மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்

Manonmaniam Sundaranar University

Reaccredited with 'A' Grade (CGPA 3.13 Out of 4.0) by NAAC (3rd Cycle)

Tirunelveli - 627 012, Tamilnadu, India.

DIRECTORATE OF DISTANCE

&

CONTINUING EDUCATION

APPLIED COSTING

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APPLIED COSTING

Objectives

1. To familiarise the students with the various cost concepts, and elements of cost
2. To enable the students to prepare cost sheets
3. To apply different methods and techniques of cost control
4. To gain knowledge of different methods of payment of wages and incentives
5. To acquaint the students in the application of Marginal costing for Business decision making.

UNIT I Introduction: Costing - Cost Accounting – Meaning and Definition – Financial Accounting Vs Cost accounting – Relationship of cost accounting with management accounting - Nature and significance of Cost Accounting – Implementation of costing system – Practical difficulties in implementation – Essentials of good costing system - Elements of cost – Cost concepts and preparation of cost sheet – Methods of Costing -job order Costing – Process Costing- Materials – Issue of materials – Pricing of material issued.

UNIT II Labour Costing: Labour – types of labour cost - Methods of time keeping – Idle time - overtime – labour turnover - Preparation of Pay Roll – Wage payment and incentive system – Overhead – meaning and classification of overheads – Departmentalization of Overheads - Allocation - Apportionment – Reapportionment- Absorption of Overhead cost – Difference between cost allocation and apportionment and Reapportionment – treatment of over and under absorbed overheads.

UNIT III Process Costing: Process costing – Comparison between joint costing and process costing – costing procedure under process costing- Process Losses – Inter process profit – Equivalent production - methods of computing equivalent units- Evaluation of equivalent production– Joint product and by products costing – accounting for joint products & by-products.

UNIT IV Marginal Costing : Marginal costing – Salient features – Marginal costing and absorption costing - Break – Even analysis – Cost – Volume-profit analysis – Application of Marginal costing for Business decision making - Determination of sales mix- Exploring new markets- Make or buy decisions- Change versus status quo - expand or contract – shut down or continue - Inflation Accounting – Human Resource Accounting.

UNIT V Cost Management: Cost management – cost reduction and cost control – Responsibility Accounting – Responsibility Centre – Accounting for Price level changes – Methods of Accounting for price level changes – Activity Based Costing – Target costing – Kaizen

Note: Question paper shall consist of 40% Theory and 60% Problems

Learning Outcomes:

After the completion of the course, the students must be able to:

1. Gain familiarity with the various cost concepts, and elements of cost
2. Prepare cost sheets
3. Apply different methods and techniques of cost control
4. Gain knowledge of different methods of payment of wages and incentives
5. Get acquaintance with the application of Marginal costing for Business decision making

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APPLIED COSTING

Unit I

Introduction:

The importance of accounting information to the successful operation of a business has long been recognized. Accounting provides timely and accurate financial information concerning the activities of an enterprise to a diverse group of people such as shareholders, managers, creditors, tax authorities, etc. On the basis of the purpose for which this information is used, accounting is divided into three parts financial accounting, cost accounting and management accounting.

Cost accounting is a branch of accounting and has been developed due to limitations of financial accounting. The financial accounting is primarily concerned with record keeping directed towards the preparation of gross profit account, profit and loss account and balance sheet. It provides information regarding the gross profit, profit and loss that the business or enterprise is making and also its financial position on a particular period. The information concerning the business or enterprise is helpful to the management to control on business.

The management of every business enterprise is interested to know much more than the usual information supplied to outsiders. In order to carry out its functions of planning, decision-making and control, it requires additional cost data. The financial accounts fail, to some extent, to provide required cost data to management and hence a new system of accounting which could provide internal report to management was conceived of.

Evolution of Cost Accounting

In 1494 Luca Pacioli, an Italian found out the double entry system of accounting and later this system was developed in England and spread to all over the world. The purpose of Cost Accounting needs are served as a small branch of Financial Accounting except a few cases like Royal wallpaper manufactory in France (17th Century), and some Iron Masters & Potters in England (18th century). The period 1880 AD-1925 saw the development of complex product designs and the emergence of multi activity diversified corporations like Du Pont, General Motors etc. It was during this period that scientific management was developed which led the accountants to convert physical standards into Cost Standards, the latter being used for variance analysis and control. During the World War I and II the social importance of Cost Accounting

grew with the growth of each country's defence expenditure. In the absence of competitive markets for most of the material required for war, the governments in several countries placed cost-plus contracts under which the price to be paid was cost of production plus an agreed rate of profit. The reliance on cost estimation by parties to defence contracts continued after World War II.

Meaning of Costing, Cost Accounting and Cost Accountancy

Costing: CIMA London defines Costing as "the techniques and processes of ascertaining costs." The technique in costing consists of the body of principles and rules for ascertaining the costs of products and services. The technique is dynamic and changes with the change of time. The process of costing is the day to day routine of ascertaining costs. Cost Accounting is the process of accounting for cost which begins with recording of income and expenditure and ends with the preparation of statistical data. It is the formal mechanism by means of which cost of products or services are ascertained and controlled. Cost Accounting provides analysis and classification of expenditure as will enable the total cost of any particular unit of product/service to be ascertained with reasonable degree of accuracy and at the same time to disclose exactly how such total cost is constituted. Cost Accounting is a quantitative method that collects, classifies, summarizes and interprets information for product costing, operation planning and control and decision making.

Cost Accounting may be defined as "Accounting for costs classification and analysis of expenditure as will enable the total cost of any particular unit of production to be ascertained with reasonable degree of accuracy and at the same time to disclose exactly how such total cost is constituted". Thus Cost Accounting is classifying, recording an appropriate allocation of expenditure for the determination of the costs of pro ducts or services, and for the presentation of suitably arranged data for the purpose of control and guidance of management.

The I.C.M.A. London defines Cost Accounting as "the process of accounting for cost from the point at which expenditure incurred or committed to the establishment of its ultimate relationship with cost centers and cost units".

Cost Accountancy

Cost Accountancy is defined as 'the application of Costing and Cost Accounting principles, methods and techniques to the science, art and practice of cost control and the ascertainment of profitability'. It includes the presentation of information derived there from for the purposes of

managerial decision making. Thus, Cost Accountancy is the science, art and practice of a Cost Accountant.

The scope of Cost Accountancy is very wide and includes the following:-

(a) Cost Ascertainment: The main objective of Cost Accounting is to find out the Cost of product /services rendered with reasonable degree of accuracy.

(b) Cost Accounting: It is the process of Accounting for Cost which begins with recording of expenditure and ends with preparation of statistical data.

(c) Cost Control: It is the process of regulating the action so as to keep the element of cost within the set parameters.

(d) Cost Reports: This is the ultimate function of Cost Accounting. These reports are primarily prepared for use by the management at different levels. Cost reports helps in planning and control, performance appraisal and managerial decision making.

(e) Cost Audit: Cost Audit is the verification of correctness of Cost Accounts and check on the adherence to the Cost Accounting plan. Its purpose is not only to ensure the arithmetic accuracy of cost records but also to see the principles and rules have been applied correctly.

Scope of Cost Accounting

The terms 'costing' and 'cost accounting' are many times used interchangeably. However, the scope of cost accounting is broader than that of costing. Following functional activities are included in the scope of cost accounting:

• **Cost book-keeping**- It involves maintaining complete record of all costs incurred from their incurrence to their charge to departments, products and services. Such recording is preferably done on the basis of double entry system.

• **Cost system**-Systems and procedures are devised for proper accounting for costs.

• **Cost ascertainment**- Ascertaining cost of products, processes, jobs, services, etc., is the important function of cost accounting. Cost ascertainment becomes the basis of managerial decision making such as pricing, planning and control.

• **Cost Analysis**- It involves the process of finding out the causal factors of actual costs varying from the budgeted costs and fixation of responsibility for cost increases.

• **Cost comparisons**-Cost accounting also includes comparisons between cost from alternative courses of action such as use of technology for production, cost of making different products and activities, and cost of same product/ service over a period of time.

• **Cost Control**-Cost accounting is the utilization of cost information for exercising control. It involves a detailed examination of each cost in the light of benefit derived from the incurrence of the cost. Thus, we can state that cost is analyzed to know whether the current level of costs is satisfactory in the light of standards set in advance.

• **Cost Reports**-Presentation of cost is the ultimate function of cost accounting. These reports are primarily for use by the management at different levels. Cost Reports form the basis for planning and control, performance appraisal and managerial decision making.

Objectives of Cost Accounting

There is a relationship among information needs of management, cost accounting objectives, and techniques and tools used for analysis in cost accounting. Cost accounting has the following main objectives to serve:

1) Determining selling price,

2) Controlling cost

3) Providing information for decision-making

4) Cost accounting helps in ascertaining the costing profit

5) Facilitating preparation of financial and other statements.

1) Determining selling price-The objective of determining the cost of products is of main importance in cost accounting. The total product cost and cost per unit of product are important in deciding selling price of product. Cost accounting provides information regarding the cost to make and sell product or services. Other factors such as the quality of product, the condition of the market, the area of distribution, the quantity which can be supplied etc., are also to be given consideration by the management before deciding the selling price, but the cost of product plays a major role.

2) Controlling cost-Cost accounting helps in attaining aim of controlling cost by using various techniques such as Budgetary Control, Standard costing, and inventory control. Each item of cost

[viz. material, labour, and expense]is budgeted at the beginning of the period and actual expenses incurred are compared with the budget. This increases the efficiency of the enterprise.

3) Providing information for decision-making-Cost accounting helps the management in providing information for managerial decisions for formulating operative policies.

4) Cost accounting helps in ascertaining the costing profit-Cost accounting helps in ascertaining the costing profit or loss of any activity on an objective basis by matching cost with the revenue of the activity.

5) Facilitating preparation of financial and other statements-Cost accounting helps to produce statements at short intervals as the management may require. The financial statements are prepared generally once a year or half year to meet the needs of the management. In order to operate the business at high efficiency, it is essential for management to have a review of production, sales and operating results. Cost accounting provides daily, weekly or monthly statements of units produced, accumulated cost with analysis. Cost accounting system provides immediate information regarding stock of raw material; semi- finished and finished goods. This helps in preparation of financial statements.

Nature of Cost Accounting

Cost accounting is a special branch of knowledge. Though considered as a branch of financial accounts, cost accounting is one of the important special branches of knowledge, i.e., a discipline by itself. It is an organized body of knowledge consisting of its own concepts, principles and conventions.

(i) Cost accounting is science because it is a systematic body of knowledge having certain principles which a cost accountant should possess for proper discharge of his responsibilities. The principles of cost accounting can be learned by anybody and these principles can help in prediction of future. But costing is not a pure science as mathematics, physic, chemistry because the accuracy of costing varies as description of the application of these principles depends upon person to person. It is a subjective approach which matters more from case to case.

(ii) Cost accounting is an art as it requires the ability and skill with which a cost accountant is able to apply the principles of cost accountancy to various managerial problems. Practice includes the continuous efforts of a cost accountant in the field of cost accountancy. Such efforts of a Cost Accountant also include the presentation of

information for the purpose of managerial decision making and keeping statistical records.

(iii) Cost accounting determines the cost of incomplete work or job in case if the work remains uncompleted. It is also provides measures for control and guidance for various levels of management i.e., top, middle and lower management.

(iv) Cost accounting is a profession. In recent years cost accounting has become one of the important professions which have become more challenging. This view is evident from two facts. First, the setting up of various professional bodies. Secondly, a large number of students have enrolled in various institutes to obtain costing degrees and memberships for earning their livelihood.

Importance of Cost Accounting

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.

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.

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.

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

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.

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.

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.

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. 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.

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.

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 of 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.

Advantages of Cost Accounting

Cost accounting is very important for a commercial organization. It is also useful for any other organization. It helps management in different fields one of such fields is presentation of information in the most useful manner. Cost accounting is used to measure, analyze or estimate the costs. Cost accounting concerns itself with the synthesis and analysis of costs. The Cost accounting system has the following advantages:-

1) Cost Accounting reveals areas where materials were used excessively, labour operated inefficiently and expenses incurred exorbitantly.

2) Cost Accounting suggests cost reduction programme. A continuous cost jointly with technical personnel seeking areas for effecting cost reduction brings beneficial results. A cost system reveals unprofitable activities, losses or inefficiencies occurring in any form such as wastage of man power, idle time and lost time.

3) Cost Accounting locates the exact causes for decrease or increase in the profit or loss of the business. It identifies the unprofitable products or product lines so that these may be eliminated or alternative measures may be taken.

4) Cost Accounts furnish suitable data and information to the management to serve as guides in making decisions involving financial considerations.

5) Cost Accounting is useful for price fixation purposes. Although sale price is generally related more with economic conditions prevailing in the market than to cost, the latter serves as a guide to test the adequacy of selling prices.

6) With the application of Standard Costing and Budgetary Control methods, the optimum level of efficiency is set.

7) Cost comparison helps in cost control. Comparison may be period to period, of the figures in respect of the same unit or factory or of several units in an industry by employing Uniform Costs and Inter-Firm Comparison methods. Comparison may be made in respect of cost of jobs, process or cost centers. A cost system provides ready figures for use by the Government, wage tribunals and boards, and labour and trade unions.

8) When a concern is not working to full capacity due to various reasons such as shortage of demands or bottlenecks in production, the cost of idle capacity can readily worked out and repealed to the management.

9) Introduction of a cost reduction programme combined with operations research and value analysis techniques leads to economy.

10) Marginal Costing is employed for suggesting courses of action to be taken. It is a useful tool for the management for making decisions.

11) Determination of cost centers or responsibility centers to meet the needs of a Cost Accounting system, ensures that the organizational structure of the concern has been pr operly laid responsibility can be properly defined and fixed on individuals.

12) Perpetual inventory system which includes a procedure for continuous stock taking is an essential feature of a cost system.

Limitations of Cost Accounting system

Like any other system of accounting, Cost Accountancy is not an exact science but an art which has developed through theories and accounting practices based on reasoning and common sense. Many of the theories cannot be proved nor can they be disproved. They grownup in course of time to become conventions and accepted principles of Cost Accounting. These principles are by no means static, they are changing from day to day and what is correct today may not hold true in the circumstances tomorrow. Large number of Conventions, Estimates and Flexible factors: No cost can be said to be exact as they incorporate a large number of conventions, estimations and flexible factors such as :- (i) Classification of costs into its elements. (ii) Materials issue pricing based on average or standard costs. (iii) Apportionment of overhead expenses and their allocation to cost units/centres. (iv) Arbitrary allocation of joint costs. (v) Division of overheads into fixed and variable. Cost Accounting lacks the uniform procedures and formats in preparing the cost information of a product/ service. Keeping in view this limitation, all Cost Accounting results can be taken as mere estimates.

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

Cost Accounting vs. Financial Accounting

Financial Accounting is primarily concerned with the preparation of financial statements, which summaries the results of operations for selected period of time and shows the financial position of the company at particular dates. In other words Financial Accounting reports on the resources available (Balance Sheet) and what has been accomplished with these resources (Profit and Loss

Account). Financial Accounting is mainly concerned with requirements of creditors, shareholders, government, prospective investors and persons outside the management. Financial Accounting is mostly concerned with external reporting. Cost Accounting, as the name implies, is primarily concerned with determination of cost of something, which may be a product, service, a process or an operation according to costing objective of management. A Cost Accountant is primarily charged with the responsibility of providing cost data for whatever purposes they may be required for.

Table 1.1 Financial Accounting vs. Cost Accounting

Financial Accounting	Cost Accounting
Financial accounting provides the information about the business in a general wayi.e. Profit and Loss Account, Balance Sheet of the business to owners and other outside partners.	Cost accounting provides information to the management for proper planning, operation, control and decision making.
Financial accounting classifies records and analyses the transactions in a subjective manner, i.e. according to the nature of expense.	Cost accounting records the expenditure in an objective manner, i.e. according to the purpose for which the costs are incurred.
Financial accounting lays emphasis on recording aspect without attaching any importance to control.	Cost accounting provides a detailed system of control for materials, labour and overhead costs with the help of standard costing and budgetary control.
Financial accounting reports operating results and financial position usually at the end of the year.	Cost accounting gives information through cost reports to management as and when desired.
Financial Accounts are accounts of the whole business. They are independent in nature.	Cost Accounting is only a part of the financial accounts and discloses profit or loss of each product, job or service.
Financial Accounts records all the commercial transactions of the business and include all expenses i.e. Manufacturing, Office, Selling etc.	Cost Accounting relates to transactions connected with Manufacturing of goods and services, means expenses which enter into production.

Financial Accounts are concerned with external transactions i.e. transactions between business concern and third party.	Cost Accounts are concerned with internal transactions, which do not involve any cash payment or receipt.
Only transactions which can be measured in monetary terms are recorded.	Non-Monetary information likes No of Units / Hours etc. are used.
Stocks are valued at Cost or Market price whichever is lower.	Stocks are valued at Cost only.

Limitations of Financial Accounting/Need of Cost Accounting

- No clear idea of operating efficiency: Sometimes profits in an organization may be less or more because of inflation or trade depression and not due to efficiency or inefficiency. But financial accounting does not give a clear reason for profit or loss.
- Weakness not spotted out by collective results: Financial Accounting shows the net result of an organization. When the profit and loss account of an organization, shows less profit or a loss, it does not give the reason for it or it does not show where the weakness lies.
- In Financial Accounting, we get the total cost of production but it does not aid in determining prices of the products, services, production order and lines of products.
- No classification of expenses and accounts: In Financial Accounting, we don't get data relating to costs incurred by departments, processes separately or per unit cost of product lines, or cost incurred in various sales territories. Further expenses are not classified as direct or indirect, controllable and uncontrollable overheads and the value added in each process is not reported.
- No data for comparison and decision making: It does not supply useful data to management for comparison with previous period and for taking various financial decisions as introduction of new products, replacement of labour by machines, price in normal or special circumstances, producing a part in the factory or buying it from outside market, production of a product to be continued or given up, priority accorded to different products, investment to be made in new products or not etc.
- Financial Accounting does not help to control materials, supplies, and wages, labour and overhead costs.

- Does not provide standards to assess the performance: Financial Accounting does not help in developing standards to assess the performance of various persons or departments. It also does not help in checking that costs do not exceed a reasonable limit for a given quantum of work of the requisite quality.
- Financial Accounting records only the historical costs incurred. It does not provide day-to-day cost information to the management for making effective plans for the future.

Cost Accounting and Management Accounting

Management Accounting is primarily concerned with management. It involves application of appropriate techniques and concepts, which help management in establishing a plan for reasonable economic objective. It helps in making rational decisions for accomplishment of these objectives. Any workable concept or techniques whether it is drawn from Cost Accounting, Financial Accounting, Economics, Mathematics and Statistics, can be used in Management Accountancy. The data used in Management Accountancy should satisfy only one broad test. It should serve the purpose that it is intended for. A Management Accountant accumulates, summarizes and analysis the available data and presents it in relation to specific problems, decisions and day-to-day task of management. A Management Accountant reviews all the decisions and analysis from management's point of view to determine how these decisions and analysis contribute to overall organizational objectives. A Management Accountant judges the relevance and adequacy of available data from management's point of view. The scope of Management Accounting is broader than the scope of Cost Accountancy. In Cost Accounting, primary emphasis is on cost and it deals with its collection analysis relevance interpretation and presentation for various problems of management. Management Accountancy utilizes the principles and practices of Financial Accounting and Cost Accounting in addition to other management techniques for efficient operations of a company. It widely uses different techniques from various branches of knowledge like Statistics, Mathematics, Economics, Laws and Psychology to assist the management in its task of maximizing profits or minimizing losses. The main thrust in Management Accountancy is towards determining policy and formulating plans to achieve desired objective of management. Management Accountancy makes corporate planning and strategy effective. From the above discussion we may conclude that the Cost Accounting and Management Accounting are interdependent, greatly related and inseparable.

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.

4) Abnormal costs should be excluded from cost accounts-costs which are of abnormal nature (e.g. 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.

Installation of costing system:

There cannot be a readymade costing system for every undertaking. In order to meet the special needs of a business, a costing system has to be specially devised to give it a blend of efficiency and economy. The cost accounting system depends upon the nature of business or industry and the product. Before a suitable system of cost accounting is installed it is necessary to undertake a

preliminary investigation so as to know the feasibility of installing cost accounting system to such business activities. While introducing a system of cost accounting it should be borne in mind that cost accounting system must suit the business.

Factors to be considered before installing a cost accounting system:

The following are the main factors to be considered before installing a cost accounting system:
1. Nature of Business: The nature of business serves as the basis for designing the cost accounts in respect of simplicity, necessity and investment involved in installing cost accounting system.
2. Objective: The designer should consider what is the objective of costing system? Whether to fix selling prices or control cost or both.

3. Organizational Factors: The organizational factors to be considered before installing a costing system are: size and type of organization, the levels of management, delegation and responsibility, centralization and decentralization, departmentalization, availability of modern office equipment's, and number of supervisory or managerial staff.

4. Technical Considerations: Technical considerations that influence the installation of cost accounts are size of factory, flow of production, existence of departments and laboratories, capacity of machines and equipment's, cost control techniques, internal transport, etc.

5. Accounting Aspects: The factors to be considered in respect of accounting are: number of financial records, existing forms, registers used in business and number of copies required in business activities.

6. Fields of cost Control: The areas where cost control is to be exercised is to be identified so that each manager may take action relevant to his business activities. If material and labour control occupies significant area of control, it must be given top most priority for exercising control over materials and labour.

7. Methods of wage payment: Existing methods of wage payment should be studied.

8. Accuracy: The degree of accuracy desired should be determined.

9. Product: The nature of product should be considered to decide type of cost system. For example, if materials used are insignificant, an elaborate system of materials control will not be necessary.

10. Reporting: The cost accounting system to be installed must ensure frequency and promptitude in reporting cost data to the management. It must also to be pointed out that duplication of reporting is to be avoided. Further, only that information which is relevant for the management in a particular context alone should be reported.

11. Selling and Distribution: The chief factors to be considered with regard to distribution process are the warehousing facilities, internal and external transport, market survey and other relevant measures, terms and conditions of sale and procurement of orders from customers.

12. Uniformity: The practice of adopting uniform costing facilitates inter firm comparison among various firms belonging to the same industry of factory. Further, it also has the benefit of adopting common costing practice if a holding company has number of subsidiaries.

Practical Difficulties:

The important difficulties in the installation of a costing system are listed below:

1. Lack of support from management: Wherever costing system is installed, it is essential to seek the support of various departmental managers. Very often the managers show hostile attitude towards the costing system. Under such circumstances it is better to convince them about the utility of costing system for the business as a whole.

2. Resistance from accounting staff: Very often the existing accounting staff resists the installation of the cost accounting system on two grounds. Firstly, they feel that the new system of accounting might lead to excess work. Secondly, they are afraid of their job security. But this difficulty may be overcome by encouraging them about the usefulness of cost accounting as a supplement to financial accounts and the generation of more employment opportunities from the installation of cost accounting system

3. Non-cooperation of working and supervisory staff: Correct activity data which is supplied by supervisory staff and workers is necessary for a costing system. They may not cooperate and resist the additional paper work arising as a result of the introduction of the system. However, they may be required to provide necessary reports concerning their area of activity so as to enable functioning of cost accounting department efficiently.

4. Shortage of trained staff: In the initial stages, there may be shortage of trained costing staff. Today this problem is overcome, thanks to the establishment of the institute of cost and works accountant of India in our country which offers professional course in costing and also offers

training facilities through various companies to the candidates undergoing the course. This problem can be overcome by paying attractive salaries to the staff.

Essential of a good costing system

The costing system should fit in the general organization of the business. Normally no alternations in the organization should be made to facilitate costing system. However, unavoidable changes could be made in the set up to ensure effective costing system.

o All relevant technical aspects (such as nature and method of production, varieties of product) should be adequately studied for employing suitable cost control devises.

o The size lay out and organization of the factory should be adequately described for the benefit of those operating costing system.

o The procedure required to be followed for purchase; receipt, storage and issue of materials should be clearly laid down.

o The methods of wage payment and system of labour control should be specified.

o The norms for appointment and allocation of overhead should be specified. o Forms and records of original entry should be suitably designed to ensure economy.

o The forms should be got printed. It should contain full instructions. Persons who use them should be adequately trained to ensure accuracy and relevance of the data written on the forms.

o An examiner should check and sign every entry in the forms.

o Responsibility for preparing and sending the cost reports to various levels of management at periodical intervals should be fixed and necessary instructions in this regard issued.

o Full co-operation from all concerned in the management should be enlisted. The resistance from the employees should be minimum.

o Cost of administering the costing system should be commensurate with the benefit available there from.

o Design the system suitably to enable exercising cost control effectively

Methods of Costing

Several methods or types of costing have been designed to suit the needs of individual business conditions. There are two main methods of costing; Job Costing and Process Costing. All other costing methods are either variants of these two methods or techniques designed for particular purposes, for specific occasions and for specific conditions.

1. **Job Costing**-This method is suitable for ascertaining cost of a job, a specific order or a batch of finished products. Here the cost unit is a job comprising a specific quantity manufactured as per an order. A job may be small or big. It may be as per a customer's order of for stock for eventual sale. Other variations of job costing are as follows:

   • Contract Costing-This method is used by contractors for construction of building bridges etc. Here the unit of cost is a contract. The period of this contract normally extends beyond the current financial years.

   • Batch Costing-This method is applicable to manufacturers producing economic batches of components for subsequent assembling. Large engineering firms use this method. Here the costing is done for a batch of the components instead of a single component.

   • Multiple Costing-This is used in large industries such as automobile, aero plane industries etc., Here the cost of components is calculated separately. Each component has a job sheet. Later, these are assembled to complete the cost of aero plane or other finished product.

2. **Process Costing**-This method is used by industries manufacturing products by continuous processes. Cost is ascertained for a period by process or department. As distinct from job costing, time is given more importance here. Hence, this is also called period costing. Examples of the industries using process costing are chemical industries, paper making and refineries. Other variants of process costing are:

   • Operation Costing-Operation Costing is applied where the production passes through several operations successively before the final product is made. Wastages may occur in each operation. Operation costing is used in industries such as box making, shoe making, toy making industries. Here cost unit is an operation around which costs are accumulated.

   • Single or Output or Unit Costing-This method is applied where the production is of continuous nature and the final product is only one or the different grades of same product. Examples of the industries applying this method are mining industry, quarries and steel production.

• Operation Costing-This method is applied for ascertaining cost of service rendered. Examples of industries using this method are transport services,electricity and boiler house. In transport services, the unit of cost is a passenger Kilo-meter, or a Kilogram kilometer.

Techniques of Costing

In each of the costing methods, various techniques may be used to ascertain cost, depending on the management requirement. These techniques may be grouped as follows:

- **Absorption costing**-It refers to the ascertainment of costs after they have been actually incurred. As per this system, fixed as well as variable costs are allotted to cost units and total overheads are absorbed by actual activity level. Absorption costing is termed as total costing, since total costs are ultimately allotted to cost units. It is also termed as historical or traditional costing. However, since costs are ascertained after they have been incurred, and substantial time-gap exists between occurrence of expenditure and reporting off cost information, it does not help to exercise cost control.
- **Marginal costing**-It refers to a principle whereby variable costs are charged to cost units and the fixed costs attributable to the relevant period is written off in full against the contribution for that period. Contribution is the difference between sales and variable or marginal cost of sales. Marginal costing is also known as direct or variable costing. It is a valuable aid to management in taking important policy decisions, such as product pricing, choosing product mix, decision to make or to buy, etc.
- **Standard costing**- It refers to the technique which uses standards for costs and revenues for the purpose of control through variance analysis. Standards are established for each cost element on a scientific basis for immediate future period, and actual are compared against the standard. Variances from standards are analyzed, reasons established and corrective action taken to stop recurrence of inefficient operation. Thus, standard costing is extremely helpful for cost control. Standard costing is normally used along with budgetary control, which refers to the establishment of budgets relating to responsibilities of executive to the requirements of a policy and the continuous comparison of actual with budgeted results, either to secure by individual action the objective of that policy or to provide a basis for its revision . Absorption costing system and marginal or direct costing system can be used in conjunction with standard costing system.
- **Differential costing**-It is defined as a technique used in the preparation of information in which only costs and income differences between alternative courses of action are taken into

consideration. It considers only the additional costs and additional revenues arising out of the decision regarding addition of a project. Similarly, incremental costing technique considers incremental costs and incremental revenue arising out of a decision to change the level of nature of activity.

- **Uniform costing**-It refers to the use by several undertakings of the same costing system i.e. the same basic methods, principles and techniques. This is not a distinct method of costing. The system is applied by a number of units of the same undertaking or several undertakings within the same industry with a view to promote operating efficiency by comparing interunit or inter firm performance data. Trade associations and multinational companies often use this system.

Cost

Cost in simple, words, means the total of all expenses. The dictionary meaning of cost is "a loss or sacrifice", or "an amount paid or required in payment for a purchase or for the production or upkeep of something, often measured in terms of effort or time expended". Cost means the amount of expenses incurred on or attributable to some specific thing or activity. The amount of expenses may be actual or notional but incurred on specified thing or activity. The term cost is used in this very form. In reference to production/manufacturing of goods and services cost refers to sum total of the value of resources used like raw material and labour and expenses incurred in producing or manufacturing of given quantity. The term 'cost' can hardly be meaningful without using a suffix or a prefix. The cost is always ascertained with reference to some object, such as, material, Iabour, direct, indirect, fixed, variable, job, process, etc. Thus, each suffix or prefix implies certain attribute which will explain its nature and limitations. Cost is a measurement, in monetary terms, of the amount of resources used for the purpose of production of goods or rendering services.

According to Crowning shield cost represents, "an expenditure made to secure an economic benefit, generally resources that promise to produce revenue. The resources may have tangible substance (material) or they may take the form of labour and services".

According to Institute of cost and work accounts (ICWA) India, Cost is, "measurement in monetary terms of the amount of resources used for the purpose of production of goods or rendering services".

Cost has been defined in terminology given by the Institute of Cost and Management Accountants as "the amount of expenditure incurred or attributed on a given thing". More simply, it can be defined as that cost which is given or scarified to obtain something. Thus,

the cost of an article is its purchase or manufacturing price, i.e., it would consist of its direct material cost, direct labour cost, direct and indirect expenses allocated or apportioned to it.

