	42836		18800	42836

Finished Stock A/c

	Units	Rs.		Units	Rs.
To Process C A/c	16000	40151			
	16000	40151		16000	40151

Abnormal Loss A/c

	Units	Rs.		Units	Rs.
To Process A To Process C	100 920	127 2309	By Cash (100 @ Rs .5 per100+920@Rs.20per 100) By Costing P&L A/c	1020	189 2247
	1020	2436		1020	2436

Normal loss A/c

	Units	Rs.		Units	Rs.
To Process A	400	20	By Abnormal Gain	275	14
To Process B	975	49	By Cash/Debtors A/c	2980	431
To Process C	1880	376			
	3255	445		3255	445

Abnormal Gain A/c

	Units	Rs.		Units	Rs.
To Normal loss (loss of income) To Costing P&L A/c (Bal.)	275	14 538	By Process C A/c	275	532
	275	532		275	532

Working note:

Process A:

Value of Abnormal loss = Rs.24980/19600 units x 100 units = Rs. 127.

Process B:

Value of Abnormal gain = Rs.35804/18525 units x 275 units = Rs. 532.

Process C:

Value of Abnormal loss = Rs.42460/16920 units x 920 units = Rs. 2309.

Work-in-Progress

In most of the firms manufacturing is on a continuous basis and the problem of work-inprogress is quite common. The work-in-progress consists of direct materials, direct wages and production overhead.

Equivalent Production

Equivalent production represents the production of a process in terms of completed units. In other words, it means converting the incomplete units into its equivalent of completed units. It is also known as effective production. For calculating equivalent production, work-in-progress needs to be inspected. Then an estimate is made of the degree of completion, usually on a percentage basis.

Steps and procedure of computation of Equivalent Production

1. Ascertain Equivalent Production in respect of opening work-in-progress, if any. In this case the Equivalent Production is computed by taking into consideration the percentage of work required to finish now in the process. The following formula is used.

   Opening WIP (Units) x % of work needed to complete.

2. Find the units introduced and completed and add this to (1). It is calculated as follows:

   Units completed and transferred – Opening work-in-progress.

3. Convert the equivalent production of closing work-in-progress and add to the above. The formula is:

   Closing work-in-progress (units) x% of work completed.

4. Obtain the total Equivalent Production terms of materials, labour and overhead separately (if degree of completion is different). For this, 'Statement of Equivalent Production' is prepared.
5. Find out the net process costs, element wise- materials, labour and overheads.
6. Ascertain the cost per unit of Equivalent Production for each element of cost separately.

$$\text{Material cost per unit} = \frac{\text{Material cost}}{\text{Equivalent Production in respect of materials}}$$

$$\text{Labour cost per unit} = \frac{\text{Labour cost}}{\text{Equivalent Production in respect of labour}}$$

$$\text{Overhead cost per unit} = \frac{\text{Overhead cost}}{\text{Equivalent Production in respect of overhead}}$$

For this purpose 'Statement of Cost is prepared'

7. Find out the value of opening work-in-progress, finished units and closing work-in-progress. The formula is:

   Equivalent Production in respect of materials x Material cost per unit

   Equivalent Production in respect of labour x Labour cost per unit

   Equivalent Production in respect of overhead x Overhead cost per unit

For this purpose ‘Statement of Evaluation or Apportionment’ is prepared.

In short, the following three statements are to be prepared:

1. Statement of Equivalent Production
2. Statement of Cost
3. Statement of Evaluation.

I. When there is only closing work-in-progress but with no process losses

Under this case the closing work-in-progress is converted into equivalent units on the basis of estimate as regards degree of completion o materials, labour and production overhead. Illustration 7: Input 3800 units, Output 3000 units and closing work-in-progress 800 units.

	Degree of completion	Process costs Rs.
Materials	80%	7280
Labour	70%	10680
Overheads	70%	7120

Find out Equivalent Production, Cost per unit of equivalent production and prepare the Process A A/c assuming that there is no opening work-in-progress and process loss.

Solution:

Statement of Equivalent Production

Input		Output		Equivalent Production			
Items	Units	Items	Units	Materials		Labour& Overhead	
				Units	%	Units	%
Units introduced	3800	Units completed & transferred	3000	3000	100	3000	100
		Work in progress	800	640	80	560	70
	3800		3800	3640		3560	

Statement of Cost

Elements of cost	Cost (Rs.)	Equivalent Production (units)	Cost per completed unit
Materials	7280	3640	2.00
Labour	10680	3560	3.00
Overheads	7120	3560	2.00
	25080		7.00

Statement of Evaluation

Finished goods 3000x7	21000
Work in progress:	
Materials 640 x2	1280
Labour 560 x3	1680
Overhead 560 x2	1120
	4080

	Units	Rs.		Units	Rs.
To Materials To Labour To Overhead	3800	7280 10680 7120	By Finished stock A/c transfer By Work-in-progress	3000 800	21000 4080
	3800	25080		3800	25080

II. When there is only closing work-in-progress but with process losses

In case of normal loss, nothing should be added as equivalent production. However, abnormal loss should be considered as production of good units completed during the period.