Cost Unit

Cost unit is the unit of quantity of product, service of time (or combination of these) in relation to which costs may be ascertained or expressed. Cost Unit is a device for the purpose of breaking up or separating costs into smaller sub divisions attributable to products or services. Cost unit can be defined as a 'Unit of product or service in relation to which costs are ascertained'. Sometimes, a single order or contract constitutes a cost unit which is known as a job. A batch which consists of a group of identical items and maintains its identity through one or more stages or production may also be taken as a cost unit.

Examples of Cost Units

Industry/ Product	**Cost Unit**
Automobile	Number of Vehicle
Cement	Ton
Chemicals	Kilograms/ Liter / Ton
Gas	Cubic Meter
Power / Electricity	Kilowatt Hour
Transport	Ton – Kilometer, Passenger – Kilometer
Hospital	Patient Day
Hotel	Bed Night
Education	Student Year

Cost Centre

The determination of suitable cost centres as well as analysis of cost under cost centres is very helpful for periodical comparison and control of cost. In order to obtain the cost of product or service, expenses should be suitably segregated to cost centre. CIMA defines a cost centre as "a location, a person, or an item of equipment (or a group of them) in or connected with an undertaking, in relation to which costs ascertained and used for the purpose of cost control". Cost centres are of two types Personal and Impersonal Cost Centre. A personal cost centre consists of person or group of persons. An impersonal cost centre consists of a location or item of equipment or group of equipment.

The manager of a cost centre is held responsible for control of cost of his cost centre. 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 such as organization of a factory, condition of

incidence of cost, availability of information, requirements of costing and management policy regarding selecting a method from various choices. Cost centre may be production cost centres operating cost centres or process cost centres depending upon the situation and classification.

Profit Centre

A profit centre is a unit of a company that generates revenue in excess of its expenses. It is expected that, through the sale of goods or services, the unit will turn a profit. This is in contrast to a cost centre, which is a unit inside a company that generates expenses with no responsibility for creating revenue. The only expectation a cost centre has is to lower expenses whenever possible while staying with a specific budget that is determined at the corporate level.

Difference between Cost Centres and Profit Centres

• Cost centres are the smallest segment of activity or area of responsibility for which costs are accumulated or ascertained. Whereas profit centres are that segment of activity which is both responsible for Revenue and expenses and disclose profit of a particular segment of activity.

• Cost centres are created for accounting convenience, where as profit centres are created to delegate responsibility to individuals.

• A cost centres does not have target cost, but efforts are made to minimize cost. But each profit centre has a profit target.

• There may be number of cost centres in a profit centre. All profit centres are cost centres but all cost centres are not profit centres.

Responsibility Centre

A responsibility centre in Cost Accounting denotes a segment of a business organization for the activities of which responsibility is assigned to a specific person. Thus a factory may be split into a number of centres and a supervisor is assigned with the responsibility of each centre.

Cost Object

Cost object may be defined as anything for which a separate measurement of cost may be defined. A cost accountant may want to know the cost of a particular thing and such thing is called a cost object. A cost object includes a product, service, cost centre, activity, sub-activity, project, contract, customer or distribution channel, etc,.

Cost Control

Cost Control is defined as the regulation by executive action of the costs of operating an undertaking, particularly where such action is guided by Cost Accounting. Cost control involves the following steps and covers the various facets of the management:

1. **Planning**-is the first step in cost control is establishing plans / targets. The plan/target may be in the form of budgets, standards, estimates and even past actual may be expressed in physical as well as monetary terms.

2. **Communication**-The plan and the policy laid down by the management are made known to all those responsible for carrying them out.

3. **Motivation**-The plan is given effect to and performances starts. The performance is evaluated, costs are ascertained and information about results achieved are collected and reported. The fact that costs are being complied for measuring performances acts as a motivating force and makes individuals' endeavor to better their performances.

4. **Appraisal and Reporting**-The actual performance is compared with the predetermined plan and variances, i.e deviations from the plan are analyzed as to their causes. The variances are reported to the proper level of management.

5. **Decision Making**-The variances are reviewed and decisions taken. Corrective actions and remedial measures or revision of the target, as required, are taken.

Classification of Cost:

This section describes the process of grouping costs according to their common characteristics, such as nature of expense, function, variability, controllability and normality. The types of cost can be done on the basis of time, their relation with the product and accounting period. Costs are classified into following categories:

On the basis of Variability

Cost is grouped on the basis of their tendency to vary with the volume or output. According to this classification cost may be fixed, variable and semi-fixed/semi variable.

1. **Fixed Cost**-Fixed costs tend to remain unaffected by the variation or change in the volume. This cost remains constant within a given period of time and range of activity in spite of fluctuations in production. Per unit fixed cost varies with the change in the volume of production. If the production increases fixed cost per unit decreases and as there is decrease in production, the fixed cost per unit increases. Rent and insurance of building, depreciation on plant and machinery are some examples of fixed costs.

Fixed Cost (Total and Per Unit)

Output (In units)	Total Fixed Cost	Fixed Cost per unit
0 (NIL)	5000	5000
50	5000	100

500	5000	50
1000	5000	5
2500	5000	2
5000	5000	1

Thus from the Table it is clear that fixed cost per unit decreases as the total number of output units increase.

2. **Variable costs**- Variable cost tends to vary directly with volume of output, such as direct material, direct labour and direct expense. Variable costs are those cost which vary directly in proportion to change in volume of production/output. The cost which increases or decreases in the same proportion in which the units produced is termed as variable cost. Direct material, direct labour, direct expenses, variable overheads are some examples of variable cost. Variable costs (per unit) remain same but total variable cost goes on fluctuating depending upon volume of production/level of activity.

Variable Cost (Total and Per Unit)

Output (In units)	Total Fixed Cost	Fixed Cost per unit
0 (NIL)	0	0
50	500	10
500	5000	10
1000	10000	10
2500	25000	10
5000	50000	10

Thus from the it is clear that Variable costs (per unit) remain same but total variable cost goes on fluctuating depending upon volume of production/level of activity.

3. **Semi-fixed/semi-variable cost**-is partly fixed and partly variable, such as telephone expense, electricity charges, etc. A cost contains both fixed and variable component and which is thus partly affected by fluctuations in the level of activity. Semi-variable costs is that cost of which some part remains fixed at the given level of production and other part varies with the change in the volume of production but not in the same proportion of

change in production. Semi-variable costs are segregated into fixed and variable cost by using the following formula:

- Semi-variable cost = Fixed Cost + Variable Cost
- Variable cost per unit = Change in Cost/Change in Output

Example- Suppose the cost of production of 1000 units is Rs 13000 and for 12500 units is Rs 15000 then

Variable cost per unit = Change in Cost/Change in Output

Variable cost per unit = (15000-13000)/ (1250-1000)

Variable cost per unit = 2000/250

Variable cost per unit = Rs. 8

Verification

Variable Cost of 1000 units=1000*8= Rs. 8000

Fixed Cost= Total Cost- Variable Cost

Fixed Cost= 13000-8000= Rs. 5000

Alternatively

Variable Cost of 1250 units=1250*8= Rs. 10000

Fixed Cost= Total Cost- Variable Cost

Fixed Cost= 15000-10000= Rs. 5000

On the basis of Cost Inventory

In this category the cost can be grouped in Product cost and Period cost.

1. **Product costs**- Product costs are those cost which are charged and identified with the product and included in stock value. In other words, the costs that are the cost of manufacturing a product are called product cost. Product cost includes direct material, direct labour, direct expenses, and manufacturing overheads.

2. **Period costs**-Period costs are those costs which are not charged to products but are written off as expenses against revenue of the period during which these are incurred. They are not

transferred as a part of value of stock to the next accounting year. They are charged against the revenue of the relevant period. Period costs include all fixed costs and total administration, selling and distribution costs.

On the basis of Controllability

This category divides the cost into two basic parts controllable cost and uncontrollable cost. Controllable cost can be influenced by the action of a specified member of an undertaking while Uncontrollable cost cannot be influenced by the action of a specified member of an undertaking.

On the basis of Normality

Costs can be divided into normal cost and abnormal cost. Normal cost refers to the cost, at a given level of output in the conditions in which that level of output is normally attained. Abnormal cost is a cost which is not normally incurred at a given level of output in the conditions in which that level of output is normally attained.

On the basis of Time

On the basis of time the costs may be classified into historical or actual cost and predetermined or future cost.

o Historical cost relates to the usual method of determining actual cost of operation based on actual expenses incurred during the period. Such evaluation of costs takes longer time, till the accounts are closed and finalized, and figures are ready for use in cost calculations.

o Predetermined cost-as the name signifies is prepared in advance before the actual operation starts on the basis of specifications and historical cost data of the earlier period and all factors affecting cost. Predetermined cost is the cost determined in advance and may be either estimated or standard.

o Estimated cost-is prepared before accepting an order for submitting price quotation. It is also used for comparing actual performance.

o Standard cost-is scientifically predetermined cost of a product or service applicable during a specific period of immediate future under current or anticipated operating conditions. The method consists of setting standards for each elements of cost, comparing actual cost incurred with the standard cost, evaluating the variance from standard cost and finding reasons for such variance, so that remedial steps can be taken promptly to check inefficient performances.

On the basis of Relation with the Product

All costs are subdivided into direct and indirect costs. The concept of direct and indirect cost is of basic importance in costing. Costs which are easily and directly allocated to products or units are termed as direct cost. Direct costs include all traceable costs. In the process of manufacturing of a product, materials are purchased, wages are paid to labour, and certain other expenses are also incurred directly. All these expenses are called as direct costs. Direct costs are those which are incurred for a particular cost unit and can be conveniently linked with that cost unit. Direct costs are also termed as **product cost.**

The expenses incurred on those items which are not directly charged to a single product because they are incurred for many products are termed as indirect costs. Indirect costs are those which are incurred for a number of cost units and also include costs which though incurred for a particular cost unit are not linked with the cost unit. Since such costs are incurred over a period and the benefits mostly derived within the same period, they are also called **period costs**.

Other Specific types of Costs

These types are developed on the principle of different cost for different purposes.

1. Opportunity cost- This cost is the value of a benefit sacrificed in favour of an alternative course of action. It is the measurable advantage foregone as a result of the rejection of best alternative uses of resources, whether of materials, labour or facilities. This cost does not involve any cash outlay and is computed only for the purpose of comparison in the context of managerial decisions.

1. Imputed/ Notional cost- This cost is a hypothetical cost taken into account in a particular situation to represent a benefit enjoyed by an entity in respect of which no actual expense is incurred.

2. Out of Pocket cost- This cost just the opposite of imputed cost. This is that portion of cost which represents actual cash outlay. Out-of-pocket cost is very much relevant in price fixation during trade depression or when a make or buy decision is to be made.

3. Sunk cost-It represents historical costs, incurred in the past and is irrevocable in a given situation. Hence, a sunk cost is not relevant to current decision making.

4. Replacement cost- This cost is the current market cost of replacing an asset or a material.

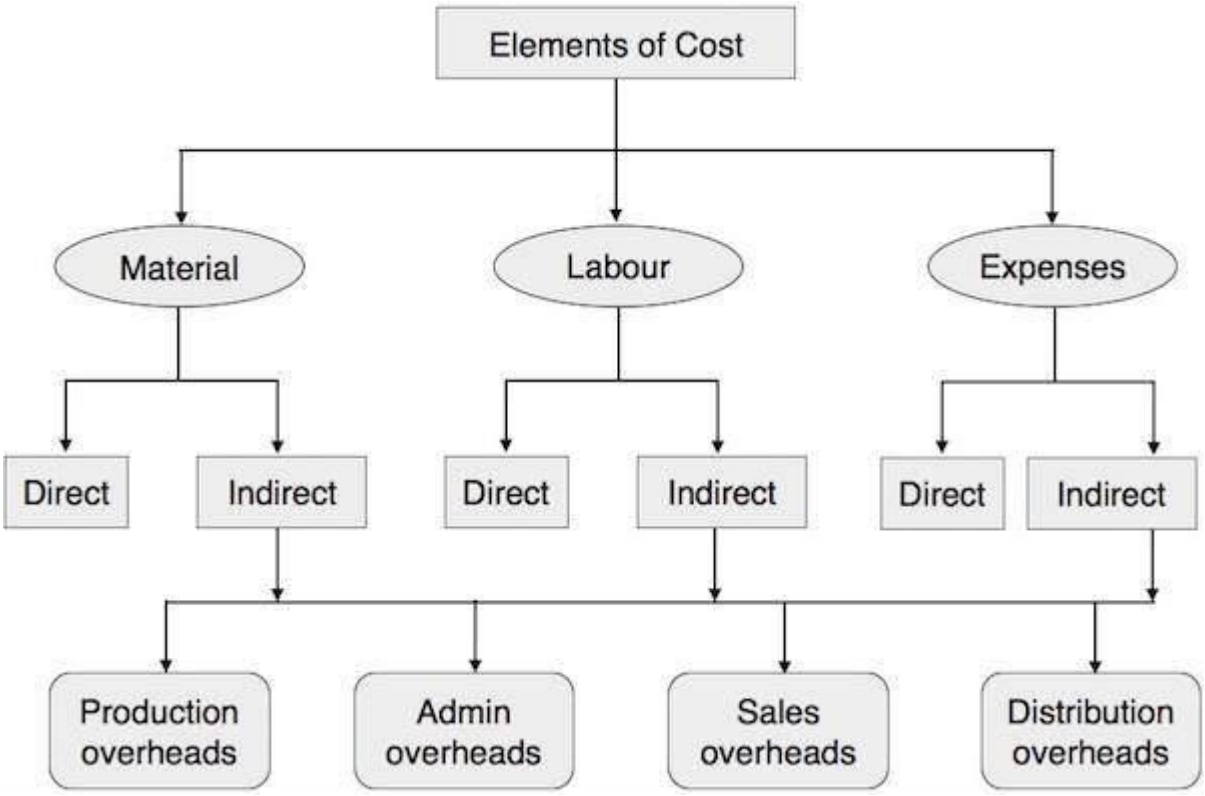
5. Avoidable cost- Such costs are specifically incurred on an activity or sector of a business and can be identified with the activity and such costs would be avoided, if the activity or the sector of the business does not exist are avoidable costs.

6. Unavoidable cost-Such costs are common costs which are apportioned to a particular activity or a segment of a business are usually unavoidable cost, because total common costs cannot be avoided or even reduced even if that activity or sector does not exist.

7. Relevant Costs and Irrelevant Costs- The relevant costs for decision-making purposes are those costs, which are incurred as a result of the decision under consideration. The relevant costs are also referred to as the incremental costs. Costs that have been incurred already and costs that will be incurred in the future, regardless of the present decision are irrelevant costs as far as the current decision problem is concerned.

Elements of Cost

The elements of cost can be divided into three groups: Material, Labour and Expenses.



Cost Sheet

Cost sheet is a statement prepared to present the detailed costs of total output during a period. It provides information relating to cost per unit at different stages of total cost of production. The

preparation of cost sheet is one of the important and primary functions of cost accounting. Cost sheet is not an account. There is a prescribed form for preparation of cost sheet. A cost sheet is a statement of cost prepared for a given period of time in such a manner that it indicates various elements of cost as clearly as possible. The cost sheet is useful in ascertaining the total cost of production per unit, formulation of production plan, fixing up the selling price and minimizes the production cost. Sometimes standard cost data are provided to facilitate comparison with the actual cost increased. Cost sheet is an analytical statement of expenses relating to production of an article which informs regarding total cost, per unit cost and quantity of production. According to Wheldon, "Cost sheets are prepared for the use of management and consequently, they must include all the essential details which will assist the manager in checking the efficiency of production. In the words of C.I.M.A., London, "Cost sheet is a cost schedule or document which provides for the assembly of the estimated detailed cost in respect of a cost centre or cost unit".

• Key Elements before preparing Cost Sheet

The preparation of the cost sheet requires understanding of the treatment of the following items:
o Stock of raw materials-The opening and closing stock of raw materials are to be adjusted with purchase of Raw materials in order to determine the value of raw materials consumed for the output produced.

o Stock of work in process-The value of stock of work in process is a part of Factory cost and therefore, it should be adjusted with factory overheads. Sale of scrap should be deducted from the factory overheads in order to determine the total factory cost.

o Stock of finished goods-Finished goods covers the products on which factory work has been completed. It is the cost of completed production. The opening and closing values of finished goods are to be adjusted with the total cost of production in order to arrive at cost of sales.

• Expenses excluded from cost sheet

The items of pure financial nature are excluded in cost sheet or statement of cost. These items are included only in financial accounts. Some of these expenses are an apportionment of profit.

Examples of these expenses are-

o Dividend to shareholders

o Income Tax

o Interest on loan

o Donations paid

o Capital expenditure

o Capital loss on sale of assets.

o Commission to Partners / Managing Director

o Discount on issue of shares/ debentures

o Underwriting Commission.

Specimen/Format of Cost Sheet
Rituparna Ltd.
Cost Sheet for the year/period ended ……
Output (in Units) ……

Elements of Cost	Amount (₹)	Units	Total Cost (₹)	Cost per Unit (₹)
Opening stock of Direct Raw Materials	xxx	xxx		
Add: Additions/ Purchases	xxx			
Freight/Carriage inwards	xxx			
Transit Insurance	xxx			
Transfer from other dept./ job etc.	xxx			
GST, Custom duty, Dock Charges etc.	xxx			
Primary Packing Materials	xxx			
Development expenses incurred in	xxx			
respect of materials	xxx			
	xxxx			
Less: Transfer to other dept./job etc	xxx			
Material lost / damaged	xxx			
Material sold	xxx			
Abnormal cost/wastage of materials	xxx			
Cash Discount received on materials	xxx			
Return outwards	xxx			
Closing stock of Raw Material	xxx		**xxxx**	**x**
Cost of Direct materials consumed:				
Direct Employee (labour) cost/ Productive				
wages:	xxx			
Add: Welfare funds such as ESI, PF,	xxx			
Canteen and Workers welfare expenses	xxx			
Recreation Expenses	xxx			
Ex- grtia, Cost of susidised food,	xxx			
Bonus, Gratuity, etc.	xxx			
Executive Director Remuneration	xxx		xxx	x
Direct (chargeable) expenses	xxx			
Add: Royalty on production	xxx			
Loose tools/equipments/moulds	xxx			
Hire charges for tools/equipment	xxx			
Cost of patents/Copy right	xxx		xxx	x
Prime Cost		**xxx**	**xxxx**	**xx**
Add: Works/ Factory Overheads				
Indirect materials			xx	
Indirect/unproductive wages			xx	
			xx	

Process Costing-This method is used by industries manufacturing products by continuous processes. Cost is ascertained for a period by process or department. As distinct from job costing, time is given more importance here. Hence, this is also called period costing. Examples of the industries using process costing are chemical industries, paper making and refineries. Other variants of process costing are:

• Operation Costing-Operation Costing is applied where the production passes through several operations successively before the final product is made. Wastages may occur in each operation. Operation costing is used in industries such as box making, shoe making, toy making industries. Here cost unit is an operation around which costs are accumulated.

• Single or Output or Unit Costing-This method is applied where the production is of continuous nature and the final product is only one or the different grades of same product. Examples of the industries applying this method are mining industry, quarries and steel production.

• Operation Costing-This method is applied for ascertaining cost of service rendered. Examples of industries using this method are transport services, electricity and boiler house. In transport services, the unit of cost is a passenger Kilo-meter, or a Kilogram kilometer.

Pricing of Material Issued

Materials are issued from the store to the jobs or work orders as per the requirement. The price of the material always changes in accordance with the market conditions. So there is a need to know about the price at which the material should be issued. The important cost price methods of pricing of material issued are as follows:

1 First in First out (FIFO) Method

2 Last in First out (LIFO) Method

3 Average Price Method

4 Replacement Price Method

5 Highest-in-First-out (HIFO)

6 Next-in-First-out (NIFO)

7 Standard Price Method

1. **First in First out (FIFO) Method**

   It is a method of pricing the issue of materials in the order in which they are purchased. In other words the materials are issued in the order in which they arrive in the store. This method is considered suitable in times of falling price because the material cost charged to production will be high while the replacement cost of materials will be low. In case of rising prices this method is not suitable. This method is considered suitable in times of

failing price because the material cost charged to production will be high while the replacement cost of materials will be low. But in the case of rising prices, if these methods adopted, the charge to production will be low as compared to the replacement cost of materials (as in the current period) in future without having additional capital resources.

• Advantages of FIFO

o It is simple and easy to operate.

o In case of falling prices, this method gives better results.

o Closing stocks represents the market prices. Material cost charged to production represents actual cost with which the cost of production should have been charged.

o In the case of falling prices, the use of this method gives better results.

o Closing stock of material will be represented very closely at current market price.

o The old material is issued first. Thus, there remains no possibility of loss of material due to spoilage or obsolescence.

• Disadvantages of FIFO

o If the prices fluctuate frequently, this method may lead to clerical errors.

o In case of rising prices this method is not advisable.

o The material costs charged to same job are likely to show different rates.

2. Last in First out (LIFO) Method

Under this method the prices of last received batch (lot) are used for pricing the issues, until it is exhausted and so on. During the inflationary period or period of rising prices, the use of LIFO would help to ensure the cost of production determined approximately on the above basis is approximately the current one. Under LIFO stocks would be valued at old prices, but not represent the current prices. This method is based on the assumption that the items of the last batch (lot) purchased are the first to be issued. Therefore, under this method the price of the last batch (lot) is used for pricing the issues, until it is exhausted, and soon. If however, the quantity of issue is more than the quantity of the latest lot than earlier (lot) and its price will also be taken into consideration.

• Advantages of LIFO

o The cost of materials issued will be either nearer to and/or will reflect the current market price.

o In case of falling prices profit tends to rise due to lower material cost. In the case of falling prices profit tends to raise due to lower material cost, yet the finished products appear to be more competitive and are at market price.

o Over a period, the use of LIFO helps to level out the fluctuations in profits.

o In the period of inflation LIFO will tend to show the correct profit and thus avoid paying undue taxes to some extent.

• Disadvantages of LIFO

o The computations become complicated if too many receipts are there.

o Companies having JIT system will face this problem more.

o In time of falling prices, there will be need for writing off stock value considerably to stick to the principle of stock valuation, i.e., the cost or the market price whichever is lower.

o This method of valuation of material is not acceptable to the income tax authorities.

o The closing stock is priced at a very old price which does not show the correct position of the business.

Unit – II

Labour Costing

Introduction

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. The role of labour in production cannot be overlooked in spite of the fact that machines are being used a vast scale these days. The efficiency of production department is based on the skill of workers. In the absence of skilled workers product cannot be manufactured. Workers convert raw materials into finished goods. Skilled worker helps in decreasing the cost of product besides increasing the quality and quantity of the production. It should be remembered that Labour is not like material as there is a human aspect involved in it. Therefore, there should be a comprehensive study of all related aspects of Labour Cost and then only computation and control over the same will be possible. Attention should also be paid to the productivity aspect. Low productivity results in higher Labour Cost per unit while higher productivity will reduce the Labour Cost per unit.

Types of Labour

Labour is of two types (a) direct labour, (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 labour engaged 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.

Distinction between Direct Labour and Indirect Labour

Point of Distinction	Direct Labour	Indirect Labour
Identification	It can be really identified with a particular job or work order.	It cannot be directly identified with a particular job or work order.
Variability	It changes directly with the volume of output.	It may or may not change directly with the volume of output.

Treatment of cost	Direct labour cost is treated as part of Prime cost.	Indirect labour cost is treated as part of overhead

Importance of Labour Cost

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

o To use direct labour cost as a basis for increasing the efficiency of workers.

o To identify direct labour cost with products, orders, jobs or processes for ascertaining the cost of every product, order, or process.

o 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.

o To determine indirect labour cost to be treated as overhead and

o To reduce the labour turnover.

So 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.

Labour Turnover

Labour Turnover of an organisation is change in the labour force during a specified period measured against a suitable index. The rate of Labour Turnover in an industry depends upon several factors such as, nature of the industry, its size, location and composition of the labour force. A controlled level of Labour Turnover is considered desirable because it helps the firm to adjust the size of its labour force in response to needs such as for seasonal changes or changes in technology. Labour turnover is the number of employees who leave the factory during a period in relation to the number of workers employed during the year due to resignation, new appointment, retrenchment, old age, ill health, pregnancy, death etc.

Reasons behind Labour Turnover

The causes giving rise to high labour turnover may be broadly classified under the following the heads:

1. Personnel Causes-Workers may leave employment purely on personal grounds like dislike for the job, locality or environments, domestic troubles and family responsibilities, Change of line for betterment, retirement due to old age and ill health etc. In all such cases, personal factors count the most and employer can practically do nothing to help the situation.

2. Unavoidable Causes-In certain circumstances it becomes obligatory on the part of the management to ask some of the workers to leave. These circumstances may like retrenchment due to seasonal trade, shortage of any material and slack market for the product, etc.

3. Avoidable Causes-Under this head, may be grouped the causes which need the attention of the management most so that the turnover may be kept low by taking remedial measures. The reasons for which workers leave are unsuitability of job, low pay, unsatisfactory working conditions, unhappy relations with co-workers and unsatisfactory behaviour of superiors.

Effects of Labour Turnover

It results in an increase in the cost of production due to the following reasons:

(i) Cost of training for new workers,
(ii) Cost of replacing workers, i.e., cost of selection,
(iii) Newly employed workers are likely to mishandle of machines and equipments, and
(iv) Loss arising out of defective work and increased wastage in production process

Cost of Labour Turnover

The cost of labour turnover can be divided under two broad categories:

(a) Preventive Costs: These are costs which are incurred by a firm to keep a contented labour force so as to prevent excessive labour turnover. The aim of these costs is to keep the workers satisfied so that they may not leave the industry. The costs may include:

(i) Cost of personnel administration,

(ii) Cost of medical services,

(iii) Cost of providing good working conditions,

(iv) Cost of welfare, e.g., provision for subsidized canteen, sports facilities, etc.

(v)Cost of gratuity and pension, etc.

(vi) A portion of high wages, bonuses, perquisites, etc.

(b) Replacement Costs: Labour turnover is associated with replacement. Replacement necessitates recruitment, training and absorption of new workers. Since, the new workers will take more time to do a job than a trained worker, there will be loss of output and more wastage. These costs are associated with replacement of workers and it includes: (i) Cost of recruitment, training, induction, placement, etc.

(ii) Inefficiency of new workers,

(iii) Cost of scrap and defective products of production,

(iv) Loss of goodwill and hence high costs in terms of disadvantageous labour contracts,
(v) Cost of additional compensation payable arising out of frequent accidents

Methods to calculate Labour Turnover

It is essential for any organisation to measure the Labour Turnover. This is necessary for having an idea about the turnover in the organisation and also to compare the Labour Turnover of the previous period with the current one. The following methods are available for measurement of the Labour Turnover:

1. Separation Rate Method

2. Replacement Rate Method

3. Flux Rate Method

1. Separation Rate Method

In this method, instead of taking the number of employees added, number of employees left during the period is taken into consideration. The method of computation is as follows.

Labour Turnover = {Number of separations/Average number of workers during the period*} ×100

***The average number of workers = {No. of Workers at the beginning of period +No. of Workers at the end of period}/ 2**

2. Replacement Method

In this method neither the additions nor the separations are taken into consideration. The number of employees replaced is taken into consideration for computing the Labour turnover.

Labour Turnover = (Number of replacements/Average number of workers during the period*) ×100

***The average number of workers = {No. of Workers at the beginning of period +No. of Workers at the end of period}/ 2**

3. Flux Method

Under this method Labour Turnover is computed by taking into consideration the additions as well as separations. The turnover can also be computed by taking replacements and separations also. Computation is done as per the following method.

Labour Turnover = ½ [Number of additions + Number of separations] /Average number of workers during the period X100

Example 1

Calculate Labour turnover rates by Separation, Replacement and Flux method from the following information for the month of March, 2015.

No. of Workers on 1-3-2015= 950

No. of Workers on 31-3-2015= 1050

No. of Workers left the factory in March=10

No. of Workers discharged in March=30

Workers recruited in the month (including 120 for Expansion) 140

Solution

1. Separation Method

Labour Turnover = {Number of separations/Average number of workers during the period*} ×100

*The average number of workers = {No. of Workers at the beginning of period +No. of Workers at the end of period}/ 2

Labour Turnover = {[10+30]/1000} ×100

Labour Turnover = {40/1000} ×100

Labour Turnover = 4%

2. Replacement Method

Labour Turnover = (Number of replacements/Average number of workers during the period*) ×100

*The average number of workers = {No. of Workers at the beginning of period +No. of Workers at the end of period}/ 2

Labour Turnover = {[140-120]/1000} X 100

Labour Turnover = {20/1000} X 100

Labour Turnover = 2%

3. Flux Method

Labour Turnover = ½ [Number of additions + Number of separations] /Average number of workers during the period X100

Labour Turnover = [½(40+ 20) / 1000] ×100

Labour Turnover = [30/1000] X 100

Labour Turnover = 3%

Working Notes

Average number of workers= {Opening number of workers + Closing number of workers} / 2 = {1900 +2100}/2 =2000

Average number of workers= [950+1050]/2

Average number of workers= 1000

Example 2

Labour force at the beginning of the month is 1900 and at the end of the month March 2100. During the month, 25 people left while 40 persons were discharged. 280 workers were engaged out of which only 30 were appointed in the vacancy created by the number of workers separated and the rest on account of expansion scheme. Calculate the Labour Turnover by Replacement and Flux methods.

Solution

1. Replacement Method

Labour Turnover = (Number of replacements/Average number of workers during the period*) ×100

*The average number of workers = {No. of Workers at the beginning of period +No. of Workers at the end of period}/ 2

Labour Turnover =30/2000 X 100 = 1.5%

2. Flux Method

Labour Turnover = ½ [Number of additions + Number of separations] /Average number of workers during the period X100

Labour Turnover = [½(280 + 65) / 2000] ×100 = 173/2000 X 100 = 8.63%

Working Notes Average number of workers = {Opening number of workers + Closing number of workers} / 2 = {1900 +2100}/2 =2000

Labour Cost Control

Labour is an essential element of the process of production, and it also plays a vital role in producing a product. In large organisation or concerns, labour is controlled by following five departments:

1. Personnel Department

2. Work Study and Engineering Department

3. Time-keeping Department

4. Payroll Department

5. Cost Accounting Department

1. Personnel Department-All the activities of selection, appointment and placement of workers are performed by this department. The personnel manager must have the knowledge of current labour laws and labour conditions in the industry, labour policies of the company, production programme and several problems of the workers. With the help of this information the manager is able to provide appropriate candidate to the industry and manager can remove all the problems which are persists in the industry in favour of labour. The personnel manager records all these information of workers into a card which is called workers history card.

2. Work Study and Engineering Department-Work study department, helps in establishing control over working conditions. This department also control over productive methods for each job and each department. The main functions of this department are as follows:

o Time Study-Time study determines standard time for an operation by direct time. It takes place with the help of stop watches to fix standard time for the job/operations. While fling standard time necessary time for rest is also added. Time study is very useful in standard costing. It serves the purposes like preparation of pay rolls in case of time-paid workers, meeting the statutory requirements, ensuring discipline in attendance, recording of each worker’s time and overhead distribution.

o Motion Study-Motion study is related with the determination of standardised methods for performing several jobs. When a worker is required to perform operations at work during which his body is moving such as movement at hands, eyes and neck. With the help of this study such movements can be minimized by proper arrangement of light, place of machines and height of chairs to reduce fatigue and tiredness.

o Job Analysis-Job analysis includes preparation of a description and classification of each job with a list of qualification needed by the workers. The main object of job analysis is to ascertain the relative worth of each job through objective evaluations.

o Merit rating is the qualitative and quantitative assessment of the worker's personality and performance. Merit rating is based on factors like quality of work, quantity of work, attendance, discipline and co-operations and job knowledge etc.

3. **Time-keeping Department-** Generally, time keeping department records each worker's time 'in' and 'out' of the factory and the time of each employee for each department. There are two methods of time-keeping; manual methods and the mechanical methods. Whichever method is used it should make a correct record of the time and the method should be cost effective and minimize the risk of fraud. The manual methods of time keeping are attendance register method, and metal disc method. The mechanical methods that are generally used for the recording of time of workers may be as time recording clocks and dial time records. This department maintains different cards which are as follows:

• Attendance Register Method: Under this method, an attendance register is kept at the entrance of the factory or organisation and the workers' attendance in and out of the factory gate or organisation gate is being noted. The noting down of arrival and departure time of the workers may be done by the workers themselves or by an employee appointed for this purpose. Thereafter, the entries are made to individual attendance records from the attendance register.

• Disc Method: This method is generally used in a small organization or factory which has limited financial resources. Under this method, metal discs bearing the numbers of the workers are placed on hooks on a board provided at the entrance of the department or organisation. While entering into the department and factory, as the case may be, the workers remove their respective discs and place them in a box on empty tray provided nearby. After a short while of the scheduled time of the department or organisation or factory, the original box or tray is removed and a late box or tray is substituted. The late box or tray is also taken at the end of the maximum late time allowed by the personnel department. The time-keeper records the attendances in a register or book which is subsequently passed on to the payroll department for the payment of workers.

• Dial Time Recorders or Time Recording Clocks: The time recording clock is a mechanical device which automatically records the time of the workers. This method has been developed to obviate some of the difficulties experienced in case of manual methods and this method is useful when the number of workers is fairly large. There is a radial arm at the centre of the dial. When a worker enters into the factory or department, he is to press the radial arm after placing it at the appropriate hole. The time recorder will then automatically record the time on a roll of paper within the machine against the number of the worker. It may be noted that the sheet of paper in which the time is recorded provides a running account of the worker's time.

• Time Card: Under card time recorders method, a clock card is allotted to each worker in which his attendance is recorded. In this latest type of card time recorder, the worker is to insert his

clock card into the machine; the time is then automatically stamped in the correct position. Late arrivals, early leavings, overtime, etc. are printed in red to attract attention. It enjoys all the advantages of the dial time recorders.

• Daily Time Sheet: Each worker is given a daily time sheet in which he records the particulars of his time spent on each job or work order. Daily Time Sheets are maintained in small works which do not go to the expense of a card time recorder. The worker completes the sheets everyday and hands it over to the foreman for signature. This acts as a check on the correctness since the foreman puts his signature daily.

• Weekly Time Sheet: These sheets record the same particulars for a week as the daily time sheets for a day. These sheets are an improvement over the daily time sheets. The main difference is that the worker enters all the particulars of work carried out for a complete week at the end of the week.

• Job Card: Under job card method a card is used for recording the time spent by workers on various jobs instead of sheets of paper. A job card is used to keep a close check on the time spent by an operator on each job which he does during the day. Usually, one card is issued to an operator by the supervisor at a time. When the operator starts the work, he records the time through the time recording clock on the card. The card is punched again when the work is finished or the operation is over. If the work or operation of the job is too long and the worker has to break off for meals or for personal needs, he should record out and in again to keep record of the time not spent on the job or operation. When the job or operation is finished, the card is deposited with the timekeeper and who sends it to the payroll department. When a job is completed, another job card is issued to the operator and he repeats the time recording process.

4. Payroll Department: This department has to perform following functions:

(i) To maintain record of job classification and wage rate of each and every employee,

(ii) To verify and to summarize the time of each worker as shown on daily time cards,

(iii) To calculate wages earned by each and every worker,

(iv)To prepare payroll of every department,

(v) To calculate wages and deductions for each employee,

(vi)To disburse wages, and

(vii)To devise a suitable internal check preparing and paying out wages.

5.Cost Accounting Department: This department perform the following functions: (i) Documentation of wages Accounting,

(ii) Analysis of total labour cost, and

(iii) Treatment of idle time , Overtime, leave pay, etc,.

Key aspects of Labour Control

In the present business environment, it is essential to make efforts for controlling and reducing the Labour Cost. Systematic efforts are required in order to achieve this target. The following steps will be useful in controlling and reducing the Labour Cost.

1. Identify the types of Labour cost

The first step in the direction of controlling and reducing the Labour Cost is proper classification of the same. The Labour Cost is classified into Direct Cost and Indirect Cost. Direct Labour Cost is the cost that can be identified with a product unit. It can also be described as cost of all Labour incurred for altering the construction, composition or condition of the product. Indirect Labour Cost is the cost, which cannot be identified with a product unit. Indirect wages are the wages paid to the workers who facilitate the production rather than actually engaged in production. The Direct Labour Cost can be charged directly to the job or product units and is included in the prime cost. Indirect

2. Planning

Effective control over the Labour Cost can be achieved through proper production planning. Production planning includes activities like planning, scheduling, routing, machine loading, product and process engineering, work study etc. With the help of work study, time and motion study can be conducted which will help in fixation of standard time for a particular job. A comparison between the standard time and actual time is constantly made to find out the difference between the two. Suitable corrective action can be taken if it is noted that the actual time taken is constantly more than the standard time allowed for the job.

3. Budget Preparation

Budget and budgetary control are effective tools for cost control and cost reduction. A Labour budget can be prepared which will set the target for the Labour Cost which will again facilitate comparison between the Budgeted Labour Cost and the Actual Labour Cost.

4. Labour Standards

Standards can be set for Labour Cost against which the Actual Labour cost can be compared. Standard Labour Cost is the cost, which should have been incurred for producing a particular quantity of production. While fixing the Standard Labour Cost, use of time and motion study is made to fix up the standard time that should be taken for the actual production.

5. Performance Report

There should be a system of periodic Labour efficiency and utilisation reports. These reports will give an idea about the efficiency and productivity of the Labour.

6. Incentive Schemes

Improving the Labour productivity is one of the important ways to reduce the Labour Cost per unit. Productivity can be improved by motivating the workers. Offering monetary and non-monetary incentives can help to improve the productivity substantially. However, there should be a periodic review of the incentive schemes and therefore incentive schemes report should be prepared at periodic intervals.

7. Labour Cost Accounting

There should be a proper cost accounting system, which will identify the Direct and Indirect Labour Cost. Similarly the cost accounting department should be able to generate and maintain records for time keeping, time booking, idle and overtime, impact of incentive schemes, per unit of Labour, cost due to Labour Turnover and other relevant records. Thus from the above mentioned points, it will be clear that there is a need to control the Labour Cost and it can be done by the combined efforts of various departments.

8. Idle Time

Usually, there is bound to be some difference between the time booked to different jobs or work orders and gate time. The difference of this is known as idle time. Idle time is that time for which the employer pays, but from which he obtains no production. Idle time is of two types:

(a) Normal idle time, and

(b) Abnormal idle time

Normal Idle Time:

This represents the time wastage that cannot be avoided and, therefore, the employer must bear the labour cost of this time. Following are some examples of normal idle time:

1. The time taken in going from the factory gate to the department in which the worker is to work, and then again the time coming from the department to the factory gate at the end of the day.

2. The time taken in packing up the work for the day.

3. The time which elapses between the completion of the job and the commencement of the next job.

4. The time taken for personal needs and tea breaks.

5. The time lost when production is interrupted for machine maintenance. As it is unavoidable cost and as such should be included in cost of production.

Abnormal Idle Time:

It is that time wastage which can be avoided if proper precautions are taken. Examples of abnormal idle time can be cited as below:

1. The time wasted due to breakdown of machinery on account of the inefficiency of the work engineers.
2. Time wasted on account of the failure of the power supply.
3. The time wasted due to strike or lockouts in the factory.

Remuneration

The remuneration of employees is a reward of services rendered by him. It is an agreement among employer and employee. For remuneration, B.K. Bharhas rightly point out that, "Remuneration is the reward for labour and services, whereas incentive is the stimulation of effort and effusiveness by offering monetary inducement or extra facilities." Wage system is one of the important components of Labour Cost Control. A system of wage payment, which takes care of both, i.e. providing guarantee of minimum wages as well as offering incentive to efficient workers helps to motivate the workers to a great extent. It should also be remembered that high wages do not necessarily mean high labour cost because it may be observed that due to high wages the productivity of workers is also high and hence the per unit cost of production is actually decreased. On the other hand, if low wages are paid, it may result in lower productivity and hence higher wages do not necessarily mean high cost.

Types of Wages

Wages may be of different types such as real wages, minimum wages, living wages, and fair wages. Their brief description is as follows:

(i) Real Wages: Real wages represent the actual exchange value of wage rates or of earning. In the most common usage in which wage rates or earnings for different periods are compared, real wages reflect adjustment to changes in the price level.

(ii) Minimum Wages: The minimum wages must also provide for some measure of education and medical, requirements and other amenities. Minimum wages means that minimum amount which the labour or workers thinks necessary for the base sustenance of life but for the preservation of the efficiency of the worker.

(iii) Fair Wages: Fair wages is that wages which the labour gets for his work which is just near to minimum wages and living wages. Generally, current rate of wages, being paid in the organization are known as fair wages.

(iv) The Living Wages: The living wages, according to the committee on fair wages, represented the highest level of the wages and naturally it would include all amenities which a

citizen living in a modern civilized society was entitled to except when the economy of the country was sufficiently advanced and the employer was able to meet the expanding aspirations of his workers. After considering various observations made by Indian and foreign authorities, the committee observed that "the living wage should enable the male earner to provide for himself and his family not merely the bare essential of food, clothing and shelter but a measure of frugal comfort including education for the children, protection against ill-health, requirements of essential social needs and a measure of insurance against the more important misfortunes including old age".

Essential Features of a successful wage payment plan

o It should be based on scientific time and motion study to ensure a fair output and a fair remuneration.

o There should be a guaranteed minimum wages at a satisfactory level.

o The wages should be related to the effort put in by the employees. It should be fair to both the employees and employer.

o The scheme should be flexible to permit any necessary variations which may arise. o There must be continuous flow of work.

o The scheme should aim at increasing the morale of the workers (i.e. minimizing absenteeism, late attendance, etc.) and reducing labour turnover.

o Suitable incentive to the workers will be provided.

o The operating and administrative cost of the scheme be kept at a minimum

Methods of Remuneration or Wage Payment

Wages are paid either on time basis or on output basis. When employees are paid as per hours worked irrespective of the quantum of output produced, the system is called time-rate. When payment is made on the basis of production or output only, it is called piece-rate. A combination of both time-rate and piece-rate is also used. So there are several methods of wage payment. These are differing from each organization to another organization. There are three basic methods of wage payment or remuneration, i.e.:

1. Time Rate Method,

2. Piece Rate Method, and

3. Individual Bonus Plans

Time Rate Method

Time Rate Method is very popular method of payment of wages. Under this method, the payment is made on the basis of time devoted by worker in the factory. It is an oldest form of wage payment. In this method wages is calculated as follows:

Total Wages = Hours Worked x Rate per Hour

Time Rate Method is used in the following situation:

o Where the work requires high skill and quality is more important than the quantity. o Where the output/services is not quantifiable, i.e. where the output/services cannot be measured.

o Where the work done by one person is dependent upon other person, in other words where an individual worker has no control over the work.

o Where the speed of production is governed by time in process or speed of a machine.

o Where the workers are learners or inexperienced.

o Where continuous supervision is not possible.

Advantages of Time Rate Method

o Easy to understand and operate.

o Easy to calculate, and hence, less clerical work involved.

o Easier to negotiate rate with the employees and the unions.

Disadvantages of Time Rate Method

o No incentive to increase the output.

o No distinction between slow, inefficient, fast and efficient workers.

o Fails to attract better workers.

o Cost per unit is not known in advance.

Piece Rate Method

Piece Rate Method is also called as payment by results where the workers are paid as per the production achieved by them. Thus if a worker produces higher output, he can earn higher wages. Under the piece rate system of wage payment the workers receive a flat rate of wages either for time worked or for units manufactured. Basically in this method, wages is paid on the basis of units produced by the workers. The rate of payment is determined by production department. Under this method, wages of workers is calculated by following formula:

Total Wages = No. of Units Produced x Rate Per Unit

Types of Piece Rate Method

Following are the main types of piece rate method:

(i) Straight Piece Rate Method: Under this system, payment is made on the basis of a fixed amount per unit or number of units produced without regard to time taken.

The wages are to be calculated from the following formula:

Wages = Number of units × Rate per unit

(ii) Taylor Differential Piece Rate Method: In the Taylor differential method, piece rates were determined by time and motion study. Day wages were not guaranteed.

There were two rates: very low piece rate and high piece rate. Thus, the system was designed to:

• Reward the efficient workers by setting a high piece rate for high level production, and

• Discourage below-average workers by providing no guaranteed wages and setting low piece rate for low level production.

(iii) Piece Graduated Time Rate: Under this method, workers are paid minimum wages on the basis of time rates. A piece rate method with graduated time rate may include any one of the following:
Guaranteed wages according to time rate plus a piece rate payment for units above a required minimum,
Piece rate with a fixed dearness allowance or cost of living bonus, and

If earning on the basis of piece rate is less than the guaranteed minimum wages, the workers will be paid on the basis of time rate.

(iv) Merrick Multiple Piece Rate Method: Merrick afterwards modified the Taylor's differential piece rate method. Under this method, the punitive lower rate is not imposed for performance below standard. On the other hand, performance above a certain level is rewarded by more than one higher differential rate. Thus, this method rewards the efficient workers and encourages the less efficient workers to increase their output by not penalizing them for performance. This method also does not guarantee day wages.

Advantages of Piece Rate Method

o As the workers are paid on the basis of the results, i.e., for each unit produced, job performed or number of operations completed, there is a tendency on their part to increase their production so that they may earn more wages.

o The increased production thus achieved results in the reduction of overhead expenses per unit of production even through total overheads may increase. The increase in overheads will be relatively small as compared to the increase in turnover.

o The wages being paid on the basis of production, the management know the labour cost per unit or per job.

o The workers are rewarded for their efficiency because the inefficient workers will not get as much as the efficient workers.

o The workers are very careful in handling their tools and machinery, etc., because on the proper maintenance of these depends their higher efficiency and in turn, their higher wages.

o This method is very simple to operate.

Disadvantages of Piece Rate Method

o It is not easy to determine the piece work rate on an equitable basis. When a rate has been fixed and later on it is found to be too high, it is very difficult to reduce it as its reduction will cause dissatisfaction and friction among the workers.

o As the labour cost per unit remains the same, the employees do not gain as a result of increase in productivity except to some extent in the form of reduction in overheads. As such if the

overhead expenses per unit are relatively small, the advantage to the employer will not be significant.

o Sometimes quantity may increase at the cost of quality. For the reason, a strict inspection has to be maintained in the form of quality control. This will result into additional expenditure.

o Materials may be used in excessive quantities and may be handed carelessly on account of the workers' efforts to achieve high output.

Example 1

Calculate total weekly wages paid to Mr. Neeraj Gupta according to Time Rate Method from the following information:

Standard Hours even to him 80 Hours Per week

Actual Hours worked 60 Hours Per week

Rate per Hour Rs. 40

Solution

The total weekly wages paid to Mr. Neeraj Gupta according to Time Rate Method will be calculated as follows

Total Wages = Hours Worked x Rate per Hour

Total Wages = 60 x Rs. 40 = Rs. 2400

Example 2

From the following information, calculate total wages by piece rate method and time rate method.

Standard Hours=60

Actual Hours Worked=50

No. of Unit Produced=500

Rate per Hour=Rs. 20

Rate per unit produced=Rs. 5

Solution

The total wages paid to workers is calculated as follows:

Time Rate Method

Total Wages = Hours Worked x Rate Per Hour

Total Wages =50 x20

Total Wages =Rs. 1000

Piece Rate Method

Total Wages = No. of Units Produced x Rate Per Unit

Total Wages =500 x5

Total Wages =Rs. 2500

Example 3: From the following particulars, calculate the earnings of workers X and Y and also comment on the labor cost.

Standard time allowed: 20 units per hour

Normal time rate: Rs.30 per hour

Differential to be applied:

80% of piece rate when below standard

120% of piece rate at or above standard

In a particular day of 8 hours, X produces 140 units while Y produces 165 units

Solution:

Standard production per day is 20 units × 8 hours = 160 units

Worker X produces 140 units which means he is below standard and will get wages @ 80% of the normal piece rate.

X's earnings:

Normal piece rate = Rs. 30 per hour/20 units = Rs. 1.5 per unit

80% of the normal piece rate = Rs. 1.20 per unit

Earnings = Rs.1.20 × 140 units = Rs. 168

Labor cost per unit = Rs. 168/140 units = Rs. 1.20

Y's Earnings: Y has produced more than the standard production of 160 units and hence he will get wages @ 120% of normal piece rate. His earnings will be as shown below.

Normal piece rate = Rs. 30 per hour/20 units = Rs. 1.50 per unit

120% of normal piece rate = Rs.1.80 per unit

Earnings = Rs. 1.80 × 165 units = Rs. 297

Labor cost per unit = Rs.1.80

Comment: Labor cost increases from Rs. 1.20 per unit to Rs.1.80 per unit. Taylor's system is resisted on this ground as well as on the ground that it is very harsh on the workers.

Individual Bonus Plans

Generally, incentive may be deemed as an extra payment paid by employer to worker/employees for his additional efficiency. The main object of an incentive plan is to induce a worker to produce more to earn higher wages.The bonus to be paid to the workers is computed on the basis of savings in the hours, i.e. the difference between the time allowed and time taken. The time allowed is the standard time, which is fixed by conducting a time and motion study by the work-study engineers. While fixing the standard time, due allowance is given for physical and mental fatigue as well as for normal idle time. The actual time taken is compared with this standard time and bonus is payable to the worker if the time taken is less than the standard time.Incentive plans increase the efficiency and capacity of workers. Some important incentive plans are as follows:

1. Halsey Premium Plan

2. Halsey Weir Plan

3. Rowan Premium Plan

4. Emerson's Efficiency Plan

5. Merric's Plan

6. Group Bonus Plan

1. Halsey Premium Plan

This plan was introduced by F.A. Halsey, an American engineer. In this plan, bonus is paid on the basis of time saved. Standard time is fixed for a job and if the actual time taken is less than the same, the worker becomes eligible for bonus. The total wages is paid to him as normal wages (Actual time x Rate per hour) plus a bonus on the basis of time saved by him on production. The rate of bonus may be 30 per cent to 70 percent of wages for time saved by workers. But, in the absence of any Information the rate of bonus may be taken at 50 percent. According to this plan, time saved can be calculated as follows:

Therefore, the total wages of worker in this plan can be calculated as follows:

Total Wages = (Actual Hour worked X Rate per Hour) + (Time saved X Rate per hour X 50/100)

Time saved = Standard Time - Actual Time i.e. .TS = ST - AT

Example 4

Calculate the amount of total wages under Halsey Premium Plan from the following information:

Standard Time=11 hours

Actual hour worked=10 hours

Wages Rate per hour =Rs. 15

Solution

Total Wages = (Actual Hour worked X Rate per Hour) + (Time saved X Rate per hour X 50/100)

Time saved = Standard Time - Actual Time i.e. .TS = ST - AT

Total wages= (10 x 15) + [(11-10) x 15 x 50/100]

Total wages= = 150 + 7.5

Total wages= Rs. 157.50

2. Halsey Weir Plan

There is only one difference as compared to the Halsey Premium Plan and that is instead of 50% bonus for the time saved, it is 30% of the time saved. Accordingly the formula for this method is modified as follows.

Total Wages = (Actual Hour worked X Rate per Hour) + (Time saved X Rate per hour X 30/100)

Time saved = Standard Time - Actual Time i.e. .TS = ST – AT

Example 5

Calculate the amount of total wages under Halsey Weir Plan from the following information:

Standard Time=12 hours

Actual hour worked=9 hours

Wages Rate per hour =Rs. 20

Solution

Total Wages = (Actual Hour worked X Rate per Hour) + (Time saved X Rate per hour X 30/100)

Time saved = Standard Time - Actual Time i.e. .TS = ST - AT

Total wages= (9 x 20) + [(12-9) x 20 x 30/100]

Total wages= = 180 + 18

Total wages= Rs. 198

3. Rowan Premium Plan

This premium bonus plan was introduced by Mr. James Rowan. It is similar to that of Halsey Plan in respect of time saved, but bonus hours are calculated as the proportion of the time taken which the time saved bears to the time allowed and they are paid for at time rate.

Total Wages= (Actual Time taken x Rate per hour) + [(Actual Time taken/Standard Time) x (Time Saved x rate per hour)]

Total wages = (AT x R) + (AT / ST x TS x R)

Example 6

Calculate the amount of total wages on the basis of Rowan Premium Plan from the following information:

Standard Output in 11 hours=120 units

Actual Output in 10 hours=132 units

Wages Rate per hour =Rs.15

Solution

Total Wages= {(Actual Time taken x Rate per hour) + [(Actual Time taken/Standard Time) x (Time Saved x rate per hour)]}

Total wages = (AT x R) + (AT / ST x TS x R)

Total wages = (10 x15) + (10/11 x 1 x 15)

Total wages =150+ 13.63 Total wages = Rs. 163.63

4. Emerson's Efficiency Plan

In Emerson's Efficiency Plan minimum wages is guaranteed but, bonus is paid on the efficiency of workers. There are several slabs for efficient workers. The standard output is fixed at 100% efficiency. If the worker uses less than 100% efficiency, bonus is not paid to him. The bonus slabs in this plan is as follows:

Efficiency of Worker	Bonus
Below 66.67% or 66 2/3%	No Bonus of actual wages
66.67% to 100%	20% Bonus
Above 100%	20% Bonus + 1% bonus for each increase of 1% in efficiency

Example 7

Calculate the amount of bonus and total wages under Emerson Efficiency Plan with the help of following information:

Standard Output in 10 Hours=240 units

Actual Output in 10 hours=264 units

Wages Rate=Rs. 10 per hour

Solution

At first, the efficiency of worker is calculated:

Efficiency of worker= (Actual Output/ Standard Output) x 100

Efficiency of worker= (264/240) x 100

Efficiency of worker=110%

Amount of Bonus= up to 100% efficiency= 20% + 1% bonus for each increase of 1% in efficiency i.e. 10%

Amount of Bonus=20%+10%

Amount of Bonus=30%

Total Wages=Wages for Actual time +Bonus for Efficiency

Total Wages=Wages for Actual time +Bonus for Efficiency

Total Wages=AT x AR + 30% (AT x AR)

Total Wages = 10 x 15 + 30/100 x 150

Total Wages = 150 + 30/100 x 150

Total Wages = 150 + 45

Total Wages = Rs. 195

5. Merric's Plan

Merric's Plan is an updated form of Taylor's plan. Taylor's plan gives two rates while Merric's Plan gives three rates.

Level of Efficiency	**Price Rate**
Up to 83.33%	Ordinary Piece Rate
83.33% to 100%	110% of Piece Rate
Above 100%	120% of Piece Rate

6. Group Bonus Plan

Group bonus refers to bonus paid for the collective efforts made by group of workers. Under a group bonus scheme, bonus is paid to a team of employees working together. The plans described above are all individual bonus plans. Many times output of individuals cannot be measured. Similarly, the output of individual is dependent on the performance of the group. In such cases, rather than implementing individual bonus systems, group bonus system is implemented. The total amount of bonus, which is determined according to productivity, can then be shared equally or in agreed proportion between the group members. The main objects of group bonus system are as follows:-

o Creation of team spirit.

o Elimination of excessive waste of materials and time.

o Recognition of group efforts.

o Improving productivity.

There are five schemes of group bonus plan –

a) Priest man’s Production Bonus

b) Cost Efficiency Bonus

c) Town Gain Sharing Plan

d) Budgeted Expenses Bonus

e) Waste Reduction Bonus

Overhead

An overhead is the amount which is not identified with any product. The name overhead might have come due to the reason of over and above the normal heads of expenditure. It is the aggregate of indirect material, indirect labour and indirect expenditure. The generic term used to denote indirect material, indirect labour and indirect expenses. Thus overheads forms a class of cost that cannot be allocated or absorbed but can only be apportioned to cost units. Overhead is the cost of material, labour and expenses which cannot be economically identified to any one cost unit, but they constitute an essential element of cost as they are incurred for producing a commodity or making it ready for sale. Overhead costs are also termed as 'indirect cost' or 'supplementary cost' or 'non-productive cost' or on cost etc.

Meaning and Definition

The term overhead has a wider meaning than the term indirect expenses. Overhead includes the cost of indirect material, indirect labour, and indirect expense. This is the aggregate sum of indirect material, indirect labour and indirect expense.

Overhead = Indirect material + indirect labour + indirect expenses

Definition of overheads: The indirect costs or fixed expenses of operating a business (that is, the costs not directly related to the manufacture of a product or delivery of a service) that range from rent to administrative costs to marketing costs.

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

CIMA defines overhead cost as "The total cost of indirect material, indirect labour and indirect expenses.

Thus overhead cost is, therefore, a group of expenses, which are not identifiable with the cost unit, but are incurred generally for the manufacturing and selling activities of the organization and can be apportioned to and absorbed by the 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

The process of grouping the overheads according to their common characteristics is known as classification of overheads. It provides the manager with information that enables them to manage the business effectively. According to CIMA classification is "the arrangement of items in logical groups having regard to their nature (subjective) or the purpose to be fulfilled (objective classification)" It is the process of arrangement of items into groups according to their degree of similarity. The overheads can be classified on the basis of:

1. According to Nature
2. According to Normality
3. According to Controllability
4. According to Variability
5. According to Function

1. According to Nature

1) **Indirect Material**-Materials which cannot be identified with the given product unit of cost centre is called as indirect materials. A material is that cost which cannot be directly attributed to a particular cost object. For example, lubricants used in a machine is an indirect material, similarly thread used to stitch clothes is also indirect material. Small nuts and bolts are also examples of indirect materials.

2) **Indirect Labour**-Indirect labour cost is the employee cost, which cannot be directly attributed to a particular cost object. Wages and salaries paid to indirect workers, i.e. workers who are not directly engaged on the production are examples of indirect wages.

3) **Indirect Expenses**-Indirect Expenses are expenses, which cannot be directly attributed to a particular cost object. Expenses such as rent and taxes, printing and stationery, power, insurance, electricity, marketing and selling expenses etc. are the examples of indirect expenses.

2. According to Normality

1) **Normal Overheads**-Such overheads are expected to be incurred in attaining a given output and are unavoidable in nature. They are included in production cost.

2) **Abnormal Overheads**-These are not expected to be incurred in attaining a given output. These arise due to some abnormal reasons e.g. cost of abnormal idle time. They are charged to costing profit and loss account.

3. According to Controllability

1) **Controllable overheads**: Indirect costs which can be controlled by executive action at the point of their incurrence. Normally variable overheads are controllable overheads.

2) **Uncontrollable overheads:** Indirect costs, which cannot be controlled by executive action at the point of their incurrence. Normally fixed overheads come under this category.

4. According to Variability

1) Fixed Overheads-Indirect costs which tend to remain unaffected by changes in the volume of production or sale are known as fixed overheads. Factory rent, rates, insurance, staff salary etc. are fixed in nature irrespective of the level of capacity utilized or units produced. It must be noted that fixed costs are not absolutely fixed for all times. If there is a change in the capacity of production or sale these costs also tend to change. Since the amount of this type of cost is fixed over a period of time, fixed cost per unit decreases as production increases and per unit fixed cost increases as production decreases. These overheads are also termed as shut down overheads or period cost.

2) Variable Overheads- Indirect costs which vary in direct proportion to changes in the volume of production or sale are known as variable overheads. Since the amount varies in relation to volume, the cost per unit tends to remain constant. For example, fuel and power, packing charges freight, selling commission etc.

3) Semi Variable Overheads-Some overhead costs tend to vary with changes in output or sales but not in direct proportion to the change. They are neither perfectly variable nor absolutely fixed in relation to changes in volume. These costs remain constant over a relatively short range of variation in output and then change to a new level with an increase or decrease in the volume of activity. These costs are partly fixed and partly variable.

The necessity for classification of cost into fixed and variable arises from the following considerations:

• Cost control -One of the main objectives of cost accounting is cost control, which is achieved by classifying costs into fixed and variable. Fixed costs are mostly in the nature of policy cost or discretionary cost arising out of the decisions to create facilities, and are, therefore, not controllable at the lower level of management. Variable cost, on the other hand is controllable at the shop floor level. Hence, a classification of cost into fixed and variable helps to fix responsibility for cost control at the appropriate level of management.

• Decision making-Management needs to know the effect of changes in the levels of activity. Cost information will be of no use, unless fixed and variable costs are segregated.