Illustration 8: During January 2000 units were introduced into Process I. the normal loss was estimated at 5% on input. At the end of the month, 1400 units had been produce and transferred to the next process, 460 units were uncompleted and 140 units had been scrapped. It was estimated that uncompleted units had reached a stage in production as follows:

Material 75% completed

Labour 50% completed

Overheads 50% completed

The cost of 20000 units was Rs.5800

Direct material introduced during the process Rs.1440

Direct wages Rs.3340

Production overheads incurred were Rs. 1670

Units scrapped realized Re.1 each.

Units scrapped passed through the process, so were 100% completed as regards material, labour and overhead.

Find out Equivalent Production, Cost per unit and prepare the necessary accounts.

Solution:

Statement of Equivalent Production

Input Units	Output	Units	Equivalent Production			
			Materials		Labour & Overhead	
			Units	%	Units	%
2000	Normal loss Abnormal loss Finished production Work in progress	100 40 1400 460	 40 1400 345	 100 100 75	 40 1400 230	 100 100 50
2000		2000	1785		1670	

Statement of Cost

Elements of cost	Cost (Rs.)	Equivalent Production (units)	Cost per completed unit
Materials			
Cost of units introduced	5800		
Direct Materials	1440		
	7240		
Less: Scrap vale of normal loss	100		
	7140		
Direct wages	3340	1785	4
Overheads	1670	1670	2
Total		1670	1
	12150	5125	7

Statement of Evaluation

Production	Cost Elements	Equivalent Production	Cost per unit	Cost	Total Cost
Abnormal loss	Material	40	4	160	
	Labour	40	2	80	
	Overheads	40	1	40	
					280
Finished production	Material	1400	4	5600	
	Labour	1400	2	2800	
	Overheads	1400	1	1400	
					9800

Work-inprogress	Material Labour Overheads	345 230 230	4 2 1	1380 460 230	2070
					12150

Process I A/c

	Units	Rs.		Units	Rs.
To Units introduced	2000	5800	By Normal loss	100	100
To Materials		1440	By abnormal loss	40	280
To Labour		3340	By Finished	1400	9800
To Overhead		1670	production		
			By Balance c/d (Work-in-progress)	460	2070
	2000	12250		2000	12250

Finished Production A/c

	Units	Rs.		Units	Rs.
To Process I A/c	1400	9800			

Abnormal Loss A/c

	Units	Rs.		Units	Rs.
To Process I A/c	40	280	By Cash (sale @ Re.1 p.u)	40	40 240

	40	280	By Costing P&L A/c (loss)	40	280

III. When there is opening as well as closing work in progress but with no process loss.

Sometimes in a continuous process there will be opening as well as closing work in progress which are to be converted into equivalent of completed units for apportionment of process costs. The procedure of conversion of opening work in progress will vary depending upon whether average cost or FIFO or LIFO method of apportionment of costs is followed.

Illustration 9: From the following details, prepare statement of equivalent production, statement of cost, statement of evaluation and process A/c by following FIFO method.

Opening work-in-progress (2000 units):

Materials (100% complete) Rs. 5000

Labour (60% complete) Rs. 3000

Overheads (60% complete) Rs. 1500

Units introdu4ed into the process Rs. 8000

There are 2000 units in progress and the stage of completion is estimated to be:

Materials 100 %

Labour 50 %

Overheads 50 %

8000 units are transferred to the next process :

The process costs for the period are:

Materials Rs.96000

Labour Rs. 54600

Overheads Rs. 31200

Solution:

Statement of Equivalent Production

Output	Units	Equivalent Production			
		Materials		Labour& Overhead	
		Units	%	Units	%
Opening WIP Completed during the period(8000-2000) Closing WIP	2000 6000 2000	 6000 2000	 100 100	800 6000 1000	40 100 50
Total	10000	8000		7800	

Statement of Cost

Elements of cost	Cost (Rs.)	Equivalent Production (units)	Cost per completed unit

Materials	96000	8000	12
Labour	54600	7800	7
Overheads	31200	7800	4
Total	181800		23

Statement of Evaluation

Opening Work-in-progress (current cost)			
Materials			
Labour	800x7	5600	
Overhead	800x4	3200	
			8800
Closing WIP			
Materials	2000x12	24000	
Labour	1000x7	7000	
Overhead	1000x4 units	4000	
completely processed during the period			35000
6000@23			138000
			181800

Process A/c

	Units	Rs.		Units	Rs.
To Opening WIP	2000	9500	By Finished stock transferred to next process (9500+8800+138000)	8000	156300
To Materials					
To Labour	8000	96000			
To Overhead		54600			
		31200	By Closing WIP	2000	35000
	10000	191300		10000	191300

IV. When there is opening as well as closing work-in-progress but with losses.

Under this equivalent production units regarding opening and closing work in progress are to be calculated with due adjustment for process losses.

Illustration 10: Following data are relating Process A for March 2012.

Opening WIP – 1500 units for Rs. 15000

Degree of completion:

Materials 100%, Labour and overheads 33 1/3%

Input of materials 18500 units at Rs.52000

Direct labourRs. 14000

Overheads Rs. 28000

Closing WIP - 5000 units.

Degree of completion: Materials 90% and labour and overheads 30%.

Norma process loss is 10% of total input (opening WIP units + units put in)

Scrap value Rs. 2 per unit.

Unit transferred to the next process 15000 units.

Compute equivalent units of production, cost per equivalent unit for each cost element and cost of finished output and closing WIP.