• Marginal costing and Break-even analysis- Marginal costing techniques are based on the separation of fixed and variable costs, which is essential for the cost-volume profit relationship and the preparation of Break-even charts and profit graphs.

• Flexible budget-Budgets are prepared for different activity levels to make comparison between actual and budget meaningful. Flexible budget cannot be established without segregation of costs into fixed and variable ones.

Example 1

The cost of producing 3000 units is as follows:

Material=Rs. 36000, wages=Rs. 24000, overhead charges (fixed and variable) =Rs. 10000.

The company produces 8000 units and sells at Rs. 25 each and earns a profit of Rs. 20000. Find out the amount of fixed and variable overheads.

Solution

Calculation of total overheads for producing 8000 units

Selling price 8000×25 =	200000
Less profit =	20,000
Total Cost=	180000
Less Material=36000/3000×8000= Less Labour=24000/3000×8000=	96000 64000
Total Overheads	20000
Variable overhead per unit=	Change in Overheads/Change in Output
Variable overhead per unit=	20000-10000/8000-3000
Variable overhead per unit=	10000/5000
Variable overhead per unit=	Rs. 2 per unit
Variable overhead for producing 3000 unit=	3000×2=6000
Fixed Overheads=	10000-6000
Fixed Overheads=	Rs. 4000

5. According to Function

1) Factory Overhead-is the total indirect costs associated with manufacturing activities, the sequence of which begins with the procurement of materials and ends with the primary packing of the product. Examples are as follows: indirect materials such as lubricants, cotton waste, and other factory supplies, direct materials of small individual value, repair parts, wages of indirect workers, supervisory salaries, salaries and wages relating to service cost centers, canteen and other welfare expenses, factory rent, rates, lighting and heating, power and fuel, depreciation of factory building, depreciation of plant and machinery and other equipment's, expenses connected with the administration of factory.

2) Office or Administration Overhead-is the total costs of formulating the policy, directing the organization and controlling the operations of an undertaking which is not directly related to production, selling, distribution, research or development activity or function. Examples of such expenses are as follows:

o Office supplies, printing and stationery, salaries to office staff, directors remuneration.

o Office rent and rates, office lighting, heating and air conditioning, postage, telephone &

o Courier service, depreciation, repair and maintenance of office building, and equipment.

o Furniture and office machines, audit fees, legal charges, bank charges and interest.

3) Selling and Distribution Overhead-refers to those expenses which are associated with the marketing and selling activities. For example: o

Salaries, commission of salesmen and selling agents, etc.

o Travelling expenses, sales office expenses

o Advertisement and publicity

o Market research

o Bad debts

o Brokerage

Distribution overhead relates to total indirect cost associated with the distribution of finished products, beginning with the primary packed product available for dispatch and ending with making reconditioned returnable empty container, if any, available for reuse. Examples are:

o Secondary packing materials.

o Packing charges.

o Salaries and wages of distribution staff.

o Carriage and freight outwards.

o Warehousing charges, insurance.

Benefits of Overhead Classification

• The proper classification of overheads is very important for accounting, apportionment and absorption of overheads cost.

• Overhead classification helps in preparation of budgets like flexible production and current budget etc.

• Accurate classification of overheads into variable, semi variable and fixed helps in cost control.

Collection of Overheads

Overheads collection is the process of recording each item of cost in the records maintained for the purpose of ascertainment of cost of each cost centre or unit. The following are the source documents for collection of overheads:

o Stores Requisition-Indirect material.

o Wages Sheet-Indirect labour

o Cash Book- Indirect material, Indirect labour and Indirect Expenses

o Purchase Orders and Invoices-Indirect material, Indirect labour and Indirect Expenses

o Journal Entries- Indirect material, Indirect labour and Indirect Expenses

o Other Registers and Records

Collection of overheads is very important for the purpose of overhead accounting. It is necessary to identify the indirect expenses and the above mentioned source documents are used for this. Proper collection of overhead expenses will help to understand accurately the total overhead expenses.

Codification of Overheads

Codification means collecting similar overhead cost items under one heading. Each item of overhead is properly analyzed and written under its head. A code number is allotted to it which is known as standing order number. It may consist number or latter or a combination of both. This also helps in adopting mechanized system of accounting. It is always advisable to codify the overhead expenses. Codification helps in easy identification of different items of overheads. There are numerous items of overheads and a code number to each one will facilitate identification of these items easily. Codification can be done by allotting numerical codes or alphabetical codes or a combination of both. Whatever system is followed, it should be remembered that the system is simple for understanding and easy to implement without any unnecessary complications.

Codification of Overheads

Cost Centre Codes	Department Name
1100	Turning department
1200	Grinding Department
1300	Components manufacturing
1400	Assembly
2100	Maintenance
2200	Quality control

2300	Stores

The logic in giving the codes is simple. All codes starting with 1 are production departments, all codes starting with 2 are factory related services and all codes starting with 3 are general services. This coding helps collection of costs on functional basis and also to identify an item of expense directly to a department or cost centre.

Objectives of Codification

• To collect the overheads of similar nature into one group.

• To help in planning and control of cost of products.

• To make the accounting system more economical and useful through reducing the number of the ledger and accounts.

• To accumulate overheads systematically.

Methods of Codification

The overheads are collected from the different sources; they are grouped under different similar headings. It means that the overheads of similar nature and feature are placed under one group. Codification is the method of grouping of overheads by allotting various numbers, alphabets or other symbols to the overheads.

Codification is associated with the use of standing order numbers and cost account numbers. The numbers are provided to items of the overheads. Allotted numbers prove helpful in maintaining secrecy with simplification. There are three methods of codification as given below:

(i) Serial Number Method: Each head of expense is given a serial number.

S.No. 1 Material

S.No. 1.1 Direct Material

S.No. 1.2 Indirect Material

S.No. 2 Factory Overheads

S.No. 2.1 Rent on Factory Building

S.No. 2.2 Salary to Factory Manager

(ii) Alphabets Method: The alphabet stands for the head of expense and the number shows further analysis of the expense. For example, “M” stands for Maintenance and it can be analysed as follows:

M = Maintenance

M 1 = Maintenance to Factory Building

M 2 = Maintenance to power House

M 3 = Maintenance to Officer Building

M 4 = Maintenance to Warehouse Building

(iii) Numerical Codes Method: For mechanized accounting, the use of alphabets is restricted and this numerical code method is, adopted in the industry. For example:

Code	particulars
100101	Depreciation on plant
100102	Depreciation on Building
200101	Salary to Factory Manager
200102	Salary to Managerial

Factory Overheads

Overhead is the aggregate of indirect material, indirect labour and indirect expenses. It refers to any cost which is not directly attributable to a cost unit. The term 'indirect' means that which cannot be allocated, but which can be apportioned to or absorbed by cost centers or cost units. Cost related to a cost center or cost unit may be divided into two i.e. Direct and Indirect cost. The Indirect cost is the overhead cost and is the total of indirect material cost, indirect labour cost, indirect expenses. After the collection, classification and codification of overheads, the next step is allocation and apportionment of overheads into the product units.

Allocation of Overheads

Allocation is the process of identification of overheads with cost centers. Expenses which cannot be identified with product or cost unit can be allocated to a specific cost centre, if latter can be identified. For example, wages to indirect workers depreciation and insurance of plant and machinery, fuel oil for boilers, etc. are instances of expenses which can be directly allocated to the cost centres. However, indirect expenses, such as rent, rates, electricity, telephone charges, factory manager's salary, etc. incurred for the entire factory cannot be allocated to any particular cost centers, but requires being apportioned to more than one cost centres on some suitable basis for benefits received.

CIMA defines Cost Allocation as, 'the charging of discrete, identifiable items of cost to cost centres or cost units'. In simple words complete distribution of an item of overhead to the departments or products on logical or equitable basis is called allocation.

The Overhead Allocation Process

Proper overheads allocation is of great importance as wrong allocation can distort income determination, asset valuation and performance evaluation. The overhead allocation process is as follows:

• Accumulating overheads on the basis of departments or products.

• Identifying the cost objectives of the allocated costs

• Selecting the method of relating costs so accumulated to the cost objectives.

Apportionment of Overheads

Cost apportionment is the allotment of proportions of items to cost centers. Wherever possible, the overheads are to be allocated. Certain items of overheads cannot be clearly allocated to any particular department or cost centre. In fact, these are combined expenses or overheads. Distribution of these combined overheads to various departments is known as apportionment of overheads. This is an indirect process to proportionate the amount of overhead on some equitable basis. This is also called as primary distribution of overheads, because in this distribution all the overhead cost should be allocated or apportioned to the production and service departments. In simple words, distribution of various items of overheads in portions to the departments or products on logical or equitable basis is called apportionment.

Principles of Apportionment of Overheads

1. Services Rendered

The principle followed in this method is quite simple. A production department which receives maximum services from service departments should be charged with the largest share of the overheads. Accordingly, the overheads of service departments are charged to the production departments.

2. Ability to Pay

This method suggests that a large share of service department's overhead costs should be assigned to those producing departments whose product contributes the most to the income of the business firm. However the practical difficulty in this method is that, it is difficult to decide the most paying department and hence difficult to operate.

3. Analysis Method

This method is used where a suitable base is difficult to find or it would be too costly to select a method which is considered suitable. For example, the postage cost could be apportioned on a survey of postage used during a year.

4. Efficiency Method

Under this method, the apportionment of expenses is made on the basis of production targets. If the target is exceeded, the unit cost reduces indicating a more than average efficiency. If the target is not achieved, the unit cost goes up, disclosing there by, the inefficiency of the department

Primary Apportionment of Overheads

Item of Overhead	Basis of Apportionment
Factory Rent	Floor Area
Insurance on Building, Machinery, Welfare Department Expenses	Insurable Value, Cost of Machinery, Number of Employees
Electric Light	Light points or Floor Area
Power Expenses	Horsepower of the Machinery
Depreciation	Plant Value
Advertisement	Sales Value

The above list is not exhaustive and depending upon peculiarities of the organization, it could be extended.

Advantages of Apportionment of Overheads

o Apportionment of overheads helps in control of overhead cost.

o Apportionment of overheads helps in calculating cost of production of the goods or services provided.

o It also helps in finding out under or over-absorption of overheads which helps in taking necessary remedial measures in case of need arises.

o Apportionment of overheads helps in calculating cost of work in progress.

Allocation vs. Apportionment

The distinction between Allocation and Apportionment can be studied in following points:

1) Allocation deals with the whole items of cost and apportionment deals with proportion of items of cost.

2) Allocation is direct process of departmentalization of overheads, whereas apportionment needs a suitable basis for sub-division of the cost.

3) Whether a particular item of expense can be allocated or apportioned does not depends on the nature of expense, but depends on the relation with the cost centre or cost unit to which it is to be charged.

Examples1

The New XXX company is divided into four departments: A, B & C (Producing Departments,) and D is a service departments. The actual costs for a period are as follows:

Rent	1000	Repair to Plant	600
Supervision	1500	Fire Insurance (Stock)	500
Depreciation on Plant	450	Power	900
Light	120	Employer's Liability to Insurance	150

The following information is available in respect of the departments;

	A	B	C	D
Area (sq.mt)	1500	1100	900	500
No.of Employees	20	15	10	5
Total Wages (Rs.)	6000	4000	3000	2000
Value of Plant (Rs)	24000	18000	12000	6000
Value of Stock (Rs)	15000	9000	6000	-
HP of Plant	24	18	12	6

You are required to apportion the costs to the various departments on the most equitable basis.

Solution

Overhead Distribution

Item	**Basis of Apportionment**	**Total Amount**	**Production Department**			**Service Department**
			A	**B**	**C**	**D**
Rent	Floor Area	1000	375	275	225	125
Supervision	No.of Employees	1500	600	450	300	150
Depreciation on Plant	Plant Value	450	180	135	90	45
Light	Floor Area	120	45	33	27	15

Repair to Plant	Plant Value	600	240	180	120	60
Fire Insurance (Stock)	Stock Value	500	250	150	100	-
Power	HP of Plant	900	360	270	180	90
Employer's liability to Insurance	No.of Employees	150	60	45	30	15
	Total	5220	2110	1538	1072	500

Factory Overheads

Factory overheads include all expenses which arise in connection with manufacturing operations but cannot be directly identified with particular products or jobs. It starts with supply of materials and ends with primary packing of the product.

Factory overhead is also called as 'manufacturing overhead' or 'production overhead', or 'factory on cost' or 'works overhead'. Following are the examples of factory overheads: o Rent rates and insurance of factory building.

o Depreciation and repairs of plant and machinery.

o Depreciation and repairs of factory building.

o Store keeping expenses, cost of consumable stores.

o Wages of indirect labour, normal idle time etc.

o Salary of works manager, foreman.

o Power used by machines.

o Drawing office expenses.

Absorption of Factory Overheads

The next important step is 'Absorption' of Overheads. CIMA defines absorption as, 'the process of absorbing all overhead costs allocated or apportioned over a particular cost center or production department by the units produced.' In simple words, absorption means charging equitable share of overhead expenses to the products. Overhead absorption is also known as levy or recovery of overheads. As the overhead expenses are indirect expenses, the absorption is to be made on some suitable basis.

The Institute of Cost and Management Accountants (UK) defines overhead absorption as "The allotment of overheads to cost units."

Methods of Absorption of Factory Overheads

An absorption rate is determined to charge overheads costs to the products or jobs. This rate can be determined using any one of the following methods:

1. Direct Material Cost Method.
2. Direct Labour Cost Method.
3. Prime Cost Method.
4. Machine Hour Rate Method.
5. Combined Rate Method
6. Production Unit Method

1. Direct Material Cost Method

Under this method the overhead rate is expressed as a percentage of direct material cost. Arithmetically the operation may be expressed as follows:

Percentage of direct material cost = [Budgeted or actual factory overhead/ Budgeted or actual material cost] x 100

Advantages of Direct Material Cost Method

o This method is simple to understand and easily applicable.

o This method is useful if material plays a major part.

o It produces fairly accurate results if the prices and grades of materials do not fluctuate widely from time to time and where output is uniform.

Disadvantages of Direct Material Cost Method

This method is not very much appropriate due to following disadvantages:

o This is a very unrealistic assumption that overheads are based on cost of material consumed.

o It ignores the time factor.

o If articles made of more expensive material are over charged with a high portion of factory overheads, sales prices will also tend to be high, which will lead to loss of market. o The quality of labour and the way machines are used by them constitute most of the factory overhead, but in this method we ignore their effect.

o If different types of materials are used in different jobs at the same time, this will charge different value of overheads which is not appropriate.

Example 2

The budgeted overhead of XYZ Ltd. Is of Rs. 200000 and the budgeted direct material cost is Rs. 500000. Calculate the amount to be charged to Factory Overheadsif a job consumes Rs. 10000 worth of material.

Solution

Percentage of direct material cost = [Budgeted or actual factory overhead/ Budgetedor actual material cost] x 100

Percentage of direct material cost = [200000/500000] x 100

Percentage of direct material cost = 40% of Material

Amount to be charged to Factory Overheads=10000 x40%

Amount to be charged to Factory Overheads=Rs. 4000

2.Direct Labour Cost Method

This method is used in those organizations where labor is a dominant factor in the total cost. Under this method, the following formula is used for calculating the overhead absorption rate.

Overhead Absorption Rate=Budgeted or Actual Overheads/ Direct Labor Cost X 100

This method is also simple to understand and easy to operate. However, it ignores the time taken by each worker for completion of the job. Similarly it ignores the work performed by machine where a labor is a mere attendant.

Advantages of Direct Labour Cost Method

o It is simple to understand and easy to apply and popular also.

o This method is useful where labour cost is an important part of total cost units.

o Labour rates are more stable than material prices, so it gives constant results. **Disadvantages of Direct Labour Cost Method**

o Under this method, wages paid would be more for skilled labour and relatively less for unskilled workers. But the time taken to complete such jobs may be relatively less than those which involve employment of unskilled labour. Thus, applying this method may give improper results.

o This method ignores the significance of all other factors in production, sometimes use of machine gives rise to certain overheads like power, deprecation, oil etc.

Example 3

The budgeted overhead of XYZ Ltd. Is of Rs. 200000 and the budgeted labour paid is Rs. 400000. Calculate the amount to be charged to Factory Overheads if a job consumes Rs. 100000 worth of material and 50000 worth of Labour cost.

Solution

Overhead Absorption Rate=Budgeted or Actual Overheads/ Direct Labor Cost X 100 Overhead Absorption Rate= [200000/400000] x 100

Overhead Absorption Rate== 50% of Direct Labour

Amount to be charged to Factory Overheads=50000 x50%

Amount to be charged to Factory Overheads=Rs. 25000

3. Prime Cost Method

This method is an improvement over the first two methods. Under this method, the Prime Cost is taken as the base for calculating the percentage of absorption of overheads by using the following formula.

Absorption Rate= [Budgeted or actual factory overhead/Budgeted or actual prime cost] X 100

Prime Cost = Direct Material + Direct Labour + Direct expenses.

This method is simple to understand and easy to apply but this method suffers from the disadvantages of both the above mentioned methods. So this method is used in rare cases.

Example 4

The budgeted overhead of XYZ Ltd. Is of Rs. 200000 and the budgeted Prime cost is Rs. 1000000. Calculate the amount to be charged to Factory Overheads if a job consumes Rs. 100000 worth of material and 50000 worth of Labour cost and 10000 as direct expenses.

Solution

Absorption Rate=[Budgeted or actual factory overhead/Budgeted or actual prime cost] X 100

Prime Cost = Direct Material + Direct Labour + Direct expenses.

Absorption Rate= [200000/1000000] x 100

Absorption Rate= 20% of Prime cost

Prime Cost = Direct Material + Direct Labour + Direct expenses.

Prime Cost = 100000+50000+1000

Prime Cost =160000

Amount to be charged to Factory Overheads=160000 x20%

Amount to be charged to Factory Overheads=Rs. 32000

4. Machine Hour Rate Method

Where machines are more dominant than labor, machine hour rate method is used. CIMA defines machine hour rate as an “Actual or predetermined rate of cost apportionment or overhead absorption, which is calculated by dividing the cost to be apportioned or absorbed by the number of hours for which a Machine or machines are operated or expected to be operated. Machine Hour Rate is calculated as follows:

Machine Hour Rate=Budgeted or Actual Factory Overhead/Budgeted or Actual Machine Hours

Steps required calculating the Machine Hour Rate

o Each machine or group of machine should be treated as a cost centre.

o The estimated overhead expenses for the period should be determined for each machine or group of machines.

o Overheads relating to a machine are divided into two parts i.e., fixed or standing charges and variable or machine expenses.

o 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.

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

Basis of apportionment in Machine Hour Rate Method:

o Rent and Rates- Floor area occupied by each machine.

o 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.

o Supervision-estimated time devoted by the supervisory staff to each machine.

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

o Insurance – Insurable value of each machine

o Miscellaneous Expenses – Equitable basis depending upon facts.

Example 5

1) Calculate the Machine Hour Rate from the following:

Cost of the Machine= Rs. 100000

Installation Charges= Rs. 10000

Scrap Value= Rs. 5000

Life of Machine= 10 years

Estimated working hours per year=2200

Hours Rent and Rates for the shop per month= Rs. 250

Supervisor's salary= Rs. 700

General lighting for the shop per month= Rs. 300

Rate of Power per 100 units= Rs 50

Power consumption per hour is 10 units. Machine occupies 1/4th area of shop. The supervisor is spending 1/5th of his time to this machine.

Solution:

Computation of Machine Hour Rate

Particular	Per Annum	Per Hour
Standing Charges		
Rent=250 x12 x1/4=	750	
Supervisor's Salary=700 x12 x1/5	1680	
General Lighting=300 x12 x1/4	900	
Total	3330	
Standing Charges per hour= 3330/2200 hrs.		1.51
Variable Charges		
Depreciation=[100000+10000-5000]/10=10500/2200		4.77
Power(10 x50)/100		5.00
Machine Hour Rate		**11.28**

5. Combined Rate Method

Where both manual and machine operations are involved two separate rates may be computed. It will require apportionment of overheads between machine centers and other general sections of factory.

6. Production Unit Method

Rate per Unit=Budgeted or Actual No. of Units Produced/ Budgeted or Actual Factory Overhead

This method is simple and if the company makes only one product, this method can be used.

Unit – III

Process Costing

Introduction

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. When the production process is such that goods are produced from a sequence of continuous or repetitive operations or processes, the cost incurred during a period is considered as Process Cost. The process cost per unit is derived by dividing the process cost by number of units produced in the process during the period. Process Costing is employed in industries where a continuous process of manufacturing is carried out. Costs are ascertained for a specified period of time by departments or process. Chemical industries, refineries, gas and electricity generating concerns may be quoted as examples of undertakings that employ process costing.

Meaning and Definition of Process Costing

Process costing is an important method of costing. It refers to costing of operation(s) or process (es) involved in converting raw materials into finished goods or products. Its main objective is to provide an average cost of product.

According to ICMA terminology, "Process Costing is that form of operation costing which applies where standardized goods are produced". Process costing is also called as "Average Costing" or "Continuous Costing".

According to Kohler, "A method of accounting whereby costs are charged to processes or operations and averaged over units produced; it is employed principally where a finished product is the result of a more or less continuous operation, as in paper mills, refineries, canneries and chemical plants; distinguished from job costing, where costs are assigned to specific orders, lots or units".

Characteristics of Process Costing

A Process cost system has the following features:

• The factory is divided into departments or process which are limited to a certain operation.

• Manufacturing costs are accumulated for each production department or process.

• The manufacturing costs are accumulated by department or process for specific period. • Process costing is an averaging process.

• Each process or department has its own account for recording the processing costs.

• The production is continuous and emphasis is uniform or standardized product.

• The unit completed in one process is transferred to the next process together with costs associated with them.

• Completed unit are transferred to finished goods.

• Wastages or cost of spoiled units is added to the cost of good units produced which increases the average cost per unit.

Advantages and Disadvantages of Process Costing

Advantages

o It is easy to compute average cot because the products are homogeneous in Process Costing.

o It is possible to ascertain the process costs at short intervals.

o Process Costing is simple and less expensive in relation

o job costing.

o By evaluating the performance of each process effective managerial control is possible.

Disadvantages

o Valuation of work in progress is difficult.

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

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

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

o Process costs are only historical.

Principles of Process Costing

- Production activity should be divided into different processes or departments.
- A separate account is opened for each process.
- Both direct and indirect costs are collected for each process.
- The quantity of output and costs are recorded in the respective process accounts.
- 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.
- Normal loss and abnormal loss are credited in the process account
- 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.
- In case of by-products and joint products their share in joint cost should be estimated and credited to the min process.

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

Process Costing Procedure

• In process costing each process is separately identified and separate process account is opened for each process along with 'Particulars Column', two columns are provided on both sides of the process account-units (quantity) and amount (Rs.).

• Then all the expenses are debited in the respective process account. Wastage, sale of scrap, by-products etc. are reordered on the credit side of the process account.

• 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.

• The cost per unit in every process is calculated by dividing the net cost by the output.

• The output of last process is transferred to the Finished Stock Account. Incomplete units at the end of the each period on every process are converted in terms of completed units.

PROCESS ACCOUNT

(A Specimen)

Particulars	Units	Rs.	Particulars	Units	Rs.
To Direct Materials			By Loss in weight		
To Direct Wages			(Normal Loss)		
To Direct Expenses			By Sale of Scrap		
To Indirect expenses			By Next Process Account (Transfer)		
To Other Expenses (if any)					
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Differences between Process Costing and Job Costing:

The main differences between process costing and job costing are as follows:

(i) In process costing production is a continuous flow and the products are standardized. In job costing, production is carried on by specific order.

(ii) Processes are related to each other. Products also lose their individual entity. Various jobs are separate and independent.

(iii) In process costing, costs are calculated at the end of period under each process. In job costing, costs are calculated when a job is completed or finished.

(iv) In process costing, transfer from one process to another is an usual feature. In job costing, there is normally no transfer from one job to another. It will be only when there is surplus or excess production.

(v) Cost are compiled on time basis: for production, for a given accounting period, for each process. Costs are determined by Jobs or batches of products.

(vi) In process costing, production is homogeneous, stable and controllable. In job costing, each product unit is different and therefore more managerial attention is needed for proper control.

(vii) The unit cost of a process, which is computed by dividing the total cost for the period into the output of the process during that period, is an average cost for the period. In job costing, unit cost of a job is calculated by dividing the total cost by units produced in the lot or batch in the period.

(viii) Production in process costing is continuous and therefore there is normally work-in-progress at beginning and closing. In job costing, there may not be opening or closing work-in-progress in an accounting period.

Important aspects in Process Accounts

1) **Materials**-Materials and supplies which are required for each process are drawn against material requisitions from stores. Each process for which the above drawn materials will be used should be debited with the cost of materials consumed on the basis of the information received from the Cost Accounting department. The finished product of first process generally become the raw materials of second process; under such a situation the account of second process, be debited with the cost of transfer from the first process and the cost of any additional material required under this second process.

2) **Labour**-Each process account should be debited with the labour cost or wages paid to labour for carrying out the processing activities. Sometimes the wages paid are apportioned over the different processes after selecting appropriate basis.

3) **Direct Expenses**-Each process account should be debited with direct expenses like depreciation, repairs, maintenance, insurance etc. associated with it.

4) **Overheads Related to Production**-Expenses like rent, power expenses, lighting bills, gas and water bills etc. are known as production overheads. These expenses cannot be allocated to a process. The suitable way-out to recover them is to apportion them over different processes by using suitable basis. Usually, these expenses are estimated in advance and the processes debited with these expenses on a pre-determined basis.

Example 1: A product passes through three processes, process A, process B and process C to completion. During the month of March, 2007, 1,000 units were produced and the following was the expenses:

	Process A (Rs.)	Process B (Rs.)	Process C (Rs.)
Materials	2,000	3,000	2,000
Labour	5,000	4,000	3,000
Direct Expenses	800	900	1,000

Indirect expenses amounted at all to 6,000. These are to be allocated on the basis of direct wages. Raw materials worth Rs. 6,000 were issued to process A. prepare process cost accounts showing cost per article produced.

Solution:

Process Account A

(Output: 1,000 units)

Particulars	**Cost per unit (Rs.)**	**Total (Rs.)**	**Particulars**	**Cost per unit (Rs.)**	**Total (Rs.)**
To Raw materials	6.00	6,000	By Transfer to Process B a/c	16.30	16,300
" Materials	2.00	2,000			
" Direct Wages	5.00	5,000			
" Direct expenses	0.80	800			
" Indirect expenses	2.50	2,500			
	16.30	**16,300**		**16.30**	**16,300**

Process Account B

Particulars	Cost per Unit (Rs.)	Total (Rs.)	Particulars	Cost per Unit (Rs.)	Total (Rs.)
To Transfer from process A a/c	16.30	16,300	By Transfer to process C a/c	26.20	26,200
" Materials	3.00	3,000			
" Direct Wages	4.00	4,000			
" Direct Expenses	0.90	900			
" Indirect Expenses	2.00	2000			
	26.20	26,200		26.20	26,200

Process C Account

Particulars	Cost per Unit (Rs.)	Total (Rs.)	Particulars	Cost per Unit (Rs.)	Total (Rs.)
To Transfer from process B a/c	26.20	26,200	By Transfer to Finished Stock a/c	33.70	33,700
" Materials	2.00	2,000			
" Direct Wages	3.00	3,000			
" Direct Expenses	1.00	1,000			
" Indirect Expenses	1.50	1,500			
	33.70	33,700		33.70	33,700

Treatment of Normal Loss, Abnormal Loss and Abnormal Gain

Process loss is defined as the loss of material arising during the course of a processing operation and is equal to the difference between the input quantity of the material and its output.

There are two types of material losses:

1. Normal Process Loss

Normal loss is a loss, which is inevitable in any process. Normal Process Loss is defined as the loss of material which is inherent in the nature of work. Such a loss can be reasonably anticipated from the nature of the material, nature of operation, the experience and technical data. It is unavoidable because of nature of the material or the process. For example if the input is 100, the output may be 95 if the normal loss is anticipated as 5%.

Treatment in Cost Accounts

The cost of normal process loss in practice is absorbed by good units produced under the process. The amount realized by the sale of normal process loss units should be credited to the process account.

2. Abnormal Process Loss

If the actual output is less than the normal output [Normal output = Input-Normal Loss], the difference between the two is the abnormal loss. Abnormal Process Loss is defined as the loss in excess of the pre-determined loss (Normal process loss). This type of loss may occur due to the carelessness of workers, a bad plant design or operation, Sabotage etc. Such a loss cannot obviously be estimated in advance. But it can be kept under control by taking suitable measures. In the example given above, the normal output is 95 which is 100- 5% of 100as the normal loss. If the actual output is 93 units then 2 units will be abnormal loss.

Treatment in Cost Accounts

The cost of an abnormal process loss unit is equal to the cost of a good unit. The total cost of abnormal process loss is credited to the process account from which it arises. Cost of abnormal process loss is not treated as a part of the cost of the product. In fact, the total cost of abnormal process loss is debited to costing profit and loss account.

3. Abnormal Gain

Sometimes, the actual production exceeds the expected figures. If the actual output is more than the normal output, the difference between the two is abnormal gains. Thus abnormal gain is the difference between actual and expected loss and actual and expected production. I n the example given above, the normal output is 95 which is 100- 5% of 100as the normal loss. If the actual output is 97 units then 2 units will be abnormal gain.

Treatment in Cost Accounts

The process account under which abnormal gain arises is debited with the abnormal gain and credited to abnormal gain account which will be closed by transferring to the Costing Profit and loss account. The cost of abnormal gain is computed on the basis of normal production.

Example1:

Calculate the cost of the finished articles if a product passes through three processes. The output of each process is treated as the raw material of the next process to which it is transferred and output of the third process is transferred to finished stock. 1st Process

(In Rs.)

	1st Process (In Rs.)	2nd Process (In Rs.)	3rd Process (In Rs.)
Material issued	40000	20000	10000
Labour	6000	4000	1000
Manufacturing overhead	10000	10000	15000

10000 units have been issued to the 1st process and after processing, the output of each process is as under:

	Output	Normal Loss
Process No. 1	9750 units	2%
Process No. 2	9400 units	5%
Process No. 3	8000 units	10%

No stock of materials or of work-in-progress was left at the end.

Solution

PROCESS No. 1 ACCOUNT

Particulars	Units	Rs.	Particulars	Units	Rs.
To Materials	10000	40000	By Normal Wastage	200	-
To Labour		6000	By Abnormal Wastage (Cost	50	286

			p. u.)		
To Overheads		10000	By Process No. 2 (Transfer of completed units)	9750	55714
	10000	**56000**		**10000**	**56000**

Working Notes

The cost of the abnormal wastage

Normal Output = 10000 units-200 units = 9,800 units

Cost per unit of normal output = Rs. 56000 + 9800 units = Rs. 5714

Cost of 50 units = Rs. 5714 x 50 = Rs. 286

PROCESS No. 2 ACCOUNT

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process No.1	9750	55714	By Normal Wastage(5% of 9,750)	488	-
To Materials		20000	By Process No. 3 (Transfer of completed units)	9400	91051
To Labour		4000			
To Overheads		10000			
To Abnormal Gain @9.686	138	1337			
	9888	**91051**		**9888**	**91051**

Working Notes

The cost per unit is obtained by dividing Rs. 89714 by 9262 units, i.e., 9750 units less488 units.

PROCESS No. 3 ACCOUNT

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process No.2	9400	91051	By Normal Wastage	940	-
To Materials		10000	By Abnormal Wastage @13.836	460	6364
To Labour		1000	By Finished Stock	8000	110687
To Overheads		15000			
To Abnormal Gain @9.686	138	1337			
	9400	**117051**		**9400**	**117051**

Working Notes

The cost of the abnormal wastage

Normal Output = 9,400 units-940 units = 8,460 units

Cost per unit of normal output = Rs. 117051 ÷ 8,460 units = Rs. 13,836

Cost of 460 units is = Rs. 6,364

Oil Refinery Processes

Oil refineries have normally three processes:

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

(b) Refining Process: Crude oil from Crushing process is debited. Other materials, wages and overheads of the process are debited. Loss-in-weight if any in this process is credited. The output of process is refined oil. Fats and residual oil may be obtained as by-products which are credited. The output being refined oil is transferred to the Finishing Process.

(c) Finishing Process: Refined oil obtained from Refining Process is debited. Other materials, wages and overheads of the process are also debited. Sale of by-product and loss-in-weight are credited. The balance of this process is credited as cost of production of refined oil. Cost of drums or tins for storage of refined oil is also debited to find out cost of stored finished oil.

Example: In an Industry, the output passes through three processes to completion i.e., Crushing, Refining and Finishing. The details are given below for the month of March, 2018:

	Crushing (Rs.)	Refining (Rs.)	Finishing (Rs.)
Wages	15,000	12,000	10,000
Power	6,000	5,000	3,000
Steam	2,000	1,000	500
Other expenses	3,000	2,000	500

Copra purchased 3,000 kg costing Rs.3, 00,000. Crude oil produced 2,500 kg, refined oil 1,800 kg, and finishing oil 1,760 kg. 500 kg crude oil was sold at cost plus 20% in Crushing process. Copra residue 300 kg sold for Rs.10,000 and sacks sold for Rs.1,000. Wastage of 100 kg of Refining process sold for Rs. 800. Casks cost Rs.3, 000. Oil stored in casks sold for Rs.200 per kg. Prepare necessary accounts of process.

Solution:

Crushing Process Account

Particulars	Kg	Amount (Rs.)	Particulars	Kg.	Amount (Rs.)
To Copra purchased	3,000	3,00,000	By Loss in weight	200	-
" Wages			" Copra residue sold	300	10,000
" Power		15,000	" Sacks sold		1,000
" Steam		6,000	" Crude oil sold (Cost Rs. 63,000 Plus 20% Profit 12,600) [(3,15,000 / 2,500) x 500]		
" Other expenses		2,000			
" Profit and Loss a/c (Profit on crude oil sold)		3,000			
		12,600	" Refining Process a/c (cost per kg Rs. 126)	500	75,600
				2,000	2,52,000
	3,000	**3,38,600**		**3,000**	**3,38,600**

Refining Process Account

Particulars	Kg	Amount (Rs.)	Particulars	Kg.	Amount (Rs.)
To Crushing process a/c (Output recd. @Rs.126)	2,000	2,52,000	By Loss in weight	100	
			" Wastage sold		
			" Finishing process a/c	100	800
" Wages					
" Power		12,000	(Output		
" Steam		5,000	transferred, cost	1,800	2,71,200
" Other expenses		1,000	per kg Rs.105.67)		
		2,000			
	2,000	**2,72,200**		**2,000**	**2,72,200**

Finishing Process Account

Particulars	Kg	Amount	Particulars	Kg.	Amount

		(Rs.)			(Rs.)
To Refinishing Process a/c (Refinished oil) " Wages " Power " Steam " Other expenses	1,800	2,71,200 10,000 3,000 500 500	By Loss in weight " Finished stock a/c (Cost per kg Rs. 162.67)	40 1,760	2,85,200
	1,800	2,85,200		1,800	2,85,200
To Finished process (Refined oil) " Cost of casks	1,760	2,85,200 3,000	By Total Cost of casks finished oil c/d (Cost per kg Rs. 163.75)	1,760	2,88,200
	`1,760	2,88,200		1,760	2,88,200
To Cost of casks finished oil (per kg Rs. 163.75) " Profit and Loss a/c (Profit per kg Rs. 36.25)	1,760	2,88,200 63,800	By sales @ Rs.200 per kg.	1,760	3,52,000
	1,760	**3,52,000**		**1,760**	**3,52,000**

Joint Products and By-Products

Joint products-Joint products represent "two or more products separated in the course of the same processing operation usually requiring further processing, each product being in such proportion that no single product can be designated as a major product". In other words, two or more products of equal importance, produced, simultaneously from the same process, with each having a significant relative sale value are known as joint products. For example, in the oil industry, gasoline, fuel oil, lubricants, paraffin, coal tar, asphalt and kerosene are all produced from crude petroleum. These are known as joint products.

By-Products- These are defined as "products recovered from material discarded in a main process, or from the production of some major products, where the material value is to be

considered at the time of severance from the main product." Thus by-products emerge as a result of processing operation of another product or they are produced from the scrap or waste of materials of a process. In short a by-product is a secondary or subsidiary product which emanates as a result of manufacture of the main product. The point at which they are separated from the main product or products is known as split-off point. The expenses of processing are joint till the split-off point. Examples of by-products are molasses in the manufacture of sugar, tar, ammonia and benzene obtained on carbonization of coal and glycerin obtained in the manufacture of soap.

Inter Process Profit

The usual practice is to transfer the materials to the next process at cost and from the last process to the finished stock account also at cost. But sometimes the transfer is made at market price.

The main advantages of such a method are that each process will then reveal profit or loss and hence the efficiency or inefficiency at any stage will be immediately known and underlined. It should be noted that merely to add a margin of profit to the cost while transferring the materials to the next process cannot serve any useful purpose. The transfer should be made at the current market price.

Following are the main objectives of inter process profit:

- To show whether the cost of production competes with the market price, and
- To make each process stand on its own efficiency and economies.

If the market price is higher than cost, a process account will reveal profit. Then the stock in the next process will not be valued at cost. The value of stock will include a margin of profit which is not proper for balance sheet purposes. Therefore, it is necessary to find out how much profit is included in the stock of each process and then to create a proper reserve for it by debiting the Profit and Loss account.

Example: A product passes through two processes A and B. Output of process A is passed to Process B at cost plus 25 per cent profit and finished output is similarly transferred to Finished Stock Account at cost plus 25 per cent profit. There was no partly finished work in either process on 30th June, on which date the following further information's was available:

	Process A (Rs.)	Process B (Rs.)
Materials consumed	2,000	6,000
Direct labour	3,000	4,000
Closing stock (30th June)	1,000	3,000

Out of the finished stocks, a portion remained at hand valued at Rs.5,000 and the balance was sold for Rs.20,000. Ignoring the question of overheads and assuming there were no opening stocks; prepare the Process and Finished stock accounts.

Solution:

Process Account A

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Materials	2,000	By Transfer to Process B a/c	5,000
" Direct Labour	3,000	" Closing Stock	1,000
" Profit & Loss account (25 % on Rs.4,000)	1,000		
	6,000		**6,000**

Process Account B

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Transferred from Process A a/c	5,000	By Transfer to Process B a/c	15,000
To Materials	6,000	" Closing Stock	3,000
" Direct Labour	4,000		
" Profit & Loss account (25 % on Rs.12,000)	3,000		
	18,000		**18,000**

Finished Stock Account

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Transferred from Process B a/c	15,000	By Sales	20,000
" Profit & Loss account	10,000	" Closing Stock	5,000
	25,000		**25,000**

Work- In- Progress (Equivalent Production)

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

Equivalent production represents the production of a process in terms of completed units. In other views, it means converting the uncompleted production into its equivalent of completed units. In every process, an estimate is made of the percentage completion of any work-in-progress.

A production statement and a cost statement will then be prepared.

The techniques of calculating equivalent production are as follows:

(a) Firstly the opening incomplete or work-in-progress units should be converted into equivalent units as incomplete. For example, opening work-in-progress is 500 units which are 60% complete, therefore only 40% work is to be done on these units in the process. Thus, on these units a cost of

500 × 40% = 200 units will be incurred in the process to complete these,

(b) To above units, add units started and finished during the production period or units completed in the process. These will be new units introduced less closing units and units scrapped,

(c) Thereafter, add equivalent units of closing units, and

(d) The total of all these will be equivalent production.

Equivalent unit should be calculated separately for each element of cost (viz. material, labour and overheads) because the percentage of completion of the different cost component may be different.

Evaluation of Equivalent Production:

After work-in-progress has been converted into equivalent completed units, the following steps are taken to evaluate it

: (1) Find out equivalent production after taking into account of the process losses, degree of completion of opening and/or closing stock.

(2) Find out net process cost according to elements of costs i.e. material, labour and overheads.

(3) Ascertain cost per unit of equivalent production of each element of cost separately by dividing each element of costs by respective equivalent production units.

(4) Evaluate the cost of output finished and transferred work in progress.

The total cost per unit of equivalent units will be equal to the total cost divided by effective units and cost of work-in-progress will be equal to the equivalent units of work-in-progress multiply by the cost per unit of effective production. In short the following from steps an involved.

Step 1 – prepare statement of Equivalent production

Step 2 – prepare statement of cost per Equivalent unit

Step 3 – prepare of Evaluation

Step 4 – prepare process account

The problem on equivalent production may be divided into following groups.

I when there is only closing stock of work-in-progress but without process losses

II when there is only closing stock of work-in-progress but with process losses

III when there is only opening as well as closing work-in-progress without process losses

IV when there is only opening as well as closing work-in-progress with process losses

Methods of valuation of work-in-progress:

(a) FIFO Method: The FIFO method of costing is based on the assumption of that the opening work-in-progress units are the first to be completed. Equivalent production of opening work-in-progress can be calculated as follows: Equivalent Production = Units of Opening WIP x Percentage of work needed to finish the units

(b) Average Cost Method: This method is useful when price fluctuate from period to period. The closing valuation of work-in-progress in the old period is added to the cost of new period and an average rate obtained. In calculating the equivalent production opening units will not be shown separately as units of work-in-progress but included in the units completed and transferred.

(c) Weighted Average Cost Method: In this method no distinction is made between completed units from opening inventory and completed units from new production. All units finished during the current accounting period are treated as if they were started and finished during that period. The weighted average cost per unit is determined by dividing the total cost (opening work-in-progress cost + current cost) by equivalent production.

(d) LIFO Method: In LIFO method the assumption is that the units entering into the process is the last one first to be completed. The cost of opening work-in-progress is charged to

the closing work-in-progress and thus the closing work-in-progress appears cost of opening work-in-progress. The completed units are at their current cost.

Example: From the following information's find out (i) Equivalent Production, (ii) Cost per unit of Equivalent production, and (iii) prepare process A Account. Assume there is no opening work-in-progress and process loss.

Input	1,900 units
Output	1,500 units
Closing work-in-progress	400 units

Items	degree of completion of closing WIP in %	Process costs of the current period (Rs.)
Materials	80	3,640
Direct labour	70	5,340
Overheads	70	3,560

Solution:

Statement of Equivalent Production

Input		Output		Equivalent Production					
Items	Units	Items	Units	Materials		Labour		Overheads	
				%	Units	%	Units	%	Units
Units Introduced	1,900	Units completed	1,500	100	1,500	100	1,500	100	1,500
		Work-in progress	400	80	320	70	280	70	280
	1,900		1,900		1,820		1,780		1,780

Statement of Cost

Element of Cost or Items	Cost Rs.	Equivalent Production (units)	Cost per unit Rs.
Materials	3,640	1,820	2.00
Direct labour	5,340	1,780	3.00

Overheads	3,560	1,780	2.00

Statement of Evaluation (Cost of per unit)

Production	Element of Cost	Equivalent Production (units)	Cost per unit	Cost Rs.	Total Rs.
Finished	Materials	1,500	2	3,000	
	Direct labour	1,500	3	4,500	
	Overheads	1,500	2	3,000	10,500

Work-in-progress	Materials	320	2	640	
	Direct labour	280	3	840	
	Overheads	280	2	560	2,040

Process Account

Items	Units	Amount(Rs)	Items	Units	Amount(Rs)
To Materials	1,900	3,640	By Finished stock a/c	1,500	10,500
To Direct labour		5,340	By Work-in-progress	400	2,040
To Overheads		3,560			
	1,900	12,540		1,900	12,540

Unit – IV

Marginal Costing

Introduction:

Marginal Costing is very important technique in solving managerial problems and contributing in various areas of decisions. In this context profitability of two or more alternative options is compared and such options is selected which offers maximum profitability along with fulfilment of objectives of the enterprise.

Marginal costing - definition

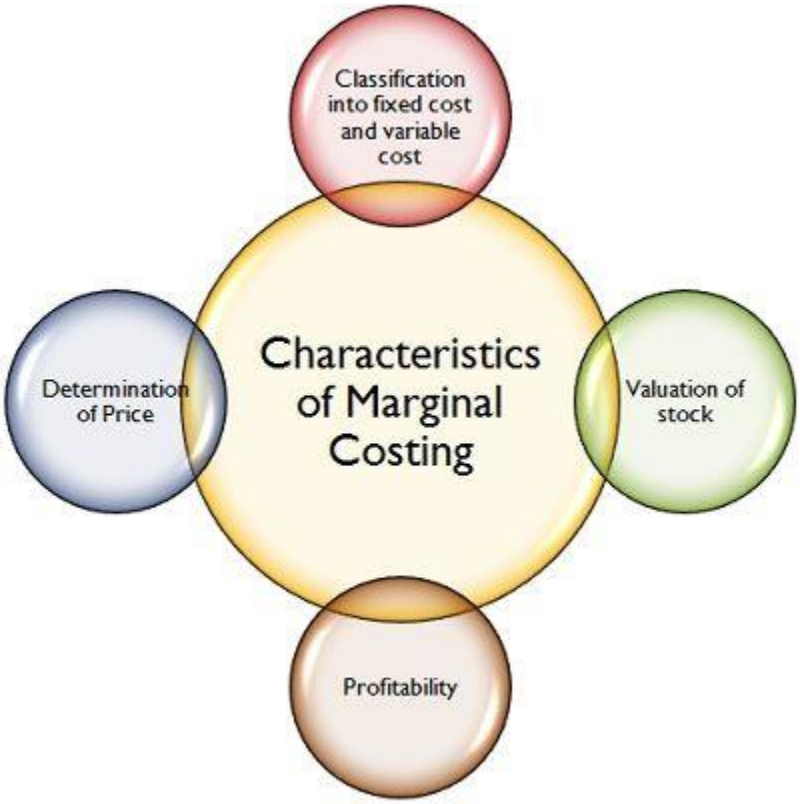
Marginal costing distinguishes between fixed costs and variable costs as convention ally classified.

The marginal cost of a product –—is its variable cost. This is normally taken to be; direct labour, direct material, direct expenses and the variable part of overheads.

Marginal costing is formally defined as:

'the accounting system in which variable costs are charged to cost units and the fixed costs of the period are written-off in full against the aggregate contribution. Its special value is in decision making'. (Terminology.)

The term 'contribution' mentioned in the formal definition is the term given to the difference between Sales and Marginal cost.



Thus, **Marginal Cost = Direct Material + Direct Labor + Direct Expenses + Variable Overheads**

Marginal Cost

The term marginal cost sometimes refers to the marginal cost per unit and sometimes to the total marginal costs of a department or batch or operation. The meaning is usually clear from the context.

Note- Alternative names for marginal costing are the contribution approach and direct costing.

Theory of Marginal Costing

The theory of marginal costing as set out in ―A report on Marginal Costing‖ published by CIMA, London is as follows:

In relation to a given volume of output, additional output can normally be obtained at less than proportionate cost because within limits, the aggregate of certain items of cost will tend to remain fixed and only the aggregate of the remainder will tend to rise proportionately with an increase in output. Conversely, a decrease in the volume of output will normally be accompanied by less than proportionate fall in the aggregate cost.

The theory of marginal costing may, therefore, by understood in the following two steps: 1. If the volume of output increases, the cost per unit in normal circumstances reduces. Conversely, if

an output reduces, the cost per unit increases. If a factory produces 1000 units at a total cost of Rs.3,000 and if by increasing the output by one unit the cost goes up to Rs.3,500, the marginal cost of additional output will be Rs.500.

2. If an increase in output is more than one, the total increase in cost divided by the total increase in output will give the average marginal cost per unit. It can be described as follows:

The ascertainment of marginal cost is based on the classification and segregation of cost into fixed and variable cost. In order to understand the marginal costing technique, it is essential to understand the meaning of marginal cost.

Marginal cost means the cost of the marginal or last unit produced. It is also defined as the cost of one more or one less unit produced besides existing level of production. In this connection, a unit may mean a single commodity, a dozen, and a gross or any other measure of goods.

Example, if a manufacturing firm produces X unit at a cost of Rs.300 and X+1 unit at a cost of Rs.320, the cost of an additional unit will be Rs.20 which is marginal cost. Similarly if the production of X-1 units comes down to Rs.280, the cost of marginal unit will be Rs.20 (300–280).

The marginal cost varies directly with the volume of production and marginal cost per unit remains the same. It consists of prime cost, i.e. cost of direct materials, direct labor and all variable overheads. It does not contain any element of fixed cost which is kept separate under marginal cost technique.

Marginal costing may be defined as the technique of presenting cost data wherein variable costs and fixed costs are shown separately for managerial decision-making. It should be clearly understood that marginal costing is not a method of costing like process costing or job costing. Rather it is simply a method or technique of the analysis of cost information for the guidance of management which tries to find out an effect on profit due to changes in the volume of output.

There are different phrases being used for this technique of costing. In UK, marginal costing is a popular phrase whereas in US, it is known as direct costing and is used in place of marginal costing. Variable costing is another name of marginal costing.

Marginal costing technique has given birth to a very useful concept of contribution where contribution is given by: Sales revenue less variable cost (marginal cost) Contribution may be defined as the profit before the recovery of fixed costs. Thus, contribution goes toward the recovery of fixed cost and profit, and is equal to fixed cost plus profit (C = F + P).

In case a firm neither makes profit nor suffers loss, contribution will be just equal to fixed cost (C = F). This is known as break even point.

The concept of contribution is very useful in marginal costing. It has a fixed relation with sales. The proportion of contribution to sales is known as P/V ratio which remains the same under given conditions of production and sales.

Definition: Marginal Costing is a costing technique wherein the marginal cost, i.e. variable cost is charged to units of cost, while the fixed cost for the period is completely written off against the contribution.

The term **marginal cost implies the additional cost involved in producing an extra unit of output,** which can be reckoned by total variable cost assigned to one unit. It can be calculated as:

Classification into Fixed and Variable Cost: Costs are bifurcated, on the basis of variability into fixed cost and variable costs. In the same way, semi variable cost is separated.

Valuation of Stock: While valuing the finished goods and work in progress, only variable cost are taken into account. However, the variable selling and distribution overheads are not included in the valuation of inventory.

Make or Buy Decision

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

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

(a) Stopping the production of the part and buying it from the maket: A business co is already making a part or component which is used in the business. Now due to some decision has to be taken whether this part or component should be bought from the market additional requirement due to increase in production of main factory should be made in factory or should be bought from the market.

In the case of a decision like stopping the production of the part or component and buying it from market, it is to be remembered that there would not be additional fixed cost in case and only marginal cost is the relevant factor to be considered. If the marginal cost is less than buying price, additional requirement of the component should be met by making rather than buying. Similarly, if buying price is less than marginal cost, it will be advantageous to purchase it from the market.

(b) Stopping the purchase of a component and to produce it in own factory: The second aspect of the problem of make or buy may be that a c0mponent or part thus far being purchased from the market should be produced or made in factory or not. In this case, normally some extra arrangement regarding space, labour, machine etc. will be required. This may involve capital

investment too. Some special overheads may also be necessary. If the decision for making requires the setting up of a new and separate factory, separate supervisory staff may also be needed. All these arrangements will require additional costs. As such, the price being paid to outsiders should be compared with additional costs which will have to be incurred in the form of raw materials, wages, salaries of additional supervisors, interest on capital investment, depreciation on new machine, rent of premises etc. If such additional cost are less than the buying price, the component should be manufactured and vice-versa.

Change in Product Mix

(a). Introducing a new line or department: The problem of introducing a new product or line involves decision in two respects- whether a new product or line should be added to the existing production or not, and if it should be introduced, then what should be the model or design or shape of the new product. In other words, if new product can be produced in more than one model, which model should be introduced? The marginal cost of new product in all its possible models should be considered. It also possible that a portion of the cost of facilities relating to the original production may be used for the purpose of producing new product.

(b). Selecting optimum product mix: When a company is engaged in a number of lines or produts, there may arise a problem of selecting most optimum product mix which would maximize the earnings. This problem becomes complicated, when one of the factors happens to be limiting or key factors. Under such a situation, profitability will be improved only by economizing the scarce resources. As pointed out earlier, contribution per unit of key factor is the real index of profitability under such case. Thus, while deciding a profitable mix of products, contribution per unit of key factor should be considered.

Shut-Down Decisions

Shut-down decisions may be of two types- closure of entire business and dropping a line or product or department.

Closure of entire business: Sometimes, a business concern may not be in a position to carry out its trading activities in an adequate volume due to trade recession or cut throat competition. As such, the management of such business concern may be faced with a problem of suspending the trading activities.

Shut-down point = Net escapable fixed cost / contribution per unit

Or

Shut-down point = Avoidable expenses / contribution per unit of raw materials

Marginal cost is the change in the total cost when the quantity produced is incremented by one. That is, it is the cost of producing one more unit of a good. For example, let us suppose:

Variable cost per unit = Rs 25

Fixed cost = Rs 1,00,000

Cost of 10,000 units = 25 × 10,000 = Rs 2,50,000

Total Cost of 10,000 units = Fixed Cost + Variable Cost

= 1,00,000 + 2,50,000

= Rs 3,50,000

Total cost of 10,001 units = 1,00,000 + 2,50,025

= Rs 3,50,025

Marginal Cost = 3,50,025 – 3,50,000

= Rs 25

The term **marginal cost implies the additional cost involved in producing an extra unit of output,** which can be reckoned by total variable cost assigned to one unit. It can be calculated as:

Marginal Cost = Direct Material + Direct Labor + Direct Expenses + Variable Overheads

Characteristics of Marginal Costing

♣ **Classification into Fixed and Variable Cost:** Costs are bifurcated, on the basis of variability into fixed cost and variable costs. In the same way, semi variable cost is separated.

♣ **Valuation of Stock:** While valuing the finished goods and work in progress, only variable cost are taken into account. However, the variable selling and distribution overheads are not included in the valuation of inventory.

♣ **Determination of Price:** The prices are determines on the basis of marginal cost and marginal contribution.

♣ **Profitability:** The ascertainment of departmental and product's profitability is based on the contribution margin.

In addition to the above characteristics, marginal costing system brings together the techniques of cost recording and reporting.

Features of Marginal Costing

Features of marginal costing are as follows:

- Marginal costing is used to know the impact of variable cost on the volume of production or output.
- Break-even analysis is an integral and important part of marginal costing.
- Contribution of each product or department is a foundation to know the profitability of the product or department.
- Addition of variable cost and profit to contribution is equal to selling price.
- Marginal costing is the base of valuation of stock of finished product and work in progress.
- Fixed cost is recovered from contribution and variable cost is charged to production.
- Costs are classified on the basis of fixed and variable costs only. Semi-fixed prices are also converted either as fixed cost or as variable cost.

Ascertainment of Profit under Marginal Cost

'Contribution' is a fund that is equal to the selling price of a product less marginal cost. Contribution may be described as follows:

Contribution = Selling Price – Marginal Cost

Contribution = Fixed Expenses + Profit

Contribution – Fixed Expenses = Profit

Income Statement under Marginal Costing

Income Statement for the year ended 31-03-2014		
Particulars	Amount	Total
Sales		25,00,000
Less: Variable Cost:		
Cost of goods manufactured	12,00,000	
Variable Selling Expenses	3,00,000	
Variable Administration Expenses	50,000	
	----------	15,50,000

Contribution		9,50,000
Less: Fixed Cost:		
Fixed Administration Expenses	70,000	
Fixed Selling Expenses	1,30,000	2,00,000
	----------	----------
		7,50,000

Facts Concerning Marginal Costing

♣ Cost Ascertainment: The basis for ascertaining cost in marginal costing is the nature of cost, which gives an idea of the cost behavior, that has a great impact on the profitability of the firm.

♣ Special technique: It is not a unique method of costing, like contract costing, process costing, batch costing. But, marginal costing is a different type of technique, used by the managers for the purpose of decision making. It provides a basis for understanding cost data so as to gauge the profitability of various products, processes and cost centers.

♣ Decision Making: It has a great role to play, in the field of decision making, as the changes in the level of activity pose a serious problem to the management of the undertaking.

Marginal Costing assists the managers in taking end number of business decisions, such as replacement of machines, discontinuing a product or service, etc. It also helps the management in ascertaining the appropriate level of activity, through break even analysis, that reflect the impact of increasing or decreasing production level, on the company's overall profit.

Advantages of Marginal Costing

The advantages of marginal costing are as follows:

- Easy to operate and simple to understand.
- Marginal costing is useful in profit planning; it is helpful to determine profitability at different level of production and sale.
- It is useful in decision making about fixation of selling price, export decision and make or buy decision.
- Break even analysis and P/V ratio are useful techniques of marginal costing.
- Evaluation of different departments is possible through marginal costing.
- By avoiding arbitrary allocation of fixed cost, it provides control over variable cost.
- Fixed overhead recovery rate is easy.

• Under marginal costing, valuation of inventory done at marginal cost. Therefore, it is not possible to carry forward illogical fixed overheads from one accounting period to the next period.

• Since fixed cost is not controllable in short period, it helps to concentrate in control over variable cost.

LIMITATIONS OF MARGINAL COSTING

• Sales staff may make mistake of marginal cost for total cost and sell at a price which will result in loss or los profits. Hence, sales staff should be cautioned while giving marginal cost.

• Overheads of fixed nature cannot be altogether excluded particularly in large contracts, while valuing the work-in-progress.

• Some of the assumptions regarding the behaviour of various costs are not necessarily true in realistic situation. For example: the assumption that fixed cost will remain static throughout is not correct.

• Marginal cost ignores time factor and investment. The marginal cost of two jobs may be the same but the time taken for their completion and the cost of machines used may differ. The true cost of a job which takes longer time and uses costlier machine would be higher. This fact is not disclosed by marginal costing.

MARGINAL COST AND MARGINAL COSTING

Marginal cost is defined as cost of producing one additional unit. Thus, marginal cost is the amount by which total cost changes when there is a change in output by one unit.

Marginal Cost means Variable Cost. Marginal cost per unit remains unchanged irrespective of the level of activity or output. Marginal cost is the sum total of direct material cost, direct labour cost, variable direct expenses and all variable overheads.

Under Marginal Costing technique, only variable costs are charged to cost units, the fixed costs attributable to a relevant period are written off in Costing Profit & Loss Account against the contribution for that period. Under Marginal Costing Technique, fixed costs are treated as period costs.

Marginal Costing is also known as:

• **Contributory Costing**

• **Variable Costing**

• **Comparative Costing**

- **ABSORPTION COSTING**

Under Absorption Costing Technique, both variable cost and fixed costs are charged to cost units. Under Absorption Costing Technique, fixed cost is treated as product cost. In short, the cost of a finished unit in inventory will include direct materials, direct labour, and both variable and fixed manufacturing overhead.

Absorption Costing is also known as:

• Full Costing

• Full Absorption Method

- **STOCK VALUATION**

Value of closing stock under Absorption Costing Technique will be higher as compared to value of closing stock under Marginal Costing Technique because of fixed cost element.

DISTINCTION BETWEEN MARGINAL COSTING AND ABSORPTION COSTING

MARGINAL COSTING	ABSORPTION COSTING
Only variable cost is charged to products and inventory valuation.	Total cost (both fixed and variable) is charged to the cost of products and inventory valuation.
Fixed cost is not included in the cost of products. It is transferred to Costing Profit and Loss Account.	Fixed cost is included in the cost of products.
Stocks are valued only at variable costs. Stock values are lower in Marginal costing than in Absorption costing.	Opening and closing stocks are valued at total cost which inducts both fixed and variable costs. Stock values in Absorption costing are, therefore, higher than in Marginal costing.
Profitability is judged by the contribution made by various products or departments.	Profitability is measured by profit earned by various products or departments.
Cost data helps to know the total contribution and contribution of each product.	Cost data is arrived on conventional pattern and hence is only the net profit for each product that is arrived at.
Difference in valuation of opening and closing stock does not affect the unit cost of production	Valuation of opening and closing stock is affected due to the fixed costs.

❖ DECISION MAKING AREAS OF MARGINAL COSTING

• **Fixation of Selling price**

✓ Under normal circumstances

✓ Under special market (export market) or a special customer

✓ During recession

✓ At marginal cost or below marginal cost.