Also prepare Process and other accounts. Assume that FIFO method is used by the company and the cost of opening WIP is fully transferred to the next process.

Solution:

Statement of Equivalent Production and Cost

Input Units	Output	Units	Equivalent Production					
			Materials		Labour		Overhead	
			Units	%	Units	%	Units	%
1500 18500	Opening WIP transfer Normal loss Finished goods Closing WIP	 1500 2000 13500 5000	 13500 4500	 100 90	 1000 13500 1500	 662/3 100 30	 1000 13500 1500	66 2 / 3 100 30
20000	less: Abnormal gain Materials less: scrap value Cost per equivalent unit	22000 2000 20000 52000 4000	18000 2000 16000 48000 Rs.3	100	16000 2000 14000 14000 Rs.1	100	16000 2000 14000 28000 Rs.2	100

Statement of Evaluation

Opening Work-in-progress			
Materials			
Labour	1000x1	1000	
Overhead	1000x2	2000	
Finished goods	13500×6		3000
Abnormal gain	2000×6		81000
Closing WIP			12000
Materials	4500x3	13500	
Labour	1500x1	1500	
Overhead	1500x2 units	3000	
			18000

Process I A/c

	Units	Rs.		Units	Rs.
To Opening WIP	1500	15000	By normal loss	2000	4000
To Materials	18500	52000	By Finished	15000	99000
To Labour		14000	stock		
To Overhead		28000	(18000+81000)		
To Abnormal gain	2000	12000	By Closing WIP	5000	18000
	22000	121000		22000	121000

Normal loss A/c

	Units	Rs.		Units	Rs.
To Process I	2000	4000	By Abnormal Gain	2000	4000

Abnormal Gain A/c

	Units	Rs.		Units	Rs.
To Normal loss (loss of income) To Costing P&L A/c (Bal.)	2000	4000 8000	By Process I A/c	2000	12000
	2000	12000		2000	12000

Module V : Marginal Costing & Budgetary Control

The basic objectives of Cost Accounting are cost ascertainment and cost control. In order to help management in cost control and decision making, cost accounting has developed certain tools and techniques. Marginal costing and Break even analysis are important techniques used for cost control and decision making.

Marginal Cost

The term Marginal cost means the additional cost incurred for producing an additional unit of output. It is the addition made to total cost when the output is increased by one unit.

Marginal cost of nth unit = Total cost of nth unit- total cost of n-1 unit.

Eg. When 100 units are produced, the total cost is Rs. 5000.When the output is increased by one unit, i.e, 101 units, total cost is Rs.5040.Then marginal cost of 101th unit is Rs. 40[5040-5000]

Marginal cost is also equal to the total variable cost of production or it is the aggregate of prime cost and variable overheads. The chartered Institute of Management Accountants [CIMA] England defines Marginal as "the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit.

Marginal Costing

It is the technique of costing in which only marginal costs or variable are charged to output or production. The cost of the output includes only variable costs .Fixed costs are not charged to output. These are regarded as 'Period Costs'. These are incurred for a period. Therefore, these fixed costs are directly transferred to Costing Profit and Loss Account.

According to CIMA, marginal costing is "the ascertainment, by differentiating between fixed and variable costs, of marginal costs and of the effect on profit of changes in volume or type of output.

Under marginal costing, it is assumed that all costs can be classified into fixed and variable costs. Fixed costs remain constant irrespective of the volume of output. Variable costs

change in direct proportion with the volume of output. The variable or marginal cost per unit remains constant at all levels of output

Features of Marginal Costing [Assumptions in MarginalCosting]

All costs can be classified into fixed and variable elements. Semi variable costs are also segregated into fixed and variable elements.

The total variable costs change in direct proportion with units of output. It follows a linear relation with volume of output and sales.

The total fixed costs remain constant at all levels of output. These are incurred for a period and have no relation with output.

Only variable costs are treated as product costs and are charged to output,product, process or operation

Fixed costs are treated as 'Period costs' and are directly transferred to Costing Profit and Loss Account.

The closing stock is also valued at marginal cost and not at total cost.

The relative profitability of product or department is based on the contribution it gives and not based on the profit

It is also assumed that the selling price per unit remains the same i.e, any number of units can be sold at the current market price.

The product or sales mix remains constant over a period of time.

Concept of Contribution

Contribution is the excess of sales over marginal cost. It is not purely profit. It is the profit before recovery of fixed assets. Fixed costs are first met out of contribution and only the remaining amount is regarded as profit. Contribution is an index of profitability. It has a fixed relationship with sales. Larger the sales more will be the contribution and vice versa.

Contribution = Sales – Marginal cost

Marginal cost equation

Sales-Marginal cost = Contribution

Contribution = Fixed costs + Profit

Therefore, Fixed cost = Contribution – Profit'

Profit Volume Ratio [P/V RATIO]

Contribution is an absolute measure of profitability but it cannot be used for comparison of two products or departments. Therefore, the contribution is related to volume of sales. It is called Contribution / Sales Ratio or Profit/Volume Ratio [P/V Ratio]

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

When the P/V Ratio is higher, profitability of the product will also be higher. It is an index of relative profitability of products or departments.

$$\text{Sales} = \frac{\text{Contribution}}{\text{P/V Ratio}}$$

Contribution = Sales x P/V Ratio

P/V Ratio can also be find out by the following formula:-

$$\text{P/V Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$$

$$\text{Or P/V Ratio} = \frac{\text{Fixed Cost}}{\text{Break even sales}} \times 100$$

Marginal cost statement

The Marginal cost statement is a profitability statement prepared according to marginal costing principles. It is prepared in the following format.

Sales Less: Variable/Marginal cost Direct Labour Direct Expenses Variable Factory overheads Variable Administration overheads Variable Selling and distribution overheads Contribution Less Fixed CostsProfit		xx

Illustration 1

You are given the following information relating to a company for the year 2012Output 20000 units

Selling price per unit Rs.12

Direct materials per unit Rs.5

Direct Labour per unit Rs.2

Variable overhears per unit Rs.1

Fixed cost per year Rs.60000

Calculate [1] Total Marginal cost [2] Contribution

[3]Profit [4]P/VRatio

Solution:-

MARGINAL COST STATEMENT		
Output 20000 Units	12	**240000**
Less :Marginal Cost		
Direct Materials	5	100000
Direct Labour	2	
Direct Expenses	1	20000
Total Marginal Cost	8	160000
Contribution	**4**	**80000**
Less: Fixed Costs		60000
Profit		**20000**

P/V Ratio = $\frac{\text{Contribution}}{\text{Sale}}$ x 100

= $\frac{80000}{240000}$ x 100 = 33.33%

Advantages of Marginal Costing

Following are the advantages of Marginal costing

1. It is simple to understand and easy to apply to any firm
2. There is no arbitrary apportionment of fixed cost in this system. Fixed costs are transferred to costing

profit and Loss account.

3. It also prevents the illegal carry forward in stock valuation of some proportionof current years fixed cost.
4. The effect of different sales mix on profit can be ascertained and management can adopt the optimum sales mix
5. It is used in control of cost by concentrating on variable cost of production.
6. It helps in profit planning by break even and cost volume profit analysis
7. It helps management to take a number of short term decisions like pricing, output, closing down of department, sales mix, make or buy etc..

Disadvantages of Marginal Costing

Important disadvantages of marginal costing are ;

1. All Assumptions of marginal costing are not appropriate. The assumption fixed cost remains constant for all levels may not hold good in the long run.
2. The assumption that changes in direct proportion with the volume of also do not hold good under all circumstances.

3. It is difficult to segregate all costs into fixed and variable elements.
4. The exclusion of fixed costs in ascertaining cost of production may give misleading results and lead to non recovery of total costs.
5. The exclusion of fixed costs from inventories affect profit and financial statements may not reflect true and fair view of financial affairs.

Break Even Analysis

Every business is interested in ascertaining the breakeven point. It is the level of operation where total revenue or sales are equal to total cost. It is the point of no profit or no loss. The contribution received at Break even point is just sufficient to meet the fixed costs, leaving nothing as profit. The firm ceases to incur losses at this point or it starts to earn a profit from this point. Breakeven point can be expressed in algebraic method or graphical method.

Algebraic Method

Breakeven point may be expressed in terms of number of units to be produced, or in terms of volume of sales or in terms of the capacity of operation. It can be calculated by the following formula.

1. Break even point in units = Total Fixed costs
Contribution per unit

2. Break even point in value = Total Fixed costs

or

P/V Ratio

= Total Fixed cost x sales

Contribution

3. Break even point (in % of capacity utilization)

= Total Fixed Cost x 100

Contribution

Illustration 2

From the following information calculate

1. P/V Ratio

2. Breakeven point in Units

3. Breakeven point in Value

Given :

Selling price per unit Rs.20

Variable cost per unit Rs.12

Fixed costs Rs.32000

P/V Ratio = Contribution/Sales x 100 = 20-12/20x100

= 40 %

Breakeven point in units = Fixed costs/ Contribution per unit = 32000/8=4000 units

Breakeven point in value = Fixed costs = 32000/40 x100
P/V Ratio

= Rs.80000

Target Profit

The Break even analysis can guide an organization to determine the volume of sales required to earn a desired level of profit. The firm can decide upon the target return or profit in advance. To achieve this profit, efforts would be taken to increase the volume of sales. The volume of sales required to achieve the desired level of profit may be computed as follows:-

Number of units to be sold = Fixed costs + desired Profit
Contribution per unit

Sales volume required = Fixed costs+ Desired Profits
P/V Ratio

Illustration 3

Product A is sold at a unit selling price of Rs. 40 and the variable cost incurred per unit is Rs.32.The firm's fixed cost are Rx.40000.Find out

1. The number of units to be produced to break even
2. The number of units to be sold to earn a profit of

Rs.10000

Solution

Contribution = SP-VC

= 40-32 = 8 per unit

1. Number of units to be produced to Break even

BEP= Fixed cost/ Contribution per unit = 40000/8

= 5000 units.

2. Number of units to be sold to earn a profit of Rs.10000

$$\frac{\text{Fixed Cost + Desired Profit}}{\text{Contribution per unit}}$$

= 40000+10000/8 = 6250 Units

Break Even Chart [Graphic Method]

It is the graphical presentation of breakeven point. It shows the relationship between sales volumes, variable and fixed costs. It also shows the profit or loss at different levels of output or volume of sales.