• **Decisions relating to most profitable product mix**

✓ Selection of optimal product mix

✓ Substitution of one product with another

✓ Discontinuing or dropping of a product line

• Acceptance or rejection of a special offer

• Decisions relating to make or buy

• Retaining or replacing a machine

• Expanding or Contracting

❖ COST-VOLUME-PROFIT ANALYSIS AND ITS OBJECTIVES

It is a technique that may used by the management to evaluate how costs and profits are affected by changes in the volume of business activities. Managers are quite often faced with decisive situations involving sales level, sales mix, selling prices and the right combination of these factors that will produce acceptable profits. As a result of change in operating conditions or change in economic environmental factors, the value of and the relationship among these variables also change. Cost Volume Profit analysis is the analysis of three variables i.e. cost, volume and profit. Such an analysis explores the relationship between costs, revenue, activity levels and the resulting profit. It aims at measuring variation in cost and volume.

Importance of CVP analysis

• The behaviour of cost in relation to volume.

• Volume of production or sales, where the business will break even.

• Sensitivity of profits due to variation in output.

• Amount of profit for a projected sales volume.

• Quantity of production and sales for a targeted profit level.

An understanding of CVP analysis is extremely useful to management in budgeting and profit planning. It elucidates the impact of the following on the net profit:

• Changes in selling prices
• Changes in volume of sales
• Changes in variable cost
• Changes in fixed cost

❖ ASSUMPTIONS OF COST VOLUME PROFIT (BREAK EVEN) ANALYSIS

• All costs are easily classified into fixed costs and variable costs.
• Both revenue and cost functions are linear over the range of activity under consideration.
• Prices of output and input remains unchanged.
• Productivity of the factors of production will remain the same.
• The state of technology and the process of production will not change.
• There will be no significant change in the levels of inventory.
• The company manufactures a single product.
• In case of a multi-product company, the sales mix will remain unchanged.

❖ PROFIT VOLUME RATIO

The Profit volume (PV Ratio) is the relationship between contribution and sales. It is also termed as contribution to sales ratio.

Significance of PV Ratio

• PV Ratio is considered to be the basic indicator of the profitability of the business.
• The higher the PV Ratio, the better it is for a business. In the case of a firm enjoying steady business conditions over a period of years, the PV Ratio will also remain stable and steady.
• If PV Ratio is improved, it will result in better profits.

Improvement of PV Ratio

• By reducing the variable cost
• By increasing the selling price
• By increasing the share of products with higher PV Ratio in the overall sales ratio

Uses of PV Ratio

• To compute the variable costs for any volume of sales

• To measure the efficiency or to choose a most profitable product line. The overall profitability of the firm can be improved by increasing the sales or output of a product giving a higher PV Ratio

• To determine break-even point and the level of output required to earn a desired profit

• To decide more profitable sales-mix

❖ MAIN USES OF BREAK EVEN CHART

Break even chart facilitates:

• Break even point

• Margin of safety

• Angle of incidence

• Sales required to earn desired amount of profit

• Fixed Cost, Variable Cost, Total Cost, Sales, Profit at various levels of operations.

• Inter firm comparisons

• Change in sales volume

• Change in Selling price

• Change in Variable Cost

• Change in fixed cost

❖ STATE THE LIMITATIONS OF BREAK EVEN ANALYSIS

• All costs cannot be separated into variable and fixed costs with accuracy.

• Fixed costs may change because of change in management policy or after a range of activity.

• Selling price may change because of increase or decrease in output, market demand &supply, competition etc.

• In case of multiple products, the sales mix need not necessarily be constant.

• Entire production need not necessarily be sold in practise

• Time value of money is ignored.

❖ ANGLE OF INCIDENCE

It is the angle of intersection between total sales line and total cost line drawn in the case of break even chart. It indicates the rate at which profits are earned. The larger the angle, the higher the rate of profit or vice versa.

❖ KEY FACTOR OR LIMITING FACTOR

Key factor is a factor which limits the activities of an undertaking. The extent of its influence must first be assessed while preparing functional budgets and taking decisions about the profitability of the product. Some of the examples of key factor are:

- Shortage of Raw Material
- Shortage of Labour
- Plant Capacity available (Machines)
- Sales Capacity Available
- Cash Available

Illustration: 1

Vidhi Corporation Ltd. has prepared the following budget for the year 2020 - 2021

Sales Units	15,000
Fixed Expenses	Rs.34,000
Sales Value (Rs.10/- per unit)	Rs. 1,50,000
Variable cost Rs.6 per unit	

Find (i) P/V ratio (ii) Break even point (iii) Margin of safety (iv) MOS Ratio (v) BEP Ratio

Illustration: 2

The following data have been extracted from the books of Alfa Ltd.

Year	Sales (Rs.)	Profit (Rs.)
2019	5,00,000	(Loss) (25,000)
2020	7,50,000	1,00,000

You are required to calculate :

(i) P/V Ratio

(ii) Fixed Cost

(iii) Break-even Sales

(iv) Profit on sales of Rs. 4,00,000

(v) Sales to earn a profit of Rs. 1,25,000

Illustration 3: A Company earned a profit of Rs.30,000 during the year 2004. If the marginal cost and selling price of the product are Rs.8 and Rs.10 per unit respectively. Find out the amount of margin of safety.

Solution:

P/V ratio = Selling Price – Variable Cost per unit / Selling Price = 10-8/10 = 20%

Margin of Safety = Profit / P.V Ratio = 30,000 / 20% = Rs. 1,50,000

Illustration 4: A ltd maintains margin of safety of 37.5 % with an overall contribution to sales ratio of 40%. Its fixed costs amount to Rs.5 lakhs.

Calculate the following:

i. Break Even Sales
ii. Total Sales
iii. Total Variable Cost
iv. Current Profit
v. New 'margin of safety' if the sales volume is increased by 7 ½ %.

Solution

i) We know that: Break – even sales (BES) × P/V Ratio = Fixed Cost

Break – even sales (BES) × 40% = Rs. 5,00,000

Break – even sales (BES) = Rs. 12,50,000

ii) Total Sales (S) = Break Even Sales + Margin of Safety

S = Rs. 12,50,000 + 0.375 S

Or, S – o.375S = Rs. 12,50,000

Or, S = Rs. 20,00,000

iii) Contribution to Sales Ration = 40%

Therefore, Variable cost to sales ratio = 60 %

Variable cost = 60% of sales = 60 % of 20,00,000

Variable Cost = 12,00,000

iv) Current Profit = Sales – (variable cost + Fixed cost)

= Rs. 20,00,000 – (12,00,000 +5,00,000) = Rs.3,00,000

v) If sales value is increased by 7 ½ %.

New Sales value = Rs.20,00,000 × 1.075 = Rs.21,50,000

New Margin of Safety = New sales value – BES

= Rs.21,50,000 – Rs.12,50,000 = Rs,9,00,000

Meaning of Decision Making

Decision making is one of the basic functions of a manager and cost is always a relevant factor in such decision making. It is the process of evaluating two or more alternatives leading to a final choice. Managers are generally faced with various decision making problems, which have been stated in the introduction. These include variety of questions relating to price, production method, make or buy decisions etc.

Irrespective of its nature, every decision has two aspects – quantitative and qualitative. The qualitative aspects include the factors like public image, social responsibilities, employee attitude, consumer's reaction etc. Management accounting is basically concerned with the quantitative factors of decision making. It deals with the relevant information such as costs, revenues, capital invested etc. required to take a decision. As mentioned above, decision making is the process of selecting one out of several alternative courses of actions available and the choice is made on the basis of profitability or cost savings.

In managerial decision making only relevant information should be used by the managers in evaluating the alternative courses of actions and taking the final decisions. Relevant information implies relevant costs and relevant revenues which are useful to evaluate the alternatives. Cost is an important factor in decision making. The managers have to evaluate the cost of one option against the cost of other. However it happens that some of the costs associated with the alternative may not be relevant for the decision to be made. In order to take the sound decision, the manager must be able to understand and distinguish between the relevant and irrelevant costs. A relevant cost may be defined as cost that is the applicable to a particular decision situation and it has a bearing on which alternative is selected by the manager. The irrelevant costs in any case must be eliminated from the decision making.

Relevant costs are expected future costs that will differ between the alternatives being considered in a decision situation. Any cost that can be eliminated completely or in part, as a result of choosing one alternative over another is relevant cost. On the other hand, the cost that cannot be avoided irrespective of which alternative is chosen by the manager, is irrelevant cost. These costs have low relevance to the future actions and therefore must be ignored in the

decision process. Relevant costs are future costs that are expected to occur during the period covered by the decision. Costs that are identical for all alternatives have no impact on decision and therefore must be ignored. **Relevant (differential) revenue** is the amount of increase or decrease in revenue expected from a particular course of action as compared with the other alternatives.

Relevant costs and **relevant revenues** are those current and future values that differ among the alternatives under considerations. These are not same in amount for all the alternatives under considerations. There are differences between the alternatives and the amount of such differences are called differentials. Thus relevant costs and revenues are also called differential costs and revenues. A differential analysis of relevant cost is always preferable to the complete analysis of all costs because of the following reasons:

1. Differential analysis focuses only on those items that differ thus providing a clearer picture of the impact of the decision.

2. A differential analysis considers fewer items making it easier and quicker.

Decision Making Process – Decision Model

The overall decision making process, also known as the decision model, involves following steps:

- Identify and define the problem.
- Identify alternatives as possible solutions to the problem.
- Collect relevant data (costs and benefits) associated with each feasible alternatives.
- Identify costs and benefits (revenues) as relevant or irrelevant and eliminate irrelevant costs and benefits (revenues) from considerations.
- Identify, to the extent possible, non-financial advantages and disadvantages (also known as qualitative factors) about each feasible alternatives.
- Total the relevant costs and benefits (revenues) for each alternatives.
- Select the alternative with the greatest overall benefits, i.e. make the decision.
- Implement or execute the decision

- Evaluate the results of the decision made.

- Carry our monitoring or modification, if need be.

Precautions in Decision Making

Relevant revenues and relevant costs are important variables in the decision making process. Managers must be careful about the following four mistakes while taking a decision:

1. Sunk costs: Sunk cost is the acquisition cost of an asset minus depreciation. Sunk costs are irrelevant in decision making.

2. Unitized fix costs: Unitized fixed cost is the cost that is incurred jointly for all the products manufactured by a firm. Such costs are generally divided by some activity measure and assigned to individual units of the product. But in decision making analysis it is better to include fixed cost in its total amount rather than as per unit cost.

3. Allocated fixed costs: It is common to allocate fixed costs across divisions, departments or product lines. It is possible that a particular product or department may appear unprofitable but actually it does make a contribution towards covering fixed costs and generating profits. Therefore before deciding to eliminate a department, it must be asked which cost will be avoided if a particular alternative is selected. A fixed cost that has been allocated to a particular department may continue even after a department has been eliminated.

4. Opportunity costs: Opportunity costs are important while taking a correct decision therefore the opportunity costs must be properly identified and included in the decision making process.

Types of Managerial Decisions

Determination of suitable sales mix

Any business firm which manufactures more than one product generally faces a decision problem as to in what proportion the products should be manufactured and sold i.e. what should be the composition of its sales mix. In other words, the firm has to decide as to how much quantity of which product should be manufactured and sold. The CVP analysis technique helps in determining the best sales mix. The best suitable sales mix is one which gives the maximum contribution. Here, contribution under various sales mix is computed and compared and the sales mix giving the maximum contribution is selected. Let us understand with the help of an example.

The following information has been drawn from the cost records of Samar Ltd manufacturing parts P1 and P2.

	Part P1	Part P2
Direct Materials	Rs.8000	Rs.6000
Direct Wages (Hours)	24 Hrs.	16 Hrs.
Wage Rate	Rs.200/Hr.	Rs.200/Hr.
Variable Overheads (150 % of direct wages)		
Fixed Overheads (Total)	`	Rs.7,50,000
Selling Price	Rs.25,000	Rs.20,000

The company has an option to adopt any of the following sales mix alternatives in the budget for the next period.

a. 250 units of P1 and 250 units of P2

b. 400 units of P2 only

c. 400 units of P1 and 100 units of P2

d. 150 units of P1 and 350 units of P2

Suggest which of the above alternative sales mixes should be adopted by the company**.**

Solution:

	Part P1	Part P2
Direct Materials	8000	6000
Direct Wages	4800	3200
Variable Overheads	7200	4800
Total Variable Cost	20,000`	14,000
Selling Price	25,000	20,000
	----------	----------
Contribution	5000	6000

S**election of sales mix alternatives:**

a. 250 units of P1 and 250 units of P2:

Contribution of Product P1 = 12,50,000

Contribution of Product P2 = 15,00,000

Less: Fixed Overheads = 7,50,000

Profit (contr. – FC) = (12,50,000 + 15,00,000) – 7,50,000

= 20,00,000

b. 400 units of Product P2 only:

Contribution of product P2 = 24,00,000

Less: Fixed Overheads = 7,50,000

Profit (contr. – FC) = 16,50,000

c. 400 units of P1 and 100 units of P2:

Contribution of Product P1 = 20,00,000

Contribution of Product P2 = 6,00,000

Less: Fixed Overheads = 7,50,000

Profit = (20,00,000 + 6,00,000) – 7,50,000

= 18,50,000

d. 150 units of P1 and 350 units of P2:

Contribution of Product P1 = 7,50,000

Contribution of Product P2 = 21,00,000

Less: Fixed Overheads = 7,50,000

Profit = (7,50,000 + 21,00,000) – 7,50,000

= 21,00,000

Decision: Since profits under sales mix (d) are the maximum (Rs. 21,00,000), therefore alternative (d) of the available sales mixes should be adopted by the firm.

Decision regarding Discontinuation (Drop) or Addition of a Product

The decision to eliminate an unprofitable product is a special case profitability evaluation. To evaluate the financial consequences of eliminating a product, it is necessary to concentrate on the differential or incremental profit effect of the decision. An important factor in the decision to drop or add a product is whether it will decrease or increase the future income of the business. Appropriate costs and profit measures must be developed for each alternative.

Care must be taken not only to consider the profitability of the product being analyzed but also to evaluate the extent to which sales of other products will be adversely affected when one product is removed. The unprofitable product may also be a complement to more profitable products, in which case some customers may buy the more profitable products because the unprofitable product is also available from the same company. If the expected sales decrease of related products is severe enough, it probably would be desirable to retain the unprofitable product.

Management needs data that will permit development of warning signals for products that may be in trouble. Following are some of the warning signals of an unprofitable product:

- Increasing number of customer complaints
- Declining sales volume
- Decreasing market share
- Expected future sales and market potential not favorable
- Return on investment below a minimum acceptable level
- Variable cost approaching or exceeding revenue
- Variable cost consistently increasing as a percentage of sales
- Increasing percentage of executive time required
- Constant reduction in price to maintain the sales
- Constantly increasing promotional budget to maintain sales.

To explain the decision regarding discontinuation of a product, let us assume that a company is considering dropping of one of its product B from its line because it is found that product B is being sold at a loss.

Income Statement

Products	**A**	**B**	**C**	**Total**
Sales Revenue	50000	10000	15000	75000
Cost of Sales:				
Direct Material	8,000	1,000	2,000	11,000
Direct Labour	14,000	2,000	3,000	19,000
Indirect manufacturing cost (50 % Labor)	7,000	1,000	1,500	9,500
	29,000	4,000	6,500	39,500

Gross Margin on sales	21,000	3,500	8,500	35,500
Administrative Expenses	12,500	4,500	4,000	21,000
Net Income (Loss)	8,500	(1,000)	4,500	14,500

Other information:

i. Factory overhead costs are made up of fixed costs of Rs. 5,850 and variable costs of Rs. 3,900. Variable costs by products are: Product A Rs 3,000; Product B Rs 400; and Product C Rs 500.

ii. Fixed costs and expenses will not be changed if product B is eliminated.

iii. Variable selling and administrative expenses to the extent of Rs 11,000 can be traced to the product as follows: A, Rs. 7,500; B, Rs. 1,500; C, Rs. 2,000.

iv. Fixed selling and administrative expenses are Rs. 10,000.

Solution:

Products	**A**	**B**	**C**	**Total**
Sales Revenue	50000	10000	15000	75000
Less: Variable Product Cost				
Direct Material	8,000	1,000	2,000	11,000
Direct Labour	14,000	2,000	3,000	19,000
Factory Overhead	3,000	400	500	3,900
Selling and Administrative expenses	7,500	1,500	2,000	11,000
	32,500	4,900	7,500	44,900
Contribution Margin	17,500	5,100	7,500	30,100
Less: Fixed Costs:				
Factory Overhead				5,850
Selling and Administrative expenses				10,000

Total Fixed costs				15,850

Net Profit (loss)				14,250

The above statement shows that product B generates a contribution of Rs. 5,100. If the sales of the product B were discontinued, its marginal contribution would be lost and the net income of the firm would be reduced by Rs. 5,100. That is, net income will be Rs 9,150. In this case, it is assumed that the sales of the products A and C will not be increased after product B is dropped. Further it has been assumed that dropping product B will not change the fixed costs. If these assumptions are not true, new analysis must be made. Let us assume, for example, that after dropping product B, the sales of the product A increase by 10%. The overall total profit of the firm will not increase by this sales increase.

Sales Revenue	50,000	100%
Variable Costs	32,500	65%
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Marginal Contribution	17,500	35%

On additional sales of Rs. 5000 (10% increase) of product A, the marginal contribution would be Rs. 1,750 (10% of 17,500):

Sales Revenue	5,000
Variable Cost (66%)	3250
Marginal Contribution	1,750

Decision:

This marginal contribution is less than Rs. 5,100 now being realized on the sales of product B. It would take additional sales of product A of approximately Rs. 14,571 ((5000/1750)*5,100) to equal the marginal contribution of Rs. 5,100 now being made by product B:

Marginal Contribution of Product B / Marginal Contribution of Product A = 5,100 / 35% = Rs. 14,571.

It is possible that dropping product B may result in the reduction in some of the fixed costs. Product B now contributes Rs. 5,100 towards recovery of fixed costs and expenses. Only if the fixed costs and expenses can be reduced by more than this amount it will be advisable to drop product B.

Key Factor (Limiting Factor)

Key factor is that factor which is the most important one for taking decisions about profitability of a product. The extent of its influence must be assessed first so as to maximize the profits. Generally on the basis of contribution, the decision regarding product mix is taken. But actually, it is not the maximization of total contribution that matters, but the contribution in terms of key factors, that is to be compared for relative profitability. Thus it is called the limiting factor or governing factor or principal budget factor. If sales can't exceed a given quantity, sales is considered as the key factor; if production capacity is limited, contribution per unit i.e. in terms of output has to be compared. If raw materials are in short supply, contribution has to be expressed in terms of per unit of raw materials required. For example, there may be labour shortage, and in such a case contribution per labour hour is to be compared. If machine capacity is a limitation, contribution per machine hour is to be considered for appropriate decision making. Thus, profitability can be measured by: Contribution per unit / Key Factor required per unit. The concept of key factor is explained below with the help of an example.

Example:

A company manufactures and sells three products: P, Q and R. All the three products are made from the same set of machines. Production is limited by machine capacity. From data given below, indicate priorities for products P, Q and R with a view to maximizing profits.

	Product P	Product Q	Product R
Raw material cost per unit	Rs. 225	Rs. 325	Rs. 425
Direct labour cost per unit	Rs. 50	Rs. 50	Rs. 50
Other variable cost per unit	Rs. 30	Rs. 45	Rs. 71
Selling price per unit	Rs.500	Rs. 600	Rs. 700
Standard machine time required per unit	39 mts.	20 mts.	28 mts.

During the, year the company faces extreme shortage of raw materials. It is noted that 3 Kg, 4 Kg and 5 Kg of raw materials are required to produce one unit of P, Q and R respectively. How would product priorities change considering the key factor?

Solution:

Comparative Statement of Profitability

	Product P	Product Q	Product R
Selling price per unit	Rs.500	Rs. 600	Rs. 700
Raw materials	Rs. 225	Rs. 325	Rs. 425
Direct labour costs	Rs. 50	Rs. 50	Rs. 50
Other variable costs	Rs. 30	Rs. 45	Rs. 71
Total Variable Costs	Rs.305	Rs.420	Rs.546
Contribution per unit (Sales – Variable costs)	Rs.195	Rs.180	Rs.154
P/V Ratio	39 %	30 %	22 %
Contr. Per minute of std machine time	5	9	5.5
Contr. Per kg of raw material	65	45	31

Decision:

If the machine capacity is limited, contribution per minute of standard machine time is to be considered for correct decision making. Product Q is most profitable, Product R comes next and then Product P last.

If the key factor is raw materials, contribution per Kg. of raw materials should be considered for decision making. Thus, Product P is most profitable, Product Q comes next and Product R last.

Diversification of Production

A business firm tries to go for product diversification in the following cases:

1. To utilize the idle capacity efficiently.

2. To maintain the interest of the consumers in the products of the enterprise.

3. Sometimes it becomes compulsions because of competition.

4. To capture more market share.

The new product should be introduced only if it can add to the contribution of the business firm as a whole. It is preferable to undertake the production of the new product if it is capable of contributing something towards fixed cost and profits after meeting the relevant variable cost of sales. Fixed costs are not to be considered on the premise that the new product can be manufactured in the existing resources without incurring any additional fixed costs. However, if it involves the incurrence of special or product specific costs, these should be deducted from the contribution of new product before making any decision.

Example:

Following is the details for the product A1 manufactured by XYZ Ltd:

Sales : Rs 5,50,000

Variable Cost : Rs 3,30,000

Fixed Overheads : Rs 1,50,000

The company proposes to introduce a new product A2 so that sales may be increased by Rs.1,35,000. The production of this new product does not involve fixed cost and the estimated variable cost is Rs. 1,10,000. Advise whether the production of product A2 will be profitable or not.

Solution:

Statement of Profitability (Product A1)

Particulars	**Amount (Rs.)**
Sales	5,50,000
Variable cost	3,30,000
Contribution	2,20,000
Less: Fixed Cost	1,50,000
Profit	70,000

Statement of Profitability (When product A2 is introduced)

Particulars	Product A1	Product A2	Total Amounts
Sales	5,50,000	1,35,000	6,85,000

Variable cost	3,30,000	1,10,000	4,40,000
Contribution	2,20,000	25,000	2,45,000
Less: Fixed Cost			1,50,000
Profit			95,000

The above analysis is on the basis of assumption that idle capacity cannot be used for any other purpose except for producing Product A2; it is advisable to undertake the production of Product A2 as it will give a contribution of Rs. 25,000 towards fixed cost and profit.

Introduction to Human Resource Accounting

Human Resources are the most valuable resources of any organisation. The success or failure of an organisation mainly depends on the quality, caliber and character of the people who are employed in the organisation. Different organisations employ different classes of workers according to the requirements of the job / work. In educational institutions, teachers, who put in a lot of hard work are responsible for the overall development of the students. But, their hard and efforts are not assigned any monetary value and not shown anywhere in the Balance Sheet of the concerned educational institution. Similarly, in corporate sector, the directors, considered as the pillars of the company, are responsible to make any vital decisions on various aspects so as to enhance the capacity of the company.. But no one made efforts to assign any monetary value to such individuals in the Balance Sheet of the Nation. So, human elements are completely ignored while recording the transactions in the books of accounts. Unless the efforts and contributions of people are measured in terms of money, it is not possible to understand the real value of human beings present in the organisation. In order to ascertain the value of human beings, a new system of accounting has been evolved which is popularly known as 'Human Resource Accounting' (HRA).

Meaning of HRA

HRA refers to accounting for people as an 'organisational resource'. It involves measuring the costs incurred by business firms and other organisations to recruit, select, hire train and develop 'human assets'. It also includes measuring the economic value of people to organisations. It serves both the internal and external users Providing management (internal users), with relevant data on which to base recruiting training and other development decisions and supplying

investors, lenders and other external users of financial statement with information concerning the investment in and utilisation of human resources in the organisation.

Definitions of HRA

(i) Woodriff," HRAis an attempt to identify and report investments made in human resources of an organisation that are presently not accounted for in conventional accounting practice. Basically, it is an information system that tells the management what changes over time are occurring to human resources of the business'.

Objectives of HRA

The following are the major objectives of an HRA system:

(i) To provide quantitative information for making managerial decisions about acquiring, allocating, developing and maintaining human resources in order to attain cost effective organisation objectives;
(ii) To permit managerial personnel to monitor effectively the use of human resources;
(iii) To help in the development of management principles by classifying the financial consequences of various practices;
(iv) To recognise the nature of all resources used or cultivated by a firm and improvement of the management of human resources, so that the quality and quantity of goods and services are increased;
(v) To evaluate the return on investment of human resources;
(vi) To communicate the value of human resources to the organisation the society at large.

From the above, it is quite evident that there are several important aspects c HRA as given below:

• Valuation of human resources;

• Recording the valuation in the books Of accounts and

• Presenting the information in the financial statements for communication

Valuation of Human Resources

Valuation of human resources can be made on the basis of either the 'cost of the resource' or an the basis of 'economic value of resource'. Therefore, different methods of valuation of human resources can be classified into the following two categories viz.,

• Cost based methods of human resource valuation.

• Value based methods of human resource valuation.

(a) Cost based Methods of Human Resource Valuation :

The following are the various methods under this category:

• Historical cost method

• Replacement cost method

• Opportunity cost method

• Standard cost method

• Total cost method

Historical Cost Method : This method of valuing human resources was first developed by William C.Pyle and R.GBarry Corporation, USA in 1967. Under the method actual costs incurred on recruiting, selecting, hiring, training and developing the human resources of the organisation are capitalised and amortised over the expected useful life of the human resources. Thus, a proper record of the expenditure made on hiring, selecting, training and developing the human assets is maintained and a part ofit is off from the income ofthe next few years during which human resources will provide service. If the human resources expire before the end of the expected useful life, the whole of the amount not yet written off is charged to the revenue of the year in which such liquidation takes place.

Replacement Cost Method : This method, first suggested by Rensis Likert, was developed by Eric G. Clamholtz. Under this method, the human resources are valued at their present replacement cost. If a new organisation has to be started now, the cost of recruiting, selecting, hiring, training and developing human resources to their present efficiency level.

Opportunity Cost Method : This method was first advocated by Hekimian and Jones. Under the method, the value of human resources is ascertained on the basis of its alternative use. i.e. on the basis of ability of doing other jobs. If an employee has no alternative use, he has no value according to this method. To put it in a nutshell, the value of an employee of one department can be determined on the basis of the offers made by other departments of the organisation for his services.

Standard Cost Method : This method was propounded by David Watson. Under the method, the standard cost per grade of employee for recruiting, selecting, hiring, training and developing

is determined year after year. The standard cost so arrived for all employees of the organisation, when aggregated, gives the value of human resources of the organisation. The standard costs of recruitment' training and developing individuals, can be developed on the basis Of replacement costs. The standard costs for various purposes are also useful to compare the actual and analyse the variations from standards.

Total Cost Method : This method was advocated by Prof. N;.Dasguta' under the method, the total expenditure incurred by the organisation towards education and training of an employee so as to make him efficient as in the his value present level or to make him fit for the organisation's requirement, it taken as the value of an employee. To an organisation, such value is to be adjusted every year on the basis of age, experience, seniority, status, performance, etc.,

Value based methods of human resource valuation

- Unpurchased goodwill method or capitalisation of super profit method
- Present value of future earning method
- Rewards valuation method:
- Net Benefit Method
- Total payment method

INFLATION ACCOUNTING

Introduction

'Money measurement concept' is a Basic Concept of Accounting. All business transactions are recorded in the books of accounts in terms of 'money' Rupees in India, dollars in U.S.A., etc. The accounting cycle culminates in the Preparation of financial statements — Profit and loss account and Balance sheet which aim at ascertaining the net result of business operations of a period and a u•ue and fair view of the financial position of the business. The reliability of the accounts and financial statements depends on the ' stability' of the unit for recording - rupee or dollar.

In fact stability of the monetary unit is the basic assumption of Historical Cost Approach (HCA). 'HCA' presumes that money value is constant and the price-level over a period of time is stable. Fixed assets acquired are recorded at the 'cost of purchase' (cost concept). Liabilities are recorded at the amounts contracted for. Sales are shown at the current market prices, where as inventories are valued at the prices at which they were purchased.

The historical cost approach which governs recording of business transactions can serve the purpose if the basic assumption holds good i.e., 'Monetary unit' remains the same. However, from the time of ' great depression' before the second world war, changing price levels characterised by inflation have become routine. In the past three decades, rising prices reflecting rampant inflation have become a worldwide phenomenon. Double digit rates of inflation have become common in many countries. In India, the inflation rate oscillates between 4% and per annum.

The changing price levels resulting from inflation have adversely affected the 'stability of the monetary unit'. As a result, the reliability of the financial statements is seriously affected. The fixed assets recorded at cost less depreciation do not reflect the current market values or replacement values. The price levels at which goods are bought and sold are different. Inventories are at unrealistic prices, not revealing their true value. To sum up, operating results shown by a business have become unreliable and the balance sheet does reflect true and fair view of the financial position of a business.

Limitations of Historical Accounting:

Conventional Accounts based on 'stability of monetary unit' show the business transactions in chronological order, almost like history. No adjustments are made to reflect changing prices. As a result, they suffer from the following limitations.

Unrealistic Values of Fixed assets: Fixed assets are recorded 'at cost 'as and when purchased. Subsequent changes in the market values of such assets are ignored. The fixed assets are, thus, shown in the balance sheet at unrealistic values, not at all reflecting the current economic realities.

Insufficient depreciation Provision: Depreciation is computed on the basis of the original cost of the assets and their estimated lifetime. As a result, the depreciation provided on assets and charged to the profit and loss account does not reflect the realistic cost of using such assets, based on their present value.

Problems in replacement of Fixed assets: Depreciation provision made on fixed assets is based on their original cost. So, the accumulated depreciation, when invested in outside securities, is

not at all sufficient to replace the assets due to the higher market prices which are the consequence of inflation.

Inflated profits: The profits shown by income statement under historical accounting ace highly unreliable. Depreciation on fixed assets is insufficient, resulting in higher profits. Similarly, sales are shown at current market prices whereas cost of goods sold includes stocks purchased in the past at lower price levels. The inflated profits result in payment of higher taxes.

Erosion of owners ' capital: Inflation erodes the value of money and thus the value of owners' capital erodes due to the decline in the purchasing power of money. No effort is made in historical accounts to protect the value of capital . In fact, dividends paid out of unrealistic profits shown by the income statement may result in payment of dividend out of capital.

Reliability and Utility of Accounting Records: Accounting records are used by different people for different purposes. Employees, creditors, owners, potential investors, tax authorities etc., are interested in the accounting data. The unreliable profit shown by historical accounts and the unrealistic asset values shown in balance sheet seriously affect the value of the accounting records for the various purposes for which the users need them.