Construction of Break even Chart

A Break even chart shows the total sales line, total cost line and the point of intersection called the breakeven point. It is constructed using a database of variable costs, fixed costs, total costs and sales at different levels of output.

The units of output or sales revenue are plotted along the X axis, using suitable scale of measurement. The costs and sales are plotted along the Y axis. The fixed costs line is plotted first. It forms a parallel line to the X axis indicating that the fixed cost remain constant at all levels of output. The variable cost line is plotted next, starting from zero it progresses continuously indicating that the variable cost increase with the volume fixed cost line of sales. The total cost line is plotted above the variable cost line. It starts from the fixed cost line on the Y axis and follows the same pattern of variable cost line. The sales line is plotted finally. It starts from the zero and progresses continuously, indicating that the sales increase with larger units of output. The point of intersection of sales line and total cost line indicates the Break even point. A vertical line drawn to the X axis from this point shows the volume of output required to Break even.

Illustration 4

Draw a Break even chart using the following data Selling price per unit Rs.12

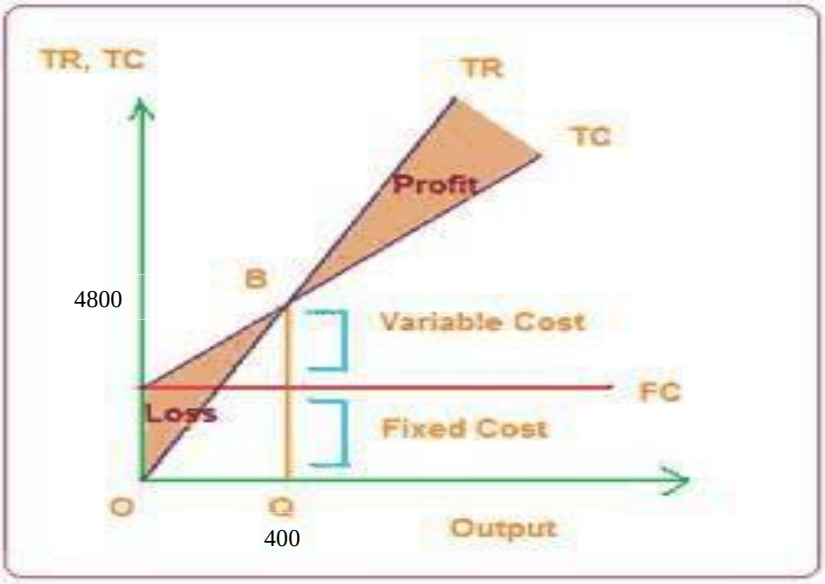
Variable cost per unit Rs.7

Fixed costs Rs. 2000

Budgeted output 800 units

Solution

Output [units]	Variable costs	Fixed costs	Total costs	Sales
200	1400	2000	3400	2400
400	2800	2000	4800	4800
600	4200	2000	6200	7200
800	5600	2000	7600	9600



Angle of Incidence

It is the angle caused by the intersection of the total sales line and total cost line at the Break even point. The width of the angle represents the rate of profitability i.e, the larger the angle the greater will be the profit the business is making on additional sales

Margin of Safety

Margin of safety represents the strength of the business to face an adverse market condition. It is the excess of actual sales over break even sales. Higher the Margin of safety, better the position of the firm.

Margin of safety = Actual sales- Break even sales

Margin of safety = Profit / P/V Ratio

Or Profit = margin of safety x P/V Ratio

Illustration 5

Calculate BEP and Margin of safety from the following?

Sales 50000 units @ Rs.6 per unit

Prime cost Rs. 3 per unit

Variable overhead Rs. 1 per unit

Fixed costs Rs.75000 per annum

Solution:-

BEP = $\frac{\text{Fixed Cost}}{\text{SP-VC per unit}} = \frac{75000}{6-4}$ =37500 units

BEP in value = 37500 x 6 = 225000

Margin of safety = Actual sales – BE sales

= [50000x6]-225000= Rs.75000

Illustration 6

The following data have been obtained from the records of a manufacturing firm.

	Period I	Period II
Sales	300000	320000
Total cost	260000	272000

Calculate

1. Break even sales
2. Profit when sales are Rs.360000.
3. Sales required to earn a profit of Rs.50000

Solution:

P/V Ratio = $\frac{\text{Change in Profit}}{\text{Change in Sales}}$ x 100

Change in profit = 48000-40000= 8000

Change in Sales = 320000-300000 = Rs.20000

P/V Ratio = 8000/20000x 100 = 40%

Contribution = Sales x P/V Ratio

Period I = 300000 x 40/100 = Rs.120000

Fixed cost = Contribution – Profit = 120000- 40000 = Rs.80000

1. BEP = Fixed cost /P/V Ratio = 8000/40 x 100

= 200000

Profit when sales are Rs.360000 Contribution

= 360000x40/100 = 144000

Profit = Contribution – Fixed cost

= 144000-80000=Rs.64000

3.Sales required to earn a profit of Rs.50000

Contribution required = Fixed cost + Profit required

= 80000+50000 = 130000

Sales = Contribution requires/ P/V ratio

= 130000/40x100 = Rs.325000

Cash Break Even Point

Total fixed costs include depreciation. Depreciation is a non cash expense. Therefore, cash break even point is the number of units to be produced to give a contribution equal to cash fixed costs.

$$\text{Cash Break even point} = \frac{\text{Fixed cost} - \text{Depreciation}}{\text{Contribution per unit}}$$

Illustration 7

Calculate cash Break even point for the following

Selling price per unit Rs.40

Variable cost per unit Rs.32

Fixed cost [including depreciation of Rs.20000] Rs.60000 per annum

Solution

Contribution per unit = S- VC = 40-32 = 8

Cash break even point = $\frac{\text{Fixed cost – depreciation}}{\text{Contribution per unit}}$

= 60000-20000/8 = 5000 units

COMPOSITE BREAK EVEN POINT

In the case of companies producing more than one product an over all or composite break even point is calculated.