Violation of Matching principle: An important accounting principle is matching of expenses and incomes. During inflationary periods, sales reflect current market prices whereas the purchases reflect earlier prices. Thus, thé matching of income and expenditure becomes distorted due to prices.

Holding and operating gains: The legitimate business profit made as a result of trading is called operating gain. Profit made on goods by storing them for appreciation in price is called holding gain. Operating gain is a trading profit whereas holding gain is a speculative profit. No distinction is made in historical accounts between these two types of gains.

Violation of the law of additively: During the period of inflation, accounting data may not be capable of being added. For example, 500 units purchased at Rs. 10 per unit and another 400 units purchased at Rs. 14 per unit should not be added as they are because the amounts give a picture without the quantities. However, in historical accounts, all the goods and assets purchased are added, irrespective of the purchase prices, thus distorting the results.

Inter-firm and intra-firm comparisons: Historical accounting data is not really useful for comparison purposes; comparing the data of two different periods of the same business is not possible because of different price levels during the periods. Similarly, comparison of the data relating to two or more businesses is also not possible without reference to the price levels at which each business has computed its data.

Managerial decision making: The top management has to make decisions relating to profitability, capital expenditure, etc. Historical accounting data may lead to wrong decisions, adversely affecting the future prospects of the business.

INFLATION ACCOUNTING

The limitations of historical accounting have paved the way for inflation accounting.

The various ways in which financial accounts can be adjusted for changing prices have come to be known as 'inflation accounting'. It is a system Of accounting which regularly records all items in financial statements at their current values. It recognises that the purchasing power of money (monetary unit) changes with passage of time. It finds out profit or loss and presents the financial position of the business on the basis of the current prices prevailing in the country.

According to the American Institute of Certified Public Accountants (AICPA) "Inflation Accounting is a system for accounting which purports to record, as a built-in mechanism, all economic events in terms of current cost".

Inflation Accounting at International and National Levels

Before Second World War, the Institute of Chartered Accountants in England and Wales published a paper "Rising price level in relation to the Accounts' • paper and H.H. Sweney's "Stabilised Accounting" have brought into focus the impact of inflation on accounts. In U.S.A and U.K, wide ranging studies were made on the effect of changing prices on accounting methods and practices. The International Accounting Standards Committee (IASC) published IAS-6 titled "Accounting Responses to changing Prices" in June 1977. Later on it was superseded by IAS- 15 titled "Information reflecting the effects of changing prices".

In India, the C.A. Institute has published a ' guidance note' on accounting for chÜ1ging prices. This note is not recommendatory or mandatory to the members of the institute. The note is meant

to encourage the adoption of the accounting for changing prices. The note has dealt with three methods current cost accounting method, current purchasing power approach and periodic revaluation of fixed assets along with the adoption of Last In First Out method (LIFO) for inventory valuation. However, current cost accounting method (CCA) is recommended by the institute as the most appropriate method for Indian environment.

Different Methods of Inflation Accounting

Price level changes or inflation can be measured in various ways. The following are the methods of accounting for price level changes, based on different methods of measuring inflation.

- Current Purchasing Power method (CPP) or General Purchasing Power method (GPP)
- Current Cost Accounting method (CCA)
- Hybrid method, which combines the features of both CPP and CCA methods

Current Purchasing Power Method (CPP)

This method was evolved in 1974 by the Institute of Charted Accountants in England and Wales. It was issued as Statement of Standard Accounting Practice No. 7. (SSAP-7), entitled "Accounting changes in the purchasing power of money".

CPP method ensures the maintenance of the purchasing power of the shareholders 'or owners' funds. In this method, all items in the financial statements are to be restated for changes in the general price level. This is accomplished by using any established and approved general price index. In India, the wholesale price index compiled by the Reserve Bank of India which shows the change in the value of Rupee in the past year is an appropriate index.

The CPP method takes into account the changes in the value of items as a result of the general price level alone. It does not account for the changes in the value of individual items. For example, a machine purchased on 1-1-90 at Rs. 5,000 when general price index was 100 is restated as Rs.10,000 on 31-12-95 if the general price index on that date is 200. However, the machine might have actually cheaper in the market due to improvements and may actually be available for Rs.4,000. But this aspect is completely iY10red.

Steps in the preparation financial statement under CPP method

(I) Determining the conversion factors: Historical Accounting figures are to be restated at current price level. This has to be done by multiplying the figures in the conventional income statement and Balance sheet with conversion which is computed as follows:

Conversion Factor = Index on the date of conversion / Index on the date the item arose

Mid period conversion: Many transactions in a business occur throughout a period. For example, sales, purchases, like salaries, e. They must be converted on the basis of average index as shown in the middle of the period. ms adoption of the mid period index for items which take place throughout a period is called 'mid period conversion. If mid period index is not available, average of the index at the beginning and at the end of the period has to used.

Gain or loss on monetary items: All assets and liabilities can be broadly divided into two categories based on the variability of their value.

Monetary items are all those assets and liabilities whose amounts are fixed contract or otherwise regardless of the changes in the general price level. The liabilities are payable and the assets are receivable in fixed amounts. For example a creditor for Rs. 10,000 will be paid the same amount without any compensation for the decline in money value from the date the creditor was created till the Earl date of payment. Thus, cash, bank balance, bills receivable, sundry debtors prepaid expenses, etc., are all monetary assets. Similarly, bills payable, sundry creditors, outstanding expenses, redeemable preference share capital, etc., are all monetary liabilities.

Non monetary items are all those assets and liabilities whose unique is likely to change with the general price index or inflation. So, they cannot be stated in monetary m-louts. All the fixed assets like buildings machinery furniture also, inventories and marketable investments are non monetary assets. Equity share capital is a non monetary liability because of the residual claims on the company's net assets which renders it variable in value.

Computation of gain or loss on monetary items

The change in the purchasing power of money or inflation affects the value of all assets and liabilities . The non monetary assets and non monetary liabilities are receivable or payable at the changed values. But the monetary assets and monetary liabilities are receivable and payable at

the original amounts only. Thus, holding of monetary liabilities results in gain and holding of monetary assets results in loss in inflationary periods. A firm receives or pays fixed amounts as per the terms of contract but it gains or loses in terms of real purchasing power. Such gain or loss is taken into account in C.P.P method as "general price level gain or loss". It is shown as a separate item in the restated income statement apart from the routine business profit or loss. It is not used for dividend payment though shown as a profit because of its nature as 'revaluation profit'.

Method of computation of general price level gain or loss

There are two ways of computing general price level gain or loss:

Method l: When all the transactions influencing the change in monetary items occur uniformly throughout the year and the average rate of change is applicable to such transactions the first method can be used.

(I) Conversion factors are computed for both opening items and any changes in the items during the year .

Conversion factor for opening items= Closing Index/Opening Index

Conversion factor for change in items during the year= Closing Index/ Average Index

(2) Opening monetary liabilities are converted to the closing level. Change in monetary liabilities during the year is also converted to the closing level. From the total of these two items converted, the closing monetary liabilities as per historical accounts are subtracted. The difference is gain (or loss) on holding monetary liabilities.

(3) Monetary assets at the beginning of the year are converted to the closing level. Change in monetary assets during the year is also converted to the closing level. From the total of these two items converted, the actual closing monetary assets are subtracted. The difference is loss (or gain) on holding monetary assets.

(4) The difference between the result of step 2 and step 3 is the net 'gain or loss on monetary items' or 'monetary result' or 'general price level gain or loss'

Method II : When transactions influencing monetary items do not occur uniformly but their occurrence is random, the following procedure is used to ascertain monetary gain or loss.

(1) Net monetary assets or liabilities at the beginning of the year is ascertained. This is the difference between opening monetary assets and opening monetary liabilities. Sources of monetary assets during the year are to be added to the opening monetary assets. Usually sales, both cash and credit is the source of monetary assets during the year should be subtracted. Purchases and' expenses are the usual uses. The opening net monetary assets as well sources and uses of the monetary assets have to be converted to the closing with the help of appropriate conversion factors. The balance at this stagerepre I what should be the closing net monetary assets. The net non on the closing date must be reduced form the above balance. The result is monetary loss for the year. If it is a negative figure, it is net monetary gain net In case the opening monetary liabilities are more than the assets, then, there are net monetary liabilities at the beginning. In such cases, the uses assets i.e., purchases and expenses should be added and the sources i.e., sales etc., should be reduced.

(2) Cost of sales and inventories: Cost of sales and the value of stocks depend on the cost flow assumptions relating to the usage of goods i. e. first-in-first-out (FIFO) or 'Last-in first-out' (LIFO). When FIFO method is used , it is assumed the stocks acquired first are used or sold first, When LIFO method is follow# goods purchased last are assumed to be used or sold first. l restating-the income statement and balance sheet under C.P.P method, it is essential to keep in mind the cost flow assumptions relating to goods because they affect the value of cost of goods sold as well as the closing and opening inventories.

(a) When FIFO method is followed:

(i) Cost of sales includes the entire opening stock and the balance from current year's purchases.

(ii) Closing inventory is completely out of current year's purchases. Since the opening stock is assumed to be completely sold, closing stock can be a part of current year's purchases only

(b) When LIFO method is followed:

(i) Cost of sales includes current year's purchases. If cost of sales is more than the current year's purchases, the excess is out of opening stock.

(ii) Closing inventory includes the opening inventory. If current purchases are not fully sold or used, the closing inventory includes the opening inventory and the unsold portion of the current year's purchases.

The following conversion factors are used for restating inventories and purchases

(a) Opening stock= Closing Index/ Opening Index

(b) Current year purchases = Closing Index/ Average Index

(c) Goods purchased in previous years but still in stock = Closing Index/Index on the date of purchase of the goods

Ascertainment of profit: the profit made during a period may be ascertained in two different ways under CPP method.

(A) conversion method or Restatement of income method

The income statement prepared on historical cost basis is restated in C.P.P with the help of conversion factors as follows:

(i) Sales which take place throughout the year and operating expenses which are also paid from the beginning till the end of the year are converted on the basis of average index rate for the year.

The conversion factor is : Closing Index/Average Index

(ii) Cost of goods sold is converted on the basis of cost flow assumptions (FIFO or LIFO) explained earlier.

(iii) Fixed assets and depreciation thereon have to be converted on the basis of the index numbers prevailing on the dates the assets concerned were purchased.

Conversion factor is : Closing index/Index on the date of buying the asset

(iv) Dividends and taxes paid should be converted on the basis of the index prevailing on the dates they were paid.

Conversion factor is :Closing index/Index on the date of payment

(v) Monetary result i. e., gain or loss on monetary items or 'general level gain or loss' should be computed as explained earlier. It should sh0'*1i as a separate item in the restated incomes statement. Of course, gain on this account cannot be used for payment of dividend to the shareholders.

(B) **Net change method**: This method is based on the concept that profit is the difference between the owners' capital at two different points in time. The same concept is used in 'the

statement of affairs method' in ascertaining profit in single entry systems. In simple words, "profit is the change in owner's equity during an accounting period".

The following steps are taken to determine the change in equity.

(i) Opening balance sheet prepared under historical accounting method is converted into C.P.P terms at the end of the accounting period. This is done with the help of appropriate conversion factors. One should remember that both monetary and non-monetary items in the opening balance sheet must be converted.

Even equity capital may be converted and the difference in balance sheet may be taken as reserves. Alliteratively, the equity share capital is not converted. Difference in the balance sheet is taken equity.

If there is opening balance sheet which is already convened (at the end of last year) such a balance sheet must be updated for the closing date by converting all the items with the conversion factor.

(ii) Closing balance sheet prepared under historical cost accounting should also be converted into C.P.P terms.

The monetary items in the closing balance sheet are not r because they are payable or receivable at their face values. All non monetary items have to be converted. If equity capital is also converted the difference in the balance sheet is Reserves. If equity capital is not converted, the difference in the balance sheet is equity.

(iii) Profit or loss for the accounting period is the change of Reserves or equity between the opening balance sheet as converted and the closing balance sheet as converted.

Profit =Closing reserves — Opening Reserves

(or)

Profit=Closing equity — Opening equity

(2) Current Cost Accounting Method

The general complaint that CPP method is not satisfactory in dealing with price level changes has made the British Government withdraw the Statement of Standard Accounting Practice — 7 (SSAP — 7) which was issued in 1974. The committee formed under the Chairmanship of Sir Francis Sandilands recommended the usage of CCA method in its report in

September 1975. The method was extensively studied and reported later on. In March 1980, the accounting Committee of U.K has issued SSAP — 16 (Statement of Standard Accounting Practice — 16) recommending the usage of CCA method.

In India also, the Institute of the Charted Accountants of India has published a guidance note on Accounting for changing prices in 1982, which describes both CPP and CCA methods, but recommends CCA method as the most appropriate to the Indian economic conditions.

Characteristics of CCA method

Current value of individual items are taken as the basis for preparation of financial statements. The general purchasing power of money (The Basis in CPP method) is ignored. Current Values of individual items are ascertained on the basis of specialised index for each specific item.

Fixed assets are shown in the balance sheet at their current replacement values. Original cost of the assets is ignored as basis for depreciation.

Inventories are shown at their current replacement cost. The old rule Of cost or market price whichever is lower is ignored.

Unit V

Cost Management

COST MANAGEMENT

Cost management involves different cost accounting methods that have the goal of improving business cost efficiency by reducing costs or at least having measures in place to restrict the growth of costs. Cost management system is helpful in identifying, collecting, classifying and collating information that can be used by managers in planning, controlling and taking right decisions to keep the costs in the desirable limits. Cost management can be defined as the process of planning and controlling the budget of the business. It helps in predicting the expenses of the business.

Concept of Cost Management

Cost management is method of collecting, analyzing and presentation of data to plan, monitor and control cost. Cost management techniques identify how an organizational resource needs to be allocated to different projects while comparing its worth or outcome. Under cost management, we identify, collect and do reporting of the information required by managers and other users. Its main objective is to make the information available to the internal users of an organization. Efficient cost management helps the organization to improve its potential of the business. It provides information to managers for cost optimization and improving cost effectiveness.

Objectives of Cost Management

The main objective of cost management is to reduce the costs expended by an organization while strengthening the strategic position of the firm. There are many ways to apply the techniques of cost management. Some of them are as follows:

a) Establish systems to streamline the transactions between corporate support departments and the operating units.

b) Devise transfer pricing systems to coordinate the buyer-supplier interactions between decentralized organizational operating units.

c) Use pseudo profit centers to create profit maximizing behavior in what were formerly cost centers.

Types of Cost Management

There are three types of cost management which are as follow:

1. Those that strengthen the organization's competitive position. An example of a cost management technique that strengthens an organization's position is illustrated as follows. A hospital redesigns its patient admission procedure so it becomes more efficient and easier for patients. The hospital will become known for its easy admission procedure so more people will come to that hospital if the patient has a choice. The strategic position of the hospital has just been increased over its competitors.

2. Those that have no impact on the organization's position. An example of a cost management technique that has no impact on the organization's competitive position is illustrated as follows. An insurance company decides to reevaluate its accounts payable system to make it more efficient. The evaluation has no positive benefits to the insurance company in the external market. The objective of the change is to make the organization more profitable.

3. Those that weaken the organization's position. An example of a cost management technique that will weaken the organization's competitive position is illustrated as follows. A large airline company only has two desks for administering and selling tickets. This setup induces long lines for the airline customers which can ultimately result in high dissatisfaction and a bad reputation for the airline. This may reduce the amount of ticket sales when compared with the airline's competitors. Even though having only two desks available for customers may initially be cost effective, in the long run, it harms the company.

As a general rule, an organization should never undertake any practices that are predicted to weaken the position of the organization.

Techniques of Cost management

Managing a business has containing cost of utmost importance. Below are mentioned some of the techniques through which the overall cost of the business can be controlled and maintained within the required limits.

Time management

The one who owns the business definitely knows the value of time for his / her business. However, it is important to pass down the relevance across the hierarchy of business to view the desired results. It is very essential to make the employees understand the value of time and how to be efficient to do more work in the same time span. This is one of the methods that will help increase the productivity without adding to the labour cost.

Inventory management

One of the major cost as well as ways of generating revenues is through inventories. First and foremost one needs to chalk out the inventory requirements, the quantity check that needs to be stored, vendor costs, etc. as all of this helps in knowing the requirements of the business and helps avoid stocking excess inventory and deploy the capital elsewhere rather than tying up in the inventory stocks. Outsourcing is one way that helps take employees on third party roles especially when it is for one time projects. This saves the employer from taking the cost onto his books. This is definitely done keeping in mind that the outsourcing partners are of the standards that do not hamper the quality of services to the customers of the business. Besides the employees, certain projects also can be outsourced, which helps in saving the additional employee costs on board as well as get access to outside talent and technology, helping in optimizing the resources.

Updated market sense

It is very important to be updated with the trends in the markets as it is game of survival of the fittest. One has to be constantly in touch with the vendors and see that renewal of the contracts keep happening with the trend in prices. This will help in negotiating for the best prices available rather than dragging on the set prices of long term contracts.

Control of headcount

The second most important cost to a business is the employee cost. Although we take employees as assets or the backbone of the business, one needs to keep in mind that they also have cost associated with them. Besides the regular pays and salaries, workplace, licenses, softwares are the additional costs added per employee. That is why, it is essential that the manager knows how to reduce the employee costs, either by taking less number of people onboard, or by taking more of low cost employees rather than few high costs ones.

Advantages of Cost Management

a. It helps in controlling the project specific cost, in turn also the overall business cost.
b. One can predict the future expenses and costs and accordingly work towards the expected revenues.
c. Predefined costs can be maintained as records for the business.
d. It helps in taking those actions that are necessary to assure that the resources and business operations aim at attaining the chalked objectives and goals.
e. It helps in analysing the long term trends of the business.
f. The actual cost incurred can be compared to the budgeted ones to see if any component of the business is spending more than expected.
g. It helps in analysing the business positioning in terms of making an acquisition factoring the cost component involved.

COST CONTROL

Cost Control is a process in which we focus on controlling the total cost through competitive analysis. It ensures that the cost incurred on production should not go beyond the pre-determined cost. Cost Control involves a chain of various activities, which starts with the preparation of the budget in relation to production. Thereafter we evaluate the actual performance. After that we compute the variances between the actual cost and the budgeted cost and further, we find out the reasons for the same. Finally, we implement the necessary actions for correcting discrepancies.

Concept of Cost Control

Cost control is prime function of cost accounting. Under cost control, cost accountant measures actual costs, compare it with the standards and find the deviations. Then redial actions are taken to reduce the variances. It involves various actions taken to keep the cost within budgeted standards and not rising beyond the limit. Cost Control focuses on decreasing the total cost of production.

Features of Cost Control

Cost control has following features:

i) It is an attempt to keep the expenses within the control.

ii) It is a continuous process which includes formulating standards and preparing budgets to set a target and then continuously comparing the actual with these standards.
iii) It requires a continuous cost control report to identify the variances to be resolved.
iv) It works as motivational and encouragement to the employees to achieve the budgetary goals and keep the cost, controlled.
v) It is not only focused on reducing the cost, it also focusses on the effective utilization of the resources to get better results with the same available resources.

For example:

If current cost of producing a unit is Rs. 100 per unit, then under cost control attempt will be made to reduce the cots in such a manner that it does not go beyond Rs. 100. Organization will attempt to achieve this target. If it is found that actual cost comes at Rs. 120, it will find the deviation which is Rs. 20. Then attempt will be made to find the method to reduce the cost to Rs. 100 This is known as cost control.

Advantages of Cost Control

The advantages of cost control are mainly as follows:

i) Cost control helps to achieve expected return on the capital invested in a company, by resolving deviations between actual and expected standards.
ii) Cost control leads to improved standards of production with the limited resources of the company.
iii) Cost control reduces the prices or tries to maintain it by reducing the cost.
iv) Cost control leads to economic use of resources.
v) It increases profitability and competitive position of a company.
vi) It enhances credit worthiness of the company.
vii) It prospers and increases economic stability of the industry.
viii) It increases the sales of the company and maintains the level of employment

Disadvantages of Cost Control

The disadvantages of cost control are mainly as follows:

i) It reduces the flexibility and process improvement in a company.
ii) It restricts innovation by emphasizing to reaching the preset standards

iii) It requires skilled personnel to set standards.

iv) It lacks creativity as it is concerned with following the current standards

v) It does not lead to improvement in standards

Techniques of Cost Control

1. Budgetary control: The budgetary control is process of continuous comparison. It works with creating budgets and continuous comparison of these budgets with the actual. It is finding the reasons for deviations and revising the budgets with needs. It helps in planning coordination and controlling.

2. Standard costing: Standard costing is setting a standard cost and using this standard cost with actual and analyze the variances. It helps in identifying the causes of variances and cost estimation.

3. Inventory control: Inventory control is regulating purchase, and usage of material to maintain the production without blocking the extra funds into it. It tries to reduce the wastage of the material and leads to effective utilization of it.

4. Ratio analysis: Ratio analysis identifies the relationship among different variables. It helps to identify the trends in an organization. Ratio analysis is also used for comparison of different organizations on different aspects. It is mainly used for comparing the performance with other organizations and external standards.

5. Variance analysis: Variance analysis is a method of cost control. It involves the identification of the amount of variance and to analyze the reasons of these variances. A variance is which varies from the standards set. It can be favourable or unfavourable.

Characteristics of a Good Cost Control System

According to Backer and Jacobson, effective cost control should have the following characteristics:

(a) Delineation of center's responsibility, i.e., deciding responsibility centers;

(b) The delegation of prescribed authority;

(c) Various cost standards;

(d) The relevance of controllable cost;

(e) Cost reporting; and

(f) Cost reduction

COST REDUCTION

Cost reduction ensures savings in cost per unit and maximization of profits of the enterprise. Cost reduction aims at cutting off the unnecessary expenses which occur during the production process like storage, selling and distribution of the product. In order to identify cost reduction, we should mainly focus on the following major elements: savings in per unit production cost, the quality of the product should not be affected and savings should be non-volatile in nature.

Concept of Cost Reduction

Cost reduction is real and permanent reduction in unit cost of goods and services provided by the organization with effecting their quality and efficiency. There are different techniques used for cost reduction which can be budgetary control, standard costing, material control, labour control and overhead control. Cost reduction focuses on decreasing per unit cost of a product. Cost reduction is a continuous process. It has no visible end.

Features of Cost Reduction

Cost control has following features:

i) Cost reduction is genuine cost reduction which can be implemented by lowering the cost of production.
ii) Cost reduction includes permanent reduction in cost. It is more due to internal factors. For example, Reduction in government taxes is not considered as cost reduction as it is not permanent nature.
iii) Cost reduction doesn't decline the quality of production. It remains the same.
iv) Unit cost is reduced either by decreasing the expenditure at a given level of output.
v) Cost reduction can also be done by increasing the quantity produced. It means reducing the expenditure will remain the same but the output will increase.

Advantages of Cost Reduction

i) Cost reduction increases the profitability of an organization.
ii) Cost reduction enhances the cash flow of the company.

iii) Cost reduction program helps in achieving the goals of the company.

iv) It is permanent in nature which affects the organizational performance in the long run.

v) Cost reduction does not impair the quality of the production while reducing the cost.

Disadvantages of Cost Reduction

There are problems with cost reduction which are generally do faced. These are as follows:

1. Workers and employees of an organization generally do not like to implement cost reduction program and they try to resist it. These are considered as difficult to be implemented.

2. Cost reduction programs are continuous in nature. It is a continuous attempt to lower the cost. But in most of the organizations, they are implemented on adhoc basis.

3. The cost reduction technique cannot be applied in all the cases.

4. Cost reduction technique requires a lot of research which adds on to the cost of the company

5. Cost reduction technique needs to be implemented in a planned manner.

There can be two ways to achieve the goal of the cost reduction

- By reducing the cost of that particular product and

- By increasing the efficiency so that we can increase the productivity of the production unit which lowers per unit cost.

Techniques of Cost Reduction

Cost reduction results from reduction of wastage, improvement in efficiency, identifying alternatives, and continuous reduction of the cost. There can be different methods for cost reduction which can be as follows:

1) Value analysis and value engineering.

2) Job evaluation and merit rating

3) Quality control

4) Economic order quantity

5) Standardization and simplification

6) Inventory management

7) Bench marking

8) Business process reengineering

9) Job Study, Works Study and Motion Study;

10) Job Evaluation and Merit Rating;

11) Value Analysis

Essentials for success of cost reduction programme

Cost reduction programme aims at improvements of human efforts at all levels of the organization, which help in reducing costs. It may be a short-term or long-term program. A short-term programmer is undertaken for sorting out immediate problems, e.g. a problem involving controlling wastages and inefficiencies in certain departments, which are likely to push up the cost and may also require capital expenditure. It involves setting up the target return on capital employed and developing a scheme for its achievement through various cost reduction measures.

The following are the **essential requisites for successful implementation of a cost reduction** programme. Let us understand them in detail.

a. There should be a separate cost reduction cell responsible for proper planning and implementation of the cost reduction programme.

b. There should be an efficient system of management reporting at all levels of management.
c. The programme should have support from the top management. It is a continuous process and, therefore, should not be allowed to degenerate into a routine affair.

d. There should be an operation and research procedure.

e. There should be close co-operation amongst different executives concerned with the programme. Each departmental head should be given a list of the areas where he is expected to affect economies in cost. Moreover, he should also be encouraged to put forward his own suggestions for improvement.

f. There should be regular follow-up to the plan and continuous appraisal of the programme performed with the actual cost reduction performance.

g. The plan should not be confined only to reducing costs but should also examine whether expenditure is really required or not. In other words, there should be efforts to eliminate uneconomic and unnecessary activities.

DIFFERENCE BETWEEN COST CONTROL AND COST REDUCTION

Cost control and cost reduction are two different concepts under cost accounting. In cost control, we try to reduce the cost to achieve the predefined target. In cost reduction we try to reduce the cost further to lower the budgeted cost. It is an attempt to improve the standards itself. Cost control ends once the standards are reached, on the other hand, there is no limit to cost reduction as there can be improvement in the standards. It is an on-going process. We can say that cost reduction is much broader as compared to cost control, it starts where control, ends cost. The difference between the two concepts can be explained as follows:

BASIS	COST CONTROL	COST REDUCTION
Steps involved	Cost Control process involves defining the standards, measuring actual performance, comparing actuals with standards, estimating variances and taking corrective actions.	Cost Reduction is critical analysis of existing standards to improve the standards rather than creating the standards.
Techniques	Cost Control uses techniques like budgetary control and standard costing	Cost Reduction uses tools like simplification, standardization, value engineering, ABC analysis, etc.
Focus	Cost Control focuses on maintaining the standards and achieving the established standards	Cost Reduction is challenging all the predefined standards and brings cost down further
Time period	Cost Control is not a dynamic function; it tries to reach to the	Cost Reduction is a continuous process. It is not

	minimum cost at a given point of time	a period based concept but it analyses new ways to reduce cost.
Orientation	Cost Control is focused on the past and present cost data.	Cost Reduction is a future oriented concept.
Nature	Cost Control can be regarded as a preventive function as it attempts to maintain the cost at the required pre-set standards	Cost Reduction is a corrective measure. It tries to improve the efficiency of the existing control mechanism. It assumes that there is always scope of reduction.
Permanency	Cost Control is temporary in nature. It is just a measure to reduce variances between actual and budgeted.	Cost Reduction is permanent reduction in cost of a good or a service
Cost concerned	Cost Control focuses on reducing the overall cost	Cost Reduction is an attempt to reduce the per unit cost
Quality concerns	Cost Control does not talk of quality of the product; it focusses on reduction only	Cost Reduction is reducing the cost whole maintain the quality of the product.
Frequency	Cost Control is more of a routine activity. It requires close monitoring.	Cost Reduction is research oriented; it is a form of improvement so it demands creativity.

Both the cost reduction and cost control are different concepts; they do not overlap each other and cannot be substituted with each other. They both perform different functions in an organization having their own importance.

Responsibility Accounting

Responsibility accounting has been very much a part of cost and management accounting for a while now. It has emerged as a widely accepted practice within budgeting.

But mind that responsibility accounting is not a separate system of management accounting. It does not involve any significant change in accounting theory or generally accepted accounting principles. Else, it represents one of the three sets of management accounting information. The two other sets are full cost information and differential cost information. In this unit you will study about the concept of responsibility accounting, design of the system and uses of responsibility accounting. In addition to this you will also learn performance evaluation of different segments besides transfer pricing.

The Concept of Responsibility Accounting

The framework of responsibility accounting was developed by Professor A.J.E. Sorgdrager titled "Particularisation of Indirect Costs". As the title suggests, responsibility accounting is a cost accounting system established on a responsibility basis. A basis is said to be responsible where actual results are as close to planned results as possible. As such, the variances are minimal. Planned results could be stated in budgets and standards. Properly speaking, responsibility accounting is a method of budgeting and performance reporting created around the structure of the organization. Individual managers are hold accountable for the costs within their jurisdiction. The purpose, obviously, is to exercise control over the operations. Hence, in simple words, it could be described as a system of collecting and reporting accounting data on the basis of managerial level. It may be defined as the approach to accountability- identification of cost, with the persons responsible for their incurrence. Performance is evaluated by assigned responsibilities. Reporting on performance is on the lines of organizational structure. There is a separate report for each box of the organization chart.

The concept emphasizes "personalization of costs" by putting questions as to where the cost was incurred and who were responsible for it. The technique seeks to control costs at the starting point. Broadly speaking, responsibility accounting is designing the accounting system according to answerability of the manager. The accumulation classification, measurement and reporting of financial data is so arranged that it promotes the fixing of precise responsibility on the concerned manager. Horngreen rightly says, "Responsibility accounting focuses on people and not on things. It is designed to present managers with information relating to their individual fields of responsibility''. The message is that since all items of income, operating costs, other expenses and capital expenditure are the responsibility of some manager, none should be left unassigned.

Responsibility accounting considers both historical and future costs. For some purposes, the activity of responsibility centers is expressed in historical amounts. For others, these are expressed in estimated future amounts.