Composite Break even point = $\frac{\text{Total Fixed Costs}}{\text{Composite P/V Ratio}}$

Composite P/V Ratio = $\frac{\text{Total contribution}}{\text{Total Sales of all products}}$ x 100

Cost-Volume Profit Analysis [CVP Analysis]

It is the study of the impact of a change in cost , price and volume on profit. Break even analysis is a narrow interpretation of cost volume profit analysis. But it is mainly confined to finding out the Break even point. In CVP analysis the relationship between cost, volume and profit is

studied in detail. It helps management in profit planning, decision making and cost control.

Assumptions in CVP analysis

The assumptions in CVP analysis are the same as that under marginal costing.

1. Cost can be classified into fixed and variable components.
2. Total fixed cost remain constant at all levels of output
3. The variable cost change in direct proportion with the volume of output
4. The product mix remains constant
5. The selling price per unit remains the same at all the levels of sales
6. There is synchronization of output and sales, i.e, what ever output is produced , the same is sold during that period.

Profit Volume Chart or [P/V Chart]

It shows the amount of profit or loss at different levels of output. When the output is zero, total loss will be equal to fixed costs. The fixed costs are recovered gradually when the volume of output is increased. When the output reaches the Break even point, the whole fixed costs are recovered.

The firm incurs no loss or earns no profit. Thereafter, the firm makes a profit and the amount of profit increases with the increase in sales volume.

Construction of P/V Chart

The same data used for drawing a Break even chart may be used for constructing a P/V chart. The following steps may be followed for constructing a P/V chart.

1. Sales or units of output are plotted along the X axis
2. The Y axis is used for marking fixed costs losses and profits
3. Points of Profits or losses are marked at different levels of sales and these points are joined to get the profit or loss line.
4. The point where the profit or loss line intersects the X axis is marked asthe Break even point.
5. The angle at the BEP measures the angle of incidence
6. The distance between BEP and actual sales on the X axis measures themargin of safety

Illustration 8

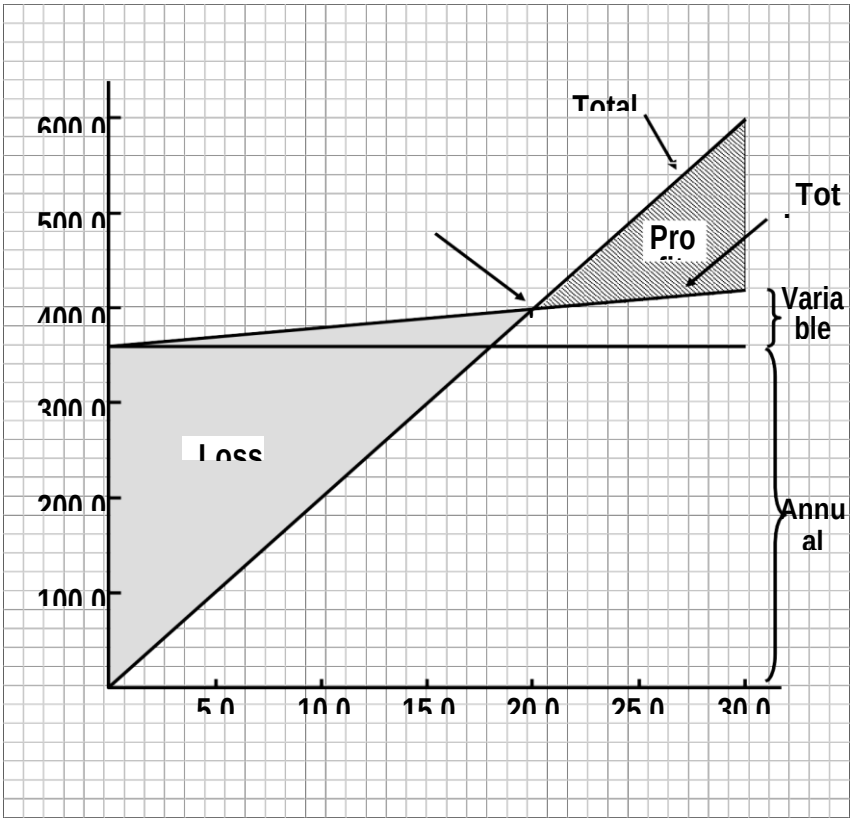
Draw a Profit/ Volume graph from the following data and find out the BEP?

Sales for the year [20000units] Rs.2000000

Variable Costs Rs.1600000

Fixed costs for the year Rs.200000

What would be the profits when the output is 22000 units?