Profit Planning and Control (PPC)

As mentioned earlier responsibility accounting is an important piece of the budgetary system. It provides for the reporting of operating data and budget comparisons to the individuals and groups who have organizational responsibility. Responsibility accounting, measures plans by budgets, and actions by actual results of each responsibility centre. If fully developed, it has a built-in budgetary system which perfectly fits the organizational chart. Budgeting provides the measuring stick by which the actual performance can be judged. Budgets, along with responsibility accounting provides systematic help to the managers if they interpret the feedback carefully.

When an integrated and comprehensive view is taken of budgeting, it becomes Profit Planning and Control (PPC). Desired or target profit figures are planned and controlled through a set of budgets. Here, responsibility accounting is the dominant concept as control is its crux. Performance is measured by using actual results. Responsibility Accounting Traditional cost accounting had been focused on determining the cost of products and services. In responsibility accounting, this is reversed. Costs are no longer associated with products and services. Else, the focus is on planning and control needs of management. Costs initially accumulated for control purposes are then recast for product costing purposes. The control aspect is emphasized by summarizing and reporting costs on the basis of individual responsibility before those costs are merged for product cost purposes.

Design of the System

In designing a system, one has to decide upon its structure and the process. So is the responsibility accounting. Its structure rests on the responsibility centres. The process consists of bifurcating costs into controllable and non-controllable groups, flexible budgeting, and performance reporting. These three dimensions of the process and, then, the structural reorganization could be called the principles or fundamentals of responsibility accounting. These are being discussed below:

1) **Establishing Responsibility Centers :** A responsibility centre (RC) is an organizational unit. It exists because of some functional activity for which each specific manager is

made responsible. Setting up of responsibility centres, therefore, becomes the first step. A large decentralized organization has to be restructured in terms of areas of influence. In ascending (i.e., rising) order of autonomy, these are cost centres, revenue centres, profit centres, and investment centres. The depth of use of responsibility accounting in the enterprise depends on the delegation of authority and assignment of responsibility. In a cost centre the manager is responsible only for the costs (expenses) incurred in his sub-unit. When actual costs of his sub-unit differ from budgeted costs then the manager must explain the significant variances. In a revenue centre, the manager is responsible for generating revenues too upto the budgeted levels. In a profit centre, the manager goes beyond, and is responsible also for profit performance. For instance, the manager of a furniture department of a departmental store is responsible for earning a profit on the furniture sold. He is expected to earn the budgeted amount of profit during the period. In an investment centre, the manager has the responsibility and control over the assets that are used to carry on its activities. For example, individual departments of a departmental store, and individual branches of a chain stores are investment centres. The manager of the concerned department is expected to achieve some target rate of return on investment. It should be noted that investment centre differs from a profit centre as investment centre is evaluated on the basis of the rate of return earned on the assets invested in the sub-unit or segment while a profit centre is evaluated on the basis of excess of revenue over the revenue for the period. Control can be exercised only though managers who are responsible for what the organization does. It is based on the principle that a manager's performance, should be assessed only on the factors that are within his span of control. Each manager's budget contains costs and revenues within his span of control. Generally costs are accumulated by departments.

Subsidiary revenue and expense accounts are created for each centre. These enable accounting transactions to be recorded not only by revenue and expense category, but also by the responsibility centre incurring the transaction. The accounting system can then summarize transactions by descriptive category for public reporting purposes, and by responsibility centre for purposes of performance evaluation. These accounts indicate how, at the lowest reporting level in an organization, performance reports show costs incurred in a division by descriptive category. At higher reporting levels, summaries reflect total costs incurred in subordinate responsibility centres.

2) **Limits to Controllable Costs:** Once the responsibility centres have been established in a company, costs and revenues under the control of each therein need be indicated. In responsibility accounting, the basis of classifying costs is controllability---the capability of the manager of a responsibility centre to influence (i.e., increase or decrease) them. As such, costs are accumulated and reported in the two groups of controllable and no controllable costs. The former are those which can be changed by the head of the responsibility centre. He has the ability to regulate the quantity or price or both of an item by his managerial action. Uncontrollable costs, obviously, are the costs which cannot be increased or decreased within a given time span at the discreation of the manager. But these can be changed at higher levels of management authority. Generally, costs of raw materials, direct labour and operating supplies are controllable. Fixed costs are non-controllable such as rentals, depreciation, and insurance on equipment. In this setup, no allocation of common or joint costs takes place, which by their very nature are quite indirect. Allocation is always an arbitrary process.

3) **Flexible Budgeting:** Responsibility accounting starts with the assumption that budgets are flexible. They have to be prepared for several levels of activity, instead of one static level. When actual output has been obtained, a fresh budget is prepared threof. Comparison of actual results is made against the budget targets freshly prepared for that level. It would be a weak analysis to use a budget based on a level of activity that differs from the actual level of activity. A performance budget is the flexible budget adjusted to the actual level attained. Flexible budgeting permits comparison of actual costs with budgeted costs that have been recast to changes in production volume. It would be recalled that flexible budgets are prepared either by the mathematical function or formula method, or the multi-activity method.

4) **Performance Reporting:** Each responsibility centre has to periodically report about its performance, the feedback. A report has both financial and statistical parts. It shows income, expenses and capital expenditures. Statistics such as volume of production, cost per unit, and manpower data are also provided. Typically, performance reports will disclose the actual costs incurred, the budgeted costs, and a variance, which is the difference between the actual and budgeted amounts. Normally these amounts will be summarized by the responsibility centre for the month being reported and also for the current year-to-date. The purpose is to take timely and corrective action. Performance

reports could be monthly, weekly, or even daily depending on the size of the organization and significance of the item. In addition, the report must be given to the manager while the information is still useful. Reports received weeks after the period are of little value. Further, once the performance reports are prepared, management need only to consider the significant variances from the budget. This is what is being referred to as management by exception.

Difficulties

Responsibility accounting is a conceptually appealing tool for motivation and control. But many organizations in practice do not achieve these objectives. Two major difficulties in implementing a successful responsibility accounting system are: Accumulation of mass of dats, and Development of appropriate performance measures. However, cost accumulation at such a detailed level throughout an organization is made practicable by the use of computer-based cost accounting systems. Computer programs can quickly summarize costs for each descriptive category for purposes of product costing and producing a traditional income statement. Similar programs can summarize costs by responsibility centres and generate the associated performance reports. Thus, the problem of data accumulation, although a substantial one can now be overcome through the use of computer technology. As a result, the problem of developing appropriate performance measures has become the more difficult one to resolve.

For a budgetary system to serve as an effective means of control, cost and revenues goals must be adopted by each manager and accepted as individual objectives. This is most likely to occur when budgeted goals are reasonable and realistically attainable and yet challenging. The cost accountant is in a position to identify these performance measure and to isolate the costs incurred in each responsibility centre. These costs must then be categorized as controllable and uncontrollable before the reporting structure is developed. These decisions will have a sound impact on the effectiveness of the system. Generally, responsibility accounting systems are used in conjunction with standard costs. A major task then of the cost accountant is of the development and then interpretation.

Uses of Responsibility Accounting

Responsibility accounting which focuses on managerial levels is an important aid in the management control process. It has several uses and confers many benefits. These are listed below:

i) **Performance Evaluation :** This is perhaps the biggest benefit. With responsibility localized, it is possible to rate individual managers on a cost basis. When a manager is held responsible for whatever he does, he become extravigilant. Responsibility accounting system provides the manager with information that helps controlling operations and evaluating the performance of subordinates.

ii) **Delegating Authority :** Large business firms can hardly survive without proper delegation of authority. By its very nature, responsibility accounting makes it happen. Decentralisation of power is its keypoint and, hence, delegation of authority follows.

iii) **Motivation :** Responsibility accounting is the use of accounting information for planning and control. When the managers know that they are being evaluated, they are prompted to put their heart and soul in meeting the targets set for them. It acts as a great stimulus. As a matter of fact, responsibility accounting is based on the motivating individual managers to maximum performance. The targets provide goals for achievement and serve to motivate managers to increase revenues or decrease costs.

iv) **Corrective Action :** If performance is unsatisfactory, the person responsible must be identified. It is only after identification of the erring subordinate that the corrective action can be taken. Under responsibility accounting, as areas of authority are clearly laid down, such corrective action becomes easier. The control action to be effective must occur immediately after identification of the causes of the problem. The longer control action is deferred, the greater the unfavourable financial effect.

v) **Management by Objectives :** The heads of divisions and departments are assigned definite objectives before the commencement of the period. They are held answerable for the attainment of these targets. Shortfalls are punished and excesses rewarded. Such a system helps in establishing the principle of management by objectives (MBO)

vi) **Management by Exception :** Performance reporting here, is on exceptions or deviations from the plan. The idea runs throughout the responsibility accounting. It helps managers by spending their time on major variances with greatest potential improvements. The concentration of managerial attention on exceptional or unusual items of deviation rather than on all is the key to success of the system.

vii) High Morale and Efficiency: Once it is clear that rewards are linked to the performance, it acts as a great morale booster. Great disappointment will be caused if an operating foreman is evaluated on the decisions in which he was not a party.

Illustration

Kelly Services Ltd. has five plants---A,B,C,D and E. Each plant has a forming, cleaning and packing department. Each level of management at the company has responsibility over costs incurred at its level. The budget for the year ended March, 2005 has been set up as follows:

Plant	**Budgeted Cost (Rs.)**
A	1,35,000
B	1,22,500
C	1,08,400
D	1,35,000
E	1,35,000

Budgeted information for Plant C is as follows:

	Rs.
Plant manager's office	2,350
Forming department	30,000
Cleaning department	55,450
Packing department	20,600

Budgeted information for Plant C forming department is as follows:

	Rs.
Direct material	8,333
Direct labour	15,000
Factory overhead	6,667

The following additional budgeted costs available:

	Rs.
President's Office	16,250
Vice President---Marketing	20,000
Vice President---Manufacturing office	4,167

The following actual costs were incurred during the year:

Plant	Budgeted Cost Rs.
A	1,27,650
B	1,24,300
C	1,08,475
D	1,31,100
E	1,36,800

Actual costs for Plant C Forming department were as follows:

	Rs.	
Direct materials	333	Under budget
Direct labour	4,000	Under budget
Factory overhead	333	Over budget

Actual cost for Plant C plant manager were:

	Rs.
Plant manager's office	2,475
Cleaning department	57,500
Packing department	22,500
Forming department	?

Actual costs for the president's level were:

	Rs.
President's Office	16,375

Vice president---marketing	29,800
Vice-president---manufacturing	6,33,315

Prepare a responsibility report for the year showing the details of the budgeted, actual and variance amounts for levels 1 through 4 for the following areas:

Level 1-Forming department---Plant C

Level 2-Plant manager---Plant C

Level 3-Vice president-manufacturing

Level 4-President.

Solution

Kelly Services

Responsibility Report for the Year ended March 2005

	Budgeted	**Actual**	**Variance**
Level 4-President:			
	Rs.	Rs.	Rs.
President's Office	16,250	16,375	125
Vice-president---marketing	20,000	29,800	9,800
Vice-president---manufacturing	6,40,000	6,33,315	(6,752)
	---	---	---
Total Controllable costs	6,76,250	6,79,490	3,173
	---	---	---

Level 3-Vice President---Manufacturing

Vice-president---manufacturing office:	4,167	4,990	* 823
Plant A	1,35,000	1,27,650	(7,350)
Plant B	1,22,500	1,24,300	1,800
Plant C	1,08,400	1,08,475	75
Plant D	1,35,000	1,31,100	(3,900)
Plant E	1,35,000	1,36,800	1,800
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Total Controllable Costs	6,40,067	6,33,315	(6752)

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Level 2 - Plant Manager ---Plant C:

Plant manager's office	2,350	2,475	125
Forming department	30,000	26,000	(4,000)
Cleaning department	55,450	57,500	2,050
Packing department	20,600	22,500	1,900
	---	---	---
Total controllable costs	1,08,400	1,08,475	75
	---	---	---

Level 1-Forming Department-Plant C:

Direct material	8,333	8,000	(333)
Direct labour	15,000	11,000	(4,000)
Factory overhead	6,667	7,000	333
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Total controllable costs	30,000	26,000	4,000
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* The difference in the actual total controllable cost arrived and the figure as given in the illustration is to be treated as the actual cost of manufacturing office of vice president.

( ) Variance favourable (Figures within parentheses indicate favourable variances)

Activity Based Costing

We have already discussed the concepts of cost, costing, cost accounting in the previous chapters. The accounting of 'overheads' is also discussed in detail in the chapter of 'overheads'. The main objective of any costing system is to determine scientifi cally the cost of a product or service. For facilitating the calculation, costs are divided into direct and indirect. Direct costs are the costs which are traceable to the products/ services offered. On the other hand, indirect costs which are also called as 'overheads' are not traceable to the products/services. Hence these costs are fi rst identifi ed, classifi ed, allocated, apportioned wherever allocation is

not possible, reapportioned and fi nally absorbed in the products/services. Charging the direct costs to the products is comparatively a simple procedure and can be done with remarkable accuracy. However, the indirect costs present problems in charging them to the products and there is a possibility of distortion of costs though the basis of charging them is quite logical. This is one of the limitation of the traditional costing system. For example, one of the methods of absorption of overheads is direct labor cost and this method is quite satisfactory when the overhead costs of indirect activities is a small percentage compared to direct labor component in actual making of products. However, the increased technology and automation has reduced the direct labor considerably and so the indirect activities have assumed greater importance. Therefore, using the direct labor as a basis for absorbing the overheads can lead to distortions in the costs. Distortions in the costs resulting into incorrect cost calculations may lead to following wrong decisions.

- Errors in fixation of selling prices.
- Wrong decisions regarding deciding of product mix.
- Ignoring customer orientation.
- Missing of profitable opportunities.

In order to overcome the limitations of traditional costing systems Activity Based Costing has been introduced.

Before we proceed to the other aspects of Activity Based Costing, let us see the limitations of traditional costing system. A brief mention of the same has already been made in the above paragraph. Some more points are discussed below.

Activity Based Costing – Various Issues

Meaning :- CIMA defines Activity Based Costing as, ‘cost attribution to cost units on the basis of benefit received from indirect activities e.g. ordering, setting up, assuring quality.’ One more definition of Activity Based Costing is, ‘the collection of financial and operational performance information tracing the significant activities of the firm to product costs.’ The following are the objectives of Activity Based Costing.

Objectives of Activity Based Costing

The objectives of Activity Based Costing are discussed below.

- To remove the distortions in computation of total costs as seen in the traditional costing system and bring more accuracy in the computation of costs of products and services.
- To help in decision making by accurately computing the costs of products and services.
- To identify various activities in the production process and further identify the value adding activities.
- To distribute overheads on the basis of activities.
- To focus on high cost activities.
- To identify the opportunities for improvement and reduction of costs.
- To eliminate non value adding activities.155

Working of Activity Based Costing

The working of Activity Based Costing is explained below.

• **Understanding and analyzing manufacturing process** :- For installation of any costing system, study of manufacturing process is essential. For Activity Based Costing system also, it is necessary to study the manufacturing process and ascertain various stages involved in the same so that 'activities' involved in the same can be identified.

• **Study of the Activities involved**:- The next step is to study the activities involved in the manufacturing process. This step is very crucial as the entire Activity Based Costing is based on identification of activities. In this step, the activities involved in a process are identified. For example, in a bank, opening of an account is one of the services offered to customers. In this service, activities involved are studied. It may be revealed that opening of a new account involves activities like issuing the application form, verification of the same and accepting the initial amount required for opening of an account. Similarly in case of a manufacturing company, purchase procedure may involve activities like receiving of purchase requisition for concerned department or the stores department, inviting quotations from various suppliers, placing of an order, follow up of the same and finally receiving and inspection of the goods. In case of an educational institute, activities in a library may include activities like issue of books, receipt of books, ordering new books, giving accession numbers, stock taking, removing obsolete and outdated books, identification of slow moving and fast

moving items etc. In this manner, whether in manufacturing or in service sector, activities are identified and the next step is to divide the activities into value adding and non value adding. The objective behind this is that attention can be focused on the value adding activities while non value adding activities can be eliminated in the future.

• **Activity Cost Pool :-** Cost pool is defined by CIMA as, 'the point of focus for the costs relating to a particular activity in an activity based costing system.' For example, in case of a library, the cost of issue and receipts, cost of ordering, stock taking costs etc. can be identified with 'Library Cost'. In other words, 'Library' will the cost pool in which all the costs mentioned above may be clubbed. In case of a manufacturing organization, as regards to stores, cost of classification, cost of issue of stores requisitions, inspection costs etc. can be pooled under the heading 'stores'. Thus cost pool concept is similar to the concept of cost center. The cost pool is the point of focus or in other words, it is the total cost assigned to an activity. It is the sum of all the cost elements assigned to an activity.

• **Cost Drivers** :- According to CIMA, 'cost driver is any factor which causes a change in the cost of an activity, e.g. the quality of parts received by an activity is a determining factor in the work required by that activity and therefore affects the resources required. An activity may have multiple cost drivers associated with it.' In other words, cost driver means the factors which determine the cost of an activity. For example, if we repeat the example of library, the number of receipts and issue of books will be cost drivers, in a stores, no. of stores requisitions will be cost drivers, in customer order processing the no. of customers as well as no. of orders will be cost drivers. Thus a cost driver is an activity which generates cost. Activity Based Costing is based on the belief that activities cause costs and therefore a link should be established between activities and product. The cost drivers thus are the link between the activities and the cost.

• **Identification of costs with the products :-** The final stage in Activity Based Costing is to identify the cost with the final products which can also be called as cost objects. Cost objects include, products, services, customers, projects and contracts. As mentioned earlier, direct costs can be identified easily with the products but the indirect costs can be linked with the products by identifying activities and cost drivers. Thus Activity Based Costing is the process of tracing costs first from resources to activities and then from activities to specific products.

• **Conclusion :-** It can be concluded that the Activity Based Costing is a costing system which tries to charge the indirect costs to the products and services fairly accurately. However for effective implementation there is a need of involvement of the staff and their training on continuous basis. Similarly there is a need to review the working of the system at periodic intervals and keep a follow up of the feedback received. These actions will ensure effective implementation of the system. Support of top management is also required for effective implementation of this system. Activity Based Costing system is definitely a better system but much depends on the implementation of the same.

Limitations of Activity Based Costing

Though this system is quite effective, it suffers from some limitations. These limitations are given below.

- Activity Based Costing is a complex system and requires lot of records and tedious calculations.
- For small organizations, traditional cost accounting system may be more beneficial than Activity Based Costing due to the simplicity of operation of the former.
- Sometimes it is difficult to attribute costs to single activities as some costs support several activities.
- There is a need of trained professionals who are limited in number.
- This system will be successful if there is a total support from the top management.
- Substantial investment of time and money is required for the implementation of this system.157

Problem 1:

1. The budgeted overheads and cost driver volumes of XYZ are as follows.

Cost Pool	Budgeted Overheads (Rs.)	Cost Driver	Budgeted Volume
Material Procurement	5,80,000	No.of Orders	1,100
Material handling	2,50,000	No. of movements	680
Set - up	4,15,000	No.of Set ups	520
Maintenance	9,70,000	Maintenance hours	8,400
Quality Control	1,76,000	No.of Inspection	900

Machinery	7,20,000	No.of machine hours	24,000

The company has produced a batch of 2,600 components of AX-15, its material cost was Rs. 1,30,000 and labor cost Rs. 2,45,000. The usage activities of the said batch are as follows.

Material orders – 26, maintenance hours – 690, material movements – 18, inspection – 28, set ups – 25, machine hours – 1,800

Calculate – cost driver rates that are used for tracing appropriate amount of overheads to the said batch and ascertain the cost of batch of components using Activity Based Costing.

Solution

The cost driver data will be determined as given below.

1. Cost driver data – The rate will be determined by dividing the amount by relevan factors. The calculations are shown below.

Particulars	**Details**	**Rate of cost drivers**
Material Procurement	Rs.5,80,000 / 1100	Rs.527
Material handling	Rs.2,50,000 / 680	Rs.368
Set up	Rs.4,15,000 / 520	Rs.798
Maintenance	Rs.9,70,000 / 8400	Rs.115
Quality Control	Rs.1,76,000 / 900	Rs.195
Machine	Rs.7,20,000 / 24,000	Rs.30

2. Calculation of a Batch of 2,600 components of AX – 15

Particulars	**Details**	**Amount in Rupees**
Direct Materials		1,30,000
Direct Labor		2,45,000
Prime Cost – Direct Materials + Direct Labor		3,75,000
Add : Overheads		
Particulars	**Details**	**Amount in Rupees**
Material Procurement	26 × Rs. 527158	13,702
Material handling	18 × Rs. 368158	6,624
Set-up cost	25 × Rs. 798158	19,950
Maintenance	690 × Rs. 115158	79,350
Quality control	28 × Rs. 195158	5,460

Machine	1,800 × Rs. 30159	54,000
Total		5,54,086

Note :- From the above calculations, it is clear that by using Activity Based Costing, there can be substantial accuracy in the overhead absorption. The overheads are charged on the basis of cost drivers and not on the basis of absorption rate.

Problem 2: A company manufactures two products, X and Y. The product X is a low volume and its sales are only Rs.5,000 p.a. Product Y is high volume and labor intensive, its sales are 25,000 units pa. Product X takes 6 labor hours to make one unit but Y requires 8 hours per unit. Details of costs for materials and labor for each product are as follows.

Particulars	**Product X**	**Product Y**
Direct Materials – Rs.	200	100
Direct Labor - @ Rs.10 per hour	60	80
Total	260	180

The company works 1,00,000 direct labor hours p.a. Total manufacturing overhead costs are Rs.17,50,000 p.a.

You are required to compute per unit cost of each product using,

I. Direct labor hour rate method for absorption of overhead costs and

II. Activity Based Costing technique for absorption of overhead costs

Solution

Firstly, we will calculate the Product Cost based on Direct Labor Hour Rate. The calculations are shown below.

A. Direct Labor Hour Rate :- Total manufacturing overheads / Total direct labor hours

Rs.17,50,000/1,00,000 = Rs. 17.50

B. Absorption of manufacturing overheads :-

Particulars	**Product X**	**Product Y**
Manufacturing Overheads	Rs.17.50 X 6 Direct Labor Hours = Rs. 105	Rs. 17.50 X 8 Direct Labor Hours = Rs.140

Overheads based on Activity Based Costing:-

A. Identification of Activities and Rate for each Activity:-

Particulars	**Total Overheads**	**Details of Activity**	**Rate per Activity (Rs.)**
Machine set up	4,50,000	10,000	45 per set up
Quality Inspection	3,00,000	15,000	20 per inspection
Production order	1,80,000	600	300 per order
Machine hours worked	6,25,000	50,000	12.5 per hour
Material receipts	1,95,000	1,500	130 per receipt
Total Overheads	17,50,000		

B. Allocation of overheads to Products on the basis of Activity Rates :-

Particulars	**Frequency of activity**	**Rate per activity**	**Product X Rs.**	**Product Y Rs.**
Machine set up	10,000	45	6,000 X Rs. 45 = Rs.2,70,000	4,000 X Rs.45 = Rs.1,80,000
Quality inspection	15,000	20	10,000 X Rs. 20 = Rs. 2,00,000	5,000 X Rs.20 = Rs.1,00,000
Production order	600	300	200 X Rs. 300 = Rs. 60,000	400 X Rs.300 = Rs.1,20,000
Machine hours worked	50,000	12.5	12,000 X Rs.12.5 = Rs. 1,50,000	38,000 X Rs.12.5 = Rs. 4,75,000
Material receipts	1,500	130	300 X Rs. 130 = Rs. 39,000	12,000 X Rs.130 = Rs. 1,56,000
Total overhead costs			7,19,000	10,31,000
Units produced			5,000	25,000

Overhead cost per unit			143.80	41.24

Computation of Total Cost under Traditional Cost Accounting and Activity Based Costing

Particulars	**Product X – Activity Based Costing**	**Product Y – Activity Based Costing**	**Product X – Traditional Costing**	**Product Y – Traditional Costing**
Direct Material	200	100	200	100
Direct Labor	60	80	60	80
Manufacturing overheads	143.80	41.24	105	140
Total cost of Manufacture	403.80	221.24	365	320

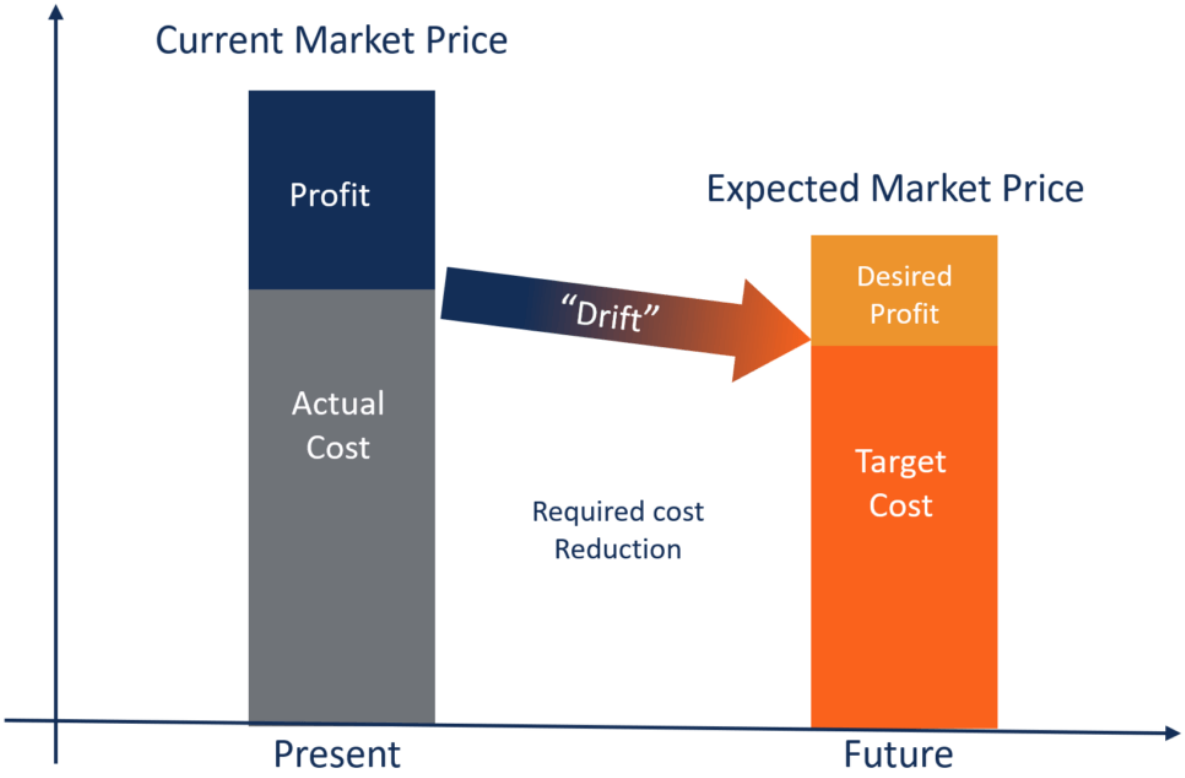
From the above comparative analysis it is clear that, under Traditional Costing, Product X is charged with Rs. 105 per unit as manufacturing overheads while in case of Product Y, the share of overhead cost is Rs. 140. Under Activity Based Costing the amount is Rs. 143.80 and Rs. 41.24 per unit. Thus due to Activity Based Costing, the distortion in cost is avoided.

Target Costing

Target costing is not just a method of costing, but rather a management technique wherein prices are determined by market conditions, taking into account several factors, such as homogeneous products, level of competition, no/low switching costs for the end customer, etc. When these factors come into the picture, management wants to control the costs, as they have little or no control over the selling price.

CIMA defines target cost as “a product cost estimate derived from a competitive market price.”

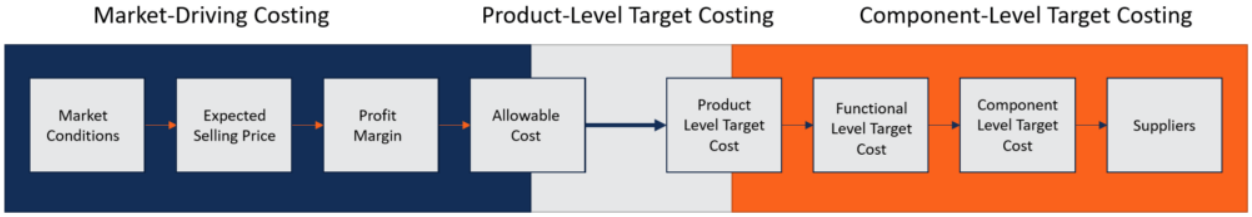
Target Costing = Selling Price – Profit Margin



Importance of Target Costing

In industries such as FMCG (Fast Moving Consumer Goods), construction, healthcare, and energy, competition is so intense that prices are determined by supply and demand in the market. Producers can't effectively control selling prices. They can only control, to some extent, their costs, so management's focus is on influencing every component of product, service, or operational costs.

The key objective of target costing is to enable management to use proactive cost planning, cost management, and cost reduction practices where costs are planned and calculated early in the design and development cycle, rather than during the later stages of product development and production.



Key Features of Target Costing

- The price of the product is determined by market conditions. The company is a **price taker** rather than a **price maker.**
- The minimum required profit margin is already included in the target selling price.
- It is part of management's strategy to focus on cost reduction and effective cost management.
- Product design, specifications, and customer expectations are already built-in while formulating the total selling price.
- The difference between the current cost and the target cost is the **"cost reduction,"** which management wants to achieve.
- A team is formed to integrate activities such as designing, purchasing, manufacturing, marketing, etc., to find and achieve the target cost.

Advantages of Target Costing

- It shows management's commitment to process improvements and product innovation to gain competitive advantages.
- The product is created from the expectation of the customer and, hence, the cost is also based on similar lines. Thus, the customer feels more value is delivered.
- With the passage of time, the company's operations improve drastically, creating economies of scale.
- The company's approach to designing and manufacturing products becomes market-driven.
- New market opportunities can be converted into real savings to achieve the best value for money rather than to simply realize the lowest cost.

Example

ABC Inc. is a big FMCG player that operates in a very competitive market. It sells packaged food to end customers. ABC can only charge $20 per unit. If the company's intended profit margin is 10% on the selling price, calculate the target cost per unit.

Solution

Target Profit Margin = 10% of 20 = Rs. 2 per unit

Target Cost = Selling Price – Profit Margin (20 – 2)

Target Cost = Rs. 18 per unit.

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