Cost-volume-profit graph

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Budget and Budgetory Control

Meaning and definition of budget

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

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

Budgeting and Budgetary control

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

In the words of Rowland Harr, "Budgeting is the process of building budgets".

Budgetary control is a system of using budgets for planning and controlling costs. The official terminology of CIMA defines the term 'budgetary control , as " the establishment of budgets relating to the responsibilities of executives to the requirement of a policy, and the continuous comparison of actual with budgetary result, either to secure by individual action the objectives of that policy or to provide a basis for its revision." Thus, when plans are embodied in a budget and the same is used as the basis for regulating operations, we have budgetary control. As such budgetary control starts with budgeting and ends with control.

Objectives of Budget and Budgetary control:

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

1. To aid the planning of annual operations
2. To co ordinate the activities of the various parts of the organization
3. To communicate plans to the various responsibility centre managers
4. To motivate managers to strive to achieve the organizational goals.
5. To control activities

6. To eliminates the wastes of all kinds
7. To provide a yard stick against which actual results can be compared
8. To evaluate the performance of managers.
9. To reduce the uncertainties

Meaning of Estimate Forecast and Budget:

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

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

Steps involved in Budgetary Control:

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

1. Laying down organizational goals or objectives
2. Formulating the necessary plans to ensure that the desired objectives are achieved.
3. Translating plans into budget

4. Relating the responsibilities of executives to the requirements of a policy.
5. Recording and reporting actual performance
6. Continuous comparison of actual with budgeted results
7. Ascertainment of deviations, if any
8. Focusing attention on significant deviations
9. Investigation into deviations to establish causes
10. Presentation of information to management, relating the variations to individual responsibility.
11. Taking corrective action to prevent recurrence of variations.
12. Provide a basis for revision of budgets.

Essentials of a Budgetary Control system

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

1. **Support by top management**: The wholehearted support of all managerial persons is very necessary for the success of a budgetary control system.
2. **Formal organization:** The existence of a formal and sound organizational structure is of an absolute necessity for an effective system of budgetary control.

3. **Budget centers:** For budgetary control purposes, the entire organization will be split into a number of departments, area or functions, known as ‘centres’, and budgets will be prepared for each such centers
4. **Clear cut objectives and reasonably attainable goals:-** If goals are too high to be attained, the purpose of budgeting is defeated. On the other hand, if the goals are so low that they can be attained very easily, there will be no incentive to special effort.
5. **Participative budgeting:** Every executive responsible for the implementation of budgets should be given an opportunity to take part in the preparation of budgets.
6. **Budget committee**: The work of preparing a budget manual should be entrusted to a Budget committee. The work of scrutinizing the budgets as well as approving of the same should be the work of this committee.
7. **Comprehensive budgeting**: Budgeting should not be partial, it should cover all the functions .
8. **Adequate accounting system:** There should be an adequate accounting system for the successful budgetary control system, because those who are involved in the preparation of estimates depend heavily on the accounting department.

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

Budget manual:

CIMA England, defines a budget manual as " a document , schedule or booklets which sets out;

inter alia, the responsibilities of the persons engaged in the routine of and the forms and records required for budgetary control". In other words, it is a written document which guides the executives in preparing various budgets.

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

Classification of Budget

1 . Classification according to time factor

2 . Classification according to flexibility factor

3 . Classification according to function.

I. **Classification according to time factor**: - On this basis, budgets can be of three types:

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

2. Short term budgets – Usually for a period of one to two years
3. Current budgets - Usually covers a period of one month or so,

II. **Classification according to flexibility:** It includes

1. Flexible budgets and
2. Fixed budgets

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

Steps in preparing flexible budgets:

1. Identifying the relevant range of activity
2. Classify cost according to variability
3. Determine variable cost
4. Determine fixed cost
5. Determine semi variable cost
6. Prepare the budget for selected levels of activity

Example 1

The expenses budgeted for production of 10,000 unit in a factory are furnished below:

		Per unit in Rs
Material cost		70
Labour cost		25
Variable factory over head		20
Fixed over head	(Rs. 1,00,000)	10
Variable expenses(Direct)		5
Selling expenses (20% fixed)		15
Distribution overhead (10% fixed)		10
Administration expenses (Rs, 50,000)		5

Prepare a flexible budget for production of 8,000 units.

Solution:

	Output Pe unit(Rs)	10,000 units Total	Out put Per unit (Rs)	8 ,000 units Total (Rs.)
Material	70.00	7,00,000	70.00	5 , 60,000
Labour	25.00	2,50,000	25.00	2 , 00,000
Direct expe, (variable)	5.00	50,000	5.00	40,000
	100.00	10,00,000	100.00	8,00,000
Factory overhead :				
Variable	20.00	2,00,000	20.00	1, 60,000
Fixed	10.00	1,00,000	12.50	1,00,000
	130.00	13,00,000	132.50	10,60,000
Administrative expenses:	5.00	50,000	6.25	50,000
	135.00	13,50,000	138.75	11, 10,000
Selling expenses:				
Fixed (20% of 15)	3.00	30,000	3.75	30,000
Variable (80% of 15)	12.00	1,20,000	12.00	96,000
Distribution expenses:				
Fixed (10% of Rs. 10)	1.00	10,000	1.25	10,000
Variable (90% of 10)	9.00	90,000	9.00	72,000
	160.00	16,00,000	164.75	13 , 18,000

Fixed Budget

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

III. **Classification according to function: It includes:**

1. Functional budgets and
2. Master budgets

Functional budgets are those which are prepared by heads of functional department s for their respective departments and are subsidiary to the master budget. Functional budget may be **Operating budgets or financial budget**. Operating budgets are those budgets which relate to the different activities or operations of a firm. These are the primary budgets. Financial budgets are those which incorporate financial decisions of an organization. They show in detail the inflow and outflow of cash and the overall financial position.

Master budget is the summary of all functional budgets. It summarizes sales, production, purchase, labour, finance budgets etc. It is considered as the overall budget of the organization.

Different types of functional budgets:

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

Illustration 1

A manufacturing company submits the following figures of product 'Z' for the first quarter of 2018

Sales (in units) January 50,000
February 40,000
March 60,000

Selling price per unit Rs. 100

Sales target of 1st quarter 2019:

Sales quantity increase 20% Sales price increase 10%

Prepare sales budget for the first quarter of 2019.

Solution:

Sales budget

For the first quarter of 2019

Months	Units	Price per unit	Value

January	60,000	110	66 , 00,000
February	48,000	110	52 , 80,000
March	72,000	110	79 , 20,000
	1,80,000		1 ,98, 00,000
	==========		==========

2. **Production budget:** It is the forecast of the quantity of production for the budget period. It is usually expressed in physical quantity.

Illustration 2

A manufacturing company submits the following figures relating to product X for the first quarter of 2018.

Sales targets: January 60 ,000 units
February 48 ,000 units
March 72 ,000 units

Stock position: 1-1-2018(% of January 2010 sale) - 50 %

Stock position: 31-3-2018 40 ,000 units

Stock position: End January & February 50 %

(% of subsequent month's sales)

You are required to prepare production budget for the first quarter of 2018.

Solution

Production Budget for The First Quarter Of 2018

Month	Sales(Units)	+closing stock (Units)	-Opening stock (Units)	Production (units)
January	60,000	24,000	30,000	54,000
February	48,000	36,000	24,000	60,000
March	72,000	40,000	36,000	76,000
				1 , 90,000 =======

3. **Material budget:** It shows the estimated quantities as well as cost of raw material required for the production of different product during the budget period.
4. **Purchase budget:** It shows the quantity of different type of materials to be purchased during the budget period taking into consideration the level of activity and the inventory levels.

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

   The cash budget is prepared on the basis of the cash forecast. The cash forecast is an estimate showing the availability or otherwise of adequate amount of cash in a future period for meeting the operating expenses and all other commitments. It summarizes the anticipated cash receipts and cash payments for the budget period.

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

a. The receipts and payment method
b. Adjusted Profit and Loss account method
c. Balance sheet method.

Example 2(Receipts and Payment method)

A company is expecting to have Rs. 25000cash in hand on 1st April 2018 and it requires you to prepare an estimate of cash position during the three month, April to June 2018. The following information is supplied to you.

Months	Sales(Rs)	Purchase(Rs)	Wages(Rs)	Expenses(Rs)
February	70,000	40,000	8,000	6,000

March	92,000	52,000	9,000	7,000
May	1,00,000	60,000	10,000	8,000
June	1,20,000	55,000	12,000	9,000

Other information:

1. Period of credit allowed by suppliers – two months
2. 25 % of sale is for cash and the period of credit allowed to customers for credit sale is one month.
3. Delay in payment of wages and expenses – one month.
4. Income tax of Rs.25,000 is to be paid in June 2018.

Solution:

Cash Budget for the Period Ending June 2018

	April (Rs.)	May(Rs.)	June(Rs.)	Total(Rs.)
Opening balance	25,000	53,000	81,000	-------
Receipts:		25,000	30,000	78,000
Cash sales	23,000	69,000	75,000	2 , 04,000
Cash from debtors	60,000			
Total	83,000	94,000	1,05,000	2 , 82,000
	========	=======	========	=======
Payments:	40,000	50,000	52,000	1 , 42,000
Creditors	8,000	9,000	10,000	27,000
Wages	7,000	7,000	8,000	22,000
Expenses	---	-----	25,000	25,000
Income Tax				

Total	55,000 ======== 53,000	66,000 ======= 81,000	95,000 91,000	2 , 10,000 ======= ----
Closing balance				

b. Adjusted Profit and Loss method: Under this method, profit is adjusted by adding back depreciations, provisions, stock and work in progress, capital receipts, decrease in debtors, increase in creditors etc. Similarly, dividends, capital payments, increase in debtors, increase in stock and decrease in creditors are deducted. The adjusted profit will be the estimated cash available. Under this method, the following information becomes necessary.

1. Expected opening balance
2. Net profit for the period
3. Changes in current asset and current liabilities
4. Capital receipts and capital expenditure
5. Payment of dividend

c. Balance sheet method: Under this method, a budgeted balance sheet is prepared for the budgeted period, showing all assets and liabilities except cash. The two sides of the balance sheet are then balanced. The balance then represents cash at bank or overdraft, depending upon whether the assets total is more than

that of the liabilities total or the latter is more than that of the former.

Advantages of Cash budget

1. It helps to ascertain the shortage of cash
2. It helps to identify excess of cash, so that the surplus cash can be invested for a short period
3. It helps to ensure sufficient cash is available when required